



2017 Annual Groundwater Monitoring and Corrective Action Report

CCR Annual Monitoring Report

Slag Pond Area

Big Stone Plant

Big Stone City, South Dakota

Prepared for
Otter Tail Power Company

January 2018

2017 CCR Annual Groundwater Monitoring and Corrective Action Report

Slag Pond Area

Big Stone Plant Big Stone City, South Dakota

January 2018

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Acronyms

Acronym	Description
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
OTP	Otter Tail Power Company
SSI	Statistically Significant Increase

1.0 Introduction

Otter Tail Power Company (OTP) operates Big Stone Plant, a coal-fired generation unit near Big Stone City, South Dakota. Coal combustion residuals (CCR) from plant operations are placed in an on-site surface impoundment, referred to as the Slag Pond. The Slag Pond is an incised impoundment that is required to comply with the provisions of the US Environmental Protection Agency (EPA) CCR Rule (40 CFR Parts 257 and 261 Disposal of Coal Combustion Residuals From Electric Utilities) for existing CCR surface impoundments.

CCR is temporarily stored in an on-site facility referred to as the Temporary Storage Area (TSA), which is required to comply with the applicable provisions of the CCR Rule for existing CCR landfills. The TSA is located adjacent to the Slag Pond.

The Slag Pond Area, in which the groundwater monitoring system is located, consists of the Slag Pond and TSA. The Slag Pond Area is shown on Figure 1. The Slag Pond Area is a multiunit groundwater monitoring system as allowed by § 257.91 (d).

This 2017 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) describes the monitoring program and results for the Slag Pond Area at Big Stone Plant (Site).

1.1 Purpose

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

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

1.2 Status of the Groundwater Monitoring and Corrective Action Program

Baseline monitoring was completed prior to October 17, 2017. The evaluation of groundwater monitoring data for statistically significant increases over background levels for the constituents listed in Appendix III from the CCR Rule began on October 17, 2017.

1.3 CCR Rule Requirements

This Annual Report has been prepared in accordance with the requirements of §257.90(e) of the CCR Rule, as outlined in the following Table 1.

Table 1 CCR Rule Requirements

CCR Rule Reference	Content Required in Report	Location
§257.90(e)(1)	Map showing the CCR unit and all monitoring wells that are part of the groundwater monitoring system	Section 2.1.1 Documentation - see Figure 1
§257.90(e)(2)	Discuss any new or decommissioned monitoring wells	Section 2.1.2 Changes to Monitoring System
§257.90(e)(3)	Provide the number and date groundwater samples were collected, and the monitoring (i.e., detection or assessment)	Section 2.2 Monitoring and Analytical Results
§257.90(e)(4)	Discuss any transition between monitoring programs	Section 2.4 Key Activities for Upcoming Year
§257.90(e)(5)	Other information specified in §257.90 through §257.98	Other information not required in this report

2.0 Groundwater Monitoring and Corrective Action Program

This section documents the status of the groundwater monitoring and corrective action program for the Slag Pond and TSA CCR units for the period starting with the effective date of the CCR Rule through the end of 2017. The groundwater monitoring system is described in Section 2.1, the monitoring and analytical results are described in Section 2.2, key actions completed and problems encountered are described in Section 2.3, and key activities planned for 2018 are described in Section 2.4.

2.1 Groundwater Monitoring System

2.1.1 Documentation

Figure 1 shows an aerial image of the CCR unit and all background (or upgradient) and downgradient monitoring wells, including the well identification numbers, that are part of the groundwater monitoring program, as required by §257.90(e)(1). Further details on the monitoring system and the CCR unit monitoring wells are included in the Groundwater Monitoring System Report, Big Stone Plant Slag Pond Area (Barr, 2016).

2.1.2 Changes to Monitoring System

The groundwater monitoring system was unchanged in 2017.

2.2 Monitoring and Analytical Results

CCR Rule provisions §257.90(e)(3) and §257.94(b) require collection of eight independent samples to establish background water quality for the detection monitoring program. A total of 56 (seven monitoring wells and eight sampling events) groundwater samples were collected and analyzed for the constituents listed in Appendices III and IV (Part 257) before October 17, 2017. Dates of sampling are reported on the field data sheets and analytical laboratory reports in Appendix A.

2.3 Key Actions Completed/Problems Encountered

The following key actions were completed for the groundwater monitoring program through 2017:

- Baseline groundwater samples were collected and analyzed for the constituents listed in Appendices III and IV from the CCR Rule.
- A statistical method was selected for evaluating groundwater monitoring data by a qualified professional engineer in 2017.

No problems were encountered during the report period.

2.4 Key Activities for Upcoming Year

The following key groundwater monitoring program activities are planned for 2018:

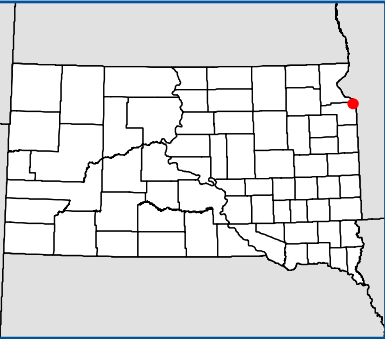
- Evaluate analytical results from the 2018 semiannual detection monitoring events for statistically significant increases (SSIs) according to the CCR Groundwater Sampling and Analysis Plan (Carlson McCain, 2017).
- Continue the groundwater monitoring program in accordance with the CCR rule.





3.0 References

Barr, 2016, Groundwater Monitoring System Report, Big Stone Plant Slag Pond Area. Prepared for Otter Tail Power Company. December 2016.

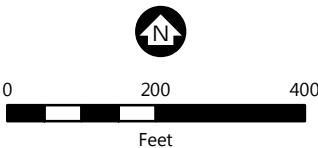
Carlson McCain, 2017. CCR Groundwater Sampling and Analysis Plan (Including Statistical Method Selection and Certification), Big Stone Plant Slag Pond Area. Prepared for Otter Tail Power Company. October 2017.

Figures



-  Upgradient Monitoring Well
-  Downgradient Monitoring Well
-  Slag Pond
-  Slag Laydown Area

Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



SITE LOCATION
Slag Pond Area
Big Stone Plant
Big Stone City, SD
Otter Tail Power Company

FIGURE 1



Appendices

Appendix A

Laboratory Reports and Field Sheets



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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FINAL REPORT COMPLETION DATE: 11 Oct 16 AX

Date Reported: 5 Oct 2016

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 31-0455
Account #: 006106
PO #: 48680

Project Name: BIG STONE PLANT CCR

T. T. T. 10/16
Field Service Manager/Date Reviewed
O. O. C. 05 Oct 2016
Chemistry Lab Manager/Date Reviewed
Mary Ann Baumgart 5 October 2016
Quality Assurance Director/Date Reviewed

RL = Reporting Limits
NQ = Not Present, Qualitative Only
PQ = Present, Qualitative Only
ND = Not Determined

All data for this report has been approved by MVTL Laboratory Management.

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



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PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016
 Lab Number: 16-A46030
 Work Order #: 31-0455
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 7 Sep 2016 12:08
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 8 Sep 2016 10:55
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG1

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					9 Sep 16	TWB
Water Digestions					9 Sep 16	TWB
Appearance, Field	CLOUDY		NA	SM 2110	7 Sep 16 12:08	AMG
Temperature - Field	14.77 deg. C		NA	170.1	7 Sep 16 12:08	AMG
Specific Conductance, Fld	2182 umhos/cm		1	120.1	7 Sep 16 12:08	AMG
pH, Field	7.17 units		1.00	I-1586-85	7 Sep 16 12:08	AMG
pH	* 7.2 units		1.0	SM 4500 H+B-96	8 Sep 16 15:44	JFG
Radium 226	See Attached					OL
Radium 228	See Attached			EPA M9320		OL
Sulfate	519 ~ mg/L		4.0	ASTM D516-02	15 Sep 16 8:59	KCJ
Chloride	15.2 mg/L		3.0	SM 4500 Cl E	15 Sep 16 7:52	AKF
Mercury	0.027 ug/L		0.005	EPA 245.7	16 Sep 16 11:40	TWB
Solids, Total Dissolved	1510 mg/L		10	SM 2540 C-97	9 Sep 16 9:15	RC
Calcium	265.0 mg/L		0.500	SW6010C	13 Sep 16 14:07	RMB
	See Narrative					
Lithium	0.095 mg/L		0.005	SW6010C	14 Sep 16 13:07	RMB
Barium	0.186 mg/L		0.005	SW6010C	13 Sep 16 14:07	RMB
Beryllium	< 0.005 mg/L		0.005	SW6010C	13 Sep 16 14:07	RMB
Chromium	0.012 mg/L		0.010	SW6010C	13 Sep 16 14:07	RMB
Cobalt	< 0.005 mg/L		0.005	SW6010C	13 Sep 16 14:07	RMB
	See Narrative					
Molybdenum	< 0.015 mg/L		0.015	SW6010C	13 Sep 16 14:07	RMB
Boron	2.020 mg/L		0.100	SW6010C	13 Sep 16 14:07	RMB
Antimony	< 2.5 @ ug/L		0.5	SW6020A	14 Sep 16 15:23	RMV
Arsenic	6.68 ug/L		0.50	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative					
Cadmium	0.63 ug/L		0.10	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative					
Lead	10.1 ug/L		0.50	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative					
Selenium	14.7 @ ug/L		0.50	SW6020A	14 Sep 16 15:23	RMV
Thallium	0.28 ug/L		0.10	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative					
Fluoride	0.370 mg/L		0.020	EPA 300.0	12 Sep 16 12:58	RMB

RL = Reporting Limit

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

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

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

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

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040

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



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Report Date: 5 Oct 2016
 Lab Number: 16-A46030
 Work Order #: 31-0455
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 7 Sep 2016 12:08
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 8 Sep 2016 10:55
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG1

Temp at Receipt: 3.0C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
-----------------------	--------------	---------------------	------------------	---------

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
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@ = Due to sample matrix # = Due to concentration of other analytes
 1 = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WH/DW # R-040

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PAUL VUKONICH
 OTTER TAIL POWER CO
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 FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016
 Lab Number: 16-AA6031
 Work Order #: 31-0455
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 7 Sep 2016 13:19
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 8 Sep 2016 10:55
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG4

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					9 Sep 16	TWB
Water Digestions					9 Sep 16	TWB
Appearance, Field	CLEAR		NA	SM 2110	7 Sep 16 13:19	AMG
Temperature - Field	10.70 deg. C		NA	170.1	7 Sep 16 13:19	AMG
Specific Conductance, Fld	2898 umhos/cm		1	120.1	7 Sep 16 13:19	AMG
pH, Field	6.73 units		1.00	I-1586-85	7 Sep 16 13:19	AMG
pH	* 6.8 units		1.0	SM 4500 H+B-96	8 Sep 16 15:44	JFG
Radium 226	See Attached					OL
Radium 228	See Attached			EPA M9320		OL
Sulfate	1490 ~ mg/L		4.0	ASTM D516-02	15 Sep 16 8:59	KCJ
Chloride	49.9 mg/L		3.0	SM 4500 Cl E	15 Sep 16 7:52	AKF
Mercury	< 0.005 ug/L		0.005	EPA 245.7	16 Sep 16 11:40	TWB
Solids, Total Dissolved	2540 mg/L		10	SM 2540 C-97	9 Sep 16 9:15	RC
Calcium	478.0 ~ mg/L		0.500	SW6010C	14 Sep 16 13:07	RMB
Lithium	0.201 mg/L		0.005	SW6010C	14 Sep 16 13:07	RMB
Barium	0.017 mg/L		0.005	SW6010C	13 Sep 16 14:07	RMB
Beryllium	< 0.005 mg/L		0.005	SW6010C	13 Sep 16 14:07	RMB
Chromium	< 0.01 mg/L		0.01	SW6010C	13 Sep 16 14:07	RMB
Cobalt	< 0.005 mg/L		0.005	SW6010C	13 Sep 16 14:07	RMB
	See Narrative					
Molybdenum	< 0.015 mg/L		0.015	SW6010C	13 Sep 16 14:07	RMB
Boron	0.875 mg/L		0.100	SW6010C	13 Sep 16 14:07	RMB
Antimony	< 2.5 @ ug/L		0.5	SW6020A	14 Sep 16 15:23	RMV
Arsenic	< 2.5 @ ug/L		0.5	SW6020A	14 Sep 16 15:23	RMV
Cadmium	< 0.5 @ ug/L		0.1	SW6020A	14 Sep 16 15:23	RMV
Lead	< 1 ug/L		0.5	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative					
Selenium	< 2.5 @ ug/L		0.5	SW6020A	14 Sep 16 15:23	RMV
Thallium	< 0.2 ug/L		0.1	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative					
Fluoride	0.160 mg/L		0.020	EPA 300.0	12 Sep 16 12:58	RMB

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
 The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NH/UN # R-040

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PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016
Lab Number: 16-A46031
Work Order #: 31-0455
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 7 Sep 2016 13:19
Sampled By: MVTI FIELD PERSONNEL
Date Received: 8 Sep 2016 10:55
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG4

Temp at Receipt: 3.0C

As Received
Result

Method
RL

Method
Reference

Date Analyzed

Analyst

* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards. The reporting limit was elevated for any analyte requiring a dilution as coded below:

for any analyte requiring a dilution as coded below:

s = Due to sample matrix	# = Due to concentration of other analytes
l = Due to sample quantity	+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WM/DN # R-040

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PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016
 Lab Number: 16-A46032
 Work Order #: 31-0455
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 7 Sep 2016 17:25
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 8 Sep 2016 10:55
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG5

Temp at Receipt: 3.0C

	AS Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				9 Sep 16	TWB
Water Digestions				9 Sep 16	TWB
Appearance, Field	SLIGHTLY CLOUDY	NA	SM 2110	7 Sep 16 17:25	DGF
Water Elevation	1083.53	NA	NA	7 Sep 16 17:25	DGF
Temperature - Field	11.45 deg. C	NA	170.1	7 Sep 16 17:25	DGF
Specific Conductance, Fld	894 umhos/cm	1	120.1	7 Sep 16 17:25	DGF
pH, Field	7.03 units	1.00	I-1586-85	7 Sep 16 17:25	DGF
pH	* 7.2 units	1.0	SM 4500 H+B-96	8 Sep 16 15:44	JFG
Radium 226	See Attached				OL
Radium 228	See Attached		EPA M9320		OL
Sulfate	109 @ mg/L	4.0	ASTM D516-02	15 Sep 16 8:59	KCJ
Chloride	11.7 mg/L	3.0	SM 4500 Cl E	15 Sep 16 7:52	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	16 Sep 16 11:40	TWB
Solids, Total Dissolved	514 mg/L	10	SM 2540 C-97	9 Sep 16 9:15	RC
Calcium	118.0 mg/L	0.500	SW6010C	13 Sep 16 14:07	RMB
	See Narrative				
Lithium	0.026 mg/L	0.005	SW6010C	14 Sep 16 13:07	RMB
Barium	0.144 mg/L	0.005	SW6010C	13 Sep 16 14:07	RMB
Beryllium	< 0.005 mg/L	0.005	SW6010C	13 Sep 16 14:07	RMB
Chromium	< 0.01 mg/L	0.01	SW6010C	13 Sep 16 14:07	RMB
Cobalt	< 0.005 mg/L	0.005	SW6010C	13 Sep 16 14:07	RMB
	See Narrative				
Molybdenum	0.017 mg/L	0.015	SW6010C	13 Sep 16 14:07	RMB
Boron	0.499 mg/L	0.100	SW6010C	13 Sep 16 14:07	RMB
Antimony	< 2.5 @ ug/L	0.5	SW6020A	14 Sep 16 15:23	RMV
Arsenic	1.70 ug/L	0.50	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative				
Cadmium	0.30 ug/L	0.10	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative				
Lead	1.27 ug/L	0.50	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative				
Selenium	< 2.5 @ ug/L	0.5	SW6020A	14 Sep 16 15:23	RMV
Thallium	< 0.2 ug/L	0.1	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative				
Fluoride	0.250 mg/L	0.020	EPA 300.0	12 Sep 16 12:58	RMB

RL = Reporting Limit

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

@ = Due to sample matrix # = Due to concentration of other analytes
 I = Due to sample quantity + = Due to internal standard response

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MINNESOTA VALLEY TESTING LABORATORIES, INC.

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2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724
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PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016
Lab Number: 16-A46032
Work Order #: 31-0455
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 7 Sep 2016 17:25
Sampled By: MVTI FIELD PERSONNEL
Date Received: 8 Sep 2016 10:55
PO #: 48680

Temp at Receipt: 3.0C

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG5

As Received
Result

Method

RL

Method
Reference

Date Analyzed

Analyst

* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards. The reporting limit was elevated for any analyte requiring a dilution as coded below:

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

@ =	Due to sample matrix	# =	Due to concentration of other analytes
1 =	Due to sample quantity	+	Due to internal standard response

CERTIFICATION: NN LAB # 027-015-125 WI LAB # 939447680 ND MICRO + 103-M ND WH/DW # R-040



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PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016
 Lab Number: 16-A46033
 Work Order #: 31-0455
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 7 Sep 2016 13:54
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 8 Sep 2016 10:55
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG6

Temp at Receipt: 3.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				9 Sep 16	TWB
Water Digestions				9 Sep 16	TWB
Appearance, Field	CLOUDY	NA	SM 2110	7 Sep 16 13:54	AMG
Water Elevation	1086.45	NA	NA	7 Sep 16 13:54	AMG
Temperature - Field	12.78 deg. C	NA	170.1	7 Sep 16 13:54	AMG
Specific Conductance, fld	1530 umhos/cm	1	120.1	7 Sep 16 13:54	AMG
pH, Field	7.05 units	1.00	I-1586-85	7 Sep 16 13:54	AMG
pH	* 7.1 units	1.0	SM 4500 H+R-96	8 Sep 16 15:44	JFG
Radium 226	See Attached				OL
Radium 228	See Attached				OL
Sulfate	501 - mg/L	4.0	ASTM D516-02	15 Sep 16 8:59	KCJ
Chloride	5.8 mg/L	3.0	SM 4500 Cl E	15 Sep 16 7:52	AKF
Mercury	0.028 ug/L	0.005	BEA 245.7	16 Sep 16 11:40	TWB
Solids, Total Dissolved	1160 mg/L	10	SM 2540 C-97	9 Sep 16 9:15	RC
Calcium	221.0 mg/L	0.500	SW6010C	13 Sep 16 14:07	RMB
	See Narrative				
Lithium	0.139 mg/L	0.005	SW6010C	14 Sep 16 13:07	RMB
Barium	0.204 mg/L	0.005	SW6010C	13 Sep 16 14:07	RMB
Beryllium	< 0.005 mg/L	0.005	SW6010C	13 Sep 16 14:07	RMB
Chromium	0.015 mg/L	0.010	SW6010C	13 Sep 16 14:07	RMB
Cobalt	< 0.005 mg/L	0.005	SW6010C	13 Sep 16 14:07	RMB
	See Narrative				
Molybdenum	0.019 mg/L	0.015	SW6010C	13 Sep 16 14:07	RMB
Boron	2.340 mg/L	0.100	SW6010C	13 Sep 16 14:07	RMB
Antimony	< 2.5 @ ug/L	0.5	SW6020A	14 Sep 16 15:23	RMV
Arsenic	7.35 ug/L	0.50	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative				
Cadmium	0.63 ug/L	0.10	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative				
Lead	8.26 ug/L	0.50	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative				
Selenium	4.93 @ ug/L	0.50	SW6020A	14 Sep 16 15:23	RMV
Thallium	0.28 ug/L	0.10	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative				
Fluoride	0.530 mg/L	0.020	EPA 300.0	12 Sep 16 12:58	RMB

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
 The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix * = Due to concentration of other analytes
 † = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WWT/DR # R-040

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



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PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016
Lab Number: 16-A46033
Work Order #: 31-0455
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 7 Sep 2016 13:54
Sampled By: MVTL FIELD PERSONNEL
Date Received: 8 Sep 2016 10:55
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG6

Temp at Receipt: 3.0C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
-----------------------	--------------	---------------------	------------------	---------

* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WM/DW # R-040

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PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016
 Lab Number: 16-A46034
 Work Order #: 31-0455
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 7 Sep 2016 14:37
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 8 Sep 2016 10:55
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG7

Temp at Receipt: 3.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				9 Sep 16	TWB
Water Digestions				9 Sep 16	TWB
Appearance, Field	CLOUDY	NA	SM 2110	7 Sep 16 14:37	AMG
Water Elevation	1098.81	NA	NA	7 Sep 16 14:37	AMG
Temperature - Field	11.66 deg. C	NA	170.1	7 Sep 16 14:37	AMG
Specific Conductance, Fld	2237 umhos/cm	1	120.1	7 Sep 16 14:37	AMG
pH, Field	7.04 units	1.00	I-1586-85	7 Sep 16 14:37	AMG
pH	* 7.3 units	1.0	SM 4500 H+B-96	8 Sep 16 15:44	JFG
Radium 226	See Attached				OL
Radium 228	See Attached		EPA M9320		OL
Sulfate	869 - mg/L	4.0	ASTM D516-02	15 Sep 16 8:59	KCJ
Chloride	5.3 mg/L	3.0	SM 4500 Cl E	15 Sep 16 7:52	AKF
Mercury	0.013 ug/L	0.005	EPA 245.7	16 Sep 16 11:40	TWB
Solids, Total Dissolved	1650 mg/L	10	SM 2540 C-97	9 Sep 16 9:15	RC
Calcium	407.0 - mg/L	0.500	SW6010C	14 Sep 16 13:07	RMB
Lithium	0.098 mg/L	0.005	SW6010C	14 Sep 16 13:07	RMB
Barium	0.134 mg/L	0.005	SW6010C	13 Sep 16 14:07	RMB
Beryllium	< 0.005 mg/L	0.005	SW6010C	13 Sep 16 14:07	RMB
Chromium	< 0.01 mg/L	0.01	SW6010C	13 Sep 16 14:07	RMB
Cobalt	< 0.005 mg/L	0.005	SW6010C	13 Sep 16 14:07	RMB
	See Narrative				
Molybdenum	0.017 mg/L	0.015	SW6010C	13 Sep 16 14:07	RMB
Boron	1.220 mg/L	0.100	SW6010C	13 Sep 16 14:07	RMB
Antimony	< 2.5 @ ug/L	0.5	SW6020A	14 Sep 16 15:23	RMV
Arsenic	4.68 @ ug/L	0.50	SW6020A	14 Sep 16 15:23	RMV
Cadmium	0.55 ug/L	0.10	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative				
Lead	5.00 ug/L	0.50	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative				
Selenium	3.96 @ ug/L	0.50	SW6020A	14 Sep 16 15:23	RMV
Thallium	< 0.2 ug/L	0.1	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative				
Fluoride	0.400 mg/L	0.020	EPA 300.0	12 Sep 16 12:58	RMB

RL = Reporting Limit

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

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

@ = Due to sample matrix # = Due to concentration of other analytes
 I = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NH/DW # R-010

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PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016
 Lab Number: 16-A46035
 Work Order #: 31-0455
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 7 Sep 2016 16:44
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 8 Sep 2016 10:55
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAGS

Temp at Receipt: 3.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				9 Sep 16	TWB
Water Digestions				9 Sep 16	TWB
Appearance, Field	SLIGHTLY CLOUDY	NA	SM 2110	7 Sep 16 16:44	AMG
Water Elevation	1110.29	NA	NA	7 Sep 16 16:44	AMG
Temperature - Field	12.75 deg. C	NA	170.1	7 Sep 16 16:44	AMG
Specific Conductance, Fld	1329 umhos/cm	1	120.1	7 Sep 16 16:44	AMG
pH, Field	7.24 units	1.00	I-1586-85	7 Sep 16 16:44	AMG
pH	* 7.4 units	1.0	SM 4500 H+B-96	8 Sep 16 16:06	JFG
Radium 226	See Attached				OL
Radium 228	See Attached		EPA M9320		OL
Sulfate	284 @ mg/L	4.0	ASTM D516-02	15 Sep 16 9:17	KCJ
Chloride	33.0 mg/L	3.0	SM 4500 Cl B	15 Sep 16 8:10	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	16 Sep 16 12:23	TWB
Solids, Total Dissolved	839 mg/L	10	SM 2540 C-97	9 Sep 16 9:15	RC
Calcium	126.0 mg/L	0.500	SW6010C	13 Sep 16 14:29	RMB
Lithium	0.058 mg/L	0.005	SW6010C	14 Sep 16 13:34	RMB
Barium	0.052 mg/L	0.005	SW6010C	13 Sep 16 14:29	RMB
Beryllium	< 0.005 mg/L	0.005	SW6010C	13 Sep 16 14:29	RMB
Chromium	< 0.01 mg/L	0.01	SW6010C	13 Sep 16 14:29	RMB
Cobalt	< 0.005 mg/L	0.005	SW6010C	13 Sep 16 14:29	RMB
	See Narrative				
Molybdenum	< 0.015 mg/L	0.015	SW6010C	13 Sep 16 14:29	RMB
Boron	0.407 mg/L	0.100	SW6010C	13 Sep 16 14:29	RMB
Antimony	< 2.5 @ ug/L	0.5	SW6020A	14 Sep 16 16:32	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	14 Sep 16 16:32	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	14 Sep 16 16:32	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	14 Sep 16 16:32	RMV
Selenium	19.9 @ ug/L	0.50	SW6020A	14 Sep 16 16:32	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	14 Sep 16 16:32	RMV
Fluoride	0.590 mg/L	0.020	EPA 300.0	12 Sep 16 20:17	RMB

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
 The reporting limit was elevated for any analyte requiring a dilution as coded below:
 @ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WY/DN # R-040

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PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016
 Lab Number: 16-A46036
 Work Order #: 31-0455
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 7 Sep 2016 18:19
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 8 Sep 2016 10:55
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG9

Temp at Receipt: 3.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				9 Sep 16	TWB
Water Digestions				9 Sep 16	TWB
Appearance, Field	CLOUDY	NA	SM 2110	7 Sep 16 18:19	AMG
Water Elevation	1105.04	NA	NA	7 Sep 16 18:19	AMG
Temperature - Field	12.19 deg. C	NA	170.1	7 Sep 16 18:19	AMG
Specific Conductance, Fld	2255 umhos/cm	1	120.1	7 Sep 16 18:19	AMG
pH, Field	7.10 units	1.00	I-1586-85	7 Sep 16 18:19	AMG
pH	* 7.2 units	1.0	SM 4500 H+B-96	8 Sep 16 16:06	JFG
Radium 226	See Attached				OL
Radium 228	See Attached		EPA M9320		OL
Sulfate	1110 - mg/L	4.0	ASTM D516-02	15 Sep 16 9:17	KCJ
Chloride	6.6 mg/L	3.0	SM 4500 Cl E	15 Sep 16 8:10	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	16 Sep 16 12:23	TWB
Solids, Total Dissolved	1920 mg/L	10	SM 2540 C-97	9 Sep 16 9:15	RC
Calcium	416.0 - mg/L	0.500	SW6010C	14 Sep 16 13:34	RMB
Lithium	0.122 mg/L	0.005	SW6010C	14 Sep 16 13:34	RMB
Barium	0.071 mg/L	0.005	SW6010C	13 Sep 16 14:29	RMB
Beryllium	< 0.005 mg/L	0.005	SW6010C	13 Sep 16 14:29	RMB
Chromium	< 0.01 mg/L	0.01	SW6010C	13 Sep 16 14:29	RMB
Cobalt	< 0.005 mg/L	0.005	SW6010C	13 Sep 16 14:29	RMB
	See Narrative				
Molybdenum	0.016 mg/L	0.015	SW6010C	13 Sep 16 14:29	RMB
Boron	0.250 mg/L	0.100	SW6010C	13 Sep 16 14:29	RMB
Antimony	< 2.5 @ ug/L	0.5	SW6020A	14 Sep 16 16:32	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	14 Sep 16 16:32	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	14 Sep 16 16:32	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	14 Sep 16 16:32	RMV
Selenium	< 2.5 @ ug/L	0.5	SW6020A	14 Sep 16 16:32	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	14 Sep 16 16:32	RMV
Fluoride	0.230 mg/L	0.020	EPA 300.0	12 Sep 16 20:17	RMB

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit
 Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
 The reporting limit was elevated for any analyte requiring a dilution as coded below:
 @ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity * = Due to internal standard response
 CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-N ND NW/DW # R-040

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PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016
 Lab Number: 16-A46037
 Work Order #: 31-0455
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 7 Sep 2016 18:27
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 8 Sep 2016 10:55
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG9 DEEP

Temp at Receipt: 3.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				9 Sep 16	TWB
Water Digestions				9 Sep 16	TWB
Appearance, Field	CLOUDY	NA	SM 2110	7 Sep 16 18:22	DGF
Water Elevation	1086.11	NA	NA	7 Sep 16 18:22	DGF
Temperature - Field	13.82 deg. C	NA	170.1	7 Sep 16 18:22	DGF
Specific Conductance, Fld	3345 umhos/cm	1	120.1	7 Sep 16 18:22	DGF
pH, Field	11.60 units	1.00	I-1586-85	7 Sep 16 18:22	DGF
pH	* 9.6 units	1.0	SM 4500 H+B-96	8 Sep 16 16:06	JFG
Radium 226	See Attached				OL
Radium 228	See Attached		EPA M9320		OL
Sulfate	1510 ~ mg/L	4.0	ASTM D516-02	15 Sep 16 9:17	KCJ
Chloride	16.5 mg/L	3.0	SM 4500 Cl E	15 Sep 16 8:10	AKF
Mercury	0.009 ug/L	0.005	EPA 245.7	16 Sep 16 12:23	TWB
Solids, Total Dissolved	2090 mg/L	10	SM 2540 C-97	9 Sep 16 9:15	RC
Calcium	339.0 mg/L	0.500	SW6010C	13 Sep 16 14:29	RMB
Lithium	0.212 mg/L	0.005	SW6010C	14 Sep 16 13:34	RMB
Barium	0.126 mg/L	0.005	SW6010C	13 Sep 16 14:29	RMB
Beryllium	< 0.005 mg/L	0.005	SW6010C	13 Sep 16 14:29	RMB
Chromium	< 0.01 mg/L	0.01	SW6010C	13 Sep 16 14:29	RMB
Cobalt	< 0.005 mg/L	0.005	SW6010C	13 Sep 16 14:29	RMB
	See Narrative				
Molybdenum	0.024 mg/L	0.015	SW6010C	13 Sep 16 14:29	RMB
Boron	0.288 mg/L	0.100	SW6010C	13 Sep 16 14:29	RMB
Antimony	< 2.5 @ ug/L	0.5	SW6020A	14 Sep 16 16:32	RMV
Arsenic	4.16 @ ug/L	0.50	SW6020A	14 Sep 16 16:32	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	14 Sep 16 16:32	RMV
Lead	4.57 @ ug/L	0.50	SW6020A	14 Sep 16 16:32	RMV
Selenium	< 2.5 @ ug/L	0.5	SW6020A	14 Sep 16 16:32	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	14 Sep 16 16:32	RMV
Fluoride	0.110 mg/L	0.020	EPA 300.0	12 Sep 16 20:17	RMB

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

OL = Analysis performed by an Outside Laboratory.

RL - Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards. The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity * = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 MI LAB # 999447680 ND MICRO # 1013-M ND WQ/DH # R-040

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



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 2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724
 1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
 www.mvttl.com



Page: 24 of 27

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016
 Lab Number: 16-A46038
 Work Order #: 31-0455
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 7 Sep 2016 18:52
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 8 Sep 2016 10:55
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG2B

Temp at Receipt: 3.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				9 Sep 16	TWB
Water Digestions				9 Sep 16	TWB
Appearance, Field	CLOUDY	NA	SM 2110	7 Sep 16 18:52	AMG
Water Elevation	1083.13	NA	NA	7 Sep 16 18:52	AMG
Temperature - Field	17.49 deg. C	NA	170.1	7 Sep 16 18:52	AMG
Specific Conductance, Fld	1919 umhos/cm	1	120.1	7 Sep 16 18:52	AMG
pH, Field	7.32 units	1.00	I-1586-85	7 Sep 16 18:52	AMG
pH	* 7.4 units	1.0	SM 4500 H+B-96	8 Sep 16 16:06	JFG
Radium 226	See Attached				OL
Radium 228	See Attached		EPA M9320		OL
Sulfate	830 - mg/L	4.0	ASTM D516-02	15 Sep 16 9:17	KCJ
Chloride	57.8 mg/L	3.0	SM 4500 Cl E	15 Sep 16 8:10	AKF
Mercury	0.077 ug/L	0.005	EPA 245.7	16 Sep 16 12:23	TWB
Solids, Total Dissolved	1510 mg/L	10	SM 2540 C-97	9 Sep 16 9:15	RC
Calcium	358.0 mg/L	0.500	SW6010C	13 Sep 16 14:29	RMB
Lithium	0.055 mg/L	0.005	SW6010C	14 Sep 16 13:34	RMB
Barium	0.482 mg/L	0.005	SW6010C	13 Sep 16 14:29	RMB
Beryllium	< 0.005 mg/L	0.005	SW6010C	13 Sep 16 14:29	RMB
Chromium	0.068 mg/L	0.010	SW6010C	13 Sep 16 14:29	RMB
Cobalt	0.016 * mg/L	0.005	SW6010C	14 Sep 16 13:34	RMB
Molybdenum	< 0.015 mg/L	0.015	SW6010C	13 Sep 16 14:29	RMB
Boron	3.830 mg/L	0.100	SW6010C	13 Sep 16 14:29	RMB
Antimony	< 5 @ ug/L	0.5	SW6020A	14 Sep 16 16:32	RMV
Arsenic	18.3 @ ug/L	0.50	SW6020A	14 Sep 16 16:32	RMV
Cadmium	1.27 @ ug/L	0.10	SW6020A	14 Sep 16 16:32	RMV
Lead	22.3 @ ug/L	0.50	SW6020A	14 Sep 16 16:32	RMV
Selenium	6.04 @ ug/L	0.50	SW6020A	14 Sep 16 16:32	RMV
Thallium	< 1 @ ug/L	0.1	SW6020A	14 Sep 16 16:32	RMV
Fluoride	0.090 mg/L	0.020	EPA 300.0	12 Sep 16 20:17	RMB

RL = Reporting Limit
 Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
 The reporting limit was elevated for any analyte requiring a dilution as coded below:
 @ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response
 CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 MD MICRO # 1013-M MD HW/DW # R-040

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

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www.mvlt.com



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PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016
Lab Number: 16-A46038
Work Order #: 31-0455
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 7 Sep 2016 18:52
Sampled By: MVTI FIELD PERSONNEL
Date Received: 8 Sep 2016 10:55
PO #: 48680

Temp at Receipt: 3.0C

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG2B

As Received
Result

Method

RL

Method
Reference

Date Analyzed

Analyst

* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND HW/CH # R-040

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



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 9/30/2016
Report ID S1609153001

ProjectName: 31-0455
Lab ID: S1609153-006
ClientSample ID: A46030 Slag 1
COC:

WorkOrder: S1609153
CollectionDate: 9/7/2016 12:08:00 PM
DateReceived: 9/9/2016 11:50:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	09/20/2016 1422	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/20/2016 1422	MB
Radium 228	4.1	pCi/L		2	Ga-Tech	09/24/2016 1957	MB
Radium 228 Precision (±)	2.8	pCi/L			Ga-Tech	09/24/2016 1957	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

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Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 9/30/2016
Report ID S1609153001

ProjectName: 31-0455
Lab ID: S1609153-007
ClientSample ID: A46031 Slag 4
COC:

WorkOrder: S1609153
CollectionDate: 9/7/2016 1:19:00 PM
DateReceived: 9/9/2016 11:50:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	09/20/2016 1422 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/20/2016 1422 MB
Radium 228	ND	pCi/L		2	Ga-Tech	09/24/2016 2258 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	09/24/2016 2258 MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



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Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 9/30/2016
Report ID S1609153001

ProjectName: 31-0455
Lab ID: S1609153-008
ClientSample ID: A46032 Slag 5
COC:

WorkOrder: S1609153
CollectionDate: 9/7/2016 5:25:00 PM
DateReceived: 9/9/2016 11:50:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	09/20/2016 1422	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/20/2016 1422	MB
Radium 228	ND	pCi/L		2	Ga-Tech	09/25/2016 159	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	09/25/2016 159	MB

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

Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

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Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: 31-0455
Lab ID: S1609153-009
ClientSample ID: A46033 Slag 6
COC:

Date Reported: 9/30/2016
Report ID: S1609153001
WorkOrder: S1609153
CollectionDate: 9/7/2016 1:54:00 PM
DateReceived: 9/9/2016 11:50:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	09/20/2016 1422	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/20/2016 1422	MB
Radium 228	ND	pCi/L		2	Ga-Tech	09/25/2016 500	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	09/25/2016 500	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by: Wade Nieuwsma
Wade Nieuwsma, Assistant Laboratory Manager

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Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 9/30/2016
Report ID S1609153001

ProjectName: 31-0455
Lab ID: S1609153-010
ClientSample ID: A46034 Slag 7
COC:

WorkOrder: S1609153
CollectionDate: 9/7/2016 2:37:00 PM
DateReceived: 9/9/2016 11:50:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	09/20/2016 1422	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/20/2016 1422	MB
Radium 228	ND	pCi/L		2	Ga-Tech	09/25/2016 801	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	09/25/2016 801	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



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Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 9/30/2016
Report ID S1609153001

ProjectName: 31-0455
Lab ID: S1609153-011
ClientSample ID: A46035 Slag 8
COC:

WorkOrder: S1609153
CollectionDate: 9/7/2016 4:44:00 PM
DateReceived: 9/9/2016 11:50:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	09/20/2016 1656	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/20/2016 1656	MB
Radium 228	ND	pCi/L		2	Ga-Tech	09/25/2016 1102	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	09/25/2016 1102	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



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Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 9/30/2016
Report ID S1609153001

ProjectName: 31-0455
Lab ID: S1609153-012
ClientSample ID: A46036 Slag 9
COC:

WorkOrder: S1609153
CollectionDate: 9/7/2016 6:19:00 PM
DateReceived: 9/9/2016 11:50:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	09/20/2016 1656	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/20/2016 1656	MB
Radium 228	ND	pCi/L		2	Ga-Tech	09/25/2016 1403	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	09/25/2016 1403	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by: Wade Nieuwsma
Wade Nieuwsma, Assistant Laboratory Manager

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Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: 31-0455
Lab ID: S1609153-013
ClientSample ID: A46037 Slag 9 Deep
COC:

Date Reported: 9/30/2016
Report ID: S1609153001

WorkOrder: S1609153
CollectionDate: 9/7/2016 6:27:00 PM
DateReceived: 9/9/2016 11:50:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	09/20/2016 1656	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/20/2016 1656	MB
Radium 228	ND	pCi/L		2	Ga-Tech	09/25/2016 1705	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	09/25/2016 1705	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 9/30/2016
Report ID S1609153001

ProjectName: 31-0455
Lab ID: S1609153-014
ClientSample ID: A46038 Slag 2B
COC:

WorkOrder: S1609153
CollectionDate: 9/7/2016 6:52:00 PM
DateReceived: 9/9/2016 11:50:00 AM
FieldSampler:
Matrix: Water


Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	09/20/2016 1656 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/20/2016 1656 MB
Radium 228	2.1	pCi/L		2	Ga-Tech	09/25/2016 2006 MB
Radium 228 Precision (±)	3.2	pCi/L			Ga-Tech	09/25/2016 2006 MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager

Page 14 of 14

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607

507 354 8517

Groundwater Assessment

Sampling Personnel

Alan Gleisner

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 7 Sep 10

Unique Station ID:

Sample ID: Slag 1

Well Condition

Well Locked? Yes No

Well Labeled? Yes No

Casing Straight? Yes No

Repairs Necessary:

Protective Posts? Yes No

State ID Tag? Yes No

Grout Seal Intact? Yes No

Well Information

Well Depth: 35.13

Constructed Depth: 34.90

Casing Diameter: 2"

Water Level Before Purge: 13.08

Well Volume: 2.73 Gallons

Well Casing Elevation: NA

Static Water Elevation: I

Previous Static: I

Water Level After Sample: 33.67

Measurement Method: Elec. WLI Steel Tape

Sampling Information

Weather Conditions Temp: 65 Wind: L-V Sky: Drizzle

Sampling Method: Grundfos Bladder SS/T Disp. Baller Whale Grab Other:

Dedicated Equipment Yes No

Well Purged Dry? Yes No

Time Purged Dry? 1203

Duplicate Sample? Yes No ID: -

Sample Appearance General: Cloudy Color: Tan Phase: None Odor: None

Pumping Rate: 0.25 gpm

Time Pump Began: 1151 am / pm

Time of Sampling: 1208 am / pm

Sample EH: 107.0

Time@	pH	Specific	Temp	D. O.	Turbidity	Gallons	SEQ	Comments:
1203	7.05	1969	14.06	NA	NA	3.0	1	
1215						6.0	2	
1227						2.0	3	
							4	
1208	7.17	2182	14.77			3.0	5	Recharge

Stabilize Yes No

Amount Water Removed: 3.0

Gallons

Comments:

Exceptions to Protocol:

- Very Slow Recharge

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Alex Gleason

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date:

7 Sep 16

Unique Station ID

Sample ID:

Slag 4

Well Condition

Well Locked? Yes No

Well Labeled? Yes No

Casing Straight? Yes No

Repairs Necessary:

Protective Posts? Yes No

State ID Tag? Yes No

Grout Seal Intact? Yes No

Well Information

Well Depth: 37.23

Constructed Depth: 39.00

Casing Diameter: 2"

Water Level Before Purge: 19.72

Well Volume: 3.18 Gallons

Well Casing Elevation:

Static Water Elevation:

Previous Static:

Water Level After Sam: 24.98

Measurement Method: Elec. W/L Steel Tape

Sampling Information

Weather Conditions: Temp: 65 Wind: L+U Sky: Drizzle

Sampling Method: Grundfos Bladder Disp. B+Whale Grab Other:

Dedicated Equipment: Yes No Pumping Rate: 0.25 gpm

Well Purged Dry? Yes No Time Pump Began: 1240 am / pm

Time Purged Dry? — Time of Sampling: 1319 am / pm

Duplicate Sample? Yes No ID: — Sample E: 100.1

Sample Appearance: General: Clear Color: None Phase: None Odor: None

Time	pH	Specific	Temp	D. O.	Turbidity	Gallons	SE	Comments:
<u>1253</u>	<u>6.74</u>	<u>3019</u>	<u>10.72</u>	<u>NA</u>	<u>NA</u>	<u>3.25</u>	<u>1</u>	
<u>1306</u>	<u>6.74</u>	<u>2909</u>	<u>10.66</u>	<u>NA</u>	<u>NA</u>	<u>6.50</u>	<u>2</u>	
<u>1319</u>	<u>6.73</u>	<u>2898</u>	<u>10.70</u>	<u>NA</u>	<u>NA</u>	<u>9.75</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? Yes No

Amount Water R: 9.75 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 560

507 354 8517

Groundwater Assessor

Sampling Person

Dusty Forsgren

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: 7/5/16

Unique Station ID: —

Sample ID: Slag 5

Well Condition

Well Locked? (Yes) No

Well Labeled? Yes (No)

Casing Straight? (Yes) No

Repairs Necessary

Protective Posts? (Yes) No

State ID Tag? Yes (No)

Grout Seal Intact? Yes (No)

Well Information

Well Depth: 39.00

Constructed Depth: 38.80

Casing Diameter: 2"

Water Level Before Purge: 23.77

Well Volume: 2.48 Gallons

Well Casing Elevation: 1107.30

Static Water Elevation: 1083.53

Previous Static: —

Water Level After Sample: 38.50

Measurement Method: (Elec. W/L) Steel Tape

Sampling Information

Weather Condition Temp: 76

Wind: SE @ 6

Sky: Mostly Cloudy

Sampling Method: Grundfos Bladder SS/T Disp. Bailor (Whale) Grab Other:

Dedicated Equipment Yes (No)

Pumping Rate: 0.25 gpm

Well Purged Dry? (Yes) No

Time Pump Began: 1710 am / pm

Time Purged Dry? 1720

Time of Sampling: 1725 am / pm

Duplicate Sample? Yes (No) ID: —

Sample EH: 450 0.0

Sample Appearance General: Sl. Cloudy Color: Gray Phase: None Odor: None

Time	pH	Specific	Temp	D. O.	Turbidity	Gallons	SEQ	Comments
1720	6.92	875	11.75	NA	NA	2.50	1	
							2	
							3	
							4	
1725	7.03	894	11.90			2.50	5	Recharge

Stabilize Yes (No)

11.45

Amount Water Removed: 2.50

Gallons

Comments:

- slow recharge

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Alan Gleisner

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 7 Sept 16

Unique Station ID:

Sample ID: Slag 6

Well Condition

Well Locked? ☒ Yes No

Well Labeled? ☒ Yes No

Casing Straight? ☒ Yes No

Repairs Necessary:

Protective Posts? ☒ Yes No

State ID Tag? Yes ☒ No

Grout Seal Intact? Yes ☒ No

Well Information

Well Depth: 37.50

Constructed Depth: 37.30

Casing Diameter: 2"

Water Level Before Purge: 25.06

Well Volume: 2.02 Gallons

Well Casing Elevation: 1111.51

Static Water Elevation: 1086.45

Previous Static:

Water Level After Samp: 34.40

Measurement Method: Elec. W/L Steel Tape

Sampling Information

Weather Conditions: Temp: 65 Wind: L+U Sky: Cloudy

Sampling Method: Grundfos Bladder SS/T Disp. Bailer Whale Grab Other:

Dedicated Equipment: Yes ☒ No Pumping Rate: 0.25 gpm

Well Purged Dry? ☒ Yes No

Time Pump Began: 1340 am / pm

Time Purged Dry? 1349

Time of Sampling: 1354 am / pm

Duplicate Sample? Yes ☒ No ID: -

Sample EH: 96.7

Sample Appearance: General: Cloudy Color: Brown Phase: Lt Sediment Odor: None

Time	pH	Specific	Temp	D. O.	Turbidity	Gallons	SEQ	Comments:
1349	7.10	1352	12.81	NA	NA	2.25	1	
1356						9.50	2	
1407						0.75	3	
							4	
1354	7.05	1530	12.78			2.25	5	Recharge

Stabilized Yes

☒ No

Amount Water Remove:

2.25

Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Alan Gleisner

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 7 Sep 16

Unique Station ID:

Sample ID: Slag 7

Well Condition

Well Locked? Yes No

Well Labeled? Yes No

Casing Straight? Yes No

Repairs Necessary:

Protective Posts? Yes No

State ID Tag? Yes No

Grout Seal Intact? Yes No

Well Information

Well Depth: 49.00

Constructed Depth: 48.70

Casing Diameter: 2"

Water Level Before Purge: 15.58

Well Volume: 5.45 Gallons

Well Casing Elevation: 1114.39

Static Water Elevation: 1098.81

Previous Static:

Water Level After Sample: 46.91

Measurement Method: Elec WL Steel Tape

Sampling Information

Weather Conditions: Temp: 65 Wind: L+U Sky: Cloudy

Sampling Method: Grundfos Bladder SS/T Disp. Bailer Whale Grab Other:

Dedicated Equipment Yes No Pumping Rate: 0.25 gpm

Well Purged Dry? Yes No Time Pump Began 1410 am / pm

Time Purged Dry? 1432 Time of Sampling: 1437 am / pm

Duplicate Sample? Yes No ID: — Sample EH: 101.0

Sample Appearance: General: Cloudy Color: Tan Phase: None Odor: None

Time	pH	Specific	Temp	D. O.	Turbidity	Gallons	S	Comments:
1432	7.20	1938	10.77	NA	NA	5.5	1	
1454						11.0	2	
1510						16.5	3	
							4	
1437	7.04	2237	11.66			5.5	5	Recharge

Stabilized? Yes No Amount Water Removed: 5.5 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Alan Gleisner

Site: Otter tail Power Co. / Big Stone

Facility ID:

Date: 7 Sep 16

Unique Station ID:

Sample ID: Slag 8

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Repairs Necessary:

Well Information

Well Depth: 52.26

Constructed Depth: 52.09

Casing Diameter: 2"

Water Level Before Purge: 116.98

Well Volume: 5.75 Gallons

Well Casing Elevation: 1127.26

Static Water Elevation: 1110.29

Previous Static: -

Water Level After Sample: 29.37

Measurement Method: ☒ Elec. W/L ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 65° Wind: L+U Sky: Cloudy

Sampling Method: Grundfos ☒ Bladder SS/T ☐ Disp. Baller ☐ Whale ☐ Grab ☐ Other:

Dedicated Equipment: Yes ☐ No ☒

Well Purged Dry? Yes ☐ No ☒

Time Purged Dry? -

Duplicate Sample? Yes ☐ No ☒ ID: -

Pumping Rate: 0.25 gpm

Time Pump Began: 1535 am / ☒ pm

Time of Sampling: 1644 am / ☒ pm

Sample EH: 92.9

Sample Appearance: General: SI Cloudy Color: Tan Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1558	7.14	1329	13.03	NA	NA	5.75	1	
1621	7.34	1322	12.86			11.50	2	
1644	7.24	1329	12.75			17.25	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 17.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Alan Gleisner

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 7 Sep 16

Unique Station ID:

Sample ID: Slag 9

Well Condition

Well Locked? Yes No

Well Labeled? Yes No

Casing Straight? Yes No

Repairs Necessary:

Protective Posts? Yes No

State ID Tag? Yes No

Grout Seal Intact? Yes No

Well Information

Well Depth: 51.27

Constructed Depth: 49.80

Casing Diameter: 2"

Water Level Before Purge: 17.31

Well Volume: 5.53 Gallons

Well Casing Elevation: 1122.35

Static Water Elevation: 1105.04

Previous Static:

Water Level After Sample 41.44

Measurement Method: Elec. W Steel Tape

Sampling Information

Weather Conditions: Temp: 65 Wind: L+V Sky: Cloudy

Sampling Method: Grundfos Bladder SS/D Disp. Bailer Whale Grab Other:

Dedicated Equipment: Yes No Pumping Rate: 0.25 gpm

Well Purged Dry? Yes No Time Pump Began 1710 am / pm

Time Purged Dry? Time of Sampling: 1819 am / pm

Duplicate Sample? Yes No ID: Sample EH: 100.4

Sample Appearance: General: Cloudy Color: Tan Phase: None Odor: None

Time	pH	Specific	Temp	D. O.	Turbidity	Gallons	S	Comments:
1733	7.08	2358	11.77	NA	NA	5.75	1	
1756	7.11	2332	12.00			11.5	2	
1819	7.10	2255	12.19			17.25	3	
							4	
							5	

Stabilized? Yes No

Amount Water Removed: 17.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607

507 354 8517

Groundwater Assessor

Sampling Personne

Dusty Farasyn

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 7/9/16

Unique Station ID:

Sample ID: Slag 9 Deep

Well Condition

Well Locked? Yes ☒ No

Well Labeled? Yes ☒ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary

Protective Posts? Yes ☒ No

State ID Tag? Yes ☒ No

Grout Seal Intact? Yes ☒ No

Well Information

Well Depth: 70.98

Constructed Depth: 68.00

Casing Diameter: 2"

Water Level Before Purge 35.81

Well Volume: 5.73 Gallons

Well Casing Elevation: 1121.12

Static Water Elevation: 1086.11

Previous Static:

Water Level After Sample 68.33

Measurement Method: Elec. W/L Steel Tape

Sampling Information

Weather Conditions: Temp: 74

Wind: L+V

Sky: Cloudy

Sampling Method: Grundfos Bladder SS/T Disp. Bailer ☒ Whale Grab Other:

Dedicated Equipment Yes ☒ No

Pumping Rate: 0.25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began 1759 am / ☒ pm

Time Purged Dry? 1822

Time of Sampling: 1827 am / ☒ pm

Duplicate Sample? Yes ☒ No ID:

Sample EH:

Sample Appearance General: Cloudy Color: Brown Phase: Hazy Sed. Odor: None

Time	pH	Specific	Temp	D. O.	Turbidity	Gallons	SE	Comments:
<u>1822</u>	<u>11.60</u>	<u>3345</u>	<u>13.82</u>	<u>NA</u>	<u>NA</u>	<u>5.75</u>	<u>1</u>	
							<u>2</u>	
							<u>3</u>	
							<u>4</u>	
<u>1827</u>						<u>5.75</u>	<u>6</u>	<u>Recharge</u>

Stabilizer Yes ☒ No

Amount Water Removed: 5.75 Gallons

Comments:

Exceptions to Protocol:

- Very slow recharge!

- Insufficient volume for recharge reading

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607

507 354 8517

Groundwater Assessor

Sampling Personne

Alan Gleisner

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 7 Sep 16

Unique Station ID:

Sample ID: Slag 2B

Well Condition

Well Locked? Yes No

Well Labeled? Yes No

Casing Straight? Yes No

Repairs Necessary

Protective Posts? Yes No

State ID Tag? Yes No

Grout Seal Intact? Yes No

Well Information

Well Depth: 46.93

Constructed Depth: 40.80

Casing Diameter: 2"

Water Level Before Purge 28.13

Well Volume: 2.08 Gallons

Well Casing Elevation: 1111.26

Static Water Elevation: 1083.13

Previous Static:

Water Level After Sample 39.83

Measurement Method: Elec. W/L Steel Tape

Sampling Information

Weather Condition: Temp: 65 Wind: L+U Sky: Cloudy / Rain

Sampling Method: Grundfos Bladder SS/T Disp. Baller Whale Grab Other:

Dedicated Equipment Yes No

Pumping Rate: 0.25 gpm

Well Purged Dry? Yes No

Time Pump Began 1838 am / pm

Time Purged Dry? 1847

Time of Sampling: 1852 am / pm

Duplicate Sample? Yes No ID: -

Sample EH: 100.8

Sample Appearance General: Cloudy Color: Brown Phase: None Odor: None

Time	pH	Specific	Temp	D. O.	Turbidity	Gallons	S	Comments:
1847	7.41	1894	15.68	NA	NA	2.25	1	
1850						2.25	2	
1853						2.25	3	
							4	
1852	7.32	1919	17.49			2.25	5	Recharge

Stabilized Yes No

Amount Water Removed: 2.25 Gallons

Comments:

Exceptions to Protocol:

- Very slow Recharge

- Limited Sample

Unable to get

- 1000 None

- 500 HNO₃

- 3/3 1 gallon None



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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



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Date Reported: 5 Oct 2016

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 201631-0455
Account Number: 006106
PO #: 48680

Project Name: BIG STONE PLANT CCR

LABORATORY NARRATIVE

INORGANIC & METALS ANALYSES:

Internal standard counts associated with arsenic and cadmium failed in the reporting limit checks for samples 16-A46027, 16-A46028, 16-A46030, and 16-A46032 through 16-A46034. Internal standard counts associated with arsenic, cadmium, thallium, and lead failed in the matrix spike for samples 16-A46027 through 16-A46034, and 16-A46025. Internal standard counts associated with arsenic and cadmium failed in the matrix spike duplicate for samples 16-A46027, 16-A46028, 16-A46030, 16-A46032 through 16-A46034. Data was reported based on acceptable recoveries of the reporting limit checks, matrix spike, and matrix spike duplicate.

The laboratory control spike failed high for cobalt for samples 16-A46025 through 16-A46037. Results below the reporting limit were reported.

Due to the high concentration of calcium in the unspiked sample, the matrix spike recovery did not meet acceptable limits for samples 16-A46025, 16-A46027, 16-A46028, 16-A46030, 16-A46032, and 16-A46033. Data was reported based on acceptable recoveries of the laboratory control spike and matrix spike duplicate as well as acceptable relative percent difference between the matrix spike and matrix spike duplicate.

No other problems were encountered with these analyses.

The analysis of radium-226 and radium-228 for samples 16-A46025 through 16-A46038 was subcontracted to:

Pace Analytical Services, Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
Phone: (612) 607-1700

**MINNESOTA VALLEY TESTING LABORATORIES, INC.**

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

MEMBER
ACIL

Page: 1 of 3

Quality Control Report

Lab IDs: 16-A46025 to 16-A46039

Project: BIG STONE PLANT CCR

Work Order: 201631-0455

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 ug/L	25.0	102	85-115	25.0	16A46025q	<2.5	26.3	105	75-125	26.3	26.5	106	0.8	10	100	90-110	<0.5
	25.0	102	85-115	25.0	a46292qc	<0.5	26.8	107	75-125	26.8	27.3	109	1.8	10	100	90-110	<0.5
Arsenic ug/L	25.0	102	85-115	25.0	16A46025q	1.81	31.2	118	75-125	31.2	31.0	117	0.6	10	104	90-110	<0.5
	25.0	105	85-115	25.0	16A46025q	<2.5	28.6	114	75-125	28.6	28.0	112	2.1	10	99	90-110	<0.5
	25.0	102	85-115	25.0	a46292qc	1.51	28.9	110	75-125	28.9	29.0	110	0.3	10	98	90-110	<0.5
Barium mg/L	1.000	104	85-115	1.00	16A46029q	0.032	1.130	110	75-125	1.130	1.160	113	2.6	10	106	90-110	<0.005
				1.00	16A46035q	0.052	1.140	109	75-125	1.140	1.140	109	0.0	10	101	90-110	<0.005
Beryllium mg/L	1.000	103	85-115	1.00	16A46029q	<0.005	1.010	101	75-125	1.010	1.010	101	0.0	10	104	90-110	<0.005
				1.00	16A46035q	<0.005	1.020	102	75-125	1.020	1.020	102	0.0	10	102	90-110	<0.005
Boron mg/L	1.000	110	85-115	1.00	16A46029q	1.210	2.390	118	75-125	2.390	2.400	119	0.4	10	103	90-110	<0.1
	1.000	105	85-115	1.00	16A46035q	0.407	1.520	111	75-125	1.520	1.540	113	1.3	10	101	90-110	<0.1
				1.00	A46029qc	1.160	2.110	95	75-125	2.110	2.160	100	2.3	10	100	90-110	<0.1
Cadmium ug/L	5.00	104	85-115	5.00	16A46025q	0.64	6.18	111	75-125	6.18	6.04	108	2.3	10	108	90-110	<0.1
	5.00	108	85-115	5.00	16A46025q	0.55	5.88	107	75-125	5.88	5.76	104	2.1	10	100	90-110	<0.1
	5.00	104	85-115	5.00	a46292qc	<0.1	5.19	104	75-125	5.19	5.25	105	1.1	10	98	90-110	<0.1
Calcium mg/L	50.00	102	85-115	50.0	16A46029q	555.0	570.0	30	75-125	570.0	594.0	78	4.1	10	98	90-110	<0.5
	50.00	105	85-115	50.0	16A46035q	126.0	178.0	104	75-125	178.0	178.0	104	0.0	10	97	90-110	<0.5
				50.0	A46029qc	606.0	644.0	76	75-125	644.0	648.0	84	0.6	10	100	90-110	
				50.0	16A46035q	131.0	182.0	102	75-125	182.0	184.0	106	1.1	10	99	90-110	
Chloride mg/L	-	-	-	60.0	16-A46034	5.3	63.7	97	85-120	63.7	63.5	97	0.3	5	101	90-110	<3
	-	-	-	60.0	16-A46405	95.2	151	93	85-120	151	152	95	0.7	5	98	90-110	<3
Chromium mg/L	1.000	111	85-115	1.00	16A46029q	<0.01	1.020	102	75-125	1.020	1.060	106	3.8	10	105	90-110	<0.01
				1.00	16A46035q	<0.01	1.090	109	75-125	1.090	1.090	109	0.0	10	103	90-110	
Cobalt mg/L	1.000	116	85-115	1.00	16A46029q	<0.005	1.030	103	75-125	1.030	1.050	105	1.9	10	110	90-110	<0.005
	1.000	108	85-115	1.00	16A46035q	<0.005	1.080	108	75-125	1.080	1.080	108	0.0	10	108	90-110	
				1.00	16A46035q	<0.005	1.060	106	75-125	1.060	1.030	103	2.9	10	105	90-110	

Quality Control Report

Lab IDs: 16-A46025 to 16-A46039

Project: BIG STONE PLANT CCR

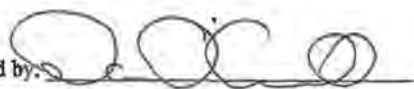
Work Order: 201631-0455

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
Fluoride mg/L	0.200	110	85-115	0.20 0.20 0.20	16-A46034 A46038QC 16-A46307	0.400 0.090 1.05	0.590 0.290 1.27	95 100 110	75-125 75-125 75-125	0.590 0.290 1.27	0.590 0.300 1.22	95 105 85	0.0 3.4 4.0	10 10 10	101 103	90-110 90-110	< 0.02
Lead ug/L	25.0 25.0 25.0	103 104 104	85-115 85-115 85-115	25.0 25.0 25.0	16A46025q 16A46025q a46292qc	< 1 < 2.5 < 0.5	27.5 26.9 26.0	110 108 104	75-125 75-125 75-125	27.5 26.9 26.0	26.3 26.0 26.0	105 104 104	4.5 3.4 0.0	10 10 10	100 98 96	90-110 90-110 90-110	< 0.5 < 0.5 < 0.5
Lithium mg/L	1.000	101	85-115	1.00 1.00	A46029qc 16-A46035	0.136 0.058	1.140 1.180	100 112	75-125 75-125	1.140 1.180	1.170 1.150	103 109	2.6 2.6	10 10	103 102	90-110 90-110	< 0.005
Mercury ug/L	- - - -	- - - -	- - - -	0.10 0.10	16-A46034 16-A46215	0.013 < 0.005	0.104 0.072	91 72	67-106 67-106	0.104 0.072	0.104 0.071	91 71	0.0 1.4	9 9	95 88	76-113 76-113	< 0.005 < 0.005 < 0.005 < 0.005
Molybdenum mg/L	1.000	106	85-115	1.00 1.00	16A46029q 16A46035q	< 0.015 < 0.015	1.010 1.060	101 106	75-125 75-125	1.010 1.060	1.050 1.050	105 105	3.9 0.9	10 10	101 100	90-110 90-110	< 0.015
pH units	- -	- -	- -	- -	- -	- -	- -	- -	- -	7.3 7.3	7.3 -	- -	0.0 -	2.5	101 101	90-110 90-110	- -
Selenium ug/L	25.0 25.0	102 102	85-115 85-115	25.0 25.0	16A46025q a46292qc	27.2 1.38	56.3 28.9	116 110	75-125 75-125	56.3 28.9	54.5 30.0	109 114	3.2 3.7	10 10	100 97	90-110 90-110	< 0.5 < 0.5
Solids, Total Dissolved mg/L	- -	- -	- -	- -	- -	- -	- -	- -	- -	925 1510	940 1500	- -	1.6 0.7	10 10	105	85-115	< 10
Sulfate mg/L	- - - -	- - - -	- - - -	600 60.0 600 60.0	16-A46034 16-A46721 16-A46514 16-A45884	869 21.5 515 54.9	1520 85.4 1170 120	108 106 109 108	78-126 78-126 79-124 78-126	1520 85.4 1170 120	1510 85.1 1150 123	107 106 106 114	0.7 0.4 1.7 2.5	5 5 5 5	101 100	90-110 90-110	< 4 < 4
Thallium ug/L	5.00 5.00 5.00	102 102 102	85-115 85-115 85-115	5.00 5.00 5.00	16A46025q 16A46025q a46292qc	< 0.2 < 0.5 < 0.1	5.49 5.35 5.25	110 107 105	75-125 75-125 75-125	5.49 5.35 5.25	5.32 5.26 5.26	106 105 105	3.1 1.7 0.2	10 10 10	100 98 96	90-110 90-110 90-110	< 0.1 < 0.1 < 0.1

The cobalt LCS recovery was above the acceptance limit, see narrative.

The calcium matrix spike recovery was outside the acceptance limit, see narrative.

Approved by:

A handwritten signature in black ink, consisting of several loops and a long horizontal stroke at the end.



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Date: 9/30/2016

CLIENT: MVTL Inc
Project: 31-0455
Lab Order: S1609153

CASE NARRATIVE
Report ID: S1609153001

Samples A46025 H2OX, A46026 H3OX, A46027 H6, A46028 H8, A46029 H9, A46030 Slag 1, A46031 Slag 4, A46032 Slag 5, A46033 Slag 6, A46034 Slag 7, A46035 Slag 8, A46036 Slag 9, A46037 Slag 9 Deep, and A46038 Slag 2B were received on September 9, 2016.

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

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

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 1



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Inc

Date: 9/30/2016

Work Order: S1609153

Report ID: S1609153001

Project: 31-0455

Radium 228 by Ga/Tech

Sample Type MBLK

Units: pCi/L

MB-386 (09/23/16 10:43)	RunNo: 139110	PrepDate: 09/14/16 12:00	BatchID: 12333
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-386 (09/23/16 13:44)	RunNo: 139110	PrepDate: 09/14/16 12:00	BatchID: 12333
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Total Radium 228

44

1

38.5

113

61.3 - 120

Radium 228 by Ga/Tech

Sample Type MS

Units: pCi/L

MS-386 (09/23/16 19:47)	RunNo: 139110	PrepDate: 09/14/16 12:00	BatchID: 12333
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Total Radium 228

36

1

38.5

ND

94.6

64.3 - 120

Radium 228 by Ga/Tech

Sample Type MSD

Units: pCi/L

MSD-386 (09/23/16 22:48)	RunNo: 139110	PrepDate: 09/14/16 12:00	BatchID: 12333
Analyte	Result	RL	Conc %RPD %REC % RPD Limits Qual

Total Radium 228

43

1

36

16.1

111

20

Radium 226 in Water - Total by SM7500RA_B

Sample Type MBLK

Units: pCi/L

MB-1663 (09/20/16 14:22)	RunNo: 138896	PrepDate: 09/14/16 0:00	BatchID: 12315
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-1663 (09/20/16 14:22)	RunNo: 138896	PrepDate: 09/14/16 0:00	BatchID: 12315
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226

5.4

0.2

5.99

89.6

67.1 - 122

Radium 226 in Water - Total by SM7500RA_B

Sample Type MS

Units: pCi/L

MS-1663 (09/20/16 14:22)	RunNo: 138896	PrepDate: 09/14/16 0:00	BatchID: 12315
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226

5.1

0.2

5.99

0.2

81.5

65 - 131

Radium 226 in Water - Total by SM7500RA_B

Sample Type MSD

Units: pCi/L

MSD-1663 (09/20/16 14:22)	RunNo: 138896	PrepDate: 09/14/16 0:00	BatchID: 12315
Analyte	Result	RL	Conc %RPD %REC % RPD Limits Qual

Radium 226

5.7

0.2

5.1

10.8

91.3

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

Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003
Phone: 800 782 3557 Fax: 507 359 2890

Field Service Chain of Custody Record

This is an exact copy of
the original document

By AK Date 8 Sept 16
pages 1-20

Project Otter Tail Power Company	Project Type: Big Stone Plant CCR	Name of Samplers: Alan Gleisner Dusty Farasyn
Report Otter Tail Power Company	Carbon Copy:	Quote Number:
Attn: Paul Vukonich	Attn:	Work Order Number: 31-0455
Address P.O. Box 496 Fergus Falls, MN 56538-0496	Address:	Lab Numbers:
Phone: 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1 Gallon none	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
AUG-25	H2OX		7 Sept 16	1230	GW		1		1	1	N								See Attached
26	H3OX			1316	GW		1		1	1	N								
	H4OX			NS	GW		1		1	1	N								
27	H-6			1418	GW		1		1	1	N								
28	H-8			1512	GW		1		1	1	N								
29	H-9			1612	GW		1		1	1	N								
30	Slag 1		7 Sept 16	1208	GW		1		1	1	N								
31	Slag 4			1319	GW		1		1	1	N								
32	Slag 5			1725	GW		1		1	1	N								
33	Slag 6			1354	GW		1		1	1	N								

Comments:

Samples Relinquished By: <u>AK</u>	Samples Received By: <u>A. Gleisner</u>
Date: <u>8 Sept 16</u> Time: <u>1055</u> Temp: <u>30.2°C</u>	Date: <u>8 Sept 16</u> Time: <u>1055</u> Temp: <u>3.0°C</u>
Samples Relinquished into: <u>Fridge</u> <u>Log in Cart</u> Other:	
Samples Relinquished By:	Samples Received By:
Date: Time: Temp:	Date: Time: Temp:
Delivery: <u>Samplers</u> Other:	Seal Number(s) - If Used
Transport: <u>Ambient</u> <u>Ice</u> Other:	Seals Intact? Yes No

Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003
Phone: 800 782 3557 Fax: 507 359 2890

Field Service Chain of Custody Record

Project Otter Tail Power Company	Project Type: Big Stone Plant CCR	Name of Samplers: Alan Gleisner Dusty Farasyn
Report: Otter Tail Power Company	Carbon Copy:	Quote Number:
Attn: Paul Vukonich	Attn:	Work Order Number:
Address: P.O. Box 496 Fergus Falls, MN 56538-0496	Address:	Lab Numbers:
Phone: 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1 Gallon none	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
34	Slag 7		7 Sep 16	1437	GW		1		1	1	N								See Attached
35	Slag 8			1644	GW		1		1	1	N								
36	Slag 9			1819	GW		1		1	1	N								
37	Slag 9 Deep			1827	GW		1		1	1	N								
38	Slag 2B			1852	GW		1		1	1	N								

Comments: Limited sample on Slag 2B - 1000 None, 500 HNO3, 3/4 gallon jng

Samples Relinquished By: <i>AK 56</i>			Samples Received By: <i>A. Furdus</i>		
Date: 8 Sep 16	Time: 1055	Temp: 30°C	Date: 8 Sep 16	Time: 1055	Temp: 30°C
Samples Relinquished into: Fridge <i>Log in Cart</i> Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: <i>Samplers</i> Other:			Seal Number(s) - If Used		
Transport: Ambient <i>Ice</i> Other:			Seals Intact? Yes No		

Big Stone Sampling

Site*	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (ml/minute)	Goes Dry?	Sampling Seasons**
WELL10	A	47.43	4	1098.70	Keck/Tsunami	No	3,000	No	1,3
WELL11	A	127.22	4	1104.00	Other Pump	Yes	38,000	No	1,3
WELL12	A	112.40	4	1071.89	Other Pump	Yes	20,000	No	1,3
S1	B	32.50	2	1102.17	Bailer	Yes	N/A	Yes	1,3
S2	B	43.12	2	1102.39	Bailer	Yes	N/A	Yes	1,3
S3	B	62.50	2	1102.65	Bailer	Yes	N/A	No	1,3
S4	B	27.70	2	1090.57	Bailer	Yes	N/A	Yes	1,3
S5	B	46.72	2	1091.40	Bailer	Yes	N/A	Yes	1,3
S6	B	62.05	2	1090.71	Bailer	Yes	N/A	No	1,3
H1OX	C, CCR	32.91	2	1115.89	Bailer	Yes	100	Yes	1,3
H1INT	C	60.11	2	1115.81	Keck/Tsunami	No	1500	No	1,3
H2OX	C, CCR	32.20	2	1103.91	Bladder	Yes	100	Yes	1,3
H2INT	C	62.30	2	1103.91	Bailer	Yes	N/A	Yes	1,3
H3OX	C, CCR	22.55	2	1095.19	Bladder	Yes	100	Yes	1,3
H3INT	C	54.31	2	1095.17	Whale	No	2000	No	1,3
H4OX	C, CCR	27.20	2	1108.22	Bladder	Yes	100	No	1,3
H4INT	C	60.01	2	1108.61	Keck/Tsunami	No	2000	Yes	1,3
H5	C	43.30	2	1122.80	Whale	No	1000	No	1,3
H6	C, CCR	15.00	2	1097.76	Bladder	Yes	100	Yes	1,3
H7	C	33.20	2	1106.06	Whale	No	1000	Yes	1,3
H8	C, CCR	22.05	2	1081.23	Bladder	Yes	100	TBD	1,3
H9	CCR	30.20	2	1086.21	Bladder	Yes	100	TBD	1,3
BC1	B	16.26	2	1118.46	Bailer	Yes	N/A	No	1,3
BC101	B	39.30	2	1118.70	Bailer	Yes	N/A	Yes	1,3
BC2R	B	32.48	2	1115.28	Bailer	Yes	N/A	No	1,3
BC3R	B	35.15	2	1114.42	Bailer	Yes	N/A	Yes	1,3
BC4R	B	34.60	2	1113.86	Bailer	Yes	N/A	Yes	1,3
BC5R	B	37.32	2	1123.02	Bailer	Yes	N/A	No	1,3
BC6R	B	33.95	2	1121.58	Bailer	Yes	N/A	No	1,3
SLAG1	CCR	34.90	2	TBD	LOW FLOW	No	100	TBD	1,3
SLAG2	CCR	TBD	2	1111.06	LOW FLOW	TBD	100	TBD	1,3
SLAG3	CCR	TBD	2	TBD	LOW FLOW	TBD	100	TBD	1,3
SLAG4	CCR	39.00	2	TBD	LOW FLOW	No	100	TBD	1,3
SLAG5	CCR	38.80	2	1107.30	LOW FLOW	No	100	TBD	1,3
SLAG6	CCR	37.30	2	1111.51	LOW FLOW	No	100	TBD	1,3
SLAG7	CCR	48.70	2	1114.39	LOW FLOW	No	100	TBD	1,3
SLAG8	CCR	52.09	2	1127.26	LOW FLOW	No	100	TBD	1,3
SLAG9	CCR	49.80	2	1122.35	LOW FLOW	No	100	TBD	1,3
SLAG9 DEEP***	CCR	68.00	2	1121.92	LOW FLOW	No	100	TBD	
SLAG2B	CCR	40.80	2	1111.26	LOW FLOW	No	100	TBD	
COOLING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
EVAPORATION POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
HOLDING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
RECLAIM POND	C	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3

* Three additional monitoring wells will be installed the Spring of 2016. Each well will be screened approximately 35' below ground surface and will be analyzed for the "C" parameter list. In addition, a new site with 9 wells will be added and will be analyzed for CCR Parameters ONLY.

** 1 = Spring (March 28 - April 28), 2 = Summer (July 1 - August 7), 3 = Fall (October 14 - November 14)

*** Only sample for the first two CCR background sampling events.

Big Stone Plant CCR Appendix III Parameters

CCR - Appendix III Detection Monitoring

Field Parameters

pH*

* Field and Laboratory Measurements

Total Concentration Parameters

Boron

Calcium

Chloride

Fluoride

pH

Sulfate

Dissolved Solids, Total

Big Stone CCR Appendix IV Parameters

CCR - Appendix IV - Assessment Monitoring

Total Concentration Parameters

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium, Total
Cobalt
Fluoride
Lead
Lithium
Mercury
Molybdenum
Selenium
Thallium
Radium 226 + 228



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724
1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
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FINAL REPORT COMPLETION DATE: 20 Dec 16

Date Reported: 5 Dec 2016

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 31-0543
Account #: 006106
PO #: 48680

Project Name: BIG STONE PLANT

T. J. H. 19 Dec 16
Field Service Manager/Date Reviewed

OC 16 Dec 2016
Chemistry Lab Manager/Date Reviewed

For 16 Dec 16
Quality Assurance Director/Date Reviewed

RL = Reporting Limits
NQ = Not Present, Qualitative Only
PQ = Present, Qualitative Only
ND = Not Determined

All data for this report has been approved by MVTL Laboratory Management.

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



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 5 Dec 2016
 Lab Number: 16-A56133
 Work Order #: 31-0543
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 17 Oct 2016 14:20
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 18 Oct 2016 14:40
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 1

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				21 Oct 16	JMS
Water Digestions				20 Oct 16	JMS
Radium 226	See Attached			2 Dec 16 15:50	ABL
Radium 228	See Attached		EPA M9320	2 Dec 16 15:50	ABL
pH, Field	7.38 units	1.00	I-1586-85	17 Oct 16 14:20	AMG
pH	* 7.5 units	1.0	SM 4500 H+B-96	19 Oct 16 17:12	RC
Sulfate	435 ~ mg/L	4.0	ASTM D516-02	20 Oct 16 8:34	AKF
Chloride	14.9 mg/L	3.0	SM 4500 Cl E	21 Oct 16 8:47	MRW
Mercury	0.054 @ ug/L	0.005	EPA 245.7	21 Oct 16 11:18	TWB
Solids, Total Dissolved	1460 mg/L	10	SM 2540 C-97	20 Oct 16 15:54	RC
Calcium	280.0 mg/L	0.500	SW6010C	25 Oct 16 10:34	RMV
	See Narrative				
Lithium	0.095 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Barium	0.216 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Boron	1.970 mg/L	0.100	SW6010C	25 Oct 16 10:34	RMV
	^See Narrative				
Antimony	< 2.5 ug/L	0.5	SW6020A	27 Oct 16 20:19	RMB
	@See Narrative				
Arsenic	8.86 @ ug/L	0.50	SW6020A	3 Nov 16 16:42	RMB
Beryllium	0.66 @ ug/L	0.05	SW6020A	15 Nov 16 10:36	RMB
Cadmium	0.61 ug/L	0.10	SW6020A	27 Oct 16 20:19	RMB
	@See Narrative				
Chromium	24.1 ug/L	0.50	SW6020A	27 Oct 16 20:19	RMB
	@See Narrative				
Lead	10.8 ug/L	0.50	SW6020A	27 Oct 16 20:19	RMB
	@See Narrative				
Molybdenum	6.30 ug/L	0.50	SW6020A	27 Oct 16 20:19	RMB
	@See Narrative				
Selenium	15.5 @ ug/L	0.50	SW6020A	3 Nov 16 16:42	RMB
Thallium	< 0.5 ug/L	0.1	SW6020A	27 Oct 16 20:19	RMB
	@See Narrative				
Fluoride	0.380 mg/L	0.020	EPA 300.0	1 Nov 16 19:54	RMB

RL = Reporting Limit

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

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

@ ~ Due to sample matrix

~ Due to concentration of other analytes

! ~ Due to sample quantity

+ ~ Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WH/DH # R-040

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



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 5 Dec 2016
Lab Number: 16-A56133
Work Order #: 31-0543
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 17 Oct 2016 14:20
Sampled By: MVTL FIELD PERSONNEL
Date Received: 18 Oct 2016 14:40
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 1

Temp at Receipt: 0.0C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
-----------------------	--------------	---------------------	------------------	---------

* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL - Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards. The reporting limit was elevated for any analyte requiring a dilution as coded below:

g = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND SW/DW # R-040



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 5 Dec 2016
 Lab Number: 16-A56134
 Work Order #: 31-0543
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 17 Oct 2016 15:28
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 18 Oct 2016 14:40
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 4

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				21 Oct 16	JMS
Water Digestions				20 Oct 16	JMS
Radium 226	See Attached			2 Dec 16 15:50	ABL
Radium 228	See Attached		EPA M9320	2 Dec 16 15:50	ABL
pH, Field	6.83 units	1.00	I-1586-85	17 Oct 16 15:28	AMG
pH	* 6.9 units	1.0	SM 4500 H+B-96	19 Oct 16 17:12	RC
Sulfate	1400 ~ mg/L	4.0	ASTM D516-02	20 Oct 16 8:34	AKF
Chloride	52.5 mg/L	3.0	SM 4500 Cl E	21 Oct 16 8:47	MRW
Mercury	0.007 ug/L	0.005	EPA 245.7	21 Oct 16 11:18	TWB
Solids, Total Dissolved	2450 mg/L	10	SM 2540 C-97	20 Oct 16 15:54	RC
Calcium	471.0 mg/L	0.500	SW6010C	25 Oct 16 10:34	RMV
	~See Narrative				
Lithium	0.205 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Barium	0.026 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Boron	0.881 mg/L	0.100	SW6010C	25 Oct 16 10:34	RMV
	^See Narrative				
Antimony	< 0.5 ug/L	0.5	SW6020A	3 Nov 16 16:42	RMB
Arsenic	1.27 ug/L	0.50	SW6020A	3 Nov 16 16:42	RMB
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	15 Nov 16 10:36	RMB
Cadmium	0.25 ug/L	0.10	SW6020A	3 Nov 16 16:42	RMB
Chromium	2.16 ug/L	0.50	SW6020A	27 Oct 16 20:19	RMB
	See Narrative				
Lead	0.75 ug/L	0.50	SW6020A	3 Nov 16 16:42	RMB
	See Narrative				
Molybdenum	1.43 ug/L	0.50	SW6020A	3 Nov 16 16:42	RMB
Selenium	0.76 ug/L	0.50	SW6020A	3 Nov 16 16:42	RMB
Thallium	< 0.1 ug/L	0.1	SW6020A	3 Nov 16 16:42	RMB
	See Narrative				
Fluoride	0.180 mg/L	0.020	EPA 300.0	1 Nov 16 19:54	RMB

RL - Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
 The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

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



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 5 Dec 2016
Lab Number: 16-A56134
Work Order #: 31-0543
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 17 Oct 2016 15:28
Sampled By: MVTL FIELD PERSONNEL
Date Received: 18 Oct 2016 14:40
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 4

Temp at Receipt: 0.0C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
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* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

@ = Due to sample matrix # = Due to concentration of other analytes
1 = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WWTW # R-040

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



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-Q496

Report Date: 5 Dec 2016
 Lab Number: 16-A56135
 Work Order #: 31-0543
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 18 Oct 2016 10:59
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 18 Oct 2016 14:40
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 5

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				21 Oct 16	JMS
Water Digestions				20 Oct 16	JMS
Radium 226	See Attached			2 Dec 16 15:50	ABL
Radium 228	See Attached		EPA M9320	2 Dec 16	ABL
pH, Field	6.96 units	1.00	I-1586-85	18 Oct 16 10:59	BMW
pH	* 7.1 units	1.0	SM 4500 H+B-96	19 Oct 16 17:12	RC
Sulfate	127 @ mg/L	4.0	ASTM D516-02	20 Oct 16 9:32	AKF
Chloride	10.0 mg/L	3.0	SM 4500 Cl E	21 Oct 16 8:47	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	21 Oct 16 11:18	TWB
Solids, Total Dissolved	491 mg/L	10	SM 2540 C-97	21 Oct 16 18:38	RC
Calcium	124.0 mg/L	0.500	SW6010C	25 Oct 16 10:34	RMV
	See Narrative				
Lithium	0.026 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Barium	0.125 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Boron	0.377 mg/L	0.100	SW6010C	27 Oct 16 12:56	RMV
Antimony	< 0.5 ug/L	0.5	SW6020A	27 Oct 16 20:19	RMB
	See Narrative				
Arsenic	1.10 ug/L	0.50	SW6020A	3 Nov 16 16:42	RMB
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	15 Nov 16 10:36	RMB
Cadmium	< 0.1 ug/L	0.1	SW6020A	27 Oct 16 20:19	RMB
	See Narrative				
Chromium	< 0.5 ug/L	0.5	SW6020A	27 Oct 16 20:19	RMB
	See Narrative				
Lead	< 0.5 ug/L	0.5	SW6020A	27 Oct 16 20:19	RMB
	See Narrative				
Molybdenum	13.1 ug/L	0.50	SW6020A	27 Oct 16 20:19	RMB
	See Narrative				
Selenium	< 0.5 ug/L	0.5	SW6020A	27 Oct 16 20:19	RMB
	See Narrative				
Thallium	< 0.1 ug/L	0.1	SW6020A	27 Oct 16 20:19	RMB
	See Narrative				
Fluoride	0.290 mg/L	0.020	EPA 300.0	1 Nov 16 19:54	RMB

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current INI standards.

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

@ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity * = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447690 ND MICRO # 1013-M ND SW/DH # R-040

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



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 5 Dec 2016
Lab Number: 16-A56135
Work Order #: 31-0543
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 18 Oct 2016 10:59
Sampled By: MVTL FIELD PERSONNEL
Date Received: 18 Oct 2016 14:40
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 5

Temp at Receipt: 0.0C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
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* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

= Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity * = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447690 ND MICRO # 1013-M ND WR/DW # R-040

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



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 5 Dec 2016
 Lab Number: 16-A56136
 Work Order #: 31-0543
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 17 Oct 2016 16:02
 Sampled By: MVTl FIELD PERSONNEL
 Date Received: 18 Oct 2016 14:40
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 6

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				21 Oct 16	JMS
Water Digestions				20 Oct 16	JMS
Radium 226	See Attached		EPA M9320	2 Dec 16 15:50	ABL
Radium 228	See Attached		I-1586-85	2 Dec 16 15:50	ABL
pH, Field	7.31 units	1.00	SM 4500 H+B-96	17 Oct 16 16:02	AMG
pH	* 7.4 units	1.0	ASTM D516-02	19 Oct 16 17:12	RC
Sulfate	447 ~ mg/L	4.0	SM 4500 Cl E	20 Oct 16 9:32	AKF
Chloride	5.3 mg/L	3.0	EPA 245.7	21 Oct 16 9:04	MRW
Mercury	0.027 @ ug/L	0.005	SM 2540 C-97	21 Oct 16 11:18	TWB
Solids, Total Dissolved	1130 mg/L	10	SW6010C	20 Oct 16 15:54	RC
Calcium	234.0 mg/L	0.500		25 Oct 16 10:34	RMV
	See Narrative				
Lithium	0.142 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Barium	0.140 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Boron	2.360 mg/L	0.100	SW6010C	25 Oct 16 10:34	RMV
	^See Narrative				
Antimony	< 2.5 @ ug/L	0.5	SW6020A	11 Nov 16 16:46	RMB
Arsenic	5.84 ug/L	0.50	SW6020A	3 Nov 16 16:42	RMB
Beryllium	0.34 @ ug/L	0.05	SW6020A	15 Nov 16 10:36	RMB
Cadmium	0.37 ug/L	0.10	SW6020A	3 Nov 16 16:42	RMB
Chromium	11.3 ug/L	0.50	SW6020A	27 Oct 16 20:19	RMB
	See Narrative				
Lead	5.89 ug/L	0.50	SW6020A	27 Oct 16 20:19	RMB
	See Narrative				
Molybdenum	6.33 ug/L	0.50	SW6020A	27 Oct 16 20:19	RMB
	See Narrative				
Selenium	4.87 ug/L	0.50	SW6020A	3 Nov 16 16:42	RMB
Thallium	0.23 ug/L	0.10	SW6020A	27 Oct 16 20:19	RMB
	See Narrative				
Fluoride	0.530 mg/L	0.020	EPA 300.0	1 Nov 16 19:54	RMB

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
 The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WR/DW # R-040

MVTl guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTl to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTl. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 5 Dec 2016
Lab Number: 16-A56136
Work Order #: 31-0543
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 17 Oct 2016 16:02
Sampled By: MVTI FIELD PERSONNEL
Date Received: 18 Oct 2016 14:40
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 6

Temp at Receipt: 0.0C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
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* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^a The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

④ = Due to sample matrix

1 = Due to sample quantity

h = Due to concentration of other analytes

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WH/DW # R-040

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



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 5 Dec 2016
 Lab Number: 16-A56137
 Work Order #: 31-0543
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 17 Oct 2016 16:45
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 18 Oct 2016 14:40
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 7

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				21 Oct 16	JMS
Water Digestions				20 Oct 16	JMS
Radium 226	See Attached			2 Dec 16 15:51	ABL
Radium 228	See Attached		EPA M9320	2 Dec 16 15:51	ABL
pH, Field	7.22 units	1.00	I-1586-85	17 Oct 16 16:45	AMG
pH	* 7.2 units	1.0	SM 4500 H+B-96	19 Oct 16 17:12	RC
Sulfate	910 ~ mg/L	4.0	ASTM D516-02	20 Oct 16 9:32	AKF
Chloride	5.5 mg/L	3.0	SM 4500 Cl E	21 Oct 16 9:04	MRW
Mercury	0.012 ug/L	0.005	EPA 245.7	21 Oct 16 11:18	TWB
Solids, Total Dissolved	1730 mg/L	10	SM 2540 C-97	20 Oct 16 15:54	RC
Calcium	447.0 mg/L	0.500	SW6010C	25 Oct 16 10:34	RMV
	~See Narrative				
Lithium	0.109 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Barium	0.068 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Boron	1.170 mg/L	0.100	SW6010C	25 Oct 16 10:34	RMV
	^See Narrative				
Antimony	< 0.5 ug/L	0.5	SW6020A	3 Nov 16 17:54	RMB
Arsenic	2.47 ug/L	0.50	SW6020A	3 Nov 16 17:54	RMB
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	14 Nov 16 14:11	RMB
Cadmium	0.32 ug/L	0.10	SW6020A	3 Nov 16 17:54	RMB
Chromium	6.75 ug/L	0.50	SW6020A	27 Oct 16 21:32	RMB
	See Narrative				
Lead	2.28 ug/L	0.50	SW6020A	3 Nov 16 17:54	RMB
	See Narrative				
Molybdenum	6.03 ug/L	0.50	SW6020A	3 Nov 16 17:54	RMB
Selenium	2.40 ug/L	0.50	SW6020A	3 Nov 16 17:54	RMB
Thallium	0.11 ug/L	0.10	SW6020A	3 Nov 16 17:54	RMB
	See Narrative				
Fluoride	0.380 mg/L	0.020	EPA 300.0	1 Nov 16 19:54	RMB

RL = Reporting Limit

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

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

B = Due to sample matrix # = Due to concentration of other analytes
 I = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-025-125 WI LAB # 999447680 ND MICRO # 1013-M ND HW/DW # R-040

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

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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Project Name: BIG STONE PLANT

Sample Description: SLAG 7

Report Date: 5 Dec 2016
Lab Number: 16-A56137
Work Order #: 31-0543
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 17 Oct 2016 16:45
Sampled By: MVTL FIELD PERSONNEL
Date Received: 18 Oct 2016 14:40
PO #: 48680

Temp at Receipt: 0.0C

As Received
Result

Method
RL

Method
Reference

Date Analyzed

Analyst

* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

* Sample diluted due to result above calibration of linear range.

^A The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:

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

0 = Due to sample matrix	# = Due to concentration of other analytes
1 = Due to sample quantity	+ = Due to instrumental standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND RW/CW # R-040

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

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



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 5 Dec 2016
 Lab Number: 16-A56138
 Work Order #: 31-0543
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 17 Oct 2016 18:15
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 18 Oct 2016 14:40
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 8

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				21 Oct 16	JMS
Water Digestions				20 Oct 16	JMS
Radium 226	See Attached			2 Dec 16 15:51	ABL
Radium 228	See Attached		EPA M9320	2 Dec 16 15:51	ABL
pH, Field	7.45 units	1.00	I-1586-85	17 Oct 16 18:15	AMG
pH	* 7.4 units	1.0	SM 4500 H+B-96	19 Oct 16 17:21	RC
Sulfate	292 ~ mg/L	4.0	ASTM D516-02	20 Oct 16 9:32	AKF
Chloride	39.0 mg/L	3.0	SM 4500 Cl E	21 Oct 16 9:04	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	21 Oct 16 11:18	TWB
Solids, Total Dissolved	865 mg/L	10	SM 2540 C-97	20 Oct 16 15:54	RC
Calcium	125.0 mg/L	0.500	SW6010C	25 Oct 16 10:34	RMV
	See Narrative				
Lithium	0.060 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Barium	0.048 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Cobalt	< 0.01 ~ mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Boron	0.486 mg/L	0.100	SW6010C	27 Oct 16 12:56	RMV
Antimony	< 0.5 ug/L	0.5	SW6020A	3 Nov 16 17:54	RMB
Arsenic	1.18 ug/L	0.50	SW6020A	3 Nov 16 17:54	RMB
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	14 Nov 16 14:11	RMB
Cadmium	< 0.1 ug/L	0.1	SW6020A	3 Nov 16 17:54	RMB
Chromium	1.47 ug/L	0.50	SW6020A	27 Oct 16 21:32	RMB
	See Narrative				
Lead	< 0.5 ug/L	0.5	SW6020A	3 Nov 16 17:54	RMB
	See Narrative				
Molybdenum	8.61 ug/L	0.50	SW6020A	27 Oct 16 21:32	RMB
	See Narrative				
Selenium	21.5 ug/L	0.50	SW6020A	3 Nov 16 17:54	RMB
Thallium	< 0.1 ug/L	0.1	SW6020A	3 Nov 16 17:54	RMB
	See Narrative				
Fluoride	0.570 mg/L	0.020	EPA 300.0	1 Nov 16 19:54	RMB

RL = Reporting Limit

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

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

@ = Due to sample matrix

! = Due to sample quantity

= Due to concentration of other analytes

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125

RI LAB # 999447680

ND MICRO # 1013-M

ND NW/DW # R-040

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

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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 5 Dec 2016
Lab Number: 16-A56138
Work Order #: 31-0543
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 17 Oct 2016 18:15
Sampled By: MVTL FIELD PERSONNEL
Date Received: 18 Oct 2016 14:40
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 8

Temp at Receipt: 0.0C

As Received
Result

Method

RL

Method
Reference

Date Analyzed

Analyst

* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

A The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

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

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

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 5 Dec 2016
Lab Number: 16-A56139
Work Order #: 31-0543
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 18 Oct 2016 9:41
Sampled By: MVTI FIELD PERSONNEL
Date Received: 18 Oct 2016 14:40
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 9

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				21 Oct 16	JMS
Water Digestions				20 Oct 16	JMS
Radium 226	See Attached			2 Dec 16 15:51	ABL
Radium 228	See Attached		EPA M9320	2 Dec 16 15:52	ABL
pH, Field	6.96 units	1.00	I-1586-85	18 Oct 16 9:41	AMG
pH	* 7.0 units	1.0	SM 4500 H+B-96	19 Oct 16 17:21	RC
Sulfate	864 ~ mg/L	4.0	ASTM D516-02	20 Oct 16 9:32	AKF
Chloride	6.8 mg/L	3.0	SM 4500 Cl E	21 Oct 16 9:04	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	21 Oct 16 11:18	TWB
Solids, Total Dissolved	1700 mg/L	10	SM 2540 C-97	20 Oct 16 15:54	RC
Calcium	376.0 mg/L	0.500	SW6010C	25 Oct 16 10:34	RMV
	See Narrative				
Lithium	0.114 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Barium	0.038 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Boron	0.266 mg/L	0.100	SW6010C	27 Oct 16 12:56	RMV
Antimony	< 0.5 ug/L	0.5	SW6020A	3 Nov 16 17:54	RMB
Arsenic	1.08 ug/L	0.50	SW6020A	3 Nov 16 17:54	RMB
Beryllium	< 0.25 0 ug/L	0.05	SW6020A	14 Nov 16 14:11	RMB
Cadmium	0.25 ug/L	0.10	SW6020A	3 Nov 16 17:54	RMB
Chromium	3.34 ug/L	0.50	SW6020A	27 Oct 16 21:32	RMB
	See Narrative				
Lead	1.12 ug/L	0.50	SW6020A	3 Nov 16 17:54	RMB
	See Narrative				
Molybdenum	9.70 ug/L	0.50	SW6020A	3 Nov 16 17:54	RMB
Selenium	1.95 ug/L	0.50	SW6020A	3 Nov 16 17:54	RMB
Thallium	< 0.1 ug/L	0.1	SW6020A	3 Nov 16 17:54	RMB
	See Narrative				
Fluoride	0.240 mg/L	0.020	EPA 300.0	1 Nov 16 19:54	RMB

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards. The reporting limit was elevated for any analyte requiring a dilution as coded below:

```

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

```

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protocol to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 5 Dec 2016
Lab Number: 16-A56139
Work Order #: 31-0543
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 18 Oct 2016 9:41
Sampled By: MVTI FIELD PERSONNEL
Date Received: 18 Oct 2016 14:40
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 9

Temp at Receipt: 0.0C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
* Holding Time Exceeded				
Radium 226 subcontracted to: Inter-Mountain Labs 1673 Terra Ave Sheridan, WY 82801				
Radium 228 subcontracted to: Inter-Mountain Labs 1673 Terra Ave Sheridan, WY 82801				
~ Sample diluted due to result above calibration of linear range.				
^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.				

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
| = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040

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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 5 Dec 2016
 Lab Number: 16-A56140
 Work Order #: 31-0543
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 18 Oct 2016 10:23
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 18 Oct 2016 14:40
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 9 DEEP

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				21 Oct 16	JMS
Water Digestions				20 Oct 16	JMS
Radium 226	See Attached			2 Dec 16 15:52	ABL
Radium 228	See Attached			2 Dec 16	ABL
pH, Field	8.97 units	1.00	EPA M9320	18 Oct 16 10:23	AMG
pH	* 10.7 units	1.0	I-1586-85	19 Oct 16 17:21	RC
Sulfate	1290 ~ mg/L	4.0	SM 4500 H+B-96	20 Oct 16 9:32	AKF
Chloride	23.0 mg/L	3.0	ASTM D516-02	21 Oct 16 9:04	MRW
Mercury	< 0.005 ug/L	0.005	SM 4500 Cl E	21 Oct 16 11:18	TWB
Solids, Total Dissolved	2050 mg/L	10	EPA 245.7	20 Oct 16 15:54	RC
Calcium	479.0 mg/L	0.500	SM 2540 C-97	25 Oct 16 10:34	RMV
	-See Narrative		SW6010C		
Lithium	0.411 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Barium	0.078 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Cobalt	< 0.01 ~ mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Boron	0.152 mg/L	0.100	SW6010C	27 Oct 16 12:56	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	3 Nov 16 17:54	RMB
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	3 Nov 16 17:54	RMB
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	14 Nov 16 14:11	RMB
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	3 Nov 16 17:54	RMB
Chromium	26.9 @ ug/L	0.50	SW6020A	15 Nov 16 10:36	RMB
Lead	< 2.5 ug/L	0.5	SW6020A	3 Nov 16 17:54	RMB
	@See Narrative				
Molybdenum	27.9 @ ug/L	0.50	SW6020A	3 Nov 16 17:54	RMB
Selenium	4.39 @ ug/L	0.50	SW6020A	3 Nov 16 17:54	RMB
Thallium	< 0.5 ug/L	0.1	SW6020A	3 Nov 16 17:54	RMB
	@See Narrative				
Fluoride	0.100 mg/L	0.020	EPA 300.0	1 Nov 16 19:54	RMB

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
 The reporting limit was elevated for any analyte requiring a dilution as coded below:

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

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

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 5 Dec 2016
Lab Number: 16-A56140
Work Order #: 31-0543
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 18 Oct 2016 10:23
Sampled By: MVTL FIELD PERSONNEL
Date Received: 18 Oct 2016 14:40
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 9 DEEP

Temp at Receipt: 0.0C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
-----------------------	--------------	---------------------	------------------	---------

* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

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

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

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040

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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 5 Dec 2016
 Lab Number: 16-A56141
 Work Order #: 31-0543
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 18 Oct 2016 10:59
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 18 Oct 2016 14:40
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 2B

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				21 Oct 16	JMS
Water Digestions				20 Oct 16	JMS
Radium 226	See Attached			2 Dec 16 15:52	ABL
Radium 228	See Attached		EPA M9320	2 Dec 16 15:52	ABL
pH, Field	7.38 units	1.00	I-1506-85	18 Oct 16 10:59	AMG
pH	* 7.8 units	1.0	SM 4500 H+B-96	19 Oct 16 17:21	RC
Sulfate	794 ~ mg/L	4.0	ASTM D516-02	20 Oct 16 9:32	AKF
Chloride	42.2 mg/L	3.0	SM 4500 Cl E	21 Oct 16 9:04	MRW
Mercury	< 0.025 @ ug/L	0.005	EPA 245.7	21 Oct 16 11:18	TWB
Solids, Total Dissolved	1460 mg/L	10	SM 2540 C-97	20 Oct 16 15:54	RC
Calcium	312.0 mg/L	0.500	SW6010C	25 Oct 16 10:34	RMV
	See Narrative				
Lithium	0.026 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Barium	0.139 mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	25 Oct 16 10:34	RMV
Boron	3.870 mg/L	0.100	SW6010C	25 Oct 16 10:34	RMV
	^See Narrative				
Antimony	< 2.5 ug/L	0.5	SW6020A	27 Oct 16 21:32	RMB
	@See Narrative				
Arsenic	4.70 ug/L	0.50	SW6020A	27 Oct 16 21:32	RMB
	@See Narrative				
Beryllium	0.36 @ ug/L	0.05	SW6020A	14 Nov 16 14:11	RMB
Cadmium	0.60 ug/L	0.10	SW6020A	27 Oct 16 21:32	RMB
	@See Narrative				
Chromium	20.0 ug/L	0.50	SW6020A	27 Oct 16 21:32	RMB
	@See Narrative				
Lead	5.73 ug/L	0.50	SW6020A	27 Oct 16 21:32	RMB
	@See Narrative				
Molybdenum	6.81 ug/L	0.50	SW6020A	27 Oct 16 21:32	RMB
	@See Narrative				
Selenium	< 2.5 @ ug/L	0.5	SW6020A	15 Nov 16 10:36	RMB
Thallium	< 0.5 ug/L	0.1	SW6020A	27 Oct 16 21:32	RMB
	@See Narrative				
Fluoride	0.110 mg/L	0.020	EPA 300.0	1 Nov 16 19:54	RMB

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
 The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WH/DN # R-040

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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 5 Dec 2016
 Lab Number: 16-A56141
 Work Order #: 31-0543
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 18 Oct 2016 10:59
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 18 Oct 2016 14:40
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 2B

Temp at Receipt: 0.0C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
-----------------------	--------------	---------------------	------------------	---------

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
 The reporting limit was elevated for any analyte requiring a dilution as coded below:

0 = Due to sample matrix # = Due to concentration of other analytes
 1 = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND HW/DW # R-040

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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
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Date Reported: 5 Dec 2016

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 201631-0543
Account Number: 006106
PO #: 48680

Project Name: BIG STONE PLANT

LABORATORY NARRATIVE

INORGANIC AND METALS ANALYSES:

Due to the sample matrix of the spiked sample, the recoveries for calcium were outside of acceptance range in the matrix spike and matrix spike duplicate for samples 16-A56133 through 16-A56142. The data was reported based on the acceptable recoveries of the laboratory control spike and relative percent difference between the matrix spikes.

Due to the sample matrix of the spiked sample, the recoveries for boron were outside of acceptance range in the matrix spike and matrix spike duplicate for samples 16-A56133, 16-A56134, 16-A56136, 16-A56137, and 16-A56141. The data was reported based on the acceptable recoveries of the laboratory control spike and relative percent difference between the matrix spikes.

The internal standard count recoveries associated with molybdenum, cadmium, antimony, thallium, and lead failed in the unspiked sample, matrix spike, and matrix spike duplicate for samples 16-A56133 and 16-A56135. The data was reported based on acceptable recoveries of the matrix spikes.

The internal standard count recoveries associated with chromium failed in the reporting limit checks for samples 16-A56133 through 16-A56139, 16-A56141, and 16-A56144 through 16-A56146. The data was reported based on the acceptable recovery of the reporting limit.

The matrix spike recoveries for selenium were above the acceptance limits for sample 16-A56135. The internal standard counts associated with selenium failed in the unspiked sample, matrix spike, and matrix spike duplicate. Data below the reporting limit was reported.

The internal standard count recoveries associated with molybdenum, thallium, and lead failed in the unspiked sample, matrix spike, and matrix spike duplicate for sample 16-A56136. The data was reported based on acceptable recoveries of the matrix spikes.

The internal standard count recoveries associated with molybdenum failed in the unspiked sample, matrix spike, and matrix spike duplicate for samples 16-A56138 and 16-A56145. The data was reported based on acceptable recoveries of the matrix spikes.

The internal standard count recoveries associated with arsenic, molybdenum, cadmium, antimony, thallium, and lead failed in the unspiked sample, matrix spike, and matrix spike duplicate for sample 16-A56141. The data was reported based on acceptable recoveries of the matrix spikes.

Internal standard counts associated with thallium and lead failed in the reporting limit checks for samples 16-A56134, 16-A56137 through 16-A56140, and 16-A56142 through 16-A56147. Data was reported based on acceptable recoveries of the reporting limit checks.

The chromium knowns were above the acceptance limits for samples 16-A56142 and 16-A56147. Results below the reporting limit were reported.

Internal standard counts associated with arsenic and selenium failed in the laboratory control spike for sample 16-A56147. Data was reported based on acceptable recoveries of the laboratory control spike.

No other problems were encountered with these analyses.

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Quality Control Report

Lab IDs: 16-A56133 to 16-A56147

Project: BIG STONE PLANT CCR

Work Order: 201631-0543

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 ug/L	25.0	107	85-115	25.0	16A56134q	<0.5	27.7	111	75-125	27.7	27.7	111	0.0	10	106	90-110	<0.5
	25.0	105	85-115	25.0	16A56146q	<0.5	28.0	112	75-125	28.0	28.2	113	0.7	10	105	90-110	<0.5
	25.0	105	85-115	25.0	A56134qc	<2.5	27.1	108	75-125	27.1	27.1	108	0.0	10	104	90-110	<0.5
	25.0	106	85-115	25.0	A56146qc	<2.5	27.7	111	75-125	27.7	27.6	110	0.4	10	104	90-110	<0.5
				25.0	A56364qc	<2.5	27.0	108	75-125	27.0	27.2	109	0.7	10	106	90-110	
				25.0	16A56134q	<2.5	25.9	104	75-125	25.9	26.0	104	0.4	10	104	90-110	
Arsenic ug/L	25.0	104	85-115	25.0	16A56146q	0.67	30.3	119	75-125	30.3	29.9	117	1.3	10	106	90-110	<0.5
	25.0	107	85-115	25.0	A56134qc	<2.5	29.7	119	75-125	29.7	29.3	117	1.4	10	101	90-110	<0.5
	25.0	103	85-115	25.0	A56146qc	<2.5	27.5	110	75-125	27.5	28.2	113	2.5	10	101	90-110	
				25.0	A56364qc	<2.5	25.0	100	75-125	25.0	25.0	100	0.0	10	102	90-110	
Barium mg/L	1.000	101	85-115	1.00	16A56142q	0.006	1.060	105	75-125	1.060	1.070	106	0.9	10	93	90-110	<0.005
				1.00	16A56085q	0.033	1.090	106	75-125	1.090	1.080	105	0.9	10	94	90-110	
Beryllium ug/L	2.50	98	85-115	2.50	16-A56146	<0.25	2.56	102	75-125	2.56	2.62	105	2.3	10	104	90-110	<0.05
	2.50	102	85-115	2.50	A56364qc	<0.25	2.77	111	75-125	2.77	2.95	118	6.3	10	100	90-110	<0.05
	2.50	104	85-115	2.50	16A56134q	<0.25	2.72	109	75-125	2.72	2.53	101	7.2	10	93	90-110	
				2.50	16A56134q	<0.25	2.55	102	75-125	2.55	2.43	97	4.8	10			

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Quality Control Report

Lab IDs: 16-A56133 to 16-A56147

Project: BIG STONE PLANT

Work Order: 201631-0543

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD/ Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec i(%)	Known % Rec Limits	Method Blank
Boron mg/L	1.000	105	85-115	1.00	16A56142q	<0.8	1.340	134	75-125	1.340	1.400	140	4.4	10	100	90-110	<0.1
	1.000	102	85-115	1.00	16A56085q	0.194	1.270	108	75-125	1.270	1.280	109	0.8	10	94	90-110	<0.1
	1.000	106	85-115	1.00	16A56142q	0.254	1.360	111	75-125	1.360	1.380	113	1.5	10	100	90-110	<0.1
				1.00	16A56085q	0.187	1.260	107	75-125	1.260	1.270	108	0.8	10	96	90-110	
				1.00	16A60703q	8.940	10.10	116	75-125	10.10	10.20	126	1.0	10			
				1.00	16A58194q	0.109	1.160	105	75-125	1.160	1.190	108	2.6	10			
Cadmium ug/L	5.00	106	85-115	5.00	16A56134q	0.25	5.61	107	75-125	5.61	5.52	105	1.6	10	106	90-110	<0.1
	5.00	104	85-115	5.00	16A56146q	<0.1	5.44	109	75-125	5.44	5.42	108	0.4	10	104	90-110	<0.1
	5.00	102	85-115	5.00	A56134qc	<0.5	5.53	111	75-125	5.53	5.55	111	0.4	10	102	90-110	<0.1
				5.00	A56146qc	<0.5	5.18	104	75-125	5.18	5.04	101	2.7	10	100	90-110	
				5.00	A56364qc	<0.5	5.19	104	75-125	5.19	5.03	101	3.1	10	99	90-110	
Calcium mg/L	50.00	104	85-115	50.0	16A56142q	299.0	494.0	390	75-125	494.0	547.0	496	10.2	10	99	90-110	<0.5
				50.0	16A56085q	102.0	150.0	96	75-125	150.0	154.0	104	2.6	10	100	90-110	
Chloride mg/L	-	-	-	60.0	16-A56135	10.0	72.8	105	85-120	72.8	75.1	108	3.1	5	98	90-110	<3
	-	-	-	60.0	16-A56145	<3	64.1	107	85-120	64.1	64.4	107	0.5	5	98	90-110	<3
	-	-	-	60.0	16-A56147	17.4	78.4	102	85-120	78.4	78.4	102	0.0	5	98	90-110	<3
	-	-	-	60.0	16-A54878	19.4	83.5	107	88-117	83.5	82.1	104	1.7	5			
	-	-	-	60.0	16-A54786	17.8	78.4	101	85-120	78.4	79.4	103	1.3	5			

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Quality Control Report

Lab IDs: 16-A56133 to 16-A56147

Project: BIG STONE PLANT

Work Order: 201631-0543

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 Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Chromium ug/L	25.0	102	85-115	25.0	16A56134q	2.16	23.1	84	75-125	23.1	21.6	78	6.7	10	98	90-110	< 0.5
	25.0	98	85-115	25.0	16A56146q	< 0.5	19.6	78	75-125	19.6	20.7	83	5.5	10	105	90-110	< 0.5
	25.0	99	85-115	25.0	A56146qc	< 5	28.0	112	75-125	28.0	29.7	119	5.9	10	102	90-110	< 0.5
	25.0	113	85-115	25.0	A56364qc	< 5	26.9	108	75-125	26.9	26.9	108	0.0	10	111	90-110	
				25.0	16A56134q	2.85	28.0	101	75-125	28.0	28.0	101	0.0	10	94	90-110	
				25.0	16A56134q	< 2.5	24.9	100	75-125	24.9	24.5	98	1.6	10			
Cobalt mg/L	1.000	107	85-115	1.00	16A56142q	< 0.01	0.985	98	75-125	0.985	0.990	99	0.5	10	98	90-110	< 0.005
				1.00	16A56085q	< 0.01	1.030	103	75-125	1.030	1.040	104	1.0	10	97	90-110	
Fluoride mg/L	0.200	105	85-115	0.20	16-A56678	0.210	0.400	95	75-125	0.400	0.420	105	4.9	10	104	90-110	< 0.02
	0.200	105	85-115	0.20	16-A56141	0.110	0.290	90	75-125	0.290	0.280	85	3.5	10	99	90-110	
Lead ug/L	25.0	100	85-115	25.0	16A56134q	0.72	27.9	109	75-125	27.9	27.3	106	2.2	10	100	90-110	< 0.5
	25.0	100	85-115	25.0	16A56146q	< 0.5	26.2	105	75-125	26.2	25.9	104	1.2	10	100	90-110	< 0.5
	25.0	98	85-115	25.0	A56134qc	< 2.5	26.9	108	75-125	26.9	26.7	107	0.7	10	101	90-110	< 0.5
				25.0	A56146qc	< 2.5	25.8	103	75-125	25.8	25.3	101	2.0	10	100	90-110	
				25.0	A56364qc	< 2.5	24.8	99	75-125	24.8	24.5	98	1.2	10	99	90-110	
Lithium mg/L	1.000	105	85-115	1.00	16-A56142	0.436	1.600	116	75-125	1.600	1.620	118	1.2	10	97	90-110	< 0.005
				1.00	a56085qc	0.008	1.110	110	75-125	1.110	1.120	111	0.9	10	99	90-110	

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Quality Control Report

Lab IDs: 16-A56133 to 16-A56147

Project: BIG STONE PLANT

Work Order: 201631-0543

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Mercury ug/L	-	-	-	0.10	16-A56142	<0.005	0.096	96	67-106	0.096	0.096	96	0.0	9	101	76-113	<0.005
	-	-	-	0.10	16-A56126	0.005	0.097	92	67-106	0.097	0.097	92	0.0	9	99	76-113	<0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.005
Molybdenum ug/L	25.0	101	85-115	25.0	16A56134q	1.41	25.8	98	75-125	25.8	25.1	95	2.8	10	100	90-110	<0.5
	25.0	102	85-115	25.0	16A56146q	14.5	39.7	101	75-125	39.7	39.4	100	0.8	10	98	90-110	<0.5
	25.0	94	85-115	25.0	A56134qc	<2.5	26.6	106	75-125	26.6	26.3	105	1.1	10	99	90-110	<0.5
	-	-	-	25.0	A56146qc	14.3	38.6	97	75-125	38.6	38.1	95	1.3	10	96	90-110	<0.5
	-	-	-	25.0	A56364qc	<2.5	23.9	96	75-125	23.9	24.1	96	0.8	10	95	90-110	<0.5
pH units	-	-	-	-	-	-	-	-	-	7.2	7.2	-	0.0	2.5	101	90-110	-
	-	-	-	-	-	-	-	-	-	6.8	6.8	-	0.0	2.5	101	90-110	-
Selenium ug/L	25.0	103	85-115	25.0	16A56134q	0.78	40.5	159	75-125	40.5	37.9	148	6.6	10	107	90-110	<0.5
	25.0	110	85-115	25.0	A56134qc	<2.5	31.1	124	75-125	31.1	29.9	120	3.9	10	102	90-110	<0.5
	25.0	100	85-115	25.0	A56146qc	8.31	35.9	110	75-125	35.9	36.9	114	2.7	10	102	90-110	<0.5
	25.0	100	85-115	25.0	A56364qc	<2.5	27.4	110	75-125	27.4	27.2	109	0.7	10	104	90-110	<0.5
	-	-	-	25.0	16A56134q	<2.5	26.7	107	75-125	35.2	35.5	106	0.8	10	100	90-110	<0.5

Quality Control Report

Lab IDs: 16-A56133 to 16-A56147

Project: BIG STONE PLANT

Work Order: 201631-0543

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
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	1700	1750	-	2.9	10	90	85-115	< 10
	-	-	-	-	-	-	-	-	-	933	954	-	2.2	10	86	85-115	< 10
	-	-	-	-	-	-	-	-	-	1240	1270	-	2.4	10			
	-	-	-	-	-	-	-	-	-	182	184	-	1.1	13			
Sulfate mg/L	-	-	-	600	16-A56134	1400	2000	100	78-126	2000	2010	102	0.5	5	94	90-110	< 4
	-	-	-	600	16-A56144	1200	1920	120	78-126	1920	1890	115	1.6	5	100	90-110	< 4
	-	-	-	600	16-A56147	1550	2200	108	78-126	2200	2280	122	3.6	5	105	90-110	< 4
	-	-	-	60.0	16-A55115	127	186	98	78-126	186	194	112	4.2	5			
Thallium ug/L	5.00	101	85-115	5.00	16A56134q	< 0.1	5.72	114	75-125	5.72	5.62	112	1.8	10	99	90-110	< 0.1
	5.00	101	85-115	5.00	16A56146q	< 0.1	5.38	108	75-125	5.38	5.32	106	1.1	10	102	90-110	< 0.1
	5.00	100	85-115	5.00	A56134qc	< 0.5	5.47	109	75-125	5.47	5.39	108	1.5	10	102	90-110	< 0.1
				5.00	A56146qc	< 0.5	5.29	106	75-125	5.29	5.17	103	2.3	10	100	90-110	
				5.00	A56364qc	< 0.5	4.98	100	75-125	4.98	4.93	99	1.0	10	100	90-110	

The boron matrix spike recoveries were outside the acceptance limits, see narrative.

The calcium matrix spike recoveries were outside the acceptance limits, see narrative.

The selenium matrix spike recoveries were outside the acceptance limits, see narrative.

The calcium duplicate RPD was outside the 10% limit at 10.2%. This result would be rounded down to 10% and meet the limit.

The chromium known recovery was outside the acceptance limits, see narrative.

Approved by:





Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Date: 11/30/2016

CLIENT: MVTL Inc
Project: WO # 31-0543
Lab Order: S1610332

CASE NARRATIVE
Report ID: S1610332001

Samples A56133 Slag 1, A56134 Slag 4, A56135 Slag 5, A56136 Slag 6, A56137 Slag 7, A56138 Slag 8, A56139 Slag 9, A56140 Slag 9 deep, A56141 Slag 2B, A56142 H2OX, A56143 H3OX, A56144 H4OX, A56145 H6, A56146 H8, and A56147 H9 were received on October 21, 2016.

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

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

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 11/30/2016
Report ID S1610332001

ProjectName: WO # 31-0543
Lab ID: S1610332-001
ClientSample ID: A56133 Slag 1
COC: WO #31-0543

WorkOrder: S1610332
CollectionDate: 10/17/2016 2:20:00 PM
DateReceived: 10/21/2016 2:23:00 PM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	10/31/2016 2307	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	10/31/2016 2307	MB
Radium 228	ND	pCi/L		2	Ga-Tech	11/17/2016 638	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	11/17/2016 638	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 11/30/2016
Report ID S1610332001

ProjectName: WO # 31-0543
Lab ID: S1610332-002
ClientSample ID: A56134 Slag 4
COC: WO #31-0543

WorkOrder: S1610332
CollectionDate: 10/17/2016 3:28:00 PM
DateReceived: 10/21/2016 2:23:00 PM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	10/31/2016 2307	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	10/31/2016 2307	MB
Radium 228	ND	pCi/L		2	Ga-Tech	11/17/2016 942	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	11/17/2016 942	MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: WO # 31-0543
Lab ID: S1610332-003
ClientSample ID: A56135 Slag 5
COC: WO #31-0543

Date Reported 11/30/2016
Report ID S1610332001

WorkOrder: S1610332
CollectionDate: 10/18/2016 10:59:00 AM
DateReceived: 10/21/2016 2:23:00 PM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	10/31/2016 2307 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	10/31/2016 2307 MB
Radium 228	ND	pCi/L		2	Ga-Tech	11/17/2016 1247 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	11/17/2016 1247 MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by: Wade Nieuwsma
Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 11/30/2016
Report ID S1610332001

ProjectName: WO # 31-0543
Lab ID: S1610332-004
ClientSample ID: A56136 Slag 6
COC: WO #31-0543

WorkOrder: S1610332
CollectionDate: 10/17/2016 4:02:00 PM
DateReceived: 10/21/2016 2:23:00 PM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	10/31/2016 2307	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	10/31/2016 2307	MB
Radium 228	ND	pCi/L		2	Ga-Tech	11/17/2016 1552	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	11/17/2016 1552	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by: Wade Nieuwsma
Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 11/30/2016
Report ID S1610332001

ProjectName: WO # 31-0543
Lab ID: S1610332-005
ClientSample ID: A56137 Slag 7
COC: WO #31-0543

WorkOrder: S1610332
CollectionDate: 10/17/2016 4:45:00 PM
DateReceived: 10/21/2016 2:23:00 PM
FieldSampler:
Matrix: Water

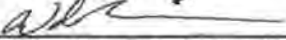
Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	10/31/2016 2307 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	10/31/2016 2307 MB
Radium 228	ND	pCi/L		2	Ga-Tech	11/17/2016 1857 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	11/17/2016 1857 MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 11/30/2016
Report ID S1610332001

ProjectName: WO # 31-0543
Lab ID: S1610332-006
ClientSample ID: A56138 Slag 8
COC: WO #31-0543

WorkOrder: S1610332
CollectionDate: 10/17/2016 6:15:00 PM
DateReceived: 10/21/2016 2:23:00 PM
FieldSampler:
Matrix: Water

Comments

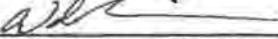
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	10/31/2016 2307 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	10/31/2016 2307 MB
Radium 228	ND	pCi/L		2	Ga-Tech	11/17/2016 2201 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	11/17/2016 2201 MB

These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

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

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager

Page 6 of 15



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported: 11/30/2016
Report ID: S1610332001

ProjectName: WO # 31-0543
Lab ID: S1610332-007
ClientSample ID: A56139 Slag 9
COC: WO #31-0543

WorkOrder: S1610332
CollectionDate: 10/18/2016 9:41:00 AM
DateReceived: 10/21/2016 2:23:00 PM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	1.4	pCi/L		1	SM 7500 Ra-B	10/31/2016 2307	MB
Radium 226 Precision (±)	0.2	pCi/L			SM 7500 Ra-B	10/31/2016 2307	MB
Radium 228	2.3	pCi/L		2	Ga-Tech	11/18/2016 105	MB
Radium 228 Precision (±)	2.9	pCi/L			Ga-Tech	11/18/2016 105	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 11/30/2016
Report ID S1610332001

ProjectName: WO # 31-0543
Lab ID: S1610332-008
ClientSample ID: A56140 Slag 9 deep
COC: WO #31-0543

WorkOrder: S1610332
CollectionDate: 10/18/2016 10:23:00 AM
DateReceived: 10/21/2016 2:23:00 PM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	11/01/2016 824	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	11/01/2016 824	MB
Radium 228	2.5	pCi/L		2	Ga-Tech	11/18/2016 409	MB
Radium 228 Precision (±)	2.9	pCi/L			Ga-Tech	11/18/2016 409	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 8 of 15



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: WO # 31-0543
Lab ID: S1610332-009
ClientSample ID: A56141 Slag 2B
COC: WO #31-0543

Date Reported 11/30/2016
Report ID S1610332001

WorkOrder: S1610332
CollectionDate: 10/18/2016 10:59:00 AM
DateReceived: 10/21/2016 2:23:00 PM
FieldSampler:
Matrix: Water

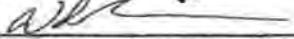
Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	11/01/2016 824 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	11/01/2016 824 MB
Radium 228	ND	pCi/L		2	Ga-Tech	11/18/2016 714 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	11/18/2016 714 MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTI Inc
 Work Order: S1610332
 Project: WO # 31-0543

Date: 11/30/2016
 Report ID: S1610332001

Radium 228 by Ga/Tech

Sample Type MBLK

Units: pCi/L

MB-397 (11/15/16 14:37)	RunNo: 141068	PrepDate: 11/02/16 14:00	BatchID: 12558					
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-397 (11/15/16 17:41)	RunNo: 141068	PrepDate: 11/02/16 14:00	BatchID: 12558					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228	39	1	39.1		98.6	61.3 - 120		

Radium 228 by Ga/Tech

Sample Type MS

Units: pCi/L

MS-397 (11/15/16 23:50)	RunNo: 141068	PrepDate: 11/02/16 14:00	BatchID: 12558					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228	43	1	39.1	ND	110	61.3 - 120		

Radium 228 by Ga/Tech

Sample Type MSD

Units: pCi/L

MSD-397 (11/16/16 02:55)	RunNo: 141068	PrepDate: 11/02/16 14:00	BatchID: 12558					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228	41	1	43	5.30	104	20		

Radium 226 In Water - Total by SM7500RA_B

Sample Type MBLK

Units: pCi/L

MB-1680 (10/31/16 23:07)	RunNo: 140413	PrepDate: 10/26/16 0:00	BatchID: 12484					
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-1680 (10/31/16 23:07)	RunNo: 140413	PrepDate: 10/26/16 0:00	BatchID: 12484					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226	5.4	0.2	5.99		90.6	67.1 - 122		

Radium 226 In Water - Total by SM7500RA_B

Sample Type LCSD

Units: pCi/L

LCSD-1680 (10/31/16 23:07)	RunNo: 140413	PrepDate: 10/26/16 0:00	BatchID: 12484					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Radium 226	6.2	0.2	5.4	13.7	104	20		

Radium 226 In Water - Total by SM7500RA_B

Sample Type MS

Units: pCi/L

S1610228-007AMS (10/31/16 23:07)	RunNo: 140413	PrepDate: 10/26/16 0:00	BatchID: 12484					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226	11.0	0.2	12	1.0	83.2	65 - 131		

Qualifiers: B Analyte detected in the associated Method Blank
 H Holding times for preparation or analysis exceeded
 L Analyzed by another laboratory
 O Outside the Range of Dilutions
 S Spike Recovery outside accepted recovery limits

E Value above quantitation range
 J Analyte detected below quantitation limits
 ND Not Detected at the Reporting Limit
 R RPD outside accepted recovery limits
 X Matrix Effect

Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003
Phone: 800 782 3557 Fax: 507 359 2890

Field Service Chain of Custody Record

Project Otter Tail Power Company	Project Type: Big Stone Plant CCR	Name of Samplers: Alan Gleisner, Dusty Farasyn Bon Wolf
Report: Otter Tail Power Company	Carbon Copy:	Quote Number:
Attn: Paul Vukonich	Attn:	Work Order Number:
Address: P.O. Box 496 Fergus Falls, MN 56538-0496	Address:	Lab Numbers:
Phone: 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
156142	H2OX		17Oct16	1815	GW		2	N	1	1	N								See Attached
43	H3OX		18Oct16	845	GW		2	N	1	1	N								
44	H4OX		I	1001	GW		2	N	1	1	N								
45	H-6		17Oct16	1634	GW		2	N	1	1	N								
46	H-8			1727	GW		2	N	1	1	N								
47	H-9			1821	GW		2	N	1	1	N								
AF 16133	Slag 1			1426	GW		2	N	1	1	N								
34	Slag 4			1528	GW		2	N	1	1	N								
35	Slag 5		18Oct16	1059	GW		2	N	1	1	N								
36	Slag 6		17Oct16	1602	GW		2	N	1	1	N								

Comments:

WORK ORDER #2

Samples Relinquished By: <i>[Signature]</i>			Samples Received By: <i>A. Gleisner</i>		
Date: 18Oct16	Time: 1440	Temp: 60.98	Date: 18Oct16	Time: 1440	Temp: 0.00
Samples Relinquished into: <i>Eridge</i> Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: <i>Samplers</i> Other:			Seal Number(s) - If Used		
Transport: <i>Ambient</i> <i>Ice</i> Other:			Seals Intact? Yes No		

Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003

Phone: 800 782 3557 Fax: 507 359 2890

Field Service Chain of Custody Record

Project Otter Tail Power Company	Project Type: Big Stone Plant CCR	Name of Samplers: Alan Gleason, Dusty Karszen, Ben Wolf
Report: Otter Tail Power Company	Carbon Copy:	Quote Number:
Attn: Paul Vukonich	Attn:	Work Order Number:
Address: P.O. Box 496	Address:	Lab Numbers:
Fergus Falls, MN 56538-0496		
Phone: 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
37	Slag 7		17 Oct 16	1645	GW		2	N	1	1	N								See Attached
38	Slag 8		I	1815	GW		2	N	1	1	N								
39	Slag 9		18 Oct 16	941	GW		2	N	1	1	N								
40	Slag 9 Deep		I	1023	GW		2	N	1	1	N								
41	Slag 2B		I	1059	GW		2	N	1	1	N								

Comments:

WORK ORDER #2

Samples Relinquished By: <i>[Signature]</i>			Samples Received By: <i>G. Friedman</i>		
Date: 18 Oct 16	Time: 1440	Temp: 0.0°C	Date: 18 Oct 16	Time: 1440	Temp: 0.0°C
Samples Relinquished into: <u>Edge</u> Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: <u>Samplers</u> Other:			Seal Number(s) - If Used		
Transport: Ambient <u>Ice</u> Other:			Seals Intact? Yes No		

Big Stone Sampling

Oct
Both CCR &
Reefine

Site*	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (ml/minute)	Goes Dry?	Sampling Seasons**
WELL10	A	47.43	4	1098.70	Keck/Tsunami	No	3,000	No	1,3
WELL11	A	127.22	4	1104.00	Other Pump	Yes	36,000	No	1,3
WELL12	A	112.40	4	1071.89	Other Pump	Yes	20,000	No	1,3
S1	B	32.50	2	1102.17	Bailer	Yes	N/A	Yes	1,3
S2	B	43.12	2	1102.39	Bailer	Yes	N/A	Yes	1,3
S3	B	62.50	2	1102.65	Bailer	Yes	N/A	No	1,3
S4	B	27.70	2	1090.57	Bailer	Yes	N/A	Yes	1,3
S5	B	46.72	2	1091.40	Bailer	Yes	N/A	Yes	1,3
S6	B	62.05	2	1090.71	Bailer	Yes	N/A	No	1,3
H1OX	C, CCR	32.91	2	1115.89	Bailer	Yes	100	Yes	1,3
H1INT	C	60.11	2	1115.81	Keck/Tsunami	No	1500	No	1,3
H2OX	C, CCR	32.20	2	1103.91	Bladder	Yes	100	Yes	1,3
H2INT	C	62.30	2	1103.91	Bailer	Yes	N/A	Yes	1,3
H3OX	C, CCR	22.55	2	1095.19	Bladder	Yes	100	Yes	1,3
H3INT	C	54.31	2	1095.17	Whale	No	2000	No	1,3
H4OX	C, CCR	27.20	2	1108.22	Bladder	Yes	100	No	1,3
H4INT	C	60.01	2	1108.61	Keck/Tsunami	No	2000	Yes	1,3
H5	C	43.30	2	1122.80	Whale	No	1000	No	1,3
H6	C, CCR	15.00	2	1097.76	Bladder	Yes	100	Yes	1,3
H7	C	33.20	2	1106.06	Whale	No	1000	Yes	1,3
H8	C, CCR	22.05	2	1081.23	Bladder	Yes	100	TBD	1,3
H9	CCR	30.20	2	1086.21	Bladder	Yes	100	TBD	1,3
BC1	B	16.26	2	1118.46	Bailer	Yes	N/A	No	1,3
BC101	B	39.30	2	1118.70	Bailer	Yes	N/A	Yes	1,3
BC2R	B	32.48	2	1115.28	Bailer	Yes	N/A	No	1,3
BC3R	B	35.15	2	1114.42	Bailer	Yes	N/A	Yes	1,3
BC4R	B	34.60	2	1113.86	Bailer	Yes	N/A	Yes	1,3
BC5R	B	37.32	2	1123.02	Bailer	Yes	N/A	No	1,3
BC6R	B	33.95	2	1121.58	Bailer	Yes	N/A	No	1,3
SLAG1	CCR	34.90	2	TBD	LOW FLOW	No	100	TBD	1,3

SLAG2	CCR	TBD	2	1111.06	LOW FLOW	TBD	100	TBD	1,3
SLAG3	CCR	TBD	2	TBD	LOW FLOW	TBD	100	TBD	1,3
SLAG4	CCR	39.00	2	TBD	LOW FLOW	No	100	TBD	1,3
SLAG5	CCR	38.80	2	1107.30	LOW FLOW	No	100	TBD	1,3
SLAG6	CCR	37.30	2	1111.51	LOW FLOW	No	100	TBD	1,3
SLAG7	CCR	48.70	2	1114.39	LOW FLOW	No	100	TBD	1,3
SLAG8	CCR	52.09	2	1127.26	LOW FLOW	No	100	TBD	1,3
SLAG9	CCR	49.80	2	1122.35	LOW FLOW	No	100	TBD	
SLAG9 DEEP***	CCR	68.00	2	1121.92	LOW FLOW	No	100	TBD	
SLAG2B	CCR	40.80	2	1111.26	LOW FLOW	No	100	TBD	
COOLING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
EVAPORATION	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
HOLDING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
RECLAIM POND	C	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3

* Three additional monitoring wells will be installed the Spring of 2016. Each well will be screened approximately 35' below ground surface and will be analyzed for the "C" parameter list. In addition, a new site with 9 wells will be added and will be analyzed for CCR Parameters ONLY.

** 1 = Spring (March 28 - April 28), 2 = Summer (July 1 - August 7), 3 = Fall (October 14- November 14)

*** Only sample for the first two CCR background sampling events.

Big Stone Plant CCR Appendix III Parameters

CCR - Appendix III Detection Monitoring

Field Parameters

pH*

* Field and Laboratory Measurements

Total Concentration Parameters

Boron

Calcium

Chloride

Fluoride

pH

Sulfate

Dissolved Solids, Total

500 HNO₃

1000 None

Big Stone CCR Appendix IV Parameters

CCR - Appendix IV - Assessment Monitoring

Total Concentration Parameters

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium, Total
Cobalt
Fluoride
Lead
Lithium
Mercury
Molybdenum
Selenium
Thallium
Radium 226 + 228

500 None

500 HNO_3

2 - 1000 HNO_3

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607:

507 354 8517

Groundwater Assessment

Sampling Personnel

Alan Coleisner

Site: Otter Tail Power Co./ Big Stone

Facility ID: _____

Date: 17 Oct 16

Unique Station ID: _____

Sample ID: Slag 1

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary: _____

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: 35.13

Constructed Depth: 34.90

Casing Diameter: 2"

Water Level Before Purge: 18.10

Well Volume: 2.77 Gallons

Well Casing Elevation: NA

Static Water Elevation: _____

Previous Static: _____

Water Level After Sample: 32.10

Measurement Method: Elec. WLD Steel Tape

Sampling Information

Weather Conditions Temp: 60 Wind: L+V

Sky: Cloudy

Sampling Method: Grundfos Bladder SS/D Disp. Bailer ☐ Whale ☐ Grab ☐ Other: _____

Dedicated Equipment Yes ☒ No ☐

Well Purged Dry? ☒ Yes ☐ No

Time Purged Dry? 1915

Duplicate Sample? Yes ☒ No ☐ ID: _____

Sample Appearance General: Cloudy

Color: Tan

Pumping Rate: 0.25 gpm

Time Pump Began: 1903 am / pm

Time of Sampling: 1920 am / pm

Sample EH: 128.6

Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1415	7.32	1984	12.75	NA	NA	3.0	1	
							2	
							3	
							4	
1420	7.38	2217	13.24				5	<u>Recharge</u>

Stabilize Yes ☒ No ☐

Amount Water Removed: 3.0

Gallons

Comments: _____

Exceptions to Protocol:

- Very Slow Recharge

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Alan Gleimer

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date:

17 Oct 16

Unique Station ID

Sample ID:

Slag 4

Well Condition

Well Locked? Yes No

Well Labeled? Yes No

Casing Straight? Yes No

Repairs Necessary:

Protective Posts? Yes No

State ID Tag? Yes No

Grout Seal Intact? Yes No

Well Information

Well Depth: 39.23

Constructed Depth: 39.00

Casing Diameter: 2"

Water Level Before Purge: 19.04

Well Volume: 3.29 Gallons

Well Casing Elevation:

Static Water Elevation:

Previous Static:

Water Level After Sam: 25.11

Measurement Method: Elec. W/L Steel Tape

Sampling Information

Weather Conditions: Temp: 60 Wind: L+U Sky: Cloudy

Sampling Method: Grundfos Bladder Disp. B&Whale Grab Other:

Dedicated Equipment: Yes No Pumping Rate: 0.25 gpm

Well Purged Dry? Yes No Time Pump Began: 1446 am / pm

Time Purged Dry? Time of Sampling: 1528 am / pm

Duplicate Sample? Yes No ID: - Sample E: 194.2

Sample Appearance: General: Sl. Cloudy Color: Tan Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SE Q #	Comments:
<u>1500</u>	<u>6.86</u>	<u>2976</u>	<u>10.22</u>	<u>NA</u>	<u>NA</u>	<u>3.50</u>	<u>1</u>	
<u>1514</u>	<u>6.82</u>	<u>2927</u>	<u>10.21</u>			<u>7.0</u>	<u>2</u>	
<u>1528</u>	<u>6.83</u>	<u>2916</u>	<u>10.14</u>			<u>10.50</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? Yes No

Amount Water R: 10.50 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 560

507 354 8517

Groundwater Assessor

Sampling Person:

Ber Wolf

Site:

Otter Tail Power Co./ Big Stone

Facility ID:

Date: 18 Oct 16

Unique Station ID:

Sample ID:

Slag 5

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: 39.00

Constructed Depth: 38.80

Casing Diameter: 2"

Water Level Before Purge: 23.92

Well Volume: 2.46 Gallons

Well Casing Elevation: 1107.30

Static Water Elevation: 1083.38

Previous Static: 1083.53

Water Level After Sample: 28.22

Measurement Method: ☒ Elec. WL ☐ Steel Tape

Sampling Information

Weather Condition Temp: 62

Wind: LLW

Sky: clear

Sampling Method: Grundfos Bladder SS/T Disp. Bailer ☒ Whale ☐ Grab ☐ Other:

Dedicated Equipm Yes ☐ No ☒

Pumping Rate: 25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began: 1044 am ☐ pm

Time Purged Dry? 1045

Time of Sampling: 1059 am ☐ pm

Duplicate Sample? Yes ☐ No ☒

ID: —

Sample EH: 71.2

Sample Appearance General: clear

Color: None

Phase: None

Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>10</u>								
<u>1054</u>	<u>6.80</u>	<u>1048</u>	<u>9.96</u>	<u>NA</u>	<u>NA</u>	<u>2.50</u>	<u>1</u>	
<u>1059</u>	<u>6.96</u>	<u>1029</u>	<u>10.23</u>	<u>1</u>	<u>1</u>	<u>—</u>	<u>2</u>	<u>Recharge</u>
							<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilize Yes ☐ No ☒

Amount Water Removed: 2.5

Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Alan Leisner

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 17 Oct 11

Unique Station ID:

Sample ID: Slag 6

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: 37.52

Constructed Depth: 37.30

Casing Diameter: 2"

Water Level Before Purge: 25.19

Well Volume: 2.00 Gallons

Well Casing Elevation: 1111.51

Static Water Elevation: 1086.32

Previous Static: 1086.45

Water Level After Samp: 34.63

Measurement Method: Elec. W/L Steel Tape

Sampling Information

Weather Conditions: Temp: 12.0 Wind: L+V Sky: Pt Cloudy

Sampling Method: Grundfos Bladder SS/T Disp. Bailer Whale Grab Other:

Dedicated Equipment: Yes ☒ No ☐ Pumping Rate: 0.25 gpm

Well Purged Dry? ☒ Yes ☐ No Time Pump Began: 1549 am / ☒ pm

Time Purged Dry: 1557 Time of Sampling: 1602 am / ☒ pm

Duplicate Sample? Yes ☒ No ☐ ID: - Sample EH: 204.6

Sample Appearance: General: Cloudy Color: Brown Phase: None Odor: None

Time ^⑧	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1557	7.29	1426	11.95	ND	ND	2.0	1	
							2	
							3	
							4	
1602	7.31	1569	11.83			2.0	5	Recharge

Stabilized Yes ☒ No ☐ Amount Water Remove: 2.0 Gallons

Comments:

Exceptions to Protocol:

- Good Recharge

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Alan Gleisner

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 17 Oct 16

Unique Station ID:

Sample ID: Slag 7

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☐ Yes ☒ No

Grout Seal Intact? ☐ Yes ☒ No

Well Information

Well Depth: 49.05

Constructed Depth: 48.70

Casing Diameter: 2"

Water Level Before Purge: 15.41

Well Volume: 5.48 Gallons

Well Casing Elevation: 1114.39

Static Water Elevation: 1098.98

Previous Static: 1098.81

Water Level After Sample: 47.24

Measurement Method: Elec. WD Steel Tape

Sampling Information

Weather Conditions: Temp: 60° Wind: NNE 15 Sky: Cloudy

Sampling Method: ☐ Grundfos ☒ Bladder SSA ☐ Disp. Bailer ☐ Whale ☐ Grab ☐ Other:

Dedicated Equipment Yes ☒ No

Pumping Rate: 0.25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began 1618 am 1pm

Time Purged Dry? 1640

Time of Sampling: 1645 am 1pm

Duplicate Sample? ☐ Yes ☒ No

ID: -

Sample EH: 121.3

Sample Appearance: General: Cloudy Color: Tan Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1640</u>	<u>7.21</u>	<u>2069</u>	<u>10.07</u>	<u>NA</u>	<u>NA</u>	<u>5.5</u>	1	
							2	
							3	
							4	
<u>1645</u>	<u>7.22</u>	<u>2351</u>	<u>10.43</u>	<u>NA</u>	<u>NA</u>	<u>5.5</u>	5	<u>Backwash</u>

Stabilized? Yes ☒ No

Amount Water Removed: 5.5 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Alan Leisner

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 17 Oct 16

Unique Station IC

Sample ID: Slag 8

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☐ Yes ☒ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: 52.25

Constructed Depth: 52.09

Casing Diameter: 2"

Water Level Before Purge: 11.75

Well Volume: 5.79 Gallons

Well Casing Elevation: 1127.26

Static Water Elevation: 1110.51

Previous Static: 1110.28

Water Level After Samp: 29.41

Measurement Method: ☒ Elec. WLL ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 60° Wind: NNE 15 Sky: Pt Cloudy

Sampling Method: Grundfos ☒ Bladder SS/T ☐ Disp. Bailer ☐ Whale ☐ Grab Other:

Dedicated Equipment Yes ☒ No ☐ Pumping Rate: 0.25 gpm

Well Purged Dry? Yes ☒ No ☐ Time Pump Began: 1703 am / pm

Time Purged Dry? Time of Sampling: 1815 am / pm

Duplicate Sample? Yes ☒ No ☐ ID: Sample EH: 216.1

Sample Appearance: General: Clear Color: None Phase: None Odor: None

Time ²⁴	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1727</u>	<u>7.22</u>	<u>1377</u>	<u>10.77</u>	<u>NA</u>	<u>NA</u>	<u>6.0</u>	<u>1</u>	
<u>1751</u>	<u>7.41</u>	<u>1370</u>	<u>10.57</u>	<u> </u>	<u> </u>	<u>12.0</u>	<u>2</u>	
<u>1815</u>	<u>7.45</u>	<u>1366</u>	<u>10.43</u>	<u> </u>	<u> </u>	<u>16.0</u>	<u>3</u>	
				<u> </u>	<u> </u>		<u>4</u>	
				<u> </u>	<u> </u>		<u>5</u>	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 18.0 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Alan Gleason

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 18 Oct 10

Unique Station ID:

Sample ID: Slag 9

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☐ Yes ☒ No

Grout Seal Intact? ☐ Yes ☒ No

Well Information

Well Depth: 51.25

Constructed Depth: 49.80

Casing Diameter: 2"

Water Level Before Purge: 17.51

Well Volume: 5.50 Gallons

Well Casing Elevation: 1122.35

Static Water Elevation: 1104.84

Previous Static: 1105.04

Water Level After Sample: 43.02

Measurement Method: ☒ Elec. ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 49° Wind: NE @ 2 Sky: Sunny

Sampling Method: Grundfos Bladder SSP Disp. Bailer Whale Grab Other:

Dedicated Equipment: Yes ☒ No

Pumping Rate: 0.25 gpm

Well Purged Dry? Yes ☒ No

Time Pump Began: 813 am / pm

Time Purged Dry?

Time of Sampling: 941 am / pm

Duplicate Sample? Yes ☒ No ID: -

Sample EH: 89.2

Sample Appearance: General: Sl. Cloudy Color: Tan Phase: None Odor: None

(22)								
Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SE Q #	Comments:
835	6.98	2316	10.05	NA	NA	5.56	1	
857	6.95	2219	9.88	I	I	11.0	2	
919	6.98	2153	9.86	I	I	16.5	3	
941	6.96	2117	9.89	I	I	22.0	4	
							5	

Stabilized: ☒ Yes ☐ No

Amount Water Removed: 22.0 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607

507 354 8517

Groundwater Assesmer

Sampling Personne

Alan Gleisner

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 18 Oct 11

Unique Station ID:

Sample ID: Slag 9 Deep

Well Condition

Well Locked? Yes No

Well Labeled? Yes No

Casing Straight? Yes No

Repairs Necessary

Protective Posts? Yes No

State ID Tag? Yes No

Grout Seal Intact? Yes No

Well Information

Well Depth: 71.49

Constructed Depth: 68.00

Casing Diameter: 2"

Water Level Before Purge 34.92

Well Volume: 5.63 Gallons

Well Casing Elevation: 1121.92

Static Water Elevation: 1085.00

Previous Static: 1086.11

Water Level After Sample 70.42

Measurement Method: Elec. WLI Steel Tape

Sampling Information

Weather Conditions Temp: 50

Wind: NE @ 2

Sky: Sunny

Sampling Method: Grundfos Blaeder SST

Disp. Bailer

Whale

Grab

Other:

Dedicated Equipme Yes No

Pumping Rate: 0.25 gpm

Well Purged Dry? Yes No

Time Pump Began 955 am / pm

Time Purged Dry? 1018

Time of Sampling: 1023 am / pm

Duplicate Sample? Yes No ID: -

Sample EH: 78.1

Sample Appearance General: Cloudy

Color: Brown

Phase: lt Sediment Odor: None

23								
Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SE Q #	Comments:
1018	10.87	2621	11.54	NA	NA	5.75	1	
							2	
							3	
							4	
1023	8.97	2566	11.74			5.75	5	Recharge

Stabilizer Yes No

Amount Water Removed: 5.75 Gallons

Comments:

Exceptions to Protocol:

- Very slow Recharge

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607

507 354 8517

Groundwater Assessor

Sampling Personnel

Alan Gleimer

Site: Offet Tail Power Co./ Big Stone

Facility ID:

Date: 12 Oct 16

Unique Station ID:

Sample ID: Slag 2B

Well Condition

Well Locked? Yes ☒ No

Well Labeled? Yes ☒ No

Casing Straight? Yes ☒ No

Repairs Necessary

Protective Posts? Yes ☒ No

State ID Tag? Yes ☒ No

Grout Seal Intact? Yes ☒ No

Well Information

Well Depth: 40.93

Constructed Depth: 40.80

Casing Diameter: 2"

Water Level Before Purge 23.63

Well Volume: 2.82 Gallons

Well Casing Elevation: 1111.26

Static Water Elevation: 1087.63

Previous Static: 1083.13

Water Level After Sample 40.31

Measurement Method: Elec. WLI Steel Tape

Sampling Information

Weather Condition: Temp: 50°

Wind: NE @ 2

Sky: Sunny

Sampling Method: Grundfos Bladder S&T Disp. Bailer Whale Grab Other:

Dedicated Equipment Yes ☒ No

Pumping Rate: 0.25 gpm

Well Purged Dry? Yes ☒ No

Time Pump Began 1042 am / pm

Time Purged Dry? 1054

Time of Sampling: 1059 am / pm

Duplicate Sample? Yes ☒ No ID: -

Sample EH: 153.5

Sample Appearance General: Cloudy Color: Brown Phase: Lt Sediment Odor: None

(12)							S E Q	
Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	#	Comments:
<u>1054</u>	<u>7.54</u>	<u>1911</u>	<u>10.64</u>	<u>NA</u>	<u>NA</u>	<u>3.0</u>	<u>1</u>	
							<u>2</u>	
							<u>3</u>	
							<u>4</u>	
<u>1059</u>	<u>7.38</u>	<u>1921</u>	<u>11.07</u>			<u>3.0</u>	<u>5</u>	<u>Recharge</u>

Stabilized Yes ☒ No

Amount Water Removed: 3.0 Gallons

Comments:

Exceptions to Protocol:

- Very slow Recharge



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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FINAL REPORT COMPLETION DATE: 12 Jan 17 AK

Date Reported: 11 Jan 2017

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 31-0620
Account #: 006106
PO #: 48680

Project Name: BIG STONE PLANT CCR

T. J. [Signature] 11 Jan 16
Field Service Manager/Date Reviewed

[Signature] 11 Jan 2017
Chemistry Lab Manager/Date Reviewed

[Signature] 11 January 2017
Quality Assurance Director/Date Reviewed

RL = Reporting Limits
NQ = Not Present, Qualitative Only
PQ = Present, Qualitative Only
ND = Not Determined

All data for this report has been approved by MVTL Laboratory Management.

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



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017
 Lab Number: 16-A63077
 Work Order #: 31-0620
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 21 Nov 2016 11:28
 Sampled By: MVT L FIELD PERSONNEL
 Date Received: 22 Nov 2016 14:00
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 1

Temp at Receipt: 0.6C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				23 Nov 16	JMS
Water Digestions				23 Nov 16	JMS
Radium 226	See Attached			10 Jan 17 11:06	ABL
Radium 228	See Attached		EPA M9320	10 Jan 17 11:06	ABL
pH, Field	7.07 units	1.00	I-1586-85	21 Nov 16 11:28	DGF
pH	* 7.1 units	1.0	SM 4500 H+B-96	22 Nov 16 14:00	DK
Sulfate	423 ~ mg/L	4.0	ASTM D516-02	1 Dec 16 8:09	AKF
Chloride	15.3 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:25	KCF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	5 Dec 16 10:36	TWE
	See Narrative				
Solids, Total Dissolved	1350 mg/L	10	SM 2540 C-97	23 Nov 16 10:30	RC
Calcium	168.0 mg/L	0.500	SW6010C	29 Nov 16 13:52	RMV
Lithium	0.077 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Barium	0.058 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Boron	1.890 mg/L	0.100	SW6010C	29 Nov 16 13:52	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Beryllium	< 0.25 ug/L	0.05	SW6020A	7 Dec 16 15:02	RMB
	@See Narrative				
Cadmium	0.70 @ ug/L	0.10	SW6020A	9 Dec 16 10:01	RMV
Chromium	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 10:01	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Molybdenum	5.10 @ ug/L	0.50	SW6020A	9 Dec 16 10:01	RMV
Selenium	14.2 ug/L	0.50	SW6020A	16 Dec 16 13:12	RMB
	@See Narrative				
Thallium	< 0.5 @ ug/L	0.1	SW6020A	7 Dec 16 15:02	RMB
Fluoride	0.390 mg/L	0.020	EPA 300.0	25 Nov 16 10:40	RME

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

RL = Reporting Limit

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

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

@ = Due to sample matrix

= Due to concentration of other analytes

! = Due to sample quantity

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-G15-125 WI LAB # 999447680 ND MICRO # 1013-M ND WH/DN # R-040

MVT L guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVT L to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVT L. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017
 Lab Number: 16-A63078
 Work Order #: 31-0620
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 21 Nov 2016 12:36
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 22 Nov 2016 14:00
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 4

Temp at Receipt: 0.6C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				23 Nov 16	JMS
Water Digestions				23 Nov 16	JMS
Radium 226	See Attached			10 Jan 17 11:06	ABL
Radium 228	See Attached		EPA M9320	10 Jan 17 11:06	ABL
pH, Field	6.79 units	1.00	I-1586-85	21 Nov 16 12:36	DGF
pH	6.9 units	1.0	SM 4500 H+B-96	22 Nov 16 14:00	DK
Sulfate	1540 ~ mg/L	4.0	ASTM D516-02	1 Dec 16 8:09	AKF
Chloride	51.3 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:25	KCF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	5 Dec 16 10:36	TWB
	See Narrative				
Solids, Total Dissolved	2480 mg/L	10	SM 2540 C-97	23 Nov 16 10:30	RC
Calcium	290.0 mg/L	0.500	SW6010C	29 Nov 16 13:52	RMV
Lithium	0.189 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Barium	0.016 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Boron	0.873 mg/L	0.100	SW6010C	29 Nov 16 13:52	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Beryllium	< 0.25 ug/L	0.05	SW6020A	7 Dec 16 15:02	RMB
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 Dec 16 10:01	RMV
Chromium	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 10:01	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 10:01	RMV
Selenium	< 5 ug/L	0.5	SW6020A	9 Dec 16 10:01	RMV
	@*See Narrative				
Thallium	< 0.5 @ ug/L	0.1	SW6020A	7 Dec 16 15:02	RMB
Fluoride	0.190 mg/L	0.020	EPA 300.0	25 Nov 16 10:40	RMB

RL - Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
 The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix

= Due to concentration of other analytes

! = Due to sample quantity

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-D40

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

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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017
Lab Number: 16-A63078
Work Order #: 31-0620
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 21 Nov 2016 12:36
Sampled By: MVTI FIELD PERSONNEL
Date Received: 22 Nov 2016 14:00
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 4

Temp at Receipt: 0.6C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
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* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

2. Sample diluted due to result above calibration of linear range.

* The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
 @ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO 1013-R ND WW/DW # R-040



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

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017
 Lab Number: 16-A63079
 Work Order #: 31-0620
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 21 Nov 2016 14:53
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 22 Nov 2016 14:00
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 5

Temp at Receipt: 0.6C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				23 Nov 16	JMS
Water Digestions				23 Nov 16	JMS
Radium 226	See Attached			10 Jan 17 11:06	ABL
Radium 228	See Attached		EPA M9320	10 Jan 17 11:07	ABL
pH, Field	6.82 units	1.00	I-1586-85	21 Nov 16 14:53	BMW
pH	* 7.2 units	1.0	SM 4500 H+B-96	22 Nov 16 14:00	DK
Sulfate	132 @ mg/L	4.0	ASTM D516-02	1 Dec 16 8:09	AKF
Chloride	9.4 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:25	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	5 Dec 16 11:12	TWB
Solids, Total Dissolved	518 mg/L	10	SM 2540 C-97	23 Nov 16 10:30	RC
Calcium	132.0 mg/L	0.500	SW6010C	29 Nov 16 13:52	RMV
Lithium	0.026 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Barium	0.105 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Boron	0.112 mg/L	0.100	SW6010C	29 Nov 16 13:52	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Arsenic	3.07 @ ug/L	0.50	SW6020A	7 Dec 16 15:02	RMB
Beryllium	< 0.25 ug/L	0.05	SW6020A	7 Dec 16 15:02	RMB
	@See Narrative				
Cadmium	< 0.5 ug/L	0.1	SW6020A	9 Dec 16 10:01	RMV
Chromium	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 10:01	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Molybdenum	9.93 ug/L	0.50	SW6020A	9 Dec 16 10:01	RMV
Selenium	< 5 ug/L	0.5	SW6020A	9 Dec 16 10:01	RMV
	@^See Narrative				
Thallium	< 0.5 @ ug/L	0.1	SW6020A	7 Dec 16 15:02	RMB
Fluoride	0.270 mg/L	0.020	EPA 300.0	25 Nov 16 10:40	RMB

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards. The reporting limit was elevated for any analyte requiring a dilution as noted below:

@ = Due to sample matrix

= Due to concentration of other analytes

! = Due to sample quantity

* = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WWT/DR # R-040

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



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017
 Lab Number: 16-A63080
 Work Order #: 31-0620
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 21 Nov 2016 13:19
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 22 Nov 2016 14:00
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 6

Temp at Receipt: 0.6C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				23 Nov 16	JMS
Water Digestions				23 Nov 16	TWB
Radium 226	See Attached			10 Jan 17 11:07	ABL
Radium 228	See Attached		EPA M9320	10 Jan 17 11:07	ABL
pH, Field	7.15 units	1.00	I-1586-85	21 Nov 16 13:19	DGF
pH	* 7.2 units	1.0	SM 4500 H+B-96	22 Nov 16 17:37	DK
Sulfate	470 ~ mg/L	4.0	ASTM D516-02	1 Dec 16 8:09	AKF
Chloride	5.8 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:25	KCJ
Mercury	0.021 ug/L	0.005	EPA 245.7	5 Dec 16 11:12	TWB
Solids, Total Dissolved	592 mg/L	10	SM 2540 C-97	23 Nov 16 10:30	RC
Calcium	251.0 mg/L	0.500	SW6010C	2 Dec 16 10:00	RMV
Lithium	0.127 ~ mg/L	0.005	SW6010C	2 Dec 16 10:00	RMV
Barium	0.143 mg/L	0.005	SW6010C	2 Dec 16 10:00	RMV
Cobalt	< 0.01 ~ mg/L	0.005	SW6010C	2 Dec 16 10:00	RMV
Boron	2.170 mg/L	0.100	SW6010C	2 Dec 16 10:00	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Arsenic	4.77 @ ug/L	0.50	SW6020A	7 Dec 16 15:02	RMB
Beryllium	0.38 @ ug/L	0.05	SW6020A	9 Dec 16 10:01	RMV
Cadmium	0.54 @ ug/L	0.10	SW6020A	9 Dec 16 10:01	RMV
Chromium	16.3 @ ug/L	0.50	SW6020A	9 Dec 16 10:01	RMV
Lead	5.93 @ ug/L	0.50	SW6020A	7 Dec 16 15:02	RMB
Molybdenum	7.23 @ ug/L	0.50	SW6020A	9 Dec 16 10:01	RMV
Selenium	< 5 ug/L	0.5	SW6020A	9 Dec 16 10:01	RMV
	@^See Narrative				
Thallium	< 0.5 @ ug/L	0.1	SW6020A	7 Dec 16 15:02	RMB
Fluoride	0.600 mg/L	0.020	EPA 300.0	25 Nov 16 10:40	RMB

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

@ = Due to sample matrix

! = Due to sample quantity

= Due to concentration of other analytes

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999417680 ND MICRO # 1013-M ND WH/DH # R-040

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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017
 Lab Number: 16-A63081
 Work Order #: 31-0620
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 21 Nov 2016 14:05
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 22 Nov 2016 14:00
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 7

Temp at Receipt: 0.6C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				23 Nov 16	JMS
Water Digestions				23 Nov 16	TWB
Radium 226	See Attached			10 Jan 17 11:07	ABL
Radium 228	See Attached		EPA M9320	10 Jan 17 11:07	ABL
pH, Field	7.14 units	1.00	I-1586-85	21 Nov 16 14:05	DGF
pH	* 7.1 units	1.0	SM 4500 H+B-96	22 Nov 16 17:37	DK
Sulfate	809 ~ mg/L	4.0	ASTM D516-02	1 Dec 16 8:09	AKF
Chloride	5.0 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:25	KCJ
Mercury	0.010 ug/L	0.005	EPA 245.7	5 Dec 16 11:12	TWB
Solids, Total Dissolved	1590 mg/L	10	SM 2540 C-97	23 Nov 16 10:30	RC
Calcium	328.0 mg/L	0.500	SW6010C	2 Dec 16 10:00	RMV
Lithium	0.082 ^ mg/L	0.005	SW6010C	2 Dec 16 10:00	RMV
Barium	0.058 mg/L	0.005	SW6010C	2 Dec 16 10:00	RMV
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	2 Dec 16 10:00	RMV
Boron	1.230 mg/L	0.100	SW6010C	2 Dec 16 10:00	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Beryllium	< 0.25 ug/L	0.05	SW6020A	7 Dec 16 15:02	RMB
	@See Narrative				
Cadmium	0.81 @ ug/L	0.10	SW6020A	9 Dec 16 10:01	RMV
Chromium	7.86 @ ug/L	0.50	SW6020A	9 Dec 16 10:01	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Molybdenum	4.99 @ ug/L	0.50	SW6020A	9 Dec 16 10:01	RMV
Selenium	< 5 ug/L	0.5	SW6020A	9 Dec 16 10:01	RMV
	@See Narrative				
Thallium	< 0.5 @ ug/L	0.1	SW6020A	7 Dec 16 15:02	RMB
Fluoride	0.400 mg/L	0.020	EPA 300.0	25 Nov 16 17:59	RMB

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

@ = Due to sample matrix

= Due to concentration of other analytes

! = Due to sample quantity

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND HH/DH # R-040

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



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017
 Lab Number: 16-A63082
 Work Order #: 31-0620
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 21 Nov 2016 15:33
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 22 Nov 2016 14:00
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 8

Temp at Receipt: 0.6C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				23 Nov 16	TWB
Water Digestions				23 Nov 16	TWB
Radium 226	See Attached			10 Jan 17 11:07	ABL
Radium 228	See Attached		EPA M9320	10 Jan 17 11:08	ABL
pH, Field	7.15 units	1.00	I-1586-85	21 Nov 16 15:33	DGF
pH	* 7.2 units	1.0	SM 4500 H+B-96	22 Nov 16 17:37	DK
Sulfate	292 @ mg/L	4.0	ASTM D516-02	1 Dec 16 8:09	AKF
Chloride	38.5 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:25	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	5 Dec 16 11:12	TWB
Solids, Total Dissolved	861 mg/L	10	SM 2540 C-97	23 Nov 16 10:30	RC
Calcium	120.0 mg/L	0.500	SW6010C	2 Dec 16 10:00	RMV
Lithium	0.057 ^ mg/L	0.005	SW6010C	2 Dec 16 10:00	RMV
Barium	0.044 mg/L	0.005	SW6010C	2 Dec 16 10:00	RMV
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	2 Dec 16 10:00	RMV
Boron	0.483 mg/L	0.100	SW6010C	2 Dec 16 10:00	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	14 Dec 16 9:34	RMB
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 10:57	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	9 Dec 16 10:57	RMV
Cadmium	0.13 ug/L	0.10	SW6020A	9 Dec 16 10:57	RMV
Chromium	< 2.5 @ ug/L	0.5	SW6020A	16 Dec 16 13:12	RMB
Lead	< 2.5 @ ug/L	0.5	SW6020A	14 Dec 16 9:34	RMB
Molybdenum	8.81 ug/L	0.50	SW6020A	9 Dec 16 10:57	RMV
Selenium	21.4 @ ug/L	0.50	SW6020A	14 Dec 16 9:34	RMB
Thallium	< 0.5 @ ug/L	0.1	SW6020A	14 Dec 16 9:34	RMB
Fluoride	0.600 mg/L	0.020	EPA 300.0	25 Nov 16 17:59	RMB

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
 Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
 The reporting limit was elevated for any analyte requiring a dilution as coded below:
 @ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WM/DW # R-040

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



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017
 Lab Number: 16-A63083
 Work Order #: 31-0620
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 21 Nov 2016 16:47
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 22 Nov 2016 14:00
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 9

Temp at Receipt: 0.6C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				23 Nov 16	TWB
Water Digestions				23 Nov 16	TWB
Radium 226	See Attached			10 Jan 17 11:08	ABL
Radium 228	See Attached		EPA M9320	10 Jan 17 11:08	ABL
pH, Field	6.96 units	1.00	I-1586-85	21 Nov 16 16:47	BMW
pH	* 7.0 units	1.0	SM 4500 H+B-96	22 Nov 16 17:37	DK
Sulfate	908 ~ mg/L	4.0	ASTM D516-02	1 Dec 16 8:27	AKF
Chloride	6.3 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:43	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	5 Dec 16 11:12	TWB
Solids, Total Dissolved	1900 mg/L	10	SM 2540 C-97	23 Nov 16 10:30	RC
Calcium	396.0 ~ mg/L	0.500	SW6010C	2 Dec 16 10:00	RMV
Lithium	0.118 ~ mg/L	0.005	SW6010C	2 Dec 16 10:00	RMV
Barium	0.044 mg/L	0.005	SW6010C	2 Dec 16 10:00	RMV
Cobalt	< 0.01 ~ mg/L	0.005	SW6010C	2 Dec 16 10:00	RMV
Boron	0.263 mg/L	0.100	SW6010C	2 Dec 16 10:00	RMV
Antimony	2.64 @ ug/L	0.50	SW6020A	12 Dec 16 16:03	RMB
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 10:57	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	9 Dec 16 10:57	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 Dec 16 10:57	RMV
Chromium	4.43 @ ug/L	0.50	SW6020A	12 Dec 16 16:03	RMB
Lead	< 2.5 @ ug/L	0.5	SW6020A	14 Dec 16 9:34	RMB
Molybdenum	10.3 @ ug/L	0.50	SW6020A	9 Dec 16 10:57	RMV
Selenium	< 5 @ ug/L	0.5	SW6020A	14 Dec 16 9:34	RMB
Thallium	< 0.5 @ ug/L	0.1	SW6020A	12 Dec 16 16:03	RMB
Fluoride	0.240 mg/L	0.020	EPA 300.0	25 Nov 16 17:59	RMB

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

@ = Due to sample matrix

= Due to concentration of other analytes

! = Due to sample quantity

* = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 959447680 ND MICRO # 1013-M ND NW/DW # R-040

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



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 2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724
 1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
 www.mvtl.com



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017
 Lab Number: 16-A63084
 Work Order #: 31-0620
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 21 Nov 2016 17:14
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 22 Nov 2016 14:00
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 2B

Temp at Receipt: 0.6C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				23 Nov 16	TWB
Water Digestions				23 Nov 16	TWB
Radium 226	See Attached			10 Jan 17 11:08	ABL
Radium 228	See Attached		EPA M9320	10 Jan 17 11:08	ABL
pH, Field	7.50 units	1.00	I-1586-85	21 Nov 16 17:14	BMV
pH	* 7.2 units	1.0	SM 4500 H+B-96	22 Nov 16 17:37	DK
Sulfate	745 ~ mg/L	4.0	ASTM D516-02	1 Dec 16 8:27	AKF
Chloride	38.0 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:43	KCJ
Mercury	0.008 ug/L	0.005	EPA 245.7	5 Dec 16 11:12	TWB
Solids, Total Dissolved	1380 mg/L	10	SM 2540 C-97	23 Nov 16 10:30	RC
Calcium	254.0 mg/L	0.500	SW6010C	2 Dec 16 10:00	RMV
Lithium	0.033 ^ mg/L	0.005	SW6010C	2 Dec 16 10:00	RMV
Barium	0.074 mg/L	0.005	SW6010C	2 Dec 16 10:00	RMV
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	2 Dec 16 10:00	RMV
Boron	3.310 mg/L	0.100	SW6010C	2 Dec 16 10:00	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	12 Dec 16 16:03	RMB
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 10:57	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	9 Dec 16 10:57	RMV
Cadmium	0.79 @ ug/L	0.10	SW6020A	9 Dec 16 10:57	RMV
Chromium	21.9 @ ug/L	0.50	SW6020A	12 Dec 16 16:03	RMB
Lead	2.56 @ ug/L	0.50	SW6020A	14 Dec 16 9:34	RMB
Molybdenum	7.07 @ ug/L	0.50	SW6020A	9 Dec 16 10:57	RMV
Selenium	< 5 @ ^ ug/L	0.5	SW6020A	14 Dec 16 9:34	RMB
Thallium	< 0.5 @ ug/L	0.1	SW6020A	12 Dec 16 16:03	RMB
Fluoride	0.090 mg/L	0.020	EPA 300.0	25 Nov 16 17:59	RMB

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
 The reporting limit was elevated for any analyte requiring a dilution as coded below:

g = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-D15-125 WI LAB # 999447680 ND MICRO # 1013-M ND RW/DW # R-040

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



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



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Date Reported: 11 Jan 2017

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 201631-0620
Account Number: 006106
PO #: 48680

Project Name: BIG STONE PLANT CCR

LABORATORY NARRATIVE

INORGANIC AND METALS ANALYSES:

The matrix spike recoveries for mercury associated with samples 16-A63071 through 16-A63074, 16-A63077 and 16-A63078 were above the acceptance limits. Only results less than the reporting limit were reported.

The knowns were above the acceptance limits for beryllium for samples 16-A63071 through 16-A63079 and 16-A63081. Data below the reporting limit was reported.

The matrix spike recoveries for beryllium, arsenic, thallium, and lead were above the acceptance limits for sample 16-A63071. Data below the reporting limit was reported.

The matrix spike recoveries for beryllium, arsenic, selenium, thallium, and lead were above the acceptance limits for sample 16-A63072. Data below the reporting limit was reported.

Due to the sample matrix of the spiked sample, the matrix spike duplicate recovery for selenium was outside of acceptance range for sample 16-A63071. Data was reported based on the acceptable recoveries of the blank spike and relative percent difference between the matrix spikes.

Due to the sample matrix of the spiked sample, the matrix spike and matrix spike duplicate recoveries for selenium were above of acceptance range for samples 16-A63073 through 16-A63076, and 16-A63078 through 16-A63081. Data below reporting limit was reported.

The matrix spike recovery for selenium was above the acceptance limits for sample 16-A63077. Data was reported based on acceptable matrix spike duplicate recovery and acceptable relative percent difference between the matrix spike and matrix spike duplicate.

The relative standard deviation between readings for selenium failed in the known for sample 16-A63077. Data was reported based on the acceptable recovery of the known.

No other problems were encountered with these analyses.



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

Your Environmental Monitoring Partner

Date: 1/10/2017

CLIENT: MVTI Inc
Project: Big Stone Plant CCR
Lab Order: S1611451

CASE NARRATIVE
Report ID: S1611451001

Samples H-6-A63074, H-8-A63075, H-9-A63076, H20X-A63071, H30X-A63072, H40X-A63073, Slag 1-A63077, Slag 2B-A63084, Slag 4-A63078, Slag 5-A63079, Slag 6-A63080, Slag 7-A63081, Slag 8-A63082, and Slag 9-A63083 were received on November 29, 2016.

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

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

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 1/10/2017
Report ID S1611451001

ProjectName: Big Stone Plant CCR
Lab ID: S1611451-007
ClientSample ID: Slag 1-A63077
COC: WEB

WorkOrder: S1611451
CollectionDate: 11/21/2016 11:23:00 AM
DateReceived: 11/29/2016 12:30:00 PM
FieldSampler: TP
Matrix: Water

Comments WO# 31-0620

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	12/13/2016 1303	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	12/13/2016 1303	MB
Radium 228	ND	pCi/L		2	Ga-Tech	12/30/2016 2114	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	12/30/2016 2114	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 1/10/2017
Report ID S1611451001

ProjectName: Big Stone Plant CCR
Lab ID: S1611451-008
ClientSample ID: Slag 4-A63078
COC: WEB

WorkOrder: S1611451
CollectionDate: 11/21/2016 12:36:00 PM
DateReceived: 11/29/2016 12:30:00 PM
FieldSampler: TP
Matrix: Water

Comments WO# 31-0620

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	12/13/2016 1303	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	12/13/2016 1303	MB
Radium 228	ND	pCi/L		2	Ga-Tech	12/31/2016 016	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	12/31/2016 016	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 1/10/2017
Report ID S1611451001

ProjectName: Big Stone Plant CCR
Lab ID: S1611451-009
ClientSample ID: Slag 5-A63079
COC: WEB

WorkOrder: S1611451
CollectionDate: 11/21/2016 2:53:00 PM
DateReceived: 11/29/2016 12:30:00 PM
FieldSampler: TP
Matrix: Water

Comments WO# 31-0620

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	12/14/2016 900	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	12/14/2016 900	MB
Radium 228	ND	pCi/L		2	Ga-Tech	12/31/2016 318	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	12/31/2016 318	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by: Wade Nieuwsma
Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

Your Environmental Monitoring Partner

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Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 1/10/2017
Report ID S1611451001

ProjectName: Big Stone Plant CCR
Lab ID: S1611451-010
ClientSample ID: Slag 6-A63080
COC: WEB

WorkOrder: S1611451
CollectionDate: 11/21/2016 1:19:00 PM
DateReceived: 11/29/2016 12:30:00 PM
FieldSampler: TP
Matrix: Water

Comments WO# 31-0620

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	12/14/2016 900	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	12/14/2016 900	MB
Radium 228	ND	pCi/L		2	Ga-Tech	12/31/2016 620	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	12/31/2016 620	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by: Wade Nieuwsma
Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 1/10/2017
Report ID S1611451001

ProjectName: Big Stone Plant CCR
Lab ID: S1611451-011
ClientSample ID: Slag 7-A63081
COC: WEB

WorkOrder: S1611451
CollectionDate: 11/21/2016 2:05:00 PM
DateReceived: 11/29/2016 12:30:00 PM
FieldSampler: TP
Matrix: Water

Comments WO# 31-0620

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	12/14/2016 900	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	12/14/2016 900	MB
Radium 228	ND	pCi/L		2	Ga-Tech	12/31/2016 921	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	12/31/2016 921	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 1/10/2017
Report ID S1611451001

ProjectName: Big Stone Plant CCR
Lab ID: S1611451-012
ClientSample ID: Slag 8-A63082
COC: WEB

WorkOrder: S1611451
CollectionDate: 11/21/2016 3:33:00 PM
DateReceived: 11/29/2016 12:30:00 PM
FieldSampler: TP
Matrix: Water

Comments WO# 31-0620

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	12/14/2016 900	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	12/14/2016 900	MB
Radium 228	ND	pCi/L		2	Ga-Tech	12/31/2016 1223	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	12/31/2016 1223	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Big Stone Plant CCR
Lab ID: S1611451-013
ClientSample ID: Slag 9-A63083
COC: WEB

Date Reported 1/10/2017
Report ID S1611451001

WorkOrder: S1611451
CollectionDate: 11/21/2016 4:47:00 PM
DateReceived: 11/29/2016 12:30:00 PM
FieldSampler: TP
Matrix: Water

Comments WO# 31-0620

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	12/14/2016 900	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	12/14/2016 900	MB
Radium 228	ND	pCi/L		2	Ga-Tech	12/31/2016 1525	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	12/31/2016 1525	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Big Stone Plant CCR
Lab ID: S1611451-014
ClientSample ID: Slag 2B-A63084
COC: WEB

Date Reported: 1/10/2017
Report ID: S1611451001

WorkOrder: S1611451
CollectionDate: 11/21/2016 5:14:00 PM
DateReceived: 11/29/2016 12:30:00 PM
FieldSampler: TP
Matrix: Water

Comments: WO# 31-0620

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	12/14/2016 900 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	12/14/2016 900 MB
Radium 228	ND	pCi/L		2	Ga-Tech	01/04/2017 246 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	01/04/2017 246 MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by: Wade Nieuwsma
Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

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

Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Inc
Work Order: S1611451
Project: Big Stone Plant CCR

Date: 1/10/2017
Report ID: S1611451001

Radium 228 by Ga/Tech

Sample Type MBLK

Units: pCi/L

TAP-407 (12/27/16 12:03)	RunNo: 142210	PrepDate: 12/05/16 12:00	BatchID: 12690					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Total Radium 228

2

1

MB-408 (01/03/17 17:40)	RunNo: 142312	PrepDate: 12/12/16 14:00	BatchID: 12727					
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-407 (12/27/16 15:05)	RunNo: 142210	PrepDate: 12/05/16 12:00	BatchID: 12690					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Total Radium 228

33

1

39.1

83.5

65.9 - 132

LCS-408 (01/03/17 14:38)	RunNo: 142312	PrepDate: 12/12/16 14:00	BatchID: 12727					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Total Radium 228

39

1

39.1

99.5

65.9 - 132

Radium 228 by Ga/Tech

Sample Type MS

Units: pCi/L

MS-407 (12/27/16 21:08)	RunNo: 142210	PrepDate: 12/05/16 12:00	BatchID: 12690					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Total Radium 228

39

1

39.1

2

94.8

50 - 139

MS-408 (01/03/17 20:42)	RunNo: 142312	PrepDate: 12/12/16 14:00	BatchID: 12727					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Total Radium 228

48

1

39.1

2

119

50 - 139

Radium 228 by Ga/Tech

Sample Type MSD

Units: pCi/L

MSD-407 (12/28/16 00:10)	RunNo: 142210	PrepDate: 12/05/16 12:00	BatchID: 12690					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	

Total Radium 228

34

1

39

13.6

82.1

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



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTI Inc
Work Order: S1611451
Project: Big Stone Plant CCR

Date: 1/10/2017
Report ID: S1611451001

Radium 226 In Water -Sample Type **MBLK**

Units: pCi/L

MB-1700 (12/13/16 13:02)	RunNo: 141804	PrepDate: 12/07/16 0:00	BatchID: 12653
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226

ND

0.2

Radium 226 In Water -Sample Type **LCS**

Units: pCi/L

LCS-1700 (12/13/16 13:02)	RunNo: 141804	PrepDate: 12/07/16 0:00	BatchID: 12653
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226

6.0

0.2

5.89

101

67.1 - 122

Radium 226 In Water -Sample Type **LCSD**

Units: pCi/L

LCSD-1700 (12/13/16 13:02)	RunNo: 141804	PrepDate: 12/07/16 0:00	BatchID: 12653
Analyte	Result	RL	Conc %RPD %REC % RPD Limits Qual

Radium 226

6.2

0.2

6.0

4.62

106

20

Radium 226 In Water -Sample Type **MS**

Units: pCi/L

S1611451-001AMS (12/13/16 13:03)	RunNo: 141804	PrepDate: 12/07/16 0:00	BatchID: 12653
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226

13

1

11.8

ND

112

65 - 131

Qualifiers: B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
O Outside the Range of Dilutions
S Spike Recovery outside accepted recovery limits

E Value above quantitation range
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
X Matrix Effect

Quality Control Report

Lab IDs: 16-A63071 to 16-A63084

Project: BIG STONE PLANT CCR

Work Order: 201631-0620

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 ug/L	25.0	106	85-115	25.0	16A63072q	<2.5	30.8	123	75-125	30.8	30.7	123	0.3	10	103	90-110	<0.5
	25.0	106	85-115	25.0	16A63081q	<2.5	26.3	105	75-125	26.3	26.4	106	0.4	10	103	90-110	<0.5
	25.0	104	85-115	25.0	A63082qc	<2.5	27.7	111	75-125	27.7	30.4	122	9.3	10	102	90-110	<0.5
				25.0	16A63082q	<2.5	28.4	114	75-125	28.4	27.5	110	3.2	10	102	90-110	
Arsenic ug/L	25.0	106	85-115	25.0	16A63072q	<2.5	32.7	131	75-125	32.7	32.3	129	1.2	10	102	90-110	<0.5
	25.0	106	85-115	25.0	16A63081q	<2.5	30.8	123	75-125	30.8	29.3	117	5.0	10	102	90-110	<0.5
				25.0	16A63082q	<2.5	28.7	115	75-125	28.7	27.6	110	3.9	10	102	90-110	
Barium mg/L	1.000	102	85-115	1.00	16A63079q	0.105	1.190	108	75-125	1.190	1.140	104	4.3	10	100	90-110	<0.005
	1.000	102	85-115	1.00	16A63112q	0.059	1.050	99	75-125	1.050	1.050	99	0.0	10	96	90-110	
Beryllium ug/L	2.50	131	85-115	2.50	16A63072q	<0.25	3.40	136	75-125	3.40	3.34	134	1.8	10	120	90-110	<0.05
	2.50	99	85-115	2.50	16A63081q	<0.25	3.09	124	75-125	3.09	3.07	123	0.6	10	124	90-110	<0.05
	2.50	95	85-115	2.50	a63081qc	<0.25	2.42	97	75-125	2.62	2.64	106	0.8	10	92	90-110	
				2.50	16A63082q	<0.25	2.62	105	75-125						100	90-110	
Boron mg/L	1.000	102	85-115	1.00	16A63079q	0.112	1.220	111	75-125	1.220	1.180	107	3.3	10	101	90-110	<0.1
	1.000	100	85-115	1.00	16A63112q	<0.1	1.040	104	75-125	1.040	1.070	107	2.8	10	100	90-110	
Cadmium ug/L	5.00	107	85-115	5.00	16A63072q	<0.5	5.51	110	75-125	5.51	5.37	107	2.6	10	98	90-110	<0.1
	5.00	98	85-115	5.00	a63081qc	0.81	6.08	105	75-125	6.08	5.93	102	2.5	10	95	90-110	<0.1
				5.00	16A63082q	<0.5	5.03	101	75-125	5.03	5.27	105	4.7	10	94	90-110	
Calcium mg/L	50.00	105	85-115	50.0	16A63079q	132.0	186.0	108	75-125	186.0	185.0	106	0.5	10	102	90-110	<0.5
	50.00	106	85-115	50.0	16A63112q	97.10	144.0	94	75-125	144.0	146.0	98	1.4	10	102	90-110	
Chloride mg/L	-	-	-	60.0	16-A63072	80.9	142	102	85-120	142	139	97	2.1	5	100	90-110	<3
	-	-	-	60.0	16-A63082	38.5	101	104	85-120	101	99.9	102	1.1	5	100	90-110	<3
	-	-	-	60.0	16-A63115	<2	63.1	105	85-120	63.1	61.8	103	2.1	5	101	90-110	<3
	-	-	-	60.0	16-A63637	24.6	87.9	106	88-117	87.9	85.9	102	2.3	5			

Quality Control Report

Lab IDs: 16-A63071 to 16-A63084

Project: BIG STONE PLANT CCR

Work Order: 201631-0620

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Chromium ug/L	25.0	112	85-115	25.0	16A63072q	< 2.5	24.3	97	75-125	24.3	25.0	100	2.8	10	101	90-110	< 0.5
	25.0	108	85-115	25.0	a63081qc	7.86	32.4	98	75-125	32.4	32.6	99	0.6	10	100	90-110	< 0.5
	25.0	111	85-115	25.0	A63082qc	< 2.5	25.6	102	75-125	25.6	28.0	112	9.0	10	100	90-110	< 0.5
	25.0	110	85-115	25.0	16-A63082	< 2.5	25.6	102	75-125	25.6	27.6	110	7.5	10	110	90-110	< 0.5
	25.0	102	85-115	25.0	A63081qc	7.91	33.0	100	75-125	33.0	32.6	99	1.2	10			< 0.5
				25.0	A65485qc	45.5	72.6	108	75-125	72.6	67.4	88	7.4	10			
Cobalt mg/L	1.000	106	85-115	1.00	16A63079q	< 0.005	1.050	105	75-125	1.050	1.040	104	1.0	10	104	90-110	< 0.005
	1.000	106	85-115	1.00	16A63112q	< 0.01	0.979	98	75-125	0.979	0.997	100	1.8	10	102	90-110	
Fluoride mg/L	0.200	100	85-115	0.20	16-A63080	0.600	0.800	100	75-125	0.800	0.800	100	0.0	10	98	90-110	< 0.02
				0.20	A63084qc	0.090	0.260	85	75-125	0.260	0.260	85	0.0	10	102	90-110	
				0.20	16-A63125	0.680	0.880	100	75-125	0.880	0.880	100	0.0	10			
Lead ug/L	25.0	108	85-115	25.0	16A63072q	< 2.5	32.1	128	75-125	32.1	31.3	125	2.5	10	105	90-110	< 0.5
	25.0	106	85-115	25.0	16A63081q	< 2.5	29.4	118	75-125	29.4	29.6	118	0.7	10	104	90-110	< 0.5
				25.0	16A63082q	< 2.5	28.0	112	75-125	28.0	26.9	108	4.0	10	99	90-110	
Lithium mg/L	1.000	104	85-115	1.00	16-A63079	0.026	1.120	109	75-125	1.120	1.080	105	3.6	10	103	90-110	< 0.005
	1.000	106	85-115	1.00	a63112qc	< 0.01	1.030	103	75-125	1.030	1.010	101	2.0	10	100	90-110	
Mercury ug/L	-	-	-	0.10	16-A63071	< 0.005	0.112	112	67-106	0.112	0.112	112	0.0	9	112	76-113	< 0.005
	-	-	-	0.10	16-A63933	< 0.005	0.106	106	67-106	0.106	0.100	100	5.8	9	110	76-113	< 0.005
	-	-	-	0.10	16-A64471	< 0.005	0.088	88	67-106	0.088	0.091	91	3.4	9	100	76-113	< 0.005
	-	-	-														< 0.005
	-	-	-														< 0.005
Molybdenum ug/L	25.0	103	85-115	25.0	16A63072q	41.4	66.6	101	75-125	66.6	66.7	101	0.2	10	98	90-110	< 0.5
	25.0	95	85-115	25.0	a63081qc	4.99	28.9	96	75-125	28.9	28.7	95	0.7	10	92	90-110	< 0.5
				25.0	16A63082q	8.81	31.6	91	75-125	31.6	32.5	95	2.8	10	90	90-110	
pH units	-	-	-	-	-	-	-	-	-	7.2	7.2	-	0.0	2.5	101	90-110	-
	-	-	-	-	-	-	-	-	-	7.2	7.2	-	0.0	2.5	101	90-110	-

Quality Control Report

Lab IDs: 16-A63071 to 16-A63084

Project: BIG STONE PLANT CCR

Work Order: 201631-0620

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Selenium ug/L	25.0	113	85-115	25.0	16A63072q	< 2.5	31.4	126	75-125	31.4	31.9	128	1.6	10	100	90-110	< 0.5
	25.0	98	85-115	25.0	16A63072q	< 5	31.3	125	75-125	31.3	34.0	136	8.3	10	109	90-110	< 0.5
	25.0	102	85-115	25.0	a63081qc	< 5	31.4	126	75-125	31.4	31.5	126	0.3	10	96	90-110	< 0.5
	25.0	109	85-115	25.0	A63365qc	< 2.5	28.7	115	75-125	28.7	30.0	120	4.4	10	97	90-110	< 0.5
	25.0	108	85-115	25.0	A63081qc	< 10	32.7	131	75-125	33.9	31.4	127	7.7	10	104	90-110	< 0.5
	25.0	108	85-115	25.0	A63081qc	< 2.5	32.8	131	75-125	51.4	49.8	121	3.2	10			< 0.5
				25.0	A65485qc	< 0.5	30.9	124	75-125	51.1	49.4	116	3.4	10			< 0.5
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	918	914	-	0.4	10	109	85-115	< 10
	-	-	-	-	-	-	-	-	-	1380	1370	-	0.7	10			
Sulfate mg/L	-	-	-	60.0	16-A62947	64.0	132	113	78-126	132	130	110	1.5	5	103	90-110	< 4
	-	-	-	600	16-A63082	292	974	114	78-126	974	977	114	0.3	5	95	90-110	< 4
	-	-	-	600	16-A63084	745	1400	109	78-126	1400	1420	112	1.4	5	99	90-110	< 4
	-	-	-	60.0	16-A62306	68.9	139	117	78-126	139	142	122	2.1	5			
	-	-	-	60.0	16-A62134	42.3	111	114	78-126	111	110	113	0.9	5			
Thallium ug/L	5.00	106	85-115	5.00	16A63072q	< 0.5	6.55	131	75-125	6.55	6.37	127	2.8	10	104	90-110	< 0.1
	5.00	108	85-115	5.00	16A63081q	< 0.5	5.68	114	75-125	5.68	5.70	114	0.4	10	104	90-110	< 0.1
	5.00	102	85-115	5.00	A63082qc	< 0.5	5.52	110	75-125	5.52	6.10	122	10.0	10	100	90-110	< 0.1
				5.00	16A63082q	< 0.5	5.74	115	75-125	5.74	5.52	110	3.9	10	100	90-110	

The arsenic matrix spike recoveries were outside the acceptance range, see narrative.
The beryllium LCS recovery was outside the acceptance limits, see narrative.
The beryllium matrix spike recoveries were outside the acceptance limits, see narrative.
The beryllium known recoveries were above the acceptance limits, see narrative.
The lead matrix spike recovery was above the acceptance limits, see narrative.
The selenium matrix spike recoveries were outside the acceptance limits, see narrative.
The thallium matrix spike recoveries were outside the acceptance limits, see narrative.
The mercury matrix spike recoveries were outside the acceptance limits, see narrative.

Approved by:



Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003

Phone: 800 782 3557 Fax: 507 359 2890

Field Service Chain of Custody Record

This is an exact copy of
the original document

By AS Date 22 Nov 16

pages 1-23

Project Otter Tail Power Company	Project Type: Big Stone Plant CCR	Name of Samplers: Dusty Forsyn, Ben Wolf
Report Otter Tail Power Company	Carbon Copy:	Quote Number:
Attn: Paul Vukonich	Attn:	Work Order Number: 31-0620
Address P.O. Box 496	Address:	Lab Numbers:
Fergus Falls, MN 56538-0496		
Phone: 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other 150 None	Analysis Required
At 3021	H2OX		21 Nov 16	1118	GW		2	N	1	1	N								See Attached
72	H3OX			1154	GW		2	N	1	1	N								
73	H4OX			1209	GW		2	N	1	1	N								
74	H-6			1246	GW		2	N	1	1	N								
75	H-8			1322	GW		2	N	1	1	N								
76	H-9			1404	GW		2	N	1	1	N								
77	Slag 1			1123	GW		2	N	1	1	N								
78	Slag 4			1236	GW		2	N	1	1	N								
79	Slag 5			1453	GW		2	N	1	1	N								
80	Slag 6			1319	GW		2	N	1	1	N								

Comments:

WORK ORDER #2

Samples Relinquished By: <u>Dusty Forsyn</u>			Samples Received By: <u>B. Wolf</u>		
Date: <u>22 Nov 16</u>	Time: <u>1400</u>	Temp: <u>0.6</u>	Date: <u>22 Nov 16</u>	Time: <u>1400</u>	Temp: <u>0.6 C</u>
Samples Relinquished into: Fridge <u>log in Cart</u> Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: <u>Samples</u> Other:			Seal Number(s) - If Used		
Transport: <u>Ambient</u> <u>Ice</u> Other:			Seals Intact? Yes No		

Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003
Phone: 800 782 3557 Fax: 507 359 2890

Field Service Chain of Custody Record

Project Otter Tail Power Company	Project Type: Big Stone Plant CCR	Name of Samplers: Dusty Fasn, Ben Wolf
Report Otter Tail Power Company	Carbon Copy:	Quote Number:
Attn: Paul Vukonich	Attn:	Work Order Number:
Address P.O. Box 496	Address:	Lab Numbers:
Fergus Falls, MN 56538-0496		
Phone: 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other 150 None	Analysis Required
81	Slag 7		21 Nov 06	1405	GW		2	N	1	1	N								See Attached
82	Slag 8		I	1533	GW		2	N	1	1	N								
83	Slag 9			1647	GW		2	N	1	1	N								
	Slag 9 Deep				GW		2	N	1	1	N								
84	Slag 2B			1714	GW		2	N	1	1	N								

Comments:

WORK ORDER #2

Samples Relinquished By: <i>Paul Vukonich</i>			Samples Received By: <i>A. Fasn</i>		
Date: 22 Nov 06	Time: 1400	Temp: 0.6	Date: 22 Nov 06	Time: 1400	Temp: 0.6
Samples Relinquished into: Fridge <i>Log in Cart</i> Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: <i>Samplers</i> Other:			Seal Number(s) - If Used		
Transport: Ambient <i>ice</i> Other:			Seals Intact? Yes No		

Big Stone Sampling

NOU
CCR ONLY

Site*	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (ml/minute)	Goes Dry?	Sampling Seasons**
WELL10	A	47.43	4	1098.70	Keck/Tsunami	No	3,000	No	1,3
WELL11	A	127.22	4	1104.00	Other Pump	Yes	36,000	No	1,3
WELL12	A	112.40	4	1071.89	Other Pump	Yes	20,000	No	1,3
S1	B	32.50	2	1102.17	Bailer	Yes	N/A	Yes	1,3
S2	B	43.12	2	1102.39	Bailer	Yes	N/A	Yes	1,3
S3	B	62.50	2	1102.65	Bailer	Yes	N/A	No	1,3
S4	B	27.70	2	1090.57	Bailer	Yes	N/A	Yes	1,3
S5	B	46.72	2	1091.40	Bailer	Yes	N/A	Yes	1,3
S6	B	62.05	2	1090.71	Bailer	Yes	N/A	No	1,3
H1OX	C, CCR	32.91	2	1115.89	Bailer	Yes	100	Yes	1,3
H1INT	C	60.11	2	1115.81	Keck/Tsunami	No	1500	No	1,3
H2OX	C, CCR	32.20	2	1103.91	Bladder	Yes	100	Yes	1,3
H2INT	C	62.30	2	1103.91	Bailer	Yes	N/A	Yes	1,3
H3OX	C, CCR	22.55	2	1095.19	Bladder	Yes	100	Yes	1,3
H3INT	C	54.31	2	1095.17	Whale	No	2000	No	1,3
H4OX	C, CCR	27.20	2	1108.22	Bladder	Yes	100	No	1,3
H4INT	C	60.01	2	1108.61	Keck/Tsunami	No	2000	Yes	1,3
H5	C	43.30	2	1122.80	Whale	No	1000	No	1,3
H6	C, CCR	15.00	2	1097.76	Bladder	Yes	100	Yes	1,3
H7	C	33.20	2	1106.06	Whale	No	1000	Yes	1,3
H8	C, CCR	22.05	2	1081.23	Bladder	Yes	100	TBD	1,3
H9	CCR	30.20	2	1086.21	Bladder	Yes	100	TBD	1,3
BC1	B	16.26	2	1118.46	Bailer	Yes	N/A	No	1,3
BC101	B	39.30	2	1118.70	Bailer	Yes	N/A	Yes	1,3
BC2R	B	32.48	2	1115.28	Bailer	Yes	N/A	No	1,3
BC3R	B	35.15	2	1114.42	Bailer	Yes	N/A	Yes	1,3
BC4R	B	34.60	2	1113.86	Bailer	Yes	N/A	Yes	1,3
BC5R	B	37.32	2	1123.02	Bailer	Yes	N/A	No	1,3
BC6R	B	33.95	2	1121.58	Bailer	Yes	N/A	No	1,3
SLAG1	CCR	34.90	2	TBD	LOW FLOW	No	100	TBD	1,3

SLAG2	CCR	TBD	2	1111.06	LOW FLOW	TBD	100	TBD	1,3
SLAG3	CCR	TBD	2	TBD	LOW FLOW	TBD	100	TBD	1,3
SLAG4	CCR	39.00	2	TBD	LOW FLOW	No	100	TBD	1,3
SLAG5	CCR	38.80	2	1107.30	LOW FLOW	No	100	TBD	1,3
SLAG6	CCR	37.30	2	1111.51	LOW FLOW	No	100	TBD	1,3
SLAG7	CCR	48.70	2	1114.39	LOW FLOW	No	100	TBD	1,3
SLAG8	CCR	52.09	2	1127.26	LOW FLOW	No	100	TBD	1,3
SLAG9	CCR	49.80	2	1122.35	LOW FLOW	No	100	TBD	
SLAG9 DEEP***	CCR	68.00	2	1121.92	LOW FLOW	No	100	TBD	
SLAG2B	CCR	40.80	2	1111.26	LOW FLOW	No	100	TBD	
COOLING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
EVAPORATION	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
HOLDING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
RECLAIM POND	C	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3

* Three additional monitoring wells will be installed the Spring of 2016. Each well will be screened approximately 35' below ground surface and will be analyzed for the "C" parameter list. In addition, a new site with 9 wells will be added and will be analyzed for CCR Parameters ONLY.

** 1 = Spring (March 28 - April 28), 2 = Summer (July 1 - August 7), 3 = Fall (October 14- November 14)

*** Only sample for the first two CCR background sampling events.

Big Stone Plant CCR Appendix III Parameters

CCR - Appendix III Detection Monitoring

Field Parameters

pH*

* Field and Laboratory Measurements

Total Concentration Parameters

Boron

Calcium

Chloride

Fluoride

pH

Sulfate

Dissolved Solids, Total

500 HNO₃

1000 None

Big Stone CCR Appendix IV Parameters

CCR - Appendix IV - Assessment Monitoring

Total Concentration Parameters

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium, Total
Cobalt
Fluoride
Lead
Lithium
Mercury
Molybdenum
Selenium
Thallium
Radium 226 + 228

500 No-e

500 HNO₃

2 - 1000 HNO₃

Big Stone Parameter List "A"

Field Parameters

Field pH
Field Temperature
Field Conductivity

Lab Parameters

Lab pH
Lab Conductivity
Total Alkalinity
Chloride
Hardness, Calcium
Hardness, Total
Nitrate-Nitrite as N
Potassium - Total
Sodium - Total
Sulfate

500 HNO₃

500 H₂SO₄

1000 NO₂-e

Big Stone Parameter List "B"

Field Parameters

Field pH
Field Temperature
Field Conductivity

Lab Parameters

Lab pH
Lab Conductivity
Total Alkalinity
Chloride
Hardness, Calcium
Hardness, Total
Nitrate-Nitrite as N
Potassium - Total
Sodium - Total
Sulfate
Arsenic - dissolved
Boron - dissolved
Cadmium - dissolved
Lead - dissolved
Manganese - dissolved
Strontium - dissolved

1000 none

500 HNO₃

500 HNO₃ Filter

500 H₂SO₄

Big Stone Parameter List "C"

Field Parameters

Field pH
Field Temperature
Field Conductivity

Lab Parameters

Lab pH
Lab Conductivity
Total Alkalinity
Chloride
Hardness, Calcium
Hardness, Total
Nitrate-Nitrite as N
Potassium - Total
Sodium - Total
Sulfate
Arsenic - Dissolved
Arsenic - Total **
Barium - Dissolved
Barium - Total **
Boron - Dissolved
Boron - Total **
Cadmium - Dissolved
Cadmium - Total **
Chromium - Dissolved
Chromium - Total **
Copper - Dissolved
Copper - Total **
Lead - Dissolved
Lead - Total **
Manganese - Dissolved
Manganese - Total **
Mercury - Dissolved
Mercury - Total **
Selenium - Dissolved
Selenium - Total **
Silver - Dissolved
Silver - Total **
Strontium - Dissolved
Strontium - Total **
Vanadium - Dissolved
Vanadium - Total **
Zinc - Dissolved
Zinc - Total **

Pond
1000 NO₂
500 H₂SO₄
500 HNO₃

Well
1000 NO₂
500 H₂SO₄
500 HNO₃ Filter

**** NOTE: ONLY Reclaim Pond is required to have Total metals run.
The groundwater samples are required to have the Dissolved metals run only.**



Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607:

507 354 8517

Groundwater Assessment

Sampling Personnel

Dusty Forsgren

Site:

Otter Tail Power Co./ Big Stone

Facility ID:

Date:

21 Nov 16

Unique Station ID:

Sample ID:

Slag 1

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: 35.14

Constructed Depth: 34.90

Casing Diameter: 2"

Water Level Before Purge: 18.67

Well Volume: 2.68 Gallons

Well Casing Elevation: NA

Static Water Elevation: 1

Previous Static: 1

Water Level After Sample: 33.95

Measurement Method: Elec. W/L Steel Tape

Sampling Information

Weather Conditions Temp: 26

Wind: SE @ 13

Sky: Ptlly. Cloudy

Sampling Method: Grundfos Bladder SSA

Disp. Baller

Whale

Grab

Other:

Dedicated Equipment? ☒ Yes ☐ No

Pumping Rate: 0.25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began: 1112 am / pm

Time Purged Dry? 1123

Time of Sampling: 1128 am / pm

Duplicate Sample? ☒ Yes ☐ No

ID:

Sample EH: None 206.5

Sample Appearance General: Cloudy

Color: Tan

Phase: None

Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1123	6.87	2147	7.73	NA	NA	2.75	1	
							2	
							3	
							4	
1128	7.07	2420	4.20	1	1	2.75	5	Recharge

Stabilize Yes ☒ No

Amount Water Removed: 2.75

Gallons

Comments:

Exceptions to Protocol:

very slow recharge



Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Ferguson

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 2/10/16

Unique Station ID

Sample ID: Slag 4

Well Condition

Well Locked? ☒ Yes No

Well Labeled? ☒ Yes No

Casing Straight? ☒ Yes No

Repairs Necessary:

Protective Posts? ☒ Yes No

State ID Tag? Yes ☒ No

Grout Seal Intact? Yes ☒ No

Well Information

Well Depth: 39.24

Constructed Depth: 39.00

Casing Diameter: 2"

Water Level Before Purge: 19.37

Well Volume: 3.24 Gallons

Well Casing Elevation: NA

Static Water Elevation:

Previous Static:

Water Level After Sam: 23.18

Measurement Method: Elec. WLD Steel Tape

Sampling Information

Weather Conditions: Temp: 28

Wind: SE @ 13

Sky: Pfty. Cloudy

Sampling Method: Grundfos

Bladder Disp. B&W

Grab

Other:

Dedicated Equipment: Yes ☒ No

Pumping Rate: 0.25 gpm

Well Purged Dry? Yes ☒ No

Time Pump Began: 1157 am / pm

Time Purged Dry?

Time of Sampling: 1236 am / pm

Duplicate Sample? Yes ☒ No

ID:

Sample E 186.7

Sample Appearance: General: Clear

Color: None

Phase: None

Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SE Q #	Comments:
1210	6.79	3174	8.05	NA	NA	3.25	1	
1223	6.79	3199	7.92	I	I	6.50	2	
1236	6.79	3173	7.55	I	I	9.75	3	
							4	
							5	

Stabilized? ☒ Yes No

Amount Water R 9.75

Gallons

Comments:

Exceptions to Protocol:



Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 560

507 354 8517

Groundwater Assessor

Sampling Person:

Ben Wolf

Site:

Otter Tail Power Co./ Big Stone

Facility ID:

Date: *21 Nov 16*

Unique Station ID:

Sample ID:

Slag 5

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: *39.00*

Constructed Depth: *38.80*

Casing Diameter: *2"*

Water Level Before Purge: *23.96*

Well Volume: *2.45* Gallons

Well Casing Elevation: *107.30*

Static Water Elevation: *103.34*

Previous Static: *103.38*

Water Level After Sample: *33.14*

Measurement Method: *Elec. WLD*

Steel Tape

Sampling Information

Weather Condition Temp: *27*

Wind: *S @ 10*

Sky: *clear*

Sampling Method: Grundfos

Bladder SS/T

Disp. Bailer

☒ Whale

Grab

Other:

Dedicated Equipm Yes ☒ No

Pumping Rate:

2.5

gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began:

1438

am / pm

Time Purged Dry? *1448*

Time of Sampling:

1453

am / pm

Duplicate Sample? Yes ☒ No

ID:

-

Sample EH: *78.5*

Sample Appearance General: *clear*

Color: *none*

Phase: *Flakes*

Odor: *none*

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<i>1448</i>	<i>6.81</i>	<i>1000</i>	<i>9.81</i>	<i>NA</i>	<i>NA</i>	<i>2.5</i>	<i>1</i>	
<i>1453</i>	<i>6.83</i>	<i>1004</i>	<i>9.44</i>	<i>L</i>	<i>L</i>	<i>-</i>	<i>2</i>	<i>Recharge</i>
							<i>3</i>	
							<i>4</i>	
							<i>5</i>	

Stabilize Yes ☒ No

Amount Water Removed:

2.5

Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Farquhar

Site:

Otter Tail Power Co./ Big Stone

Facility ID:

Date: 2/Nov/06

Unique Station ID:

Sample ID:

Slag 6

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? Yes ☒ No

Grout Seal Intact? Yes ☒ No

Well Information

Well Depth: 37.50

Constructed Depth: 37.30

Casing Diameter: 2"

Water Level Before Purge: 23.72

Well Volume: 1.92 Gallons

Well Casing Elevation: 111.51

Static Water Elevation: 1085.79

Previous Static: 1086.32

Water Level After Samp: 31.46

Measurement Method: Elec. WLI Steel Tape

Sampling Information

Weather Conditions: Temp: 30

Wind: SE @ 15

Sky: Fair

Sampling Method: Grundfos Bladder SS/T Disp. Bailer Whale Grab Other:

Dedicated Equipment: Yes ☒ No

Pumping Rate: 0.25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began: 1306 am / pm

Time Purged Dry? 1314

Time of Sampling: 1319 am / pm

Duplicate Sample? Yes ☒ No ID: —

Sample EH: 213.2

Sample Appearance: General: Cloudy Color: Tan

Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1314	7.07	1628	8.58	NA	NA	2.0	1	
							2	
							3	
							4	
1319	7.15	1585	8.55	↓	↓	2.0	5	Recharge

Stabilized Yes ☒ No

Amount Water Removed: 2.0

Gallons

Comments:

Exceptions to Protocol:

- Good Recharge



Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Farquhar

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 2/11/2016

Unique Station ID:

Sample ID: Slag 7

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? Yes ☒ No

Grout Seal Intact? Yes ☒ No

Well Information

Well Depth: 49.05

Constructed Depth: 48.70

Casing Diameter: 2"

Water Level Before Purge: 15.48

Well Volume: 5.48 Gallons

Well Casing Elevation: 1114.39

Static Water Elevation: 1098.91

Previous Static: 1098.92

Water Level After Sample: 45.90

Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 31

Wind: SE @ 15

Sky: Fair

Sampling Method: Grundfos ☒ Bladder SS/T ☐ Disp. Bailer ☐ Whale ☐ Grab ☐ Other:

Dedicated Equipment Yes ☒ No

Pumping Rate: 0.25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began 1338 am / pm

Time Purged Dry? 1400

Time of Sampling: 1405 am / pm

Duplicate Sample? Yes ☒ No

ID: —

Sample EH: 187.5

Sample Appearance: General: Cloudy

Color: Tan

Phase: None

Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1400	7.08	2044	7.84	NA	NA	5.5	1	
							2	
							3	
							4	
1405	7.14	2076	7.46	↓	↓	5.5	5	Recheck

Stabilized? Yes ☒ No

Amount Water Removed: 5.5

Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Faris

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 21 Nov 16

Unique Station IC

Sample ID: Slag 8

Well Condition

Well Locked? Yes No

Well Labeled? Yes No

Casing Straight? Yes No

Repairs Necessary:

Protective Posts? Yes No

State ID Tag? Yes No

Grout Seal Intact? Yes No

Well Information

Well Depth: 52.24

Constructed Depth: 52.09

Casing Diameter: 2"

Water Level Before Purge: 17.02

Well Volume: 5.75 Gallons

Well Casing Elevation: 1127.26

Static Water Elevation: 1110.24

Previous Static: 1110.51

Water Level After Sam: 33.00

Measurement Method: Elec. W/L Steel Tape

Sampling Information

Weather Conditions: Temp: 32

Wind: SE @ 15

Sky: Fair

Sampling Method: Grundfos Bladder SS/T Disp. Bailer Whale Grab Other:

Dedicated Equipment Yes No

Pumping Rate: 0.25 gpm

Well Purged Dry? Yes No

Time Pump Began 1424 am / pm

Time Purged Dry?

Time of Sampling 1533 am / pm

Duplicate Sample? Yes No ID: —

Sample EH: 189.0

Sample Appearance: General: Clear

Color: None

Phase: None

Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1447</u>	<u>7.20</u>	<u>1468</u>	<u>9.08</u>	<u>NA</u>	<u>NA</u>	<u>5.75</u>	<u>1</u>	
<u>1510</u>	<u>7.19</u>	<u>1470</u>	<u>8.78</u>	<u>I</u>	<u>I</u>	<u>11.5</u>	<u>2</u>	
<u>1533</u>	<u>7.15</u>	<u>1469</u>	<u>8.89</u>	<u>I</u>	<u>I</u>	<u>17.25</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? Yes No

Amount Water Removed: 17.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben Wolf
Dusty Forasyn

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 21 Nov 16

Unique Station ID:

Sample ID: Slag 9

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: 51.25

Constructed Depth: 49.80

Casing Diameter: 2"

Water Level Before Purge: 17.35

Well Volume: 5.53 Gallons

Well Casing Elevation: 1122.35

Static Water Elevation: 1105.00

Previous Static: 1104.84

Water Level After Sample: 36.10

Measurement Method: ☒ Elec. W ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 25 Wind: S @ 10 Sky: Fair

Sampling Method: ☒ Grundfos ☒ Bladder SS/T ☐ Disp. Bailer ☐ Whale ☐ Grab ☐ Other:

Dedicated Equipment: ☒ Yes ☐ No Pumping Rate: .25 gpm

Well Purged Dry? ☒ Yes ☐ No Time Pump Began: 1538 am / pm

Time Purged Dry? - Time of Sampling: 1647 am / pm

Duplicate Sample? ☒ Yes ☐ No ID: - Sample EH: 178.8

Sample Appearance: General: Slightly cloudy Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1601	7.02	2438	8.95	NA	NA	5.75	1	
1624	7.01	2453	8.53	I	I	11.5	2	
1647	6.96	2371	8.46	I	I	17.25	3	
							4	
							5	

Stabilized ☒ Yes ☐ No

Amount Water Removed: 17.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607

507 354 8517

Groundwater Assessor

Sampling Personne

Ben Wolf
Dusty Farley

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 21 Nov 16

Unique Station ID:

Sample ID: Slag 2B

Well Condition

Well Locked? Yes ☒ No

Well Labeled? Yes ☒ No

Casing Straight? Yes ☒ No

Repairs Necessary

Protective Posts? Yes ☒ No

State ID Tag? Yes ☒ No

Grout Seal Intact? Yes ☒ No

Well Information

Well Depth: 40.94

Constructed Depth: 40.80

Casing Diameter: 2"

Water Level Before Purge 19.63

Well Volume: 3.48 Gallons

Well Casing Elevation: 1111.26

Static Water Elevation: 1091.63

Previous Static: 1087.63

Water Level After Sample 40.80

Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 25 Wind: SE 5-10 Sky: Fair

Sampling Method: Grundfos ☒ Bladder SS/T ☐ Disp. Bailer ☐ Whale ☐ Grab ☐ Other:

Dedicated Equipment Yes ☒ No

Pumping Rate: .25 gpm

Well Purged Dry? Yes ☒ No

Time Pump Began 1655 am ☒ pm

Time Purged Dry? 1704

Time of Sampling: 1714 am ☒ pm

Duplicate Sample? Yes ☒ No ID: -

Sample EH: 79.1

Sample Appearance General: cloudy Color: Brown Phase: light sediment odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1704	7.11	199.3	8.56	NA	NA	3.5	1	
1714	7.50	209.0	5.56	I	I	-	2	Recharge
							3	
							4	
							5	

Stabilizer Yes ☒ No

Amount Water Removed: 3.5 Gallons

Comments:

*slow Recharge

Exceptions to Protocol:



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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



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FINAL REPORT COMPLETION DATE: 7 Apr 17 AX

Date Reported: 4 Apr 2017

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 31-0070
Account #: 006106
PO #: 48680

Project Name: BIG STONE PLANT CCR

T. J. T. Caffrey
Field Service Manager/Date Reviewed
Q. O. O. O. 04 April 17
Chemistry Lab Manager/Date Reviewed
W. Tulare for 4 Apr 2017
Quality Assurance Director/Date Reviewed

RL = Reporting Limits
NQ = Not Present, Qualitative Only
PQ = Present, Qualitative Only
ND = Not Determined



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

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 4 Apr 2017
 Lab Number: 17-A6384
 Work Order #: 31-0070
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 27 Feb 2017 10:48
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 27 Feb 2017 19:06
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 1

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					28 Feb 17	JMS
Water Digestions					28 Feb 17	JMS
Radium 226	SEE ATTACHED				3 Apr 17 8:40	ABL
Radium 228	SEE ATTACHED			EPA M9320	3 Apr 17 8:40	ABL
pH, Field	6.97 units		1.00	I-1586-85	27 Feb 17 10:48	DGF
pH	* 7.3 units		1.0	SM 4500 H+B-96	28 Feb 17 9:20	CER
	See Narrative					
Sulfate	448 ~ mg/L		4.0	ASTM D516-02	9 Mar 17 12:41	KCJ
Chloride	14.2 mg/L		3.0	SM 4500 Cl E	2 Mar 17 9:47	KCJ
Mercury	0.005 ug/L		0.005	EPA 245.7	1 Mar 17 9:30	TWB
Solids, Total Dissolved	1400 mg/L		10	SM 2540 C-97	28 Feb 17 13:24	RC
Calcium	192.0 mg/L		0.500	SW6010C	2 Mar 17 12:23	RMB
Lithium	0.077 mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Barium	0.071 mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Cobalt	< 0.01 ^ mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Boron	1.980 ^ mg/L		0.100	SW6010C	2 Mar 17 12:23	RMB
Antimony	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Arsenic	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Beryllium	< 0.25 @ ug/L		0.05	SW6020A	3 Mar 17 15:38	RMV
Cadmium	< 0.5 @ ug/L		0.1	SW6020A	3 Mar 17 15:38	RMV
Chromium	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Lead	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Molybdenum	4.83 @ ug/L		0.50	SW6020A	3 Mar 17 15:38	RMV
Selenium	10.3 @ ug/L		0.50	SW6020A	3 Mar 17 15:38	RMV
Thallium	< 0.5 @ ug/L		0.1	SW6020A	3 Mar 17 15:38	RMV
Fluoride	0.380 mg/L		0.020	EPA 300.0	1 Mar 17 12:34	RMR

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

^ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

@ = Due to sample matrix

= Due to concentration of other analytes

! = Due to sample quantity

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040

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



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 4 Apr 2017
 Lab Number: 17-A6385
 Work Order #: 31-0070
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 27 Feb 2017 11:52
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 27 Feb 2017 19:06
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 4

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				28 Feb 17	JMS
Water Digestions				28 Feb 17	JMS
Radium 226	SEE ATTACHED			3 Apr 17 8:40	ABL
Radium 228	SEE ATTACHED		EPA M9320	3 Apr 17 8:40	ABL
pH, Field	6.64 units	1.00	I-1586-85	28 Feb 17 11:52	DGF
pH	* 6.9 units	1.0	SM 4500 H+B-96	28 Feb 17 9:20	CEH
	See Narrative				
Sulfate	1450 ~ mg/L	4.0	ASTM D516-02	9 Mar 17 12:41	KCJ
Chloride	46.2 mg/L	3.0	SM 4500 Cl E	2 Mar 17 9:47	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	1 Mar 17 9:30	TWB
Solids, Total Dissolved	2520 mg/L	10	SM 2540 C-97	28 Feb 17 13:24	RC
Calcium	505.0 ~ mg/L	0.500	SW6010C	3 Mar 17 11:15	RMB
Lithium	0.215 mg/L	0.005	SW6010C	2 Mar 17 12:23	RMB
Barium	0.028 mg/L	0.005	SW6010C	2 Mar 17 12:23	RMB
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	2 Mar 17 12:23	RMB
Boron	0.828 ^ mg/L	0.100	SW6010C	2 Mar 17 12:23	RMB
Antimony	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 15:38	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 15:38	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	3 Mar 17 15:38	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	3 Mar 17 15:38	RMV
Chromium	2.51 @ ug/L	0.50	SW6020A	3 Mar 17 15:38	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 15:38	RMV
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 15:38	RMV
Selenium	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 15:38	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	3 Mar 17 15:38	RMV
Fluoride	0.170 mg/L	0.020	EPA 300.0	1 Mar 17 12:34	RMB

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

@ = Due to sample matrix

= Due to concentration of other analytes

! = Due to sample quantity

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WWTW # R-040

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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 4 Apr 2017
 Lab Number: 17-A6386
 Work Order #: 31-0070
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 27 Feb 2017 14:15
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 27 Feb 2017 19:06
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 5

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					28 Feb 17	JMS
Water Digestions					28 Feb 17	JMS
Radium 226	SEE ATTACHED				3 Apr 17 8:41	ABL
Radium 228	SEE ATTACHED			EPA M9320	3 Apr 17 8:41	ABL
pH, Field	7.07 units		1.00	I-1586-85	27 Feb 17 14:15	BMW
pH	* 7.2 units		1.0	SM 4500 H+B-96	28 Feb 17 9:20	CEH
	See Narrative					
Sulfate	61.3 g mg/L		4.0	ASTM D516-02	9 Mar 17 12:41	KCJ
Chloride	8.9 mg/L		3.0	SM 4500 Cl E	2 Mar 17 9:47	KCJ
Mercury	< 0.005 ug/L		0.005	EPA 245.7	1 Mar 17 9:30	TWB
Solids, Total Dissolved	494 mg/L		10	SM 2540 C-97	28 Feb 17 13:24	RC
Calcium	124.0 mg/L		0.500	SW6010C	2 Mar 17 12:23	RMB
Lithium	0.025 mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Barium	0.140 mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Cobalt	< 0.01 mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Boron	0.337 mg/L		0.100	SW6010C	3 Mar 17 11:15	RMB
Antimony	< 2.5 g ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Arsenic	< 2.5 g ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Beryllium	< 0.25 g ug/L		0.05	SW6020A	3 Mar 17 15:38	RMV
Cadmium	< 0.5 g ug/L		0.1	SW6020A	3 Mar 17 15:38	RMV
Chromium	< 2.5 g ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Lead	< 2.5 g ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Molybdenum	11.8 g ug/L		0.50	SW6020A	3 Mar 17 15:38	RMV
Selenium	< 2.5 g ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Thallium	< 0.5 g ug/L		0.1	SW6020A	3 Mar 17 15:38	RMV
Fluoride	0.310 mg/L		0.020	EPA 300.0	1 Mar 17 12:34	RME

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

* The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

g = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447650 ND MICRO # 1013-M ND NW/WW # R-040

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 www.mvtl.com



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 4 Apr 2017
 Lab Number: 17-A6387
 Work Order #: 31-0070
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 27 Feb 2017 12:26
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 27 Feb 2017 19:06
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 6

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					28 Feb 17	JMS
Water Digestions					28 Feb 17	JMS
Radium 226	SEE ATTACHED				3 Apr 17 8:41	ABL
Radium 228	SEE ATTACHED			EPA M9320	3 Apr 17 8:41	ABL
pH, Field	7.07 units		1.00	I-1586-85	27 Feb 17 12:26	DGF
pH	* 7.2 units		1.0	SM 4500 H+B-96	28 Feb 17 9:20	CEH
	See Narrative					
Sulfate	240 ~ mg/L		4.0	ASTM D516-02	9 Mar 17 12:41	KCJ
Chloride	6.5 mg/L		3.0	SM 4500 Cl E	2 Mar 17 9:47	KCJ
Mercury	0.010 ug/L		0.005	EPA 245.7	1 Mar 17 9:30	TWB
Solids, Total Dissolved	910 mg/L		10	SM 2540 C-97	28 Feb 17 13:24	RC
Calcium	162.0 mg/L		0.500	SW6010C	2 Mar 17 12:23	RMB
Lithium	0.113 mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Barium	0.107 mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Cobalt	< 0.01 ~ mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Boron	2.630 ^ mg/L		0.100	SW6010C	2 Mar 17 12:23	RMB
Antimony	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Arsenic	2.70 @ ug/L		0.50	SW6020A	3 Mar 17 15:38	RMV
Beryllium	< 0.25 @ ug/L		0.05	SW6020A	3 Mar 17 15:38	RMV
Cadmium	< 0.5 @ ug/L		0.1	SW6020A	3 Mar 17 15:38	RMV
Chromium	9.77 @ ug/L		0.50	SW6020A	3 Mar 17 15:38	RMV
Lead	2.96 @ ug/L		0.50	SW6020A	3 Mar 17 15:38	RMV
Molybdenum	7.35 @ ug/L		0.50	SW6020A	3 Mar 17 15:38	RMV
Selenium	3.28 @ ug/L		0.50	SW6020A	3 Mar 17 15:38	RMV
Thallium	< 0.5 @ ug/L		0.1	SW6020A	3 Mar 17 15:38	RMV
Fluoride	0.740 mg/L		0.020	EPA 300.0	1 Mar 17 12:34	RMB

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

@ = Due to sample matrix # = Due to concentration of other analytes

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

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 4 Apr 2017
 Lab Number: 17-A6388
 Work Order #: 31-0070
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 27 Feb 2017 13:09
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 27 Feb 2017 19:06
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 7

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				28 Feb 17	JMS
Water Digestions				28 Feb 17	JMS
Radium 226	SEE ATTACHED			3 Apr 17 8:41	ABL
Radium 228	SEE ATTACHED		EPA M9320	3 Apr 17 8:41	ABL
pH, Field	7.15 units	1.00	I-1586-85	27 Feb 17 13:09	DGF
pH	* 7.4 units	1.0	SM 4500 H+B-96	28 Feb 17 10:30	CEH
Sulfate	608 ~ mg/L	4.0	ASTM D516-02	9 Mar 17 12:41	KCJ
Chloride	4.6 mg/L	3.0	SM 4500 Cl E	2 Mar 17 9:47	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	1 Mar 17 10:06	TWB
Solids, Total Dissolved	1200 mg/L	10	SM 2540 C-97	28 Feb 17 13:24	RC
Calcium	206.0 mg/L	0.500	SW6010C	2 Mar 17 12:45	RMB
Lithium	0.176 mg/L	0.005	SW6010C	2 Mar 17 12:45	RMB
Barium	0.040 mg/L	0.005	SW6010C	2 Mar 17 12:45	RMB
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	3 Mar 17 11:39	RMB
Boron	1.290 mg/L	0.100	SW6010C	3 Mar 17 11:39	RMB
	See Narrative				
Antimony	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 16:42	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 16:42	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	3 Mar 17 16:42	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	3 Mar 17 16:42	RMV
Chromium	9.04 @ ug/L	0.50	SW6020A	6 Mar 17 14:51	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 16:42	RMV
Molybdenum	4.64 @ ug/L	0.50	SW6020A	3 Mar 17 16:42	RMV
Selenium	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 16:42	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	3 Mar 17 16:42	RMV
Fluoride	0.440 mg/L	0.020	EPA 300.0	6 Mar 17 10:13	RMB

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL - Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards. The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 4 Apr 2017
 Lab Number: 17-A6389
 Work Order #: 31-0070
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 27 Feb 2017 14:25
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 27 Feb 2017 19:06
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 8

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				28 Feb 17	JMS
Water Digestions				28 Feb 17	JMS
Radium 226	SEE ATTACHED			3 Apr 17 8:41	ABL
Radium 228	SEE ATTACHED		EPA M9320	3 Apr 17 8:41	ABL
pH, Field	7.05 units	1.00	I-1586-85	27 Feb 17 14:25	DSF
pH	* 7.2 units	1.0	SM 4500 H+B-96	28 Feb 17 10:30	CEH
Sulfate	250 mg/L	4.0	ASTM D516-02	9 Mar 17 12:41	KCJ
Chloride	35.6 mg/L	3.0	SM 4500 Cl E	2 Mar 17 9:47	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	1 Mar 17 10:06	TWB
Solids, Total Dissolved	881 mg/L	10	SM 2540 C-97	28 Feb 17 13:24	RC
Calcium	129.0 mg/L	0.500	SW6010C	2 Mar 17 12:45	RMB
Lithium	0.061 mg/L	0.005	SW6010C	2 Mar 17 12:45	RMB
Barium	0.046 mg/L	0.005	SW6010C	2 Mar 17 12:45	RMB
Cobalt	< 0.01 mg/L	0.005	SW6010C	3 Mar 17 11:39	RMB
Boron	0.574 mg/L	0.100	SW6010C	3 Mar 17 11:39	RMB
	See Narrative				
Antimony	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 16:42	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 16:42	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	3 Mar 17 16:42	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	3 Mar 17 16:42	RMV
Chromium	< 2.5 @ ug/L	0.5	SW6020A	6 Mar 17 14:51	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 16:42	RMV
Molybdenum	9.11 @ ug/L	0.50	SW6020A	3 Mar 17 16:42	RMV
Selenium	18.8 @ ug/L	0.50	SW6020A	3 Mar 17 16:42	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	3 Mar 17 16:42	RMV
Fluoride	0.580 mg/L	0.020	EPA 300.0	6 Mar 17 10:13	RMB

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

@ = Due to sample matrix

= Due to concentration of other analytes

! = Due to sample quantity

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WWTW # R-040

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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 4 Apr 2017
 Lab Number: 17-A6390
 Work Order #: 31-0070
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 27 Feb 2017 15:59
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 27 Feb 2017 19:06
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 9

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				28 Feb 17	JMS
Water Digestions				28 Feb 17	JMS
Radium 226	SEE ATTACHED			3 Apr 17 8:42	ABL
Radium 228	SEE ATTACHED		EPA M9320	3 Apr 17 8:42	ABL
pH, Field	6.80 units	1.00	I-1586-85	27 Feb 17 15:59	DGF
pH	* 7.0 units	1.0	SM 4500 H+B-96	28 Feb 17 10:30	CEH
Sulfate	1050 ~ mg/L	4.0	ASTM D516-02	9 Mar 17 12:41	KCJ
Chloride	6.3 mg/L	3.0	SM 4500 Cl E	2 Mar 17 9:47	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	1 Mar 17 10:06	TWB
Solids, Total Dissolved	1830 mg/L	10	SM 2540 C-97	28 Feb 17 13:24	RC
Calcium	412.0 mg/L	0.500	SW6010C	3 Mar 17 11:39	RMB
	~ See Narrative				
Lithium	0.135 mg/L	0.005	SW6010C	2 Mar 17 12:45	RMB
Barium	0.026 mg/L	0.005	SW6010C	2 Mar 17 12:45	RMB
Cobalt	< 0.01 ~ mg/L	0.005	SW6010C	3 Mar 17 11:39	RMB
Boron	0.270 mg/L	0.100	SW6010C	3 Mar 17 11:39	RMB
	See Narrative				
Antimony	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 16:42	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 16:42	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	3 Mar 17 16:42	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	3 Mar 17 16:42	RMV
Chromium	< 2.5 @ ug/L	0.5	SW6020A	6 Mar 17 14:51	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 16:42	RMV
Molybdenum	10.2 @ ug/L	0.50	SW6020A	3 Mar 17 16:42	RMV
Selenium	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 16:42	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	3 Mar 17 16:42	RMV
Fluoride	0.220 mg/L	0.020	EPA 300.0	6 Mar 17 10:13	RMB

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards. The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WH/DW # R-040

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



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 4 Apr 2017
 Lab Number: 17-A6391
 Work Order #: 31-0070
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 27 Feb 2017 14:50
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 27 Feb 2017 19:06
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 2B

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				28 Feb 17	JMS
Water Digestions				28 Feb 17	JMS
Radium 226	SEE ATTACHED			3 Apr 17 8:42	ABL
Radium 228	SEE ATTACHED		EPA M9320	3 Apr 17 8:42	ABL
pH, Field	7.10 units	1.00	I-1586-85	27 Feb 17 14:50	BMW
pH	* 8.4 units	1.0	SM 4500 H+B-96	28 Feb 17 10:30	CEH
Sulfate	743 ~ mg/L	4.0	ASTM D516-02	9 Mar 17 12:58	KCJ
Chloride	30.9 mg/L	3.0	SM 4500 Cl E	2 Mar 17 10:05	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	1 Mar 17 10:06	TWB
Solids, Total Dissolved	1300 mg/L	10	SM 2540 C-97	28 Feb 17 13:24	RC
Calcium	288.0 mg/L	0.500	SW6010C	2 Mar 17 12:45	RMB
Lithium	0.044 mg/L	0.005	SW6010C	2 Mar 17 12:45	RMB
Barium	0.046 mg/L	0.005	SW6010C	2 Mar 17 12:45	RMB
Cobalt	< 0.01 ~ mg/L	0.005	SW6010C	3 Mar 17 11:39	RMB
Boron	4.190 mg/L	0.100	SW6010C	3 Mar 17 11:39	RMB
	See Narrative				
Antimony	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 16:42	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 16:42	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	3 Mar 17 16:42	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	3 Mar 17 16:42	RMV
Chromium	< 2.5 @ ug/L	0.5	SW6020A	6 Mar 17 14:51	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 16:42	RMV
Molybdenum	5.08 @ ug/L	0.50	SW6020A	3 Mar 17 16:42	RMV
Selenium	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 16:42	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	3 Mar 17 16:42	RMV
Fluoride	0.220 mg/L	0.020	EPA 300.0	6 Mar 17 10:13	RMB

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

@ = Due to sample matrix

= Due to concentration of other analytes

() = Due to sample quantity

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 MI LAB # 999447680 ND MICRO # 1013-M ND WY/DW # R-040

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



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INORGANIC & METALS ANALYSES:

The pH sample set that included samples 17-A6378 through 17-A6387 contained 11 samples before a duplicate. Data was reported based on acceptable knowns, duplication, and ample QC for the entire worklist.

The boron matrix spike recovery did not meet acceptable limits for samples 17-A6388 through 17-A6391. Data was reported based on acceptable blank spike and matrix spike duplicate recoveries and acceptable relative percent difference between the matrix spike and matrix spike duplicate.

Due to the high concentration of calcium in the unspiked sample, the matrix spike duplicate recovery did not meet acceptable limits for sample 17-A6390. Data was reported based on acceptable blank spike and matrix spike recoveries and acceptable relative percent difference between the matrix spike and matrix spike duplicate.

No other problems were encountered with these analyses.

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Quality Control Report

Lab IDs: 17-A6378 to 17-A6391

Project: BIG STONE PLANT CCR

Work Order: 201731-0070

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 ug/L	25.0	97	85-115	25.0	17A6386q	< 2.5	25.7	103	75-125	25.7	26.1	104	1.5	10	94	90-110	< 0.5
	25.0	104	85-115	25.0	17A6391q	< 2.5	25.8	103	75-125	25.8	25.8	103	0.0	10	94	90-110	< 0.5
Arsenic ug/L	25.0	96	85-115	25.0	17A6386q	< 2.5	26.5	106	75-125	26.5	26.7	107	0.8	10	92	90-110	< 0.5
	25.0	105	85-115	25.0	17A6391q	< 2.5	26.4	106	75-125	26.4	27.2	109	3.0	10	93	90-110	< 0.5
				25.0	17A6310q	6.68	34.0	109	75-125	34.0	33.7	108	0.9	10			
Barium mg/L	1.000	104	85-115	1.00	17A6387q	0.107	1.210	110	75-125	1.210	1.220	111	0.8	10	98	90-110	< 0.005
				1.00	17A6390q	0.026	1.140	111	75-125	1.140	1.150	112	0.9	10	96	90-110	
Beryllium ug/L	2.50	100	85-115	2.50	17A6386q	< 0.25	2.50	100	75-125	2.50	2.41	96	3.7	10	94	90-110	< 0.05
	2.50	114	85-115	2.50	17A6391q	< 0.25	2.38	95	75-125	2.38	2.56	102	7.3	10	98	90-110	< 0.05
Boron mg/L	1.000	105	85-115	1.00	17A6387q	2.630	3.700	107	75-125	3.700	3.810	118	2.9	10	100	90-110	< 0.1
	1.000	103	85-115	1.00	A6387qc	2.570	3.500	93	75-125	3.500	3.630	106	3.6	10	98	90-110	< 0.1
				1.00	A6390qc	< 0.5	1.280	128	75-125	1.280	1.200	120	6.5	10	98	90-110	
Cadmium ug/L	5.00	101	85-115	5.00	17A6386q	< 0.5	5.35	107	75-125	5.35	5.45	109	1.9	10	98	90-110	< 0.1
	5.00	109	85-115	5.00	17A6391q	< 0.5	5.52	110	75-125	5.52	5.37	107	2.8	10	100	90-110	< 0.1
Calcium mg/L	50.00	109	85-115	50.0	17A6387q	162.0	212.0	100	75-125	212.0	220.0	116	3.7	10	101	90-110	< 0.5
	50.00	107	85-115	50.0	17A6390q	394.0	436.0	84	75-125	436.0	439.0	90	0.7	10	98	90-110	< 0.5
				50.0	A6387qc	167.0	214.0	94	75-125	214.0	220.0	106	2.8	10	102	90-110	
				50.0	A6390qc	412.0	460.0	96	75-125	460.0	435.0	46	5.6	10	101	90-110	
Chloride mg/L	-	-	-	60.0	17-A6380	45.5	103	96	85-121	103	99.3	90	3.7	5	95	90-110	< 3
	-	-	-	60.0	17-A6390	6.3	61.6	92	85-121	61.6	62.8	94	1.9	5	92	90-110	< 3
	-	-	-	60.0	17-A6391	30.9	85.1	90	85-121	85.1	84.6	90	0.6	5	92	90-110	< 3
	-	-	-	60.0	17-A6607	< 3	54.7	91	85-120	54.7	53.7	90	1.8	6			
Chromium ug/L	25.0	95	85-115	25.0	17A6386q	< 2.5	22.4	90	75-125	22.4	21.6	86	3.6	10	91	90-110	< 0.5
	25.0	103	85-115	25.0	17-A6390	< 2.5	23.1	92	75-125	23.1	23.5	94	1.7	10	102	90-110	< 0.5

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Page: 2 of 3

Quality Control Report

Lab IDs: 17-A6378 to 17-A6391

Project: BIG STONE PLANT CCR

Work Order: 201731-0070

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Cobalt mg/L	1.000	107	85-115	1.00	17A6387q	< 0.01	1.020	102	75-125	1.020	1.020	102	0.0	10	102	90-110	< 0.005
	1.000	110	85-115	1.00	A6390qc	< 0.05	1.010	101	75-125	1.010	0.953	95	5.8	10	104	90-110	
Fluoride mg/L	0.200	105	85-115	0.20	17-A6387	0.740	0.920	90	75-125	0.920	0.930	95	1.1	10	102	90-110	< 0.02
	0.200	100	85-115	0.20	17-A6390	0.220	0.390	85	75-125	0.390	0.400	90	2.5	10	98	90-110	< 0.02
				0.20	A6359qc	0.020	0.210	95	75-125	0.210	0.220	100	4.7	10			
Lead ug/L	25.0	102	85-115	25.0	17A6386q	< 2.5	25.6	102	75-125	25.6	25.7	103	0.4	10	95	90-110	< 0.5
	25.0	107	85-115	25.0	17A6391q	< 2.5	25.0	100	75-125	25.0	25.4	102	1.6	10	96	90-110	< 0.5
Lithium mg/L	1.000	102	85-115	1.00	17-A6387	0.113	1.220	111	75-125	1.220	1.240	113	1.6	10	95	90-110	< 0.005
				1.00	17-A6390	0.135	1.270	114	75-125	1.270	1.290	116	1.6	10	93	90-110	
Mercury ug/L	-	-	-	0.10	17-A6378	< 0.005	0.086	86	63-111	0.086	0.087	87	1.2	18	86	76-113	< 0.005
	-	-	-	0.10	17-A6244	0.016	0.099	83	63-111	0.099	0.101	85	2.0	18	103	76-113	< 0.005
	-	-	-														< 0.005
	-	-	-														< 0.005
Molybdenum ug/L	25.0	98	85-115	25.0	17A6386q	11.8	37.7	104	75-125	37.7	38.1	105	1.1	10	96	90-110	< 0.5
	25.0	104	85-115	25.0	17A6391q	5.08	30.2	100	75-125	30.2	30.2	100	0.0	10	96	90-110	< 0.5
pH units	-	-	-	-	-	-	-	-	-	7.2	7.2	-	0.0	2.5	101	90-110	-
	-	-	-	-	-	-	-	-	-	7.7	7.7	-	0.0	2.5	101	90-110	-
Selenium ug/L	25.0	96	85-115	25.0	17A6386q	< 2.5	24.0	96	75-125	24.0	22.2	89	7.8	10	93	90-110	< 0.5
	25.0	105	85-115	25.0	17A6391q	< 2.5	26.6	106	75-125	26.6	26.9	108	1.1	10	92	90-110	< 0.5
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	903	912	-	1.0	8	89	85-115	< 10
	-	-	-	-	-	-	-	-	-	1830	1900	-	3.8	8			
Sulfate mg/L	-	-	-	500	17-A6390	1050	1480	86	74-128	1480	1460	82	1.4	5	106	80-120	< 5
	-	-	-	500	17-A6391	743	1170	85	74-128	1170	1170	85	0.0	5	104	80-120	< 5
	-	-	-	50.0	17-A6689	12.1	70.6	117	74-128	70.6	71.2	118	0.8	5	111	80-120	< 5
	-	-	-	500	17-A6380	1200	1640	88	74-128	1640	1660	92	1.2	5			

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Quality Control Report

Lab IDs: 17-A6378 to 17-A6391

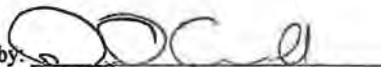
Project: BIG STONE PLANT CCR

Work Order: 201731-0070

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
Thallium ug/L	5.00	103	85-115	5.00	17A6386q	< 0.5	5.30	106	75-125	5.30	5.30	106	0.0	10	96	90-110	< 0.1
	5.00	107	85-115	5.00	17A6391q	< 0.5	5.18	104	75-125	5.18	5.20	104	0.4	10	96	90-110	< 0.1

The boron matrix spike recovery was outside the acceptance limits, see narrative.

The calcium matrix spike duplicate recovery was outside the acceptance limits, see narrative.

Approved by: 



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Date: 3/31/2017

CLIENT: MVTL Inc
Project: Ottertail Power Big Stone
Lab Order: S1703017

CASE NARRATIVE
Report ID: S1703017001

Samples H-6-A6381, H-8-A6382, H-9-A6383, H2OX-A6378, H3OX-A6379, H4OX-A6380, Slag 2B A6391, Slag-1-A6384, Slag-4-A6385, Slag-5-A6386, Slag-6-A6387, Slag-7-A6388, Slag-8-A6389, and Slag-9-A6390 were received on March 2, 2017.

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

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

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 1



Inter-Mountain Labs

Your Environmental Monitoring Partner

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 872-8945

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Big Stone
Lab ID: S1703017-007
ClientSample ID: Slag-1-A6384
COC: WEB

Date Reported: 3/31/2017
Report ID: S1703017001

WorkOrder: S1703017
CollectionDate: 2/27/2017 10:48:00 AM
DateReceived: 3/2/2017 10:11:00 AM
FieldSampler: DF
Matrix: Water

Comments: WO# 31-0070

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	03/21/2017 1524 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	03/21/2017 1524 MB
Radium 228	2.1	pCi/L		2	Ga-Tech	03/20/2017 1442 MB
Radium 228 Precision (±)	3.0	pCi/L			Ga-Tech	03/20/2017 1442 MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: Wade Nieuwsma
Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Big Stone
Lab ID: S1703017-008
ClientSample ID: Slag-4-A6385
COC: WEB

Date Reported: 3/31/2017
Report ID: S1703017001

WorkOrder: S1703017
CollectionDate: 2/27/2017 11:52:00 AM
DateReceived: 3/2/2017 10:11:00 AM
FieldSampler: DF
Matrix: Water

Comments WO# 31-0070


Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	03/21/2017 1524	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	03/21/2017 1524	MB
Radium 228	ND	pCi/L		2	Ga-Tech	03/20/2017 1746	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	03/20/2017 1746	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 3/31/2017
Report ID S1703017001

ProjectName: Ottertail Power Big Stone
Lab ID: S1703017-009
ClientSample ID: Slag-5-A6386
COC: WEB

WorkOrder: S1703017
CollectionDate: 2/27/2017 2:15:00 PM
DateReceived: 3/2/2017 10:11:00 AM
FieldSampler: DF
Matrix: Water

Comments WO# 31-0070

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	03/21/2017 1524 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	03/21/2017 1524 MB
Radium 228	ND	pCi/L		2	Ga-Tech	03/20/2017 2051 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	03/20/2017 2051 MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Big Stone
Lab ID: S1703017-010
ClientSample ID: Slag-6-A6387
COC: WEB

Comments WO# 31-0070

Date Reported 3/31/2017
Report ID S1703017001

WorkOrder: S1703017
CollectionDate: 2/27/2017 12:26:00 PM
DateReceived: 3/2/2017 10:11:00 AM
FieldSampler: DF
Matrix: Water

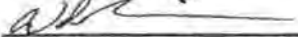
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	03/21/2017 1524 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	03/21/2017 1524 MB
Radium 228	ND	pCi/L		2	Ga-Tech	03/20/2017 2357 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	03/20/2017 2357 MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 3/31/2017
Report ID S1703017001

ProjectName: Ottertail Power Big Stone
Lab ID: S1703017-011
ClientSample ID: Slag-7-A6388
COC: WEB

WorkOrder: S1703017
CollectionDate: 2/27/2017 1:09:00 PM
DateReceived: 3/2/2017 10:11:00 AM
FieldSampler: DF
Matrix: Water

Comments WO# 31-0070


Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	03/27/2017 1119	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	03/27/2017 1119	MB
Radium 228	ND	pCi/L		2	Ga-Tech	03/21/2017 302	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	03/21/2017 302	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager

Page 11 of 14



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Big Stone
Lab ID: S1703017-012
ClientSample ID: Slag-8-A6389
COC: WEB

Date Reported 3/31/2017
Report ID S1703017001

WorkOrder: S1703017
CollectionDate: 2/27/2017 2:25:00 PM
DateReceived: 3/2/2017 10:11:00 AM
FieldSampler: DF
Matrix: Water

Comments WO# 31-0070

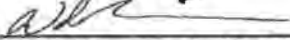
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	03/27/2017 1119	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	03/27/2017 1119	MB
Radium 228	ND	pCi/L		2	Ga-Tech	03/21/2017 607	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	03/21/2017 607	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager

Page 12 of 14



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Big Stone
Lab ID: S1703017-013
ClientSample ID: Slag-9-A6390
COC: WEB

Date Reported: 3/31/2017
Report ID: S1703017001

WorkOrder: S1703017
CollectionDate: 2/27/2017 3:59:00 PM
DateReceived: 3/2/2017 10:11:00 AM
FieldSampler: DF
Matrix: Water

Comments: WO# 31-0070

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Int	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	03/27/2017 1119	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	03/27/2017 1119	MB
Radium 228	ND	pCi/L		2	Ga-Tech	03/21/2017 912	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	03/21/2017 912	MB


These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

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

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

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 3/31/2017
Report ID S1703017001

ProjectName: Ottertail Power Big Stone
Lab ID: S1703017-014
ClientSample ID: Slag 2B A6391
COC: WEB

WorkOrder: S1703017
CollectionDate: 2/27/2017 2:50:00 PM
DateReceived: 3/2/2017 10:11:00 AM
FieldSampler: DF
Matrix: Water

Comments WO# 31-0070

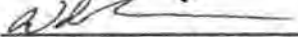
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	2.2	pCi/L		1	SM 7500 Ra-B	03/27/2017 1119	MB
Radium 226 Precision (±)	0.3	pCi/L			SM 7500 Ra-B	03/27/2017 1119	MB
Radium 228	2.4	pCi/L		2	Ga-Tech	03/21/2017 1535	MB
Radium 228 Precision (±)	2.8	pCi/L			Ga-Tech	03/21/2017 1535	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Inc
Work Order: S1703017
Project: Ottertail Power Big Stone

Date: 3/31/2017
Report ID: S1703017001

Radium 228 by Ga/Tech		Sample Type MBLK		Units: pCi/L				
MB-423 (03/18/17 10:24)		RunNo: 144032		PrepDate: 03/13/17 12:00		BatchID 12937		
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-423 (03/18/17 13:28)		RunNo: 144032		PrepDate: 03/13/17 12:00		BatchID 12937		
Analyte		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		40	1	40.1		100	65.9 - 132	
Radium 228 by Ga/Tech		Sample Type MS		Units: pCi/L				
MS-423 (03/18/17 19:36)		RunNo: 144032		PrepDate: 03/13/17 12:00		BatchID 12937		
Analyte		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		40	1	40.1	ND	99.6	65.9 - 132	
Radium 228 by Ga/Tech		Sample Type MSD		Units: pCi/L				
MSD-423 (03/18/17 22:42)		RunNo: 144032		PrepDate: 03/13/17 12:00		BatchID 12937		
Analyte		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228		43	1	40	6.64	106	20	

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



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTI Inc
 Work Order: S1703017
 Project: Ottertail Power Big Stone

Date: 3/31/2017
 Report ID: S1703017001

Radium 226 in Water -

Sample Type MBLK

Units: pCi/L

MB-1727 (03/21/17 11:51)	RunNo: 144019	PrepDate: 03/15/17 0:00	BatchID 12952
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226

ND 0.2

MB-1728 (03/27/17 11:19)	RunNo: 144273	PrepDate: 03/20/17 0:00	BatchID 12974
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226

ND 0.2

Radium 226 in Water -

Sample Type LCS

Units: pCi/L

LCS-1727 (03/21/17 11:51)	RunNo: 144019	PrepDate: 03/15/17 0:00	BatchID 12952
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226

5.8 0.2 5.89 98.8 67.1 - 122

LCS-1728 (03/27/17 11:19)	RunNo: 144273	PrepDate: 03/20/17 0:00	BatchID 12974
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226

5.8 0.2 5.89 99.0 67.1 - 122

Radium 226 in Water -

Sample Type LCSD

Units: pCi/L

LCSD-1727 (03/21/17 11:51)	RunNo: 144019	PrepDate: 03/15/17 0:00	BatchID 12952
Analyte	Result	RL	Conc %RPD %REC % RPD Limits Qual

Radium 226

8.6 0.2 5.8 12.4 112 20

LCSD-1728 (03/27/17 11:19)	RunNo: 144273	PrepDate: 03/20/17 0:00	BatchID 12974
Analyte	Result	RL	Conc %RPD %REC % RPD Limits Qual

Radium 226

5.4 0.2 5.8 8.50 90.9 20

Radium 226 in Water -

Sample Type MS

Units: pCi/L

S1702327-005AMS (03/21/17 11:51)	RunNo: 144019	PrepDate: 03/15/17 0:00	BatchID 12952
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226

11 1 11.8 ND 91.7 65 - 131

S1703036-003AMS (03/27/17 11:19)	RunNo: 144273	PrepDate: 03/20/17 0:00	BatchID 12974
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226

6.1 0.2 5.89 0.2 99.9 65 - 131

Radium 226 in Water -

Sample Type MSD

Units: pCi/L

S1703036-003AMSD (03/27/17 14:28)	RunNo: 144273	PrepDate: 03/20/17 0:00	BatchID 12974
Analyte	Result	RL	Conc %RPD %REC % RPD Limits Qual

Radium 226

5.3 0.2 6.1 13.7 86.5 20

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

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



Inter-Mountain Labs
Sheridan, WY and Gillette, WY

CHAIN OF CUSTODY RECORD		Page _____ of _____
All shaded fields must be completed.		#WEB
This is a legal document; any misrepresentation may be construed as fraud.		

Client Name MVTI		Project Identification Ottertail Power Big Stone		Sampler (Signature/Attestation of Authenticity) <i>[Signature]</i>		Telephone # 507-276-8089													
Report Address 1126 North Front St New Ulm, Mn 56073		Contact Name Tim Portner		Email tportner@mvti.com		ANALYSES / PARAMETERS													
Invoice Address Same		Phone 507-276-8089		Purchase Order #		Quote #													
						REMARKS													
ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME	SAMPLE IDENTIFICATION	Matrix	# of Containers	Radium 226 + 228												
1	SR03017-001	2/20/17	1103	H2OX - A6378	WT	2	x												
2	002		1129	H3OX - A6379	WT	2	x												
3	003		1155	H4OX - A6380	WT	2	x												
4	004		1211	H-6 - A6381	WT	2	x												
5	005		1250	H-8 - A6382	WT	2	x												
6	006		1340	H-9 - A6383	WT	2	x												
7	007		1048	Slag-1 A6384	WT	2	x												
8	008		1152	Slag-4 A6385	WT	2	x												
9	009		1415	Slag-5 A6386	WT	2	x												
10	010		1226	Slag-6 A6387	WT	2	x												
11	011		1309	Slag-7 A6388	WT	2	x												
12	012		1425	Slag-8 A6389	WT	2	x												
13																			
14																			
LAB COMMENTS 13.42 13.1		Relinquished By (Signature/Printed) <i>[Signature]</i>		DATE 2/20/17		TIME 1900		Received By (Signature/Printed) Kathryn Boyd		DATE 3.2.17		TIME 10:11							
SHIPPING INFO		MATRIX CODES		TURN AROUND TIMES		COMPLIANCE INFORMATION		ADDITIONAL REMARKS											
<input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> USPS <input type="checkbox"/> Hand Carried <input type="checkbox"/> Other		Water WT Soil SL Solid SD Filter FT Other OT		Check desired service: <input type="checkbox"/> Standard turnaround <input type="checkbox"/> RUSH - 5 Working Days <input type="checkbox"/> URGENT - < 2 Working Days Rush & Urgent Surcharges will be applied		Compliance Monitoring? Program (SDWA, NPDES,...) PWSID / Permit # Chlorinated?		Y / N											
						Sample Disposal: Lab		Client											



Inter-Mountain Labs
Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -		Page _____ of _____
All shaded fields must be completed.		#WEB
This is a legal document; any misrepresentation may be construed as fraud.		

Client Name MVTI		Project Identification Otertail Power Big Stone		Sampler (Signature/Attestation of Authenticity) <i>[Signature]</i>		Telephone # 507-276-8089	
Report Address 1126 North Front St New Ulm, Mn 56073		Contact Name Tim Portner		ANALYSES / PARAMETERS			
Invoice Address Same		Email tportner@mvti.com					
		Phone 507-276-8089					
		Purchase Order #					
		Quote #					
						REMARKS	

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME	SAMPLE IDENTIFICATION	Matrix	# of Containers	Radium 226 + 228											
1	51703017-013	2/25/17	1559	Slag 9 A6390	WT	2	x											
2	51703018	L	—	Slag 9 Deep — NO sample	WT	2	x											
3	0114015	L	1450	Slag 2B A6391	WT	2	x											
4							x											
5							x											
6				MVTI WO # 31-0070			x											
7							x											
8							x											
9							x											
10							x											
11							x											
12							x											
13							x											
14							x											

LAB COMMENTS 13.1 13.4		Relinquished By (Signature/Printed) <i>[Signature]</i>		DATE 2/25/17		TIME 1933		Received By (Signature/Printed) Kathy Boud		DATE 3.2.17		TIME 10:11	

SHIPPING INFO		MATRIX CODES		TURN AROUND TIMES		COMPLIANCE INFORMATION		ADDITIONAL REMARKS	
<input type="checkbox"/> UPS	Water	WT	Check desired service		Compliance Monitoring ?		Y / N		
<input type="checkbox"/> FedEx	Soil	SL	<input type="checkbox"/> Standard turnaround		Program (SDWA, NPDES,...)				
<input type="checkbox"/> USPS	Solid	SD	<input type="checkbox"/> RUSH - 5 Working Days		PWSID / Permit #				
<input type="checkbox"/> Hand Carried	Filter	FT	<input type="checkbox"/> URGENT - < 2 Working Days		Chlorinated?		Y / N		
<input type="checkbox"/> Other	Other	OT	Rush & Urgent Surcharges will be applied		Sample Disposal: Lab		Client		

Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003
Phone: 800 782 3557 Fax: 507 359 2890

Field Service Chain of Custody Record

This is an exact copy of
the original document

By AR Date 28 Feb 17
pages 1-23

Project Otter Tail Power Company	Project Type: Big Stone Plant CCR	Name of Samplers: Dusty Farnsyn, Ben Wolf
Report Otter Tail Power Company	Carbon Copy:	Quote Number:
Attn: Paul Vukonich	Attn:	Work Order Number: 31-0070
Address P.O. Box 496	Address:	Lab Numbers:
Fergus Falls, MN 56538-0496		
Phone: 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
A6378	H2OX		27 Feb 17	1103	GW		2	N	1	1	N								See Attached
79	H3OX		1	1129	GW		2	N	1	1	N								
80	H4OX			1155	GW		2	N	1	1	N								
81	H-6			1211	GW		2	N	1	1	N								
82	H-8			1250	GW		2	N	1	1	N								
83	H-9			1340	GW		2	N	1	1	N								
84	Slag 1			1048	GW		2	N	1	1	N								
85	Slag 4			1152	GW		2	N	1	1	N								
86	Slag 5			1415	GW		2	N	1	1	N								
87	Slag 6			1220	GW		2	N	1	1	N								

Comments:

WORK ORDER #2

Samples Relinquished By: <u>AR</u>			Samples Received By: <u>Alice Luedin</u>		
Date: <u>27 Feb 17</u>	Time: <u>1904</u>	Temp: <u>0.0</u>	Date: <u>28 Feb 17</u>	Time: <u>800</u>	Temp: <u>3.8C</u>
Samples Relinquished into: <u>Fridge</u> Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: <u>Samplers</u> Other:			Seal Number(s) - If Used		
Transport: Ambient <u>Ice</u> Other:			Seals Intact? Yes No		

Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003

Phone: 800 782 3557 Fax: 507 359 2890

Field Service Chain of Custody Record

Project Otter Tail Power Company	Project Type: Big Stone Plant CCR	Name of Samplers: Dusty Farzayn, Ben Wolf
Report Otter Tail Power Company	Carbon Copy:	Quote Number:
Attn: Paul Vukonich	Attn:	Work Order Number:
Address P.O. Box 496	Address:	Lab Numbers:
Fergus Falls, MN 56538-0496		
Phone: 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
88	Slag 7		27-2-17	1309	GW		2	N	1	1	N								See Attached
89	Slag 8		I	1425	GW		2	N	1	1	N								
90	Slag 9			1539	GW		2	N	1	1	N								
	Slag 9 Deep				GW		2	N	1	1	N								
91	Slag 2B		I	1450	GW		2	N	1	1	N								

Comments:

WORK ORDER #2

Samples Relinquished By: <u>Dusty Farzayn</u>	Samples Received By: <u>Alice Audin</u>
Date: <u>27 Feb 17</u> Time: <u>1900</u> Temp: <u>0.0</u>	Date: <u>28 Feb 17</u> Time: <u>800</u> Temp: <u>3.80</u>
Samples Relinquished into: <u>Bridge</u> Log in Cart Other:	
Samples Relinquished By:	Samples Received By:
Date: Time: Temp:	Date: Time: Temp:
Delivery: <u>Samplers</u> Other:	Seal Number(s) - If Used
Transport: <u>Ambient</u> Other:	Seals Intact? Yes No

CCR 2017
(make copy)

February
CCR

Big Stone Sampling

Site*	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (ml/minute)	Goes Dry?	Sampling Seasons**
WELL10	A	47.43	4	1098.70	Keck/Tsunami	No	3,000	No	1,3
WELL11	A	127.22	4	1104.00	Other Pump	Yes	36,000	No	1,3
WELL12	A	112.40	4	1071.89	Other Pump	Yes	20,000	No	1,3
S1	B	32.50	2	1102.17	Bailer	Yes	N/A	Yes	1,3
S2	B	43.12	2	1102.39	Bailer	Yes	N/A	Yes	1,3
S3	B	62.50	2	1102.65	Bailer	Yes	N/A	No	1,3
S4	B	27.70	2	1090.57	Bailer	Yes	N/A	Yes	1,3
S5	B	46.72	2	1091.40	Bailer	Yes	N/A	Yes	1,3
S6	B	62.05	2	1090.71	Bailer	Yes	N/A	No	1,3
H1OX	C, CCR	32.91	2	1115.89	Bailer	Yes	100	Yes	1,3
H1INT	C	60.11	2	1115.81	Keck/Tsunami	No	1500	No	1,3
H2OX	C, CCR	32.20	2	1103.91	Bladder	Yes	100	Yes	1,3
H2INT	C	62.30	2	1103.91	Bailer	Yes	N/A	Yes	1,3
H3OX	C, CCR	22.55	2	1095.19	Bladder	Yes	100	Yes	1,3
H3INT	C	54.31	2	1095.17	Whale	No	2000	No	1,3
H4OX	C, CCR	27.20	2	1108.22	Bladder	Yes	100	No	1,3
H4INT	C	60.01	2	1108.61	Keck/Tsunami	No	2000	Yes	1,3
H5	C	43.30	2	1122.80	Whale	No	1000	No	1,3
H6	C, CCR	15.00	2	1097.76	Bladder	Yes	100	Yes	1,3
H7	C	33.20	2	1106.06	Whale	No	1000	Yes	1,3
H8	C, CCR	22.05	2	1081.23	Bladder	Yes	100	TBD	1,3
H9	CCR	30.20	2	1086.21	Bladder	Yes	100	TBD	1,3
BC1	B	16.26	2	1118.46	Bailer	Yes	N/A	No	1,3
BC101	B	39.30	2	1118.70	Bailer	Yes	N/A	Yes	1,3
BC2R	B	32.48	2	1115.28	Bailer	Yes	N/A	No	1,3
BC3R	B	35.15	2	1114.42	Bailer	Yes	N/A	Yes	1,3
BC4R	B	34.60	2	1113.86	Bailer	Yes	N/A	Yes	1,3
BC5R	B	37.32	2	1123.02	Bailer	Yes	N/A	No	1,3
BC6R	B	33.95	2	1121.58	Bailer	Yes	N/A	No	1,3
SLAG1	CCR	34.90	2	TBD	LOW FLOW	No	100	TBD	1,3

SLAG2	CCR	TBD	2	1111.08	LOW FLOW	TBD	100	TBD	1,3
SLAG3	CCR	TBD	2	TBD	LOW FLOW	TBD	100	TBD	1,3
SLAG4	CCR	39.00	2	TBD	LOW FLOW	No	100	TBD	1,3
SLAG5	CCR	38.80	2	1107.30	LOW FLOW	No	100	TBD	1,3
SLAG6	CCR	37.30	2	1111.51	LOW FLOW	No	100	TBD	1,3
SLAG7	CCR	48.70	2	1114.39	LOW FLOW	No	100	TBD	1,3
SLAG8	CCR	52.09	2	1127.26	LOW FLOW	No	100	TBD	1,3
SLAG9	CCR	49.80	2	1122.35	LOW FLOW	No	100	TBD	
SLAG9 DEEP***	CCR	68.00	2	1121.92	LOW FLOW	No	100	TBD	
SLAG2B	CCR	40.80	2	1111.26	LOW FLOW	No	100	TBD	
COOLING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
EVAPORATION	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
HOLDING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
RECLAIM POND	C	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3

* Three additional monitoring wells will be installed the Spring of 2016. Each well will be screened approximately 35' below ground surface and will be analyzed for the "C" parameter list. In addition, a new site with 9 wells will be added and will be analyzed for CCR Parameters ONLY.

** 1 = Spring (March 28 - April 28), 2 = Summer (July 1 - August 7), 3 = Fall (October 14- November 14)

*** Only sample for the first two CCR background sampling events.

Big Stone Plant CCR Appendix III Parameters

CCR - Appendix III Detection Monitoring

Field Parameters

pH*

* Field and Laboratory Measurements

Total Concentration Parameters

Boron

Calcium

Chloride

Fluoride

pH

Sulfate

Dissolved Solids, Total

500 HNO₃

1000 NO₂

Big Stone CCR Appendix IV Parameters

CCR - Appendix IV - Assessment Monitoring

Total Concentration Parameters

Antimony

Arsenic

Barium

Beryllium

Cadmium

Chromium, Total

Cobalt

Fluoride

Lead

Lithium

Mercury

Molybdenum

Selenium

Thallium

Radium 226 + 228

500 None

500 HNO_3

2 - 1000 HNO_3

Big Stone Parameter List "A"

Field Parameters

Field pH
Field Temperature
Field Conductivity

Lab Parameters

Lab pH
Lab Conductivity
Total Alkalinity
Chloride
Hardness, Calcium
Hardness, Total
Nitrate-Nitrite as N
Potassium - Total
Sodium - Total
Sulfate

500 HNO_3

500 H_2SO_4

1000 NaOH

Big Stone Parameter List "B"

Field Parameters

Field pH
Field Temperature
Field Conductivity

Lab Parameters

Lab pH
Lab Conductivity
Total Alkalinity
Chloride
Hardness, Calcium
Hardness, Total
Nitrate-Nitrite as N
Potassium - Total
Sodium - Total
Sulfate
Arsenic - dissolved
Boron - dissolved
Cadmium - dissolved
Lead - dissolved
Manganese - dissolved
Strontium - dissolved

1000 none

500 HNO₃

500 HNO₃ Filter

500 H₂SO₄

Big Stone Parameter List "C"

Field Parameters

Field pH
Field Temperature
Field Conductivity

Lab Parameters

Lab pH
Lab Conductivity
Total Alkalinity
Chloride
Hardness, Calcium
Hardness, Total
Nitrate-Nitrite as N
Potassium - Total
Sodium - Total
Sulfate
Arsenic - Dissolved
Arsenic - Total **
Barium - Dissolved
Barium - Total **
Boron - Dissolved
Boron - Total **
Cadmium - Dissolved
Cadmium - Total **
Chromium - Dissolved
Chromium - Total **
Copper - Dissolved
Copper - Total **
Lead - Dissolved
Lead - Total **
Manganese - Dissolved
Manganese - Total **
Mercury - Dissolved
Mercury - Total **
Selenium - Dissolved
Selenium - Total **
Silver - Dissolved
Silver - Total **
Strontium - Dissolved
Strontium - Total **
Vanadium - Dissolved
Vanadium - Total **
Zinc - Dissolved
Zinc - Total **

Pond
1000 NO₃⁻
500 H₂SO₄
500 HNO₃

Well
1000 NO₃⁻
500 H₂SO₄
500 HNO₃ Filter

**** NOTE: ONLY Reclaim Pond is required to have Total metals run.
The groundwater samples are required to have the Dissolved metals run only.**

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56072

507 354 8517

Groundwater Assessment

Sampling Personnel

Dusty Fargy

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: 27 Feb 17

Unique Station ID: —

Sample ID: Slag 1

Well Condition

Well Locked? ☒ Yes No

Well Labeled? ☒ Yes No

Casing Straight? ☒ Yes No

Repairs Necessary:

Protective Posts? ☒ Yes No

State ID Tag? Yes ☒ No

Grout Seal Intact? Yes ☒ No

Well Information

Well Depth: 35.14

Constructed Depth: 34.90

Casing Diameter: 2"

Water Level Before Purge: 16.77

Well Volume: 3.00 Gallons

Well Casing Elevation: NA

Static Water Elevation: 1

Previous Static: 1

Water Level After Sample: 30.35

Measurement Method: Elec. WLD Steel Tape

Sampling Information

Weather Conditions Temp: 30

Wind: L+V

Sky: Mostly Cloudy

Sampling Method: Grundfos

Booster SS/T

Disp. Bailer

Whale

Grab

Other:

Dedicated Equipment Yes ☒ No

Pumping Rate: 0.23 gpm

Well Purged Dry? ☒ Yes No

Time Pump Began: 1031 am / pm

Time Purged Dry? 1043

Time of Sampling: 1048 am / pm

Duplicate Sample? Yes ☒ No

ID: —

Sample EH: 130.0

Sample Appearance General: Clear

Color: None

Phase: Lt. Sed.

Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1043	7.03	1990	9.47	NA	NA	3.00	1	
							2	
							3	
							4	
1048	6.97	2233	7.10	1	1	3.00	5	Recharge

Stabilize Yes ☒ No

Amount Water Removed: 3.00

Gallons

Comments:

Exceptions to Protocol:

- very slow Recharge

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Ferguson

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: *27 Feb 17*

Unique Station ID: —

Sample ID: Slag 4

Well Condition

Well Locked? *Yes* No

Well Labeled? *Yes* No

Casing Straight? *Yes* No

Repairs Necessary:

Protective Posts? *Yes* No

State ID Tag? Yes *No*

Grout Seal Intact? Yes *No*

Well Information

Well Depth: *39.24*

Constructed Depth: 39.00

Casing Diameter: 2"

Water Level Before Purge: *18.97*

Well Volume: *3.31* Gallons

Well Casing Elevation: *NA*

Static Water Elevation: *L*

Previous Static: *L*

Water Level After Sam: *21.15*

Measurement Method: *Elec. Well* Steel Tape

Sampling Information

Weather Conditions: Temp: *30* Wind: *LW* Sky: *Mostly Cloudy*

Sampling Method: Grundfos *Bladder Disp. B&Whale* Grab Other:

Dedicated Equipment: Yes *No* Pumping Rate: *0.25* gpm

Well Purged Dry? Yes *No* Time Pump Began: *1110* *am* / pm

Time Purged Dry? *✓* Time of Sampling: *1152* *am* / pm

Duplicate Sample? Yes *No* ID: — Sample E: *1422*

Sample Appearance: General: *Sl. Cloudy* Color: *None* Phase: *None* Odor: *None*

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SE Q #	Comments:
<i>1124</i>	<i>6.62</i>	<i>2794</i>	<i>8.43</i>	<i>NA</i>	<i>NA</i>	<i>3.5</i>	1	
<i>1138</i>	<i>6.65</i>	<i>2836</i>	<i>8.13</i>	<i>L</i>	<i>L</i>	<i>7</i>	2	
<i>1152</i>	<i>6.64</i>	<i>2868</i>	<i>7.93</i>	<i>L</i>	<i>L</i>	<i>10.5</i>	3	
							4	
							5	

Stabilized? *Yes* No Amount Water R: *10.5* Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 560

507 354 8517

Groundwater Assessor

Sampling Person

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID: _____

Date: 27 Feb 17

Unique Station ID: _____

Sample ID: Slag 5

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary _____

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: 39.00

Constructed Depth 38.80

Casing Diameter: 2"

Water Level Before Purge 2341

Well Volume: 2.54 Gallons

Well Casing Elevation: 1107.30

Static Water Elevation: 1083.89

Previous Static: 1083.34

Water Level After Sample: 37.74

Measurement Method: ☒ Elec. WL ☐ Steel Tape

Sampling Information

Weather Condition Temp: 40

Wind: SE 5-10

Sky: cloudy

Sampling Method: Grundfos ☐ Bladder SS/T ☐ Disp. Bailer ☒ Whale ☐ Grab ☐ Other: _____

Dedicated Equipm Yes ☐ No ☒

Pumping Rate: .25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began: 1359 am / ☒ pm

Time Purged Dry? 1410

Time of Sampling: 1415 am / pm

Duplicate Sample? Yes ☐ No ☒ ID: _____

Sample EH: 110.6

Sample Appearance General: clear

Color: none Phase: none

Odor: none

ii Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1410	7.08	950	10.15	NA	NA	2.75	1	
1415	7.07	942	9.99			—	2	Recharge
							3	
							4	
							5	

Stabilize Yes ☐ No ☒

Amount Water Removed: 2.75 Gallons

Comments: _____

Exceptions to Protocol: _____

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Farson

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: 27 Feb 17

Unique Station ID: —

Sample ID: Slag 6

Well Condition

Well Locked? Yes No

Well Labeled? Yes No

Casing Straight? Yes No

Repairs Necessary: —

Protective Posts? Yes No

State ID Tag? Yes NO

Grout Seal Intact? Yes NO

Well Information

Well Depth: 37.50

Constructed Depth: 37.30

Casing Diameter: 2"

Water Level Before Purge: 23.64

Well Volume: 2.24 Gallons

Well Casing Elevation: NA

Static Water Elevation: 1

Previous Static: 1

Water Level After Samp: 29.80

Measurement Method: Elec. Well Steel Tape

Sampling Information

Weather Conditions: Temp: 30 Wind: LHV Sky: Mostly Cloudy

Sampling Method: Grundfos Bladder SBT Disp. Bailer Whale Grab Other: —

Dedicated Equipment: Yes NO Pumping Rate: 0.25 gpm

Well Purged Dry? Yes No Time Pump Began: 1212 am / PM

Time Purged Dry? 1221 Time of Sampling: 1228 am / PM

Duplicate Sample? Yes NO ID: — Sample EH: 171.6

Sample Appearance: General: Cloudy Color: Tan Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1221</u>	<u>6.91</u>	<u>1430</u>	<u>9.59</u>	<u>NA</u>	<u>NA</u>	<u>2.25</u>	1	
				<u>1</u>	<u>1</u>		2	
							3	
							4	
<u>1228</u>	<u>7.07</u>	<u>1317</u>	<u>9.89</u>	<u>1</u>	<u>1</u>	<u>3.25</u>	5	<u>Recharge</u>

Stabilized Yes NO Amount Water Remove: — Gallons

Comments:

Exceptions to Protocol:

* good recharge

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Ferguson

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 27 Feb 17

Unique Station ID:

Sample ID: Slag 7

Well Condition

Well Locked? Yes No

Well Labeled? Yes No

Casing Straight? Yes No

Repairs Necessary:

Protective Posts? Yes No

State ID Tag? Yes No

Grout Seal Intact? Yes No

Well Information

Well Depth: 41.05

Constructed Depth: 48.70

Casing Diameter: 2"

Water Level Before Purge: 13.83

Well Volume: 5.74 Gallons

Well Casing Elevation: NA

Static Water Elevation:

Previous Static:

Water Level After Sample: 42.08

Measurement Method: Elec. W.P. Steel Tape

Sampling Information

Weather Conditions: Temp: 30

Wind: Low

Sky: Mostly Cloudy

Sampling Method: Grundfos Bladder SST Disp. Bailer Whale Grab Other:

Dedicated Equipment Yes No

Pumping Rate: 0.75 gpm

Well Purged Dry? Yes No

Time Pump Began: 1241 am / pm

Time Purged Dry? 1304

Time of Sampling: 1309 am / pm

Duplicate Sample? Yes No ID:

Sample EH: 171.0

Sample Appearance: General: sl. Cloudy Color: Tan

Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1304</u>	<u>7.20</u>	<u>1623</u>	<u>9.24</u>	<u>NA</u>	<u>NA</u>	<u>5.75</u>	1	
							2	
							3	
							4	
<u>1309</u>	<u>7.15</u>	<u>1689</u>	<u>8.98</u>	<u> </u>	<u> </u>	<u>5.75</u>	5	<u>Recharge</u>

Stabilized Yes No

Amount Water Removed: 5.75 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Peterson

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: 27 Feb 17

Unique Station ID: —

Sample ID: Slag 8

Well Condition

Well Locked? Yes No

Well Labeled? Yes No

Casing Straight? Yes No

Repairs Necessary:

Protective Posts? Yes No

State ID Tag? Yes NO

Grout Seal Intact? Yes No

Well Information

Well Depth: 52.24

Constructed Depth: 52.09

Casing Diameter: 2"

Water Level Before Purge: 17.55

Well Volume: 5.44 Gallons

Well Casing Elevation: NA

Static Water Elevation: I

Previous Static: I

Water Level After Sample: 29.95

Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 30 Wind: LHV Sky: Mostly Cloudy

Sampling Method: Grundfos Bladder SRT Disp. Bailer Whale Grab Other:

Dedicated Equipment Yes NO Pumping Rate: 0.25 gpm

Well Purged Dry? Yes NO Time Pump Began: 1316 am / PM

Time Purged Dry? Time of Sampling: 1425 am / PM

Duplicate Sample? Yes NO ID: — Sample EH: 154.3

Sample Appearance: General: Clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1339</u>	<u>7.12</u>	<u>1351</u>	<u>9.46</u>	<u>NA</u>	<u>NA</u>	<u>5.75</u>	<u>1</u>	
<u>1402</u>	<u>7.07</u>	<u>1352</u>	<u>9.40</u>	<u>I</u>	<u>I</u>	<u>11.5</u>	<u>2</u>	
<u>1425</u>	<u>7.05</u>	<u>1363</u>	<u>9.73</u>	<u>I</u>	<u>I</u>	<u>17.25</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? Yes No

Amount Water Removed: 17.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Persyn

Site: Offet Tail Power Co./ Big Stone

Facility ID: —

Date: 27 Feb 17

Unique Station ID: —

Sample ID: —

Slag 9

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary: —

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☐ Yes ☒ No

Grout Seal Intact? ☐ Yes ☒ No

Well Information

Well Depth: 51.25

Constructed Depth: 49.80

Casing Diameter: 2"

Water Level Before Purge: 15.13

Well Volume: 5.89 Gallons

Well Casing Elevation: MA

Static Water Elevation: I

Previous Static: I

Water Level After Sample 23.10

Measurement Method: Elec. W Steel Tape

Sampling Information

Weather Conditions: Temp: 30

Wind: LHV

Sky: Mostly Cloudy

Sampling Method: Grundfos Bladder SPT Disp. Bailer — Whale — Grab — Other: —

Dedicated Equipment: Yes ☒ No ☐

Pumping Rate: 0.25 gpm

Well Purged Dry? Yes ☒ No ☐

Time Pump Began 1447 am / PM

Time Purged Dry? —

Time of Sampling: 1559 am / PM

Duplicate Sample? Yes ☒ No ☐ ID: —

Sample EH: 110.4

Sample Appearance: General: Clear

Color: None

Phase: None

Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1511</u>	<u>6.79</u>	<u>2378</u>	<u>9.67</u>	<u>NA</u>	<u>NA</u>	<u>6</u>	<u>1</u>	
<u>1535</u>	<u>6.79</u>	<u>2344</u>	<u>9.44</u>	<u>I</u>	<u>I</u>	<u>12</u>	<u>2</u>	
<u>1559</u>	<u>6.80</u>	<u>2320</u>	<u>9.36</u>	<u>I</u>	<u>I</u>	<u>18</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 18

Gallons

Comments: —

Exceptions to Protocol: —

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607

507 354 8517

Groundwater Assessor

Sampling Personne

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 27 Feb 17

Unique Station ID:

Sample ID: Slag 2B

Well Condition

Well Locked? Yes ☒ No ☐

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary

Protective Posts? Yes ☒ No ☐

State ID Tag? Yes ☒ No ☐

Grout Seal Intact? Yes ☒ No ☐

Well Information

Well Depth: 40.94

Constructed Depth: 40.80

Casing Diameter: 2"

Water Level Before Purge 18.38

Well Volume: 3.68 Gallons

Well Casing Elevation: 1141.26

Static Water Elevation: 1092.88

Previous Static: 1091.63

Water Level After Sample 40.78

Measurement Method: Elec. Well Steel Tape

Sampling Information

Weather Conditions Temp: 40

Wind: S @ 5-10

Sky: cloudy

Sampling Method: Grundfos Bladder SS/T Disp. Baller Whale Grab Other:

Dedicated Equipment Yes ☒ No ☐

Pumping Rate: .25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began 1430 am / pm

Time Purged Dry? 1445

Time of Sampling: 1450 am / pm

Duplicate Sample? Yes ☒ No ☐ ID: -

Sample EH: 113.0

Sample Appearance General: Slightly cloudy Color: gray Phase: Light Sed. Odor: None

15								
Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SE Q #	Comments:
<u>1445</u>	<u>7.02</u>	<u>2113</u>	<u>10.28</u>	<u>NA</u>	<u>NA</u>	<u>3.75</u>	<u>1</u>	
<u>1450</u>	<u>7.10</u>	<u>2124</u>	<u>9.97</u>	<u>I</u>	<u>I</u>	<u>-</u>	<u>2</u>	<u>Recharge</u>
							<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilizer Yes ☒ No ☐

Amount Water Removed: 3.75 Gallons

Comments:

*Slow Recharge

Exceptions to Protocol:



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



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FINAL REPORT COMPLETION DATE: 17 May 17 AH

Date Reported: 4 May 2017

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 31-0123
Account #: 006106
PO #: 48680

Project Name: BIG STONE PLANT

T. H. H. 15 May 17
Field Service Manager/Date Reviewed
Q. C. C. 10 May 2017
Chemistry Lab Manager/Date Reviewed
Vukonich P. 10 May 2017
Quality Assurance Director/Date Reviewed

RL = Reporting Limits
NQ = Not Present, Qualitative Only
PQ = Present, Qualitative Only
ND = Not Determined

All data for this report has been approved by MVT Laboratory Management.

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



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 4 May 2017
 Lab Number: 17-A11091
 Work Order #: 31-0123
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 29 Mar 2017 13:44
 Sampled By: MVT L FIELD PERSONNEL
 Date Received: 30 Mar 2017 13:27
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 4

Temp at Receipt: 0.4C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				3 Apr 17	JMS
Water Digestions				4 Apr 17	JMS
Radium 226	SEE ATTACHED			2 May 17 16:10	ABL
Radium 228	SEE ATTACHED		EPA M9320	2 May 17 16:10	ABL
pH, Field	6.54 units	1.00	I-1586-85	29 Mar 17 13:44	JLH
pH	* 6.8 units	1.0	SM 4500 H+ B-2000	31 Mar 17 11:52	DS
Sulfate	1400 ~ mg/L	5.0	ASTM D516-07	6 Apr 17 8:56	KCJ
Chloride	50.0 mg/L	3.0	SM 4500 Cl E	6 Apr 17 9:33	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	7 Apr 17 11:44	RMB
Solids, Total Dissolved	2640 mg/L	10	SM 2540 C-97	31 Mar 17 12:50	RC
Calcium	458.0 ~ mg/L	0.500	SW6010C	12 Apr 17 11:27	RMV
Lithium	0.195 mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Barium	0.014 mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Chromium	< 0.01 mg/L	0.01	SW6010C	12 Apr 17 11:27	RMV
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Boron	0.091 mg/L	0.100	SW6010C	12 Apr 17 11:27	RMV
Antimony	< 5 @ ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Arsenic	< 5 @ ug/L	0.5	SW6020A	10 Apr 17 9:52	RMV
Beryllium	< 0.5 ug/L	0.05	SW6020A	5 Apr 17 11:37	RMV
	@See Narrative				
Cadmium	< 1 @ ug/L	0.1	SW6020A	5 Apr 17 11:37	RMV
Lead	< 5 @ ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Molybdenum	5.38 @ ug/L	0.50	SW6020A	10 Apr 17 9:52	RMV
Selenium	< 5 @ ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Thallium	< 1 @ ug/L	0.1	SW6020A	5 Apr 17 11:37	RMV
Fluoride	0.180 mg/L	0.020	EPA 300.0	7 Apr 17 10:37	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards. The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-N ND NW/DW # R-040



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 4 May 2017
 Lab Number: 17-A11092
 Work Order #: 31-0123
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 30 Mar 2017 8:24
 Sampled By: MVTl FIELD PERSONNEL
 Date Received: 30 Mar 2017 13:27
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 5

Temp at Receipt: 0.4C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					3 Apr 17	JMS
Water Digestions					4 Apr 17	JMS
Radium 226	SEE ATTACHED				2 May 17 16:10	ABL
Radium 228	SEE ATTACHED			EPA M9320	2 May 17 16:10	ABL
pH, Field	6.97	units	1.00	I-1586-85	30 Mar 17 8:24	JLH
pH	* 7.1	units	1.0	SM 4500 H+ B-2000	31 Mar 17 11:52	DS
Sulfate	72.6 @	mg/L	5.0	ASTM D516-07	6 Apr 17 8:56	KCJ
Chloride	9.0	mg/L	3.0	SM 4500 Cl E	6 Apr 17 9:33	MRW
Mercury	< 0.005	ug/L	0.005	EPA 245.7	7 Apr 17 11:44	RMB
Solids, Total Dissolved	522	mg/L	10	SM 2540 C-97	31 Mar 17 12:50	RC
Calcium	116.0	mg/L	0.500	SW6010C	12 Apr 17 11:27	RMV
Lithium	0.026	mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Barium	0.143	mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Chromium	< 0.01	mg/L	0.01	SW6010C	12 Apr 17 11:27	RMV
Cobalt	< 0.01 ^	mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Boron	0.453	mg/L	0.100	SW6010C	12 Apr 17 11:27	RMV
Antimony	< 5 @	ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Arsenic	< 5 @	ug/L	0.5	SW6020A	10 Apr 17 9:52	RMV
Beryllium	< 0.5	ug/L	0.05	SW6020A	5 Apr 17 11:37	RMV
	@See Narrative					
Cadmium	< 1 @	ug/L	0.1	SW6020A	5 Apr 17 11:37	RMV
Lead	< 5 @	ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Molybdenum	12.2 @	ug/L	0.50	SW6020A	10 Apr 17 9:52	RMV
Selenium	< 5 @	ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Thallium	< 1 @	ug/L	0.1	SW6020A	5 Apr 17 11:37	RMV
Fluoride	0.220	mg/L	0.020	EPA 300.0	7 Apr 17 10:37	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

@ = Due to sample matrix

I = Due to sample quantity

= Due to concentration of other analytes

+ = Due to internal standard response

CERTIFICATION: NN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

MVTl guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTl to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTl. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 4 May 2017
 Lab Number: 17-A11093
 Work Order #: 31-0123
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 29 Mar 2017 14:25
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 30 Mar 2017 13:27
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 6

Temp at Receipt: 0.4C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					3 Apr 17	JMS
Water Digestions					4 Apr 17	JMS
Radium 226	SEE ATTACHED				2 May 17 16:10	ABL
Radium 228	SEE ATTACHED			EPA M9320	2 May 17 16:10	ABL
pH, Field	6.89	units	1.00	I-1586-85	29 Mar 17 14:25	JLH
pH	* 7.1	units	1.0	SM 4500 H+ B-2000	31 Mar 17 11:52	DS
Sulfate	325 ~	mg/L	5.0	ASTM D516-07	6 Apr 17 8:56	KCJ
Chloride	7.2	mg/L	3.0	SM 4500 Cl E	6 Apr 17 9:33	MRW
Mercury	0.005	ug/L	0.005	EPA 245.7	7 Apr 17 11:44	RMB
Solids, Total Dissolved	1040	mg/L	10	SM 2540 C-97	31 Mar 17 12:50	RC
Calcium	183.0	mg/L	0.500	SW6010C	12 Apr 17 11:27	RMV
Lithium	0.106	mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Barium	0.039	mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Chromium	< 0.01	mg/L	0.01	SW6010C	12 Apr 17 11:27	RMV
Cobalt	< 0.01 ^	mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Boron	2.320	mg/L	0.100	SW6010C	12 Apr 17 11:27	RMV
Antimony	< 5 @	ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Arsenic	< 5 @	ug/L	0.5	SW6020A	10 Apr 17 9:52	RMV
Beryllium	< 0.5	ug/L	0.05	SW6020A	5 Apr 17 11:37	RMV
	@See Narrative					
Cadmium	< 1 @	ug/L	0.1	SW6020A	5 Apr 17 11:37	RMV
Lead	< 5 @	ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Molybdenum	6.59 @	ug/L	0.50	SW6020A	10 Apr 17 9:52	RMV
Selenium	< 5 @	ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Thallium	< 1 @	ug/L	0.1	SW6020A	5 Apr 17 11:37	RMV
Fluoride	0.660	mg/L	0.020	EPA 300.0	7 Apr 17 10:37	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

@ = Due to sample matrix

! = Due to sample quantity

= Due to concentration of other analytes

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 4 May 2017
 Lab Number: 17-A11094
 Work Order #: 31-0123
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 29 Mar 2017 15:25
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 30 Mar 2017 13:27
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 7

Temp at Receipt: 0.4C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				3 Apr 17	JMS
Water Digestions				4 Apr 17	JMS
Radium 226	SEE ATTACHED			2 May 17 16:11	ABL
Radium 228	SEE ATTACHED		EPA M9320	2 May 17 16:11	ABL
pH, Field	6.98 units	1.00	I-1586-85	29 Mar 17 15:25	JLH
pH	* 7.2 units	1.0	SM 4500 H+ B-2000	31 Mar 17 11:52	DS
Sulfate	522 ~ mg/L	5.0	ASTM D516-07	6 Apr 17 8:56	KCJ
Chloride	5.1 mg/L	3.0	SM 4500 Cl E	6 Apr 17 9:33	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	7 Apr 17 11:44	RMB
Solids, Total Dissolved	1210 mg/L	10	SM 2540 C-97	31 Mar 17 12:50	RC
Calcium	253.0 mg/L	0.500	SW6010C	12 Apr 17 11:27	RMV
Lithium	0.116 mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Barium	0.028 mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Chromium	< 0.01 mg/L	0.01	SW6010C	12 Apr 17 11:27	RMV
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Boron	1.350 mg/L	0.100	SW6010C	12 Apr 17 11:27	RMV
Antimony	< 5 @ ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Arsenic	< 5 @ ug/L	0.5	SW6020A	10 Apr 17 9:52	RMV
Beryllium	< 0.5 ug/L	0.05	SW6020A	5 Apr 17 11:37	RMV
	@See Narrative				
Cadmium	< 1 @ ug/L	0.1	SW6020A	5 Apr 17 11:37	RMV
Lead	< 5 @ ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Molybdenum	< 5 @ ug/L	0.5	SW6020A	10 Apr 17 9:52	RMV
Selenium	< 5 @ ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Thallium	< 1 @ ug/L	0.1	SW6020A	5 Apr 17 11:37	RMV
Fluoride	0.470 mg/L	0.020	EPA 300.0	7 Apr 17 10:37	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

@ = Due to sample matrix

! = Due to sample quantity

= Due to concentration of other analytes

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WQ/DW # R-040

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



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 4 May 2017
Lab Number: 17-A11095
Work Order #: 31-0123
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 29 Mar 2017 16:48
Sampled By: MVTL FIELD PERSONNEL
Date Received: 30 Mar 2017 13:27
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 8

Temp at Receipt: 0.4C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					3 Apr 17	JMS
Water Digestions					4 Apr 17	JMS
Radium 226	SEE ATTACHED				2 May 17 16:11	ABL
Radium 228	SEE ATTACHED			EPA M9320	2 May 17 16:11	ABL
pH, Field	6.92	units	1.00	I-1586-85	29 Mar 17 16:48	JLH
pH	* 7.2	units	1.0	SM 4500 H+ B-2000	31 Mar 17 11:52	DS
Sulfate	250 @	mg/L	5.0	ASTM D516-07	6 Apr 17 8:56	KCJ
Chloride	37.7	mg/L	3.0	SM 4500 Cl E	6 Apr 17 9:33	MRW
Mercury	< 0.005	ug/L	0.005	EPA 245.7	7 Apr 17 12:21	RMB
Solids, Total Dissolved	885	mg/L	10	SM 2540 C-97	31 Mar 17 12:50	RC
Calcium	124.0	mg/L	0.500	SW6010C	12 Apr 17 11:27	RMV
Lithium	0.056	mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Barium	0.037	mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Chromium	< 0.01	mg/L	0.01	SW6010C	12 Apr 17 11:27	RMV
Cobalt	< 0.01 ^	mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Boron	0.598	mg/L	0.100	SW6010C	12 Apr 17 11:27	RMV
Antimony	< 5 @	ug/L	0.5	SW6020A	5 Apr 17 10:25	RMV
Arsenic	< 5 @	ug/L	0.5	SW6020A	5 Apr 17 10:25	RMV
Beryllium	< 0.5	ug/L	0.05	SW6020A	5 Apr 17 10:25	RMV
	@See Narrative					
Cadmium	< 1 @	ug/L	0.1	SW6020A	5 Apr 17 10:25	RMV
Lead	< 5 @	ug/L	0.5	SW6020A	5 Apr 17 10:25	RMV
Molybdenum	9.04 @	ug/L	0.50	SW6020A	10 Apr 17 8:40	RMV
Selenium	21.4 @	ug/L	0.50	SW6020A	5 Apr 17 10:25	RMV
Thallium	< 1 @	ug/L	0.1	SW6020A	5 Apr 17 10:25	RMV
Fluoride	0.580	mg/L	0.020	EPA 300.0	7 Apr 17 17:28	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards. The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix

! = Due to sample quantity

= Due to concentration of other analytes

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WQ/DW # R-040

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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 4 May 2017
 Lab Number: 17-A11096
 Work Order #: 31-0123
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 29 Mar 2017 18:19
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 30 Mar 2017 13:27
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 9

Temp at Receipt: 0.4C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					3 Apr 17	JMS
Water Digestions					4 Apr 17	JMS
Radium 226	SEE ATTACHED				2 May 17 16:11	ABL
Radium 228	SEE ATTACHED			EPA M9320	2 May 17 16:11	ABL
pH, Field	6.78 units		1.00	I-1586-85	29 Mar 17 18:19	JLH
pH	* 7.0 units		1.0	SM 4500 H+ B-2000	31 Mar 17 11:52	DS
Sulfate	824 ~ mg/L		5.0	ASTM D516-07	6 Apr 17 8:56	KCJ
Chloride	6.9 mg/L		3.0	SM 4500 Cl E	6 Apr 17 9:33	MRW
Mercury	< 0.005 ug/L		0.005	EPA 245.7	7 Apr 17 12:21	RMB
Solids, Total Dissolved	1670 mg/L		10	SM 2540 C-97	31 Mar 17 12:50	RC
Calcium	325.0 mg/L		0.500	SW6010C	12 Apr 17 11:27	RMV
Lithium	0.113 mg/L		0.005	SW6010C	12 Apr 17 11:27	RMV
Barium	0.026 mg/L		0.005	SW6010C	12 Apr 17 11:27	RMV
Chromium	< 0.01 mg/L		0.01	SW6010C	12 Apr 17 11:27	RMV
Cobalt	< 0.01 ^ mg/L		0.005	SW6010C	12 Apr 17 11:27	RMV
Boron	0.251 mg/L		0.100	SW6010C	12 Apr 17 11:27	RMV
Antimony	< 5 @ ug/L		0.5	SW6020A	5 Apr 17 10:25	RMV
Arsenic	< 5 @ ug/L		0.5	SW6020A	5 Apr 17 10:25	RMV
Beryllium	< 0.5 ug/L		0.05	SW6020A	5 Apr 17 10:25	RMV
	@See Narrative					
Cadmium	< 1 @ ug/L		0.1	SW6020A	5 Apr 17 10:25	RMV
Lead	< 5 @ ug/L		0.5	SW6020A	5 Apr 17 10:25	RMV
Molybdenum	8.13 @ ug/L		0.50	SW6020A	10 Apr 17 8:40	RMV
Selenium	< 5 @ ug/L		0.5	SW6020A	5 Apr 17 10:25	RMV
Thallium	< 1 @ ug/L		0.1	SW6020A	5 Apr 17 10:25	RMV
Fluoride	0.250 mg/L		0.020	EPA 300.0	7 Apr 17 17:28	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

@ = Due to sample matrix

= Due to concentration of other analytes

! = Due to sample quantity

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WH/DW # R-040

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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 4 May 2017
 Lab Number: 17-A11097
 Work Order #: 31-0123
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 30 Mar 2017 8:56
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 30 Mar 2017 13:27
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 2B

Temp at Receipt: 0.4C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				3 Apr 17	JMS
Water Digestions				4 Apr 17	JMS
Radium 226	SEE ATTACHED			2 May 17 16:11	ABL
Radium 228	SEE ATTACHED		EPA M9320	2 May 17 16:12	ABL
pH, Field	6.99 units	1.00	I-1586-85	30 Mar 17 8:56	JLH
pH	* 7.2 units	1.0	SM 4500 H+ B-2000	31 Mar 17 11:52	DS
Sulfate	815 ~ mg/L	5.0	ASTM D516-07	6 Apr 17 9:14	KCJ
Chloride	33.2 mg/L	3.0	SM 4500 Cl E	6 Apr 17 9:56	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	7 Apr 17 12:21	RMB
Solids, Total Dissolved	1510 mg/L	10	SM 2540 C-97	31 Mar 17 12:50	RC
Calcium	249.0 mg/L	0.500	SW6010C	12 Apr 17 11:27	RMV
Lithium	0.040 mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Barium	0.052 mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Chromium	< 0.01 mg/L	0.01	SW6010C	12 Apr 17 11:27	RMV
Cobalt	< 0.01 ~ mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Boron	3.880 mg/L	0.100	SW6010C	12 Apr 17 11:27	RMV
Antimony	< 5 @ ug/L	0.5	SW6020A	5 Apr 17 10:25	RMV
Arsenic	< 5 @ ug/L	0.5	SW6020A	5 Apr 17 10:25	RMV
Beryllium	< 0.5 ug/L	0.05	SW6020A	5 Apr 17 10:25	RMV
	@See Narrative				
Cadmium	1.30 @ ug/L	0.10	SW6020A	5 Apr 17 10:25	RMV
Lead	< 5 @ ug/L	0.5	SW6020A	5 Apr 17 10:25	RMV
Molybdenum	5.24 @ ug/L	0.50	SW6020A	10 Apr 17 8:40	RMV
Selenium	< 5 @ ug/L	0.5	SW6020A	5 Apr 17 10:25	RMV
Thallium	< 1 @ ug/L	0.1	SW6020A	5 Apr 17 10:25	RMV
Fluoride	< 0.1 @ mg/L	0.02	EPA 300.0	7 Apr 17 17:28	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
 Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
 The reporting limit was elevated for any analyte requiring a dilution as coded below:
 @ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response
 CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND HW/DW # R-040

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



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INORGANIC & METALS ANALYSES:

The internal standard counts associated with beryllium were outside of acceptance range in the blank spike for samples 17-A11085 through 17-A11097. Data was reported based on the acceptable recovery of beryllium in the blank spike. Beryllium recoveries were elevated in the knowns for the same set of samples. Data that was below the reporting limit was reported.

Due to the sample matrix of the spiked sample, the recoveries of the matrix spike and matrix spike duplicate were outside of acceptance limits for boron and calcium for samples 17-A11085 through 17-A11089. Data was reported based on the acceptable recoveries of the blank spike and relative percent difference of the matrix spikes.

No other problems were encountered with these analyses.

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Page: 1 of 5

Quality Control Report

Lab IDs: 17-A11085 to 17-A11097

Project: BIG STONE PLANT CCR

Work Order: 201731-0123

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 ug/L	25.0	100	85-115	25.0	17A11094q	<5	25.8	103	75-125	25.8	26.1	104	1.2	10	98	90-110	<0.5
	25.0	100	85-115	25.0	17A11097q	<5	26.5	106	75-125	26.5	24.8	99	6.6	10	98	90-110	<0.5
Arsenic ug/L	25.0	102	85-115	25.0	17A10348q	2.25	28.6	105	75-125	28.6	28.7	106	0.3	10	92	90-110	<0.5
	25.0	97	85-115	25.0	17A10930q	<0.5	22.6	90	75-125	22.6	24.3	97	7.2	10	96	90-110	<0.5
				25.0	17A11097q	<5	26.4	106	75-125	26.4	23.9	96	9.9	10			
				25.0	17A11094q	<5	27.9	112	75-125	27.9	28.6	114	2.5	10			
Barium mg/L	1.000	104	85-115	1.00	a10486qc	0.092	1.100	101	75-125	1.100	1.180	109	7.0	10	98	90-110	<0.005
	1.000	103	85-115	1.00	17-A11089	0.013	1.130	112	75-125	1.130	1.120	111	0.9	10	98	90-110	<0.005
	1.000	102	85-115	1.00	17A11064q	0.041	1.120	108	75-125	1.120	1.090	105	2.7	10			<0.005
Beryllium ug/L	2.50	116	85-115	2.50	17A11094q	<0.5	2.76	110	75-125	2.76	2.85	114	3.2	10	112	90-110	<0.05
	2.50	116	85-115	2.50	17A11097q	<0.5	2.77	111	75-125	2.77	2.67	107	3.7	10	110	90-110	<0.05
Boron mg/L	1.000	101	85-115	1.00	a10486qc	0.168	1.220	105	75-125	1.220	1.270	110	4.0	10	98	90-110	<0.1
	1.000	100	85-115	1.00	17-A11089	8.040	9.490	145	75-125	9.490	9.400	136	1.0	10	101	90-110	<0.1
	1.000	105	85-115	1.00	17A11064q	1.200	2.280	108	75-125	2.280	2.200	100	3.6	10			<0.1

Quality Control Report

Lab IDs: 17-A11085 to 17-A11097

Project: BIG STONE PLANT CCR

Work Order: 201731-0123

Analyte	LGS Spike Amt	LGS Rec %	LGS % 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
Cadmium ug/L	5.00	100	85-115	5.00	17A11094q	<1	5.55	111	75-125	5.55	5.29	106	4.8	10	96	90-110	<0.1
	5.00	100	85-115	5.00	17A11097q	1.30	6.24	99	75-125	6.24	5.91	92	5.4	10	98	90-110	<0.1
Calcium mg/L	50.00	104	85-115	50.0	a10486qc	106.0	157.0	102	75-125	157.0	160.0	108	1.9	10	100	90-110	<0.5
	50.00	104	85-115	50.0	17-A11089	376.0	491.0	230	75-125	491.0	450.0	148	8.7	10	102	90-110	<0.5
	50.00	106	85-115	50.0	17A11064q	169.0	218.0	98	75-125	218.0	213.0	88	2.3	10			<0.5
Chloride mg/L	-	-	-	60.0	17-A11086	4.0	61.9	96	85-121	61.9	62.9	98	1.6	5	94	90-110	<3
	-	-	-	60.0	17-A11096	6.9	64.7	96	85-121	64.7	66.2	99	2.3	5	94	90-110	<3
	-	-	-	60.0	17-A11777	125	182	95	85-121	182	183	97	0.5	5	95	90-110	<3
Chromium mg/L	1.000	102	85-115	1.00	a10486qc	<0.01	0.976	98	75-125	0.976	1.020	102	4.4	10	101	90-110	<0.01
	1.000	105	85-115	1.00	17-A11089	<0.01	1.020	102	75-125	1.020	1.020	102	0.0	10	99	90-110	<0.01
	1.000	103	85-115	1.00	17A11064q	<0.01	0.986	99	75-125	0.986	0.953	95	3.4	10			<0.01
Cobalt mg/L	1.000	107	85-115	1.00	a10486qc	<0.005	1.010	101	75-125	1.010	1.060	106	4.8	10	103	90-110	<0.005
	1.000	110	85-115	1.00	17-A11089	<0.01	1.040	104	75-125	1.040	1.040	104	0.0	10	103	90-110	<0.005
	1.000	109	85-115	1.00	17A11064q	<0.01	1.030	103	75-125	1.030	1.000	100	3.0	10			<0.005
Fluoride mg/L	-	-	-	0.20	17-A11094	0.470	0.660	95	75-125	0.660	0.670	100	1.5	10	97	90-110	<0.02
	-	-	-	0.20	17-A11967	0.170	0.400	115	75-125	0.400	0.400	115	0.0	10	99	90-110	

Quality Control Report

Lab IDs: 17-A11085 to 17-A11097

Project: BIG STONE PLANT CCR

Work Order: 201731-0123

Analyte	LCS Spike Amt	LCS Rec %	ECS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD/ Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (≤)	Known Rec (%)	Known % Rec Limits	Method Blank
Lead ug/L	25.0	105	85-115	25.0	17A11094q	< 5	26.9	108	75-125	26.9	26.0	104	3.4	10	100	90-110	< 0.5
				25.0	17A10930q	7.46	27.4	80	75-125	27.4	29.3	87	6.7	10	100	90-110	< 0.5
				25.0	17A11097q	< 5	27.4	110	75-125	27.4	25.6	102	6.8	10			
Lithium mg/L	1.000	106	85-115	1.00	17-A11089	0.134	1.340	121	75-125	1.340	1.350	122	0.7	10	102	90-110	< 0.005
	1.000	106	85-115	1.00	a11064qc	0.212	1.390	118	75-125	1.390	1.340	113	3.7	10	105	90-110	< 0.005
Mercury ug/L	-	-	-	0.10	17-A11094	< 0.005	0.101	101	63-111	0.101	0.108	108	6.7	18	107	76-113	< 0.005
	-	-	-	0.10	17-A10931	< 0.005	0.074	74	63-111	0.074	0.075	75	1.3	18	105	76-113	< 0.005
	-	-	-														< 0.005
	-	-	-														< 0.005
Molybdenum ug/L	25.0	100	85-115	25.0	17A11094q	< 5	29.1	116	75-125	29.1	29.0	116	0.3	10	95	90-110	< 0.5
	25.0	100	85-115	25.0	17A10930q	< 2.5	25.8	103	75-125	25.8	26.7	107	3.4	10	95	90-110	< 0.5
				25.0	17A11097q	5.24	30.3	100	75-125	30.3	29.4	97	3.0	10			

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Page: 4 of 5

Quality Control Report

Lab IDs: 17-A11085 to 17-A11097

Project: BIG STONE PLANT CCR

Work Order: 201731-0123

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
pH units	-	-	-	-	-	-	-	-	-	6.9	6.9	-	0.0	2.5	101	90-110	-
	-	-	-	-	-	-	-	-	-	7.8	7.9	-	1.3	2.5	101	90-110	-
Selenium ug/L	25.0	101	85-115	25.0	17A11094q	< 5	29.3	117	75-125	29.3	30.4	122	3.7	10	96	90-110	< 0.5
	25.0	101	85-115	25.0	17A10930q	0.56	24.0	94	75-125	24.0	25.9	101	7.6	10	96	90-110	< 0.5
				25.0	17A11097q	< 5	26.7	107	75-125	26.7	25.0	100	6.6	10			
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	2640	2740	-	3.7	8	100	85-115	< 10
	-	-	-	-	-	-	-	-	-	1670	1630	-	2.4	8			
Sulfate mg/L	-	-	-	500	17-A11086	272	801	106	74-128	801	812	108	1.4	5	98	80-120	< 5
	-	-	-	500	17-A11096	824	1280	91	74-128	1280	1260	87	1.6	5	98	80-120	< 5
	-	-	-	50.0	17-A11783	< 5	42.0	84	74-128	42.0	42.1	84	0.2	5	98	80-120	< 5

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Quality Control Report

Lab IDs: 17-A11085 to 17-A11097

Project: BIG STONE PLANT CCR


Work Order: 201731-0123

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
Thallium ug/L	5.00	106	85-115	5.00	17A11094q	< 1	5.44	109	75-125	5.44	5.18	104	4.9	10	102	90-110	< 0.1
	5.00	106	85-115	5.00	17A10930q	< 0.1	4.33	87	75-125	4.33	4.64	93	6.9	10	103	90-110	< 0.1
				5.00	17A11097q	< 1	5.36	107	75-125	5.36	5.05	101	6.0	10			

The beryllium LCS recovery and known recovery were above the acceptance limits, see narrative.

The boron matrix spike and spike duplicate recoveries were outside the acceptance limits, see narrative.

The calcium matrix spike and spike duplicate recoveries were outside the acceptance limits, see narrative.

Approved by: 



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Date: 5/1/2017

CLIENT: MVTL Inc
Project: Ottertail Power Big Stone
Lab Order: S1704052

CASE NARRATIVE
Report ID: S1704052001

Samples H-6-A11085, H-8-A11086, H-9-A11087, H2OX-A11088, H3OX-A11089, H4OX-A11090, Slag 2B A11097, Slag 9-A11096, Slag-4-A11091, Slag-5-A11092, Slag-6-A11093, Slag-7-A11094, and Slag-8-A11095 were received on April 5, 2017.

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

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

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

Qualifiers by sample

S1704140-003 - Radium 228 by Ga/Tech/Total Radium 228 - RPD outside accepted recovery limits

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 5/1/2017
Report ID S1704052001

ProjectName: Ottetail Power Big Stone
Lab ID: S1704052-007
ClientSample ID: Slag-4-A11091
COC: WEB 31-0123

WorkOrder: S1704052
CollectionDate: 3/29/2017 1:44:00 PM
DateReceived: 4/5/2017 11:28:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	04/24/2017 1203	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	04/24/2017 1203	MB
Radium 228	ND	pCi/L		2	Ga-Tech	04/23/2017 2254	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	04/23/2017 2254	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Big Stone
Lab ID: S1704052-008
ClientSample ID: Slag-5-A11092
COC: WEB 31-0123

Date Reported 5/1/2017
Report ID S1704052001

WorkOrder: S1704052
CollectionDate: 3/30/2017 8:24:00 AM
DateReceived: 4/5/2017 11:28:00 AM
FieldSampler:
Matrix: Water

Comments

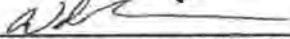
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	04/24/2017 1203	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	04/24/2017 1203	MB
Radium 228	5.3	pCi/L		2	Ga-Tech	04/24/2017 158	MB
Radium 228 Precision (±)	2.5	pCi/L			Ga-Tech	04/24/2017 158	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gliette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073
ProjectName: Ottertail Power Big Stone
Lab ID: S1704052-009
ClientSample ID: Slag-6-A11093
COC: WEB 31-0123

Date Reported 5/1/2017
Report ID S1704052001
WorkOrder: S1704052
CollectionDate: 3/29/2017 2:25:00 PM
DateReceived: 4/5/2017 11:28:00 AM
FieldSampler:
Matrix: Water

Comments


Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	04/24/2017 1203	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	04/24/2017 1203	MB
Radium 228	ND	pCi/L		2	Ga-Tech	04/24/2017 503	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	04/24/2017 503	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073
ProjectName: Ottertail Power Bldg Stone
Lab ID: S1704052-010
ClientSample ID: Slag-7-A11094
COC: WEB 31-0123

Date Reported 5/1/2017
Report ID S1704052001
WorkOrder: S1704052
CollectionDate: 3/29/2017 3:25:00 PM
DateReceived: 4/5/2017 11:28:00 AM
FieldSampler:
Matrix: Water

Comments


Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	04/24/2017 1203	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	04/24/2017 1203	MB
Radium 228	ND	pCi/L		2	Ga-Tech	04/24/2017 806	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	04/24/2017 806	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 5/1/2017
Report ID S1704052001

ProjectName: Ottetail Power Big Stone
Lab ID: S1704052-011
ClientSample ID: Slag-8-A11095
COC: WEB 31-0123

WorkOrder: S1704052
CollectionDate: 3/29/2017 4:48:00 PM
DateReceived: 4/5/2017 11:28:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	04/24/2017 1203 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	04/24/2017 1203 MB
Radium 228	2.2	pCi/L		2	Ga-Tech	04/24/2017 1111 MB
Radium 228 Precision (±)	2.9	pCi/L			Ga-Tech	04/24/2017 1111 MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: Wade Nieuwsma
Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073
ProjectName: Ottertail Power Big Stone
Lab ID: S1704052-012
ClientSample ID: Slag 9-A11096
COC: WEB 31-0123

Date Reported 5/1/2017
Report ID S1704052001
WorkOrder: S1704052
CollectionDate: 3/29/2017 6:19:00 PM
DateReceived: 4/5/2017 11:28:00 AM
FieldSampler:
Matrix: Water

Comments

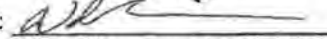
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	04/24/2017 1203 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	04/24/2017 1203 MB
Radium 228	ND	pCi/L		2	Ga-Tech	04/24/2017 1415 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	04/24/2017 1415 MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 5/1/2017
Report ID S1704052001

ProjectName: Ottetail Power Big Stone
Lab ID: S1704052-013
ClientSample ID: Slag 2B A11097
COC: WEB 31-0123

WorkOrder: S1704052
CollectionDate: 3/30/2017 8:56:00 AM
DateReceived: 4/5/2017 11:28:00 AM
FieldSampler:
Matrix: Water

Comments

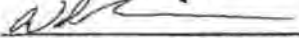
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	04/24/2017 1203	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	04/24/2017 1203	MB
Radium 228	ND	pCi/L		2	Ga-Tech	04/26/2017 2105	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	04/26/2017 2105	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager

Page 13 of 13



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Inc
Work Order: S1704052
Project: Ottertail Power Big Stone

Date: 5/1/2017
Report ID: S1704052001

Radium 228 by Ga/Tech		Sample Type	MBLK	Units: pCi/L				
MB-429 (04/21/17 15:43)	Analyte	RunNo:	145273	PrepDate:	04/12/17 12:00	BatchID	13101	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		ND	1					
MB-430 (04/26/17 11:52)	Analyte	RunNo:	145297	PrepDate:	04/17/17 14:00	BatchID	13102	
		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-429 (04/21/17 18:45)	Analyte	RunNo:	145273	PrepDate:	04/12/17 12:00	BatchID	13101	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		40	1	40.1		99.4	65.9 - 132	
LCS-430 (04/26/17 14:57)	Analyte	RunNo:	145297	PrepDate:	04/17/17 14:00	BatchID	13102	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		39	1	40.1		98.1	65.9 - 132	
Radium 228 by Ga/Tech		Sample Type	LCSD	Units: pCi/L				
LCSD-430 (04/26/17 18:01)	Analyte	RunNo:	145297	PrepDate:	04/17/17 14:00	BatchID	13102	
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228		41	1	39	3.17	101	20	
Radium 228 by Ga/Tech		Sample Type	MS	Units: pCi/L				
MS-429 (04/22/17 00:54)	Analyte	RunNo:	145273	PrepDate:	04/12/17 12:00	BatchID	13101	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		41	1	40.1	ND	101	50 - 139	
S1704140-003AMS (04/28/17 15:59)	Analyte	RunNo:	145297	PrepDate:	04/17/17 14:00	BatchID	13102	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		25	1	40.1	ND	62.8	50 - 139	
Radium 228 by Ga/Tech		Sample Type	MSD	Units: pCi/L				
MSD-429 (04/22/17 03:57)	Analyte	RunNo:	145273	PrepDate:	04/12/17 12:00	BatchID	13101	
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228		43	1	41	5.19	107	20	
S1704140-003AMSD (04/28/17 19:04)	Analyte	RunNo:	145297	PrepDate:	04/17/17 14:00	BatchID	13102	
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228		35	1	25	31.3	86.1	20	R

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

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



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTI Inc
Work Order: S1704052
Project: Ottertail Power Bldg Stone

Date: 5/1/2017
Report ID: S1704052001

Radium 226 in Water -

Sample Type MBLK

Units: pCi/L

MB-1738 (04/20/17 14:04)	RunNo: 145012	PrepDate: 04/12/17 0:00	BatchID 13074					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Radium 226

ND

0.2

MB-1739 (04/24/17 12:03)	RunNo: 145172	PrepDate: 04/17/17 0:00	BatchID 13086					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Radium 226

ND

0.2

Radium 226 in Water -

Sample Type LCS

Units: pCi/L

LCS-1738 (04/20/17 14:04)	RunNo: 145012	PrepDate: 04/12/17 0:00	BatchID 13074					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Radium 226

6.5

0.2

5.89

110

67.1 - 122

LCS-1739 (04/24/17 12:03)	RunNo: 145172	PrepDate: 04/17/17 0:00	BatchID 13086					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Radium 226

6.1

0.2

5.89

103

67.1 - 122

Radium 226 in Water -

Sample Type LCSD

Units: pCi/L

LCSD-1738 (04/20/17 14:04)	RunNo: 145012	PrepDate: 04/12/17 0:00	BatchID 13074					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	

Radium 226

6.2

0.2

6.5

4.82

105

20

LCSD-1739 (04/24/17 12:03)	RunNo: 145172	PrepDate: 04/17/17 0:00	BatchID 13086					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	

Radium 226

7.0

0.2

6.1

14.3

119

20

Radium 226 in Water -

Sample Type MS

Units: pCi/L

S1704026-003AMS (04/20/17 14:04)	RunNo: 145012	PrepDate: 04/12/17 0:00	BatchID 13074					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Radium 226

11.0

0.4

11.8

ND

93.3

65 - 131

S1704052-005AMS (04/24/17 12:03)	RunNo: 145172	PrepDate: 04/17/17 0:00	BatchID 13086					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Radium 226

11

1

11.8

ND

98.8

65 - 131

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

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

Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003

Phone: 800 782 3557 Fax: 507 359 2890

Field Service Chain of Custody Record

Project Otter Tail Power Company	Project Type: Big Stone Plant CCR	Name of Samplers: Jeff Hoffman, Daryl Farnsworth Ben Wolf
Report Otter Tail Power Company	Carbon Copy:	Quote Number:
Attn: Paul Vukonich	Attn:	Work Order Number:
Address P.O. Box 496	Address:	Lab Numbers:
Fergus Falls, MN 56538-0496		
Phone: 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
88	H2OX		29 Mar 17	1628	GW		2	N	1	1	N								See Attached
89	H3OX		29 Mar 17	1701	GW		2	N	1	1	N								
90	H4OX		30 Mar 17	824	GW		2	N	1	1	N								
A11085	H-6		29 Mar 17	1524	GW		2	N	1	1	N								
86	H-8		29 Mar 17	1606	GW		2	N	1	1	N								
87	H-9		29 Mar 17	1706	GW		2	N	1	1	N								
	Slag 4		29 Mar 17	1344	GW		2	N	1	1	N								
A11091	Slag 4		29 Mar 17	1344	GW		2	N	1	1	N								
92	Slag 5		30 Mar 17	824	GW		2	N	1	1	N								
93	Slag 6		29 Mar 17	1425	GW		2	N	1	1	N								

Comments:

WORK ORDER #2

Samples Relinquished By: <i>[Signature]</i>			Samples Received By: <i>[Signature]</i>		
Date: 30 Mar 17	Time: 1327	Temp: 4.58°C	Date: 30 Mar 17	Time: 1327	Temp: 0.4°C
Samples Relinquished into: Fridge Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: Samplers Other:			Seal Number(s) - If Used		
Transport: Ambient Ice Other:			Seals Intact? Yes No		

1126 North Front Street New Ulm, MN 56003
Phone: 800 782 3557 Fax: 507 359 2890

Project Otter Tail Power Company	Project Type: Big Stone Plant CCR	Name of Samplers: Jeff Kesterman, Dusty, Fergus
Report Otter Tail Power Company	Carbon Copy:	Ben Wolf
Attn: Paul Vukonich	Attn:	Quote Number:
Address P.O. Box 496	Address:	Work Order Number:
Fergus Falls, MN 56538-0496		Lab Numbers:
Phone: 218-739-8349		

Comments:**WORK ORDER #2**

Samples Relinquished By: <i>AKH</i>			Samples Received By: <i>A. Kiedar</i>		
Date: <i>30 Mar 17</i>	Time: <i>1327</i>	Temp: <i>4.58</i>	Date: <i>30 Mar 17</i>	Time: <i>1327</i>	Temp: <i>0.4C</i>
Samples Relinquished into: Fridge Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: Samplers Other:			Seal Number(s) - If Used		
Transport: Ambient Ice Other:	Seals Intact? Yes No				

Big Stone Sampling 2017

Spring 2017

A=3 500 HNO₃
500 H₂SO₄
1000 NONE

B=4 1600 NONE
500 HNO₃
500 HNO₃ R.Het
500 H₂SO₄

C=3 1000 NONE
500 H₂SO₄
500 HNO₃ F.Het
500 HNO₃

C=3 "Pond"
1000 NONE
500 H₂SO₄
500 HNO₃

CCR=4
2-1000 HNO₃
1000 NONE
500 HNO₃

Site	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (ml/minute)	Goes Dry?	Sampling Seasons**
WELL10	A	47.43	4	1098.70	Keck/Tsunami	No	3,000	No	1,3
WELL11	A	127.22	4	1104.00	Other Pump	Yes	36,000	No	1,3
WELL12	A	112.40	4	1071.89	Other Pump	Yes	20,000	No	1,3
S1	B	32.50	2	1102.17	Bailer	Yes	N/A	Yes	1,3
S2	B	43.12	2	1102.39	Bailer	Yes	N/A	Yes	1,3
S3	B	62.50	2	1102.65	Bailer	Yes	N/A	No	1,3
S4	B	27.70	2	1090.57	Bailer	Yes	N/A	Yes	1,3
S5	B	48.72	2	1091.40	Bailer	Yes	N/A	Yes	1,3
S6	B	62.05	2	1090.71	Bailer	Yes	N/A	No	1,3
H10X	C	32.91	2	1115.89	Bailer	Yes	100	Yes	1,3
H1INT	C	60.11	2	1115.81	Keck/Tsunami	No	1500	No	1,3
H20X	C, CCR	32.20	2	1103.91	Bladder	Yes	100	Yes	1,3
H2INT	C	62.30	2	1103.91	Bailer	Yes	N/A	Yes	1,3
H30X	C, CCR	22.55	2	1095.19	Bladder	Yes	100	Yes	1,3
H3INT	C	54.31	2	1095.17	Whale	No	2000	No	1,3
H40X	C, CCR	27.20	2	1108.22	Bladder	Yes	100	No	1,3
H4INT	C	60.01	2	1108.61	Keck/Tsunami	No	2000	Yes	1,3
H5	C	43.30	2	1122.80	Whale	No	1000	No	1,3
H6	C, CCR	15.00	2	1097.76	Bladder	Yes	100	Yes	1,3
H7	C	33.20	2	1106.06	Whale	No	1000	Yes	1,3
H8	C, CCR	22.05	2	1081.23	Bladder	Yes	100	No	1,3
H9	C, CCR	30.20	2	1086.21	Bladder	Yes	100	No	1,3
BC1	B	16.26	2	1118.46	Bailer	Yes	N/A	No	1,3
BC101	B	39.30	2	1118.70	Bailer	Yes	N/A	Yes	1,3
BC2R	B	32.48	2	1115.28	Bailer	Yes	N/A	No	1,3
BC3R	B	35.15	2	1114.42	Bailer	Yes	N/A	Yes	1,3
BC4R	B	34.60	2	1113.86	Bailer	Yes	N/A	Yes	1,3
BC5R	B	37.32	2	1123.02	Bailer	Yes	N/A	No	1,3
BC6R	B	33.95	2	1121.58	Bailer	Yes	N/A	No	1,3
STAG4		34.90	2	TBD	LOW FLOW	No	100	Yes	1,3
STAG2			2	1111.08			100		
STAG3			2				100		
STAG4	CCR	39.00	2	TBD	LOW FLOW	No	100	No	1,3
STAG5	CCR	38.80	2	1107.30	LOW FLOW	No	100	Yes	1,3
STAG6	CCR	37.30	2	1111.51	LOW FLOW	No	100	Yes	1,3
STAG7	CCR	48.70	2	1114.39	LOW FLOW	No	100	Yes	1,3
STAG8	CCR	52.09	2	1127.26	LOW FLOW	No	100	No	1,3
STAG9	CCR	49.80	2	1122.35	LOW FLOW	No	100	No	1,3
STAG10 DEEP		88.00	2	1121.92	LOW FLOW	No	100	Yes	
STAG11	CCR	40.80	2	1111.26	LOW FLOW	No	100	Yes	
COOLING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
EVAPORATION POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
HOLDING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
RECLAIM POND	C	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3

** 1 = Spring (March 28 - April 28), 2 = Summer (July 1 - August 7), 3 = Fall (October 14 - November 14)

10/11/17

Big Stone Plant CCR Appendix III Parameters

CCR - Appendix III Detection Monitoring

Field Parameters

pH*

* Field and Laboratory Measurements

Total Concentration Parameters

Boron

Calcium

Chloride

Fluoride

pH

Sulfate

Dissolved Solids, Total

Big Stone CCR Appendix IV Parameters

CCR - Appendix IV - Assessment Monitoring

Total Concentration Parameters

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium, Total
Cobalt
Fluoride
Lead
Lithium
Mercury
Molybdenum
Selenium
Thallium
Radium 226 + 228

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffmann

Site: Otter Tail Power Co./ Big Stone

Facility ID: _____

Date: 29 MAR 17

Unique Station ID: _____

Sample ID: _____ Slag 4

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Protective Posts? ☒ Yes ☐ No

State ID Tag? Yes ☒ No

Grout Seal Intact? Yes ☒ No

Repairs Necessary: _____

Well Information

Well Depth: 39.25

Constructed Depth: 39.00

Casing Diameter: 2"

Water Level Before Purge: 19.06

Well Volume: 3.29 Gallons

Well Casing Elevation: NA

Static Water Elevation: L

Previous Static: _____

Water Level After Sample: 21.85

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 50

Wind: SE L

Sky: Cloudy

Sampling Method: Grundfos ☐ Bladder SS/T ☐ Disp. Bailer ☒ Whale ☐ Grab ☐ Other: _____

Dedicated Equipment: Yes ☒ No

Pumping Rate: 0.25 gpm

Well Purged Dry? Yes ☒ No

Time Pump Began: 13:03 am ☒ pm

Time Purged Dry? _____

Time of Sampling: 13:44 am ☒ pm

Duplicate Sample? Yes ☒ No

ID: _____

Sample EH: 145.8

Sample Appearance: General: Clear

Color: None

Phase: None

Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1317	6.55	2836	10.44	NA	NA	3.5	1	
1331	6.56	2831	10.67			7.0	2	
1344	6.54	2837	10.72			10.5	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 10.5 Gallons

Comments: _____

→ not in notes

Exceptions to Protocol: _____

CCP

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben Wolk

Jeff Hoffmann

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 30 Mar 17

Unique Station ID:

Sample ID: Slag 5

Well Condition

Well Locked? ☒ Yes ☐ No
Well Labeled? ☒ Yes ☐ No
Casing Straight? ☒ Yes ☐ No

Protective Posts? ☒ Yes ☐ No
State ID Tag? ☒ Yes ☐ No
Grout Seal Intact? ☒ Yes ☐ No

Repairs Necessary:

Well Information

Well Depth: 39.02

Constructed Depth: 38.80

Casing Diameter: 2"

Water Level Before Purge: 23.31

Well Volume: 2.56 Gallons

Well Casing Elevation: 1107.30

Static Water Elevation: 1083.99

Previous Static: 1083.38

Water Level After Sample: 36.61

Measurement Method: ☒ Elec. WL ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 38° Wind: E-7 Sky: Sunny

Sampling Method: Grundfos ☒ Bladder SS/T ☐ Disp. Baller ☒ Whale ☐ Grab ☐ Other:

Dedicated Equipment: ☒ Yes ☐ No

Pumping Rate: 25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began: 8:05 ☒ am ☐ pm

Time Purged Dry? - 8:19

Time of Sampling: 8:24 ☒ am ☐ pm

Duplicate Sample? ☒ Yes ☐ No ID: —

Sample EH: 91.4

Sample Appearance: General: Clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
8:16	6.70	852	9.84	NA	NA	2.75	1	
8:24	6.97	861	9.61			3.50	2	Recharge
							3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 3.50 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffmann

Site: Otter Tail Power Co./ Big Stone

Facility ID: _____

Date: 29 Mar 17

Unique Station ID: _____

Sample ID: Slag 6

Well Condition

Well Locked? Yes No

Well Labeled? Yes No

Casing Straight? Yes No

Protective Posts? Yes No

State ID Tag? Yes No

Grout Seal Intact? Yes No

Repairs Necessary: _____

Well Information

Well Depth: 37.45

Constructed Depth: 37.30

Casing Diameter: 2"

Water Level Before Purge: 24.20

Well Volume: 2.16 Gallons

Well Casing Elevation: 111.61

Static Water Elevation: 1082.31

Previous Static: 1086.32

Water Level After Sample: 34.87

Measurement Method: Elec. WLI Steel Tape

Sampling Information

Weather Conditions: Temp: 50 Wind: SE 6 Sky: cloudy

Sampling Method: Grundfos Bladder SS/T Disp. Bailer Wheal Grab Other: _____

Dedicated Equipment: Yes No

Pumping Rate: 0.25 gpm

Well Purged Dry? Yes No

Time Pump Began: 1402 am pm

Time Purged Dry? 1420

Time of Sampling: 1425 am pm

Duplicate Sample? Yes No ID: _____

Sample EH: 141.1

Sample Appearance: General: Slightly Cloudy Color: none Phase: none Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1411</u>	<u>6.90</u>	<u>1272</u>	<u>12.09</u>	<u>NA</u>	<u>NA</u>	<u>2.25</u>	<u>1</u>	
<u>1420</u>	<u>6.88</u>	<u>1364</u>	<u>12.21</u>	<u> </u>	<u> </u>	<u>4.50</u>	<u>2</u>	
<u>1425</u>	<u>6.89</u>	<u>1412</u>	<u>12.27</u>	<u> </u>	<u> </u>		<u>3</u>	<u>Recharge</u>
							<u>4</u>	
							<u>5</u>	

Stabilized? Yes No

Amount Water Removed: 4.50

Gallons

Comments: _____

Exceptions to Protocol: _____

- not in Notes
- Good recharge

CCP

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 29 Mar 17

Unique Station ID:

Sample ID: Slag 7

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Repairs Necessary:

Well Information

Well Depth: 49.05

Constructed Depth: 48.70

Casing Diameter: 2"

Water Level Before Purge: 13.68

Well Volume: 5.76 Gallons

Well Casing Elevation: 1114.39

Static Water Elevation: 1100.7

Previous Static: 1098.98

Water Level After Sample: 47.33

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 50°

Wind: SE 13

Sky: Cloudy

Sampling Method: Grundfos ☐ Bladder SS/T ☐ Disp. Baller ☒ Whale ☐ Grab ☐ Other:

Dedicated Equipment: Yes ☒ No ☐

Pumping Rate: 0.25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began: 14 44 am ☒ pm

Time Purged Dry? 15 20

Time of Sampling: 15 25 am ☒ pm

Duplicate Sample? Yes ☒ No ☐ ID: 1

Sample EH: 101.0

Sample Appearance: General: Slightly cloudy Color: none Phase: none Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>24</u> <u>1508</u>	<u>6.93</u>	<u>1680</u>	<u>10.74</u>	<u>NA</u>	<u>NA</u>	<u>6.0</u>	<u>1</u>	
<u>1525</u>	<u>6.98</u>	<u>1638</u>	<u>10.58</u>	<u>1</u>	<u>1</u>	<u>7.0</u>	<u>2</u>	<u>Recharge</u>
							<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? Yes ☒ No ☐

Amount Water Removed: Gallons

Comments:

Exceptions to Protocol:

RR

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffmann

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: *29 Mar 17*

Unique Station ID:

Sample ID: Slag 8

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Repairs Necessary:

Well Information

Well Depth: *52.25*

Constructed Depth: 52.09

Casing Diameter: 2"

Water Level Before Purge: *17.52*

Well Volume: *5.66* Gallons

Well Casing Elevation: *1127.26*

Static Water Elevation: *1109.79*

Previous Static: *1110.51*

Water Level After Sample: *37.24*

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: *50°* Wind: *SE 6* Sky: *Cloudy*

Sampling Method: Grundfos ☐ Bladder SS/T ☐ Disp. Baller ☒ Whale ☐ Grab ☐ Other:

Dedicated Equipment: Yes ☒ No

Pumping Rate: *0.25* gpm

Well Purged Dry? Yes ☒ No

Time Pump Began: *15:38* am / ☒ pm

Time Purged Dry? ☒

Time of Sampling: *16:48* am / ☒ pm

Duplicate Sample? Yes ☒ No ID: *—*

Sample EH: *143.3*

Sample Appearance: General: *Clear* Color: *none* Phase: *none* Odor: *none*

23 Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<i>1602</i>	<i>6.99</i>	<i>1354</i>	<i>10.80</i>	<i>NA</i>	<i>NA</i>	<i>5.75</i>	<i>1</i>	
<i>1625</i>	<i>6.93</i>	<i>1361</i>	<i>10.87</i>	<i> </i>	<i> </i>	<i>11.5</i>	<i>2</i>	
<i>1648</i>	<i>6.92</i>	<i>1358</i>	<i>10.91</i>	<i> </i>	<i> </i>	<i>17.25</i>	<i>3</i>	
							<i>4</i>	
							<i>5</i>	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: *17.25* Gallons

Comments:

Exceptions to Protocol:

note in notes p.

CCP

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Otter Tail Power Co./ Big Stone

Facility ID: _____

Date: 29 Mar 17

Unique Station ID: _____

Sample ID: Slag 9

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary: _____

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☐ Yes ☒ No

Grout Seal Intact? ☐ Yes ☒ No

Well Information

Well Depth: 51.27

Constructed Depth: 49.80

Casing Diameter: 2"

Water Level Before Purge: 15.63

Well Volume: 5.81 Gallons

Well Casing Elevation: 1122.35

Static Water Elevation: 1106.72

Previous Static: 1104.84

Water Level After Sample: 37.37

Measurement Method: ☒ Elec. W/L ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 56° Wind: SE 15 Sky: Cloudy

Sampling Method: Grundfos ☐ Bladder SS/T ☐ Disp. Bailer ☒ Whale ☐ Grab ☐ Other: _____

Dedicated Equipment: Yes ☒ No ☐

Well Purged Dry? Yes ☒ No ☐

Time Purged Dry? _____

Duplicate Sample? Yes ☒ No ☐ ID:

Pumping Rate: 0.25 gpm

Time Pump Began: 1707 am ☒ pm ☐

Time of Sampling: 1819 am ☐ pm ☒

Sample EH: 140.4

Sample Appearance: General: Clear Color: None Phase: None Odor: None

<u>24</u> Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1731	6.81	2245	10.30	NA	NA	6	1	
1755	6.75	2187	10.48			12	2	
1819	6.28	2146	10.49			18	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 18 Gallons

Comments: _____

Exceptions to Protocol: _____

Notes in boxes p.

CCR

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 30 Mar 17

Unique Station ID:

Sample ID: Slag 2B

Well Condition

Well Locked? Yes ☒ No ☐
Well Labeled? ☒ Yes ☐ No
Casing Straight? ☒ Yes ☐ No

Protective Posts? ☒ Yes ☐ No
State ID Tag? Yes ☒ No
Grout Seal Intact? Yes ☒ No

Repairs Necessary:

Well Information

Well Depth: 40.93

Constructed Depth: 40.80

Casing Diameter: 2"

Water Level Before Purge: 18.87

Well Volume: 3.59 Gallons

Well Casing Elevation: 111.26

Static Water Elevation: 1092.39

Previous Static: 1087.63

Water Level After Sample: 59.76

Measurement Method: ☒ Elec. WLV ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 38 Wind: E-7 Sky: Partly Cloudy

Sampling Method: Grundfos Bladder SS/T Disp. Baller ☒ Whale Grab Other:

Dedicated Equipment: Yes ☒ No

Pumping Rate: 0.25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began: 8:36 ☒ am ☐ pm

Time Purged Dry? 8:52

Time of Sampling: 8:56 ☒ am ☐ pm

Duplicate Sample? Yes ☒ No ID: —

Sample EH: 15.5

Sample Appearance: General: cloudy Color: none Phase: none Odor: none

IS Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
8:51	7.90	1903	9.52	NA	NA	3.75	1	
8:56	10.99	1928	10.31			4.00	2	Recharge
							3	
							4	
							5	

Stabilized? Yes ☒ No

Amount Water Removed: 4.00 Gallons

Comments:

- slow recharge

Exceptions to Protocol:

not in notes

CCR



Inter-Mountain Labs
Sheridan, WY and Gillette, WY

CHAIN OF CUSTODY RECORD

Page _____ of _____

All shaded fields must be completed.

#WEB

This is a legal document; any misrepresentation may be construed as fraud.

Client Name MVTL		Project Identification Ottertail Power Big Stone		Sampler (Signature/Attestation of Authenticity)		Telephone #	
Report Address 1126 North Front St New Ulm, Mn 56073		Contact Name Tim Portner		ANALYSES / PARAMETERS			
Invoice Address Same		Email tportner@mvtl.com					
		Phone 507-276-8089		Purchase Order #		Quote #	

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME	SAMPLE IDENTIFICATION	Matrix	# of Containers	Radium 226 + 228									REMARKS
1		29 Mar 17	1628	H2OX - A11088	WT	2	x									MVTL Work order - 31-0123
2			1701	H3OX A11090 A11089	WT	2	x									
3		30 Mar 17	824	H4OX A11090	WT	2	x									
4		29 Mar 17	1524	H-6 - A11085	WT	2	x									
5			1606	H-8 - A11086	WT	2	x									
6			1706	H-9 - A11087	WT	2	x									
7				Slag-1 no sample	WT	2	x									
8		29 Mar 17	1344	Slag-4 - A11091	WT	2	x									
9		30 Mar 17	824	Slag-5 - A11092	WT	2	x									
10		29 Mar 17	1425	Slag-6 - A11093	WT	2	x									
11			1525	Slag-7 - A11094	WT	2	x									
12			1648	Slag-8 - A11095	WT	2	x									
13																
14																

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	<i>[Signature]</i>	30 Mar 17	1327			

SHIPPING INFO	MATRIX CODES	TURN AROUND TIMES	COMPLIANCE INFORMATION	ADDITIONAL REMARKS
<input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> USPS <input type="checkbox"/> Hand Carried <input type="checkbox"/> Other	Water WT Soil SL Solid SD Filter FT Other OT	Check desired service <input type="checkbox"/> Standard turnaround <input type="checkbox"/> RUSH - 5 Working Days <input type="checkbox"/> URGENT - < 2 Working Days <i>Rush & Urgent Surcharges will be applied</i>	Compliance Monitoring ? Y / N Program (SDWA, NPDES,...) PWSID / Permit # Chlorinated? Y / N Sample Disposal: Lab Client	



Page of

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#WEB

LAB COMMENTS

Relinquished By (Signature/Printed)

DATE	TIME
------	------

Received By (Signature/Printed)

DATE	TIME
------	------

	901 01/11	30 mar 17	1357			

SHIPPING INFO

MATRIX CODES

TURN AROUND TIMES

COMPLIANCE INFORMATION

ADDITIONAL REMARKS

☐ UPS
☐ FedEx
☐ USPS
☐ Hand Carried
☐ Other

Water	WT
Soil	SL
Solid	SD
Filter	FT
Other	OT

Check desired service

☐ Standard turnaround

☐ RUSH - 5 Working Days

☐ URGENT - < 2 Working Days

Rush & Urgent Surcharges will be applied

Compliance Monitoring ?	<u>Y / N</u>
Program (SDWA, NPDES,...)	
PWSID / Permit #	
Chlorinated?	<u>Y / N</u>
Sample Disposal:	Lab Client

Inter-Mountain Labs. Inc.

www.intermountainlabs.com

Rev 4.6 Web



MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
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www.mvtl.com



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FINAL REPORT COMPLETION DATE: 23 Jun 17 AS

Date Reported: 20 Jun 2017

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 31-0190
Account #: 006106
PO #: 48680

Project Name: BIG STONE PLANT

T. J. Vukovich 22 Jun 17
Field Service Manager/Date Reviewed

[Signature] 20 Jun 17
Chemistry Lab Manager/Date Reviewed

[Signature] for 20 Jun 2017
Quality Assurance Director/Date Reviewed

RL = Reporting Limits
NQ = Not Present, Qualitative Only
PQ = Present, Qualitative Only
ND = Not Determined

All data for this report has been approved by MVTL Laboratory Management.

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

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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 20 Jun 2017
Lab Number: 17-A18623
Work Order #: 31-0190
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 3 May 2017 11:10
Sampled By: MVTI FIELD PERSONNEL
Date Received: 3 May 2017 18:47
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 4

Temp at Receipt: 1.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				5 May 17	JMS
Water Digestions				5 May 17	JMS
Radium 226	SEE ATTACHED			20 Jun 17 7:23	ABL
Radium 228	SEE ATTACHED		EPA M9320	20 Jun 17 7:23	ABL
pH, Field	6.59 units	1.00	I-1586-85	3 May 17 11:10	DGF
pH	* 6.9 units	1.0	SM 4500 H+ B-2000	4 May 17 17:01	DK
Sulfate	1440 ~ mg/L	5.0	ASTM D516-07	11 May 17 8:19	KCJ
Chloride	52.6 mg/L	3.0	SM 4500 Cl E	5 May 17 12:11	AKF
Mercury	0.008 ug/L	0.005	EPA 245.7	18 May 17 15:10	RMB
Solids, Total Dissolved	2520 mg/L	10	SM 2540 C-97	5 May 17 13:54	RC
Calcium	458.0 ~ mg/L	0.500	SW6010C	9 May 17 10:44	RC
Lithium	0.196 mg/L	0.005	SW6010C	9 May 17 10:44	RC
Barium	0.043 mg/L	0.005	SW6010C	9 May 17 10:44	RC
Chromium	< 0.01 mg/L	0.01	SW6010C	9 May 17 10:44	RC
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	9 May 17 10:44	RC
Boron	0.910 mg/L	0.100	SW6010C	9 May 17 10:44	RC
Antimony	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Beryllium	< 0.25 ug/L	0.05	SW6020A	17 May 17 13:16	RMV
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	17 May 17 13:16	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Selenium	< 5 @ ^ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	17 May 17 13:16	RMV
Fluoride	0.270 mg/L	0.020	EPA 300.0	5 May 17 16:57	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
0 = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response
CERTIFICATION: NN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-H ND WH/DH # R-040

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

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MEMBER
ACIL

Page: 9 of 15

CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 20 Jun 2017
Lab Number: 17-A18624
Work Order #: 31-0190
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 3 May 2017 15:36
Sampled By: MVTI FIELD PERSONNEL
Date Received: 3 May 2017 18:47
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 5

Temp at Receipt: 1.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					5 May 17	JMS
Water Digestions					5 May 17	JMS
Radium 226	SEE ATTACHED				20 Jun 17 7:23	ABL
Radium 228	SEE ATTACHED			EPA M9320	20 Jun 17 7:23	ABL
pH, Field	7.15	units	1.00	I-1586-85	3 May 17 15:36	MS
pH	* 7.2	units	1.0	SM 4500 H+ B-2000	4 May 17 17:01	DK
Sulfate	88.0 @	mg/L	5.0	ASTM D516-07	11 May 17 8:19	KCJ
Chloride	9.2	mg/L	3.0	SM 4500 Cl E	5 May 17 12:11	AKF
Mercury	< 0.005	ug/L	0.005	EPA 245.7	18 May 17 15:10	RMB
Solids, Total Dissolved	529	mg/L	10	SM 2540 C-97	5 May 17 13:54	RC
Calcium	120.0	mg/L	0.500	SW6010C	9 May 17 10:44	RC
Lithium	0.025	mg/L	0.005	SW6010C	9 May 17 10:44	RC
Barium	0.145	mg/L	0.005	SW6010C	9 May 17 10:44	RC
Chromium	< 0.01	mg/L	0.01	SW6010C	9 May 17 10:44	RC
Cobalt	< 0.01 ^	mg/L	0.005	SW6010C	9 May 17 10:44	RC
Boron	0.527	mg/L	0.100	SW6010C	9 May 17 10:44	RC
Antimony	< 2.5 @	ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Arsenic	< 2.5 @	ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Beryllium	< 2.5	ug/L	0.05	SW6020A	17 May 17 13:16	RMV
	@See Narrative					
Cadmium	< 0.5 @	ug/L	0.1	SW6020A	17 May 17 13:16	RMV
Lead	< 2.5 @	ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Molybdenum	14.3 @	ug/L	0.50	SW6020A	17 May 17 13:16	RMV
Selenium	< 5 @^	ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Thallium	< 0.5 @	ug/L	0.1	SW6020A	17 May 17 13:16	RMV
Fluoride	0.280	mg/L	0.020	EPA 300.0	5 May 17 16:57	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WH/DW # R-040

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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 20 Jun 2017
 Lab Number: 17-A18625
 Work Order #: 31-0190
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 May 2017 12:55
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 3 May 2017 18:47
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 6

Temp at Receipt: 1.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					5 May 17	JMS
Water Digestions					5 May 17	JMS
Radium 226	SEE ATTACHED				20 Jun 17 7:24	ABL
Radium 228	SEE ATTACHED			EPA M9320	20 Jun 17 7:24	ABL
pH, Field	6.97 units	1.00		I-1586-85	3 May 17 12:55	DGF
pH	* 7.1 units	1.0		SM 4500 H+ B-2000	4 May 17 17:01	DK
Sulfate	368 ~ mg/L	5.0		ASTM D516-07	11 May 17 8:19	KCJ
Chloride	8.8 mg/L	3.0		SM 4500 Cl E	5 May 17 12:11	AKF
Mercury	0.014 ug/L	0.005		EPA 245.7	18 May 17 15:10	RMB
Solids, Total Dissolved	1040 mg/L	10		SM 2540 C-97	5 May 17 13:54	RC
Calcium	168.0 mg/L	0.500		SW6010C	9 May 17 10:44	RC
Lithium	0.101 mg/L	0.005		SW6010C	9 May 17 10:44	RC
Barium	0.093 mg/L	0.005		SW6010C	9 May 17 10:44	RC
Chromium	0.017 mg/L	0.010		SW6010C	9 May 17 10:44	RC
Cobalt	< 0.01 ~ mg/L	0.005		SW6010C	9 May 17 10:44	RC
Boron	2.060 mg/L	0.100		SW6010C	9 May 17 10:44	RC
Antimony	< 2.5 @ ug/L	0.5		SW6020A	17 May 17 13:16	RMV
Arsenic	3.74 @ ug/L	0.50		SW6020A	17 May 17 13:16	RMV
Beryllium	< 2.5 ug/L	0.05		SW6020A	17 May 17 13:16	RMV
	@See Narrative					
Cadmium	< 0.5 @ ug/L	0.1		SW6020A	17 May 17 13:16	RMV
Lead	3.74 @ ug/L	0.50		SW6020A	17 May 17 13:16	RMV
Molybdenum	7.58 @ ug/L	0.50		SW6020A	17 May 17 13:16	RMV
Selenium	5.56 @^ ug/L	0.50		SW6020A	17 May 17 13:16	RMV
Thallium	< 0.5 @ ug/L	0.1		SW6020A	17 May 17 13:16	RMV
Fluoride	0.630 mg/L	0.020		EPA 300.0	5 May 17 16:57	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards. The reporting limit was elevated for any analyte requiring a dilution as coded below:

B = Due to sample matrix
 I = Due to sample quantity
 C = Due to concentration of other analytes
 + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WQ/DW # R-040

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



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 20 Jun 2017
 Lab Number: 17-A18626
 Work Order #: 31-0190
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 May 2017 11:55
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 3 May 2017 18:47
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 7

Temp at Receipt: 1.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				5 May 17	JMS
Water Digestions				5 May 17	JMS
Radium 226	SEE ATTACHED			20 Jun 17 7:24	ABL
Radium 228	SEE ATTACHED		EPA M9320	20 Jun 17 7:24	ABL
pH, Field	6.90 units	1.00	I-1586-85	3 May 17 11:55	DGF
pH	* 7.2 units	1.0	SM 4500 H+ B-2000	4 May 17 17:01	DK
Sulfate	534 ~ mg/L	5.0	ASTM D516-07	11 May 17 8:19	KCJ
Chloride	5.0 mg/L	3.0	SM 4500 Cl E	5 May 17 12:11	AKF
Mercury	0.006 ug/L	0.005	EPA 245.7	18 May 17 15:10	RMB
Solids, Total Dissolved	1250 mg/L	10	SM 2540 C-97	5 May 17 13:54	RC
Calcium	224.0 mg/L	0.500	SW6010C	9 May 17 10:44	RC
Lithium	0.074 mg/L	0.005	SW6010C	9 May 17 10:44	RC
Barium	0.047 mg/L	0.005	SW6010C	9 May 17 10:44	RC
Chromium	0.010 mg/L	0.010	SW6010C	9 May 17 10:44	RC
Cobalt	< 0.01 ~ mg/L	0.005	SW6010C	9 May 17 10:44	RC
Boron	1.230 mg/L	0.100	SW6010C	9 May 17 10:44	RC
Antimony	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Beryllium	< 0.25 ug/L	0.05	SW6020A	17 May 17 13:16	RMV
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	17 May 17 13:16	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Molybdenum	4.27 @ ug/L	0.50	SW6020A	17 May 17 13:16	RMV
Selenium	< 5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	17 May 17 13:16	RMV
Fluoride	0.510 mg/L	0.020	EPA 300.0	5 May 17 16:57	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

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

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

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-H ND NW/DH # R-040

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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 20 Jun 2017
 Lab Number: 17-A18627
 Work Order #: 31-0190
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 May 2017 14:21
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 3 May 2017 18:47
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 8

Temp at Receipt: 1.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				5 May 17	JMS
Water Digestions				5 May 17	JMS
Radium 226	SEE ATTACHED			20 Jun 17 7:24	ABL
Radium 228	SEE ATTACHED		EPA M9320	20 Jun 17 7:24	ABL
pH, Field	6.99 units	1.00	I-1586-85	3 May 17 14:21	DGF
pH	* 7.3 units	1.0	SM 4500 H+ B-2000	4 May 17 17:01	DK
Sulfate	231 @ mg/L	5.0	ASTM D516-07	11 May 17 8:19	KCJ
Chloride	39.7 mg/L	3.0	SM 4500 Cl E	5 May 17 12:11	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	18 May 17 15:10	RMB
Solids, Total Dissolved	842 mg/L	10	SM 2540 C-97	5 May 17 13:54	RC
Calcium	109.0 mg/L	0.500	SW6010C	9 May 17 10:44	RC
Lithium	0.056 mg/L	0.005	SW6010C	9 May 17 10:44	RC
Barium	0.055 mg/L	0.005	SW6010C	9 May 17 10:44	RC
Chromium	< 0.01 mg/L	0.01	SW6010C	9 May 17 10:44	RC
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	9 May 17 10:44	RC
Boron	0.555 mg/L	0.100	SW6010C	9 May 17 10:44	RC
Antimony	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Beryllium	< 0.25 ug/L	0.05	SW6020A	17 May 17 13:16	RMV
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	17 May 17 13:16	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Molybdenum	9.07 @ ug/L	0.50	SW6020A	17 May 17 13:16	RMV
Selenium	19.0 @ ^ ug/L	0.50	SW6020A	17 May 17 13:16	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	17 May 17 13:16	RMV
Fluoride	0.540 mg/L	0.020	EPA 300.0	5 May 17 16:57	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

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

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

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 20 Jun 2017
 Lab Number: 17-A18628
 Work Order #: 31-0190
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 May 2017 15:38
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 3 May 2017 18:47
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 9

Temp at Receipt: 1.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				5 May 17	JMS
Water Digestions				5 May 17	JMS
Radium 226	SEE ATTACHED			20 Jun 17 7:24	ABL
Radium 228	SEE ATTACHED		EPA M9320	20 Jun 17 7:24	ABL
pH, Field	6.80 units	1.00	I-1586-85	3 May 17 15:38	DGF
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	4 May 17 17:01	DK
Sulfate	1020 ~ mg/L	5.0	ASTM D516-07	11 May 17 8:19	KCJ
Chloride	6.8 mg/L	3.0	SM 4500 Cl E	5 May 17 12:11	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	18 May 17 15:10	RMB
Solids, Total Dissolved	1790 mg/L	10	SM 2540 C-97	5 May 17 13:54	RC
Calcium	346.0 mg/L	0.500	SW6010C	9 May 17 10:44	RC
Lithium	0.123 mg/L	0.005	SW6010C	9 May 17 10:44	RC
Barium	0.026 mg/L	0.005	SW6010C	9 May 17 10:44	RC
Chromium	< 0.01 mg/L	0.01	SW6010C	9 May 17 10:44	RC
Cobalt	0.011 ~ mg/L	0.005	SW6010C	9 May 17 10:44	RC
Boron	0.240 mg/L	0.100	SW6010C	9 May 17 10:44	RC
Antimony	< 5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Beryllium	< 0.5 ug/L	0.05	SW6020A	17 May 17 13:16	RMV
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	17 May 17 13:16	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Molybdenum	9.54 @ ug/L	0.50	SW6020A	17 May 17 13:16	RMV
Selenium	< 5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	17 May 17 13:16	RMV
Fluoride	0.250 mg/L	0.020	EPA 300.0	5 May 17 16:57	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

@ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: NN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WQ/DW # R-040

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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 20 Jun 2017
 Lab Number: 17-A18629
 Work Order #: 31-0190
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 May 2017 12:26
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 3 May 2017 18:47
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: SLAG 2B

Temp at Receipt: 1.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				5 May 17	JMS
Water Digestions				5 May 17	JMS
Radium 226	SEE ATTACHED			20 Jun 17 7:25	ABL
Radium 228	SEE ATTACHED		EPA M9320	20 Jun 17 7:25	ABL
pH, Field	7.02 units	1.00	I-1586-85	3 May 17 12:26	DGF
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	4 May 17 17:28	DK
Sulfate	856 ~ mg/L	5.0	ASTM D516-07	11 May 17 8:19	KCJ
Chloride	35.7 mg/L	3.0	SM 4500 Cl E	5 May 17 12:11	AKF
Mercury	0.012 ug/L	0.005	EPA 245.7	18 May 17 15:10	RMB
Solids, Total Dissolved	1550 mg/L	10	SM 2540 C-97	5 May 17 13:54	RC
Calcium	248.0 mg/L	0.500	SW6010C	9 May 17 10:44	RC
Lithium	0.036 mg/L	0.005	SW6010C	9 May 17 10:44	RC
Barium	0.101 mg/L	0.005	SW6010C	9 May 17 10:44	RC
Chromium	0.015 mg/L	0.010	SW6010C	9 May 17 10:44	RC
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	9 May 17 10:44	RC
Boron	3.660 mg/L	0.100	SW6010C	9 May 17 10:44	RC
Antimony	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Arsenic	2.50 @ ug/L	0.50	SW6020A	17 May 17 13:16	RMV
Beryllium	< 0.25 ug/L	0.05	SW6020A	17 May 17 13:16	RMV
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	17 May 17 13:16	RMV
Lead	3.17 @ ug/L	0.50	SW6020A	17 May 17 13:16	RMV
Molybdenum	4.89 @ ug/L	0.50	SW6020A	17 May 17 13:16	RMV
Selenium	< 5 @ ^ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	17 May 17 13:16	RMV
Fluoride	0.100 mg/L	0.020	EPA 300.0	5 May 17 16:57	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

8 = Due to sample matrix

= Due to concentration of other analytes

1 = Due to sample quantity

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125

WI LAB # 999447690

ND MICRO # 1013-M

ND NW/DW # R-040

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



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Date Reported: 20 Jun 2017

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 201731-0190
Account Number: 006106
PO #: 48680

Project Name: BIG STONE PLANT

LABORATORY NARRATIVE

INORGANIC & METALS ANALYSES:

The relative percent difference between the matrix spike and matrix spike duplicate for Thallium was above the acceptance range for samples 17-A18617 through 17-A18619. The laboratory control spike, matrix spike, and matrix spike duplicate recoveries were all acceptable. Data that was below the reporting limit was reported.

The recovery of Beryllium was above the acceptance range in the known for samples 17-A18620 through A18629. Data that was below the reporting limit was reported.

Due to the concentration of calcium in the spiked sample, calcium failed to recover in the matrix spike for samples 17-A18617 through 17-A18619. Data was reported based on acceptable laboratory control spike recovery and relative percent difference between the matrix spike and matrix spike duplicate.

No other problems were encountered with these analyses.



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Date: 6/19/2017

CLIENT: MVTL Inc
Project: Ottertail Power Big Stone
Lab Order: S1705190

CASE NARRATIVE

Report ID: S1705190001

Samples A18617 H2OX, A18618 H3OX, A18619 H4OX, A18620 H-6, A18621 H-8, A18622 H-9, A18623 Slag-4, A18624 Slag-5, A18625 Slag-6, A18626 Slag-7, A18627 Slag-8, A18628 Slag-9, and A18629 Slag-2B were received on May 9, 2017.

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

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

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Big Stone
Lab ID: S1705190-007
ClientSample ID: A18623 Slag-4
COC: WEB

Date Reported 6/19/2017
Report ID S1705190001

WorkOrder: S1705190
CollectionDate: 5/3/2017 11:10:00 AM
DateReceived: 5/9/2017 11:24:00 AM
FieldSampler:
Matrix: Water

Comments

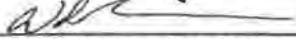
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	05/30/2017 952	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	05/30/2017 952	MB
Radium 228	ND	pCi/L		2	Ga-Tech	06/04/2017 254	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	06/04/2017 254	MB

These results apply only to the samples tested.

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

RL - Reporting Limit

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Big Stone
Lab ID: S1705190-008
ClientSample ID: A18624 Slag-5
COC: WEB

Date Reported 6/19/2017
Report ID S1705190001

WorkOrder: S1705190
CollectionDate: 6/3/2017 3:36:00 PM
DateReceived: 5/9/2017 11:24:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	05/30/2017 1242 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	05/30/2017 1242 MB
Radium 228	ND	pCi/L		2	Ga-Tech	06/04/2017 557 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	06/04/2017 557 MB


These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

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

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

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager



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Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Big Stone
Lab ID: S1705190-009
ClientSample ID: A18625 Slag-6
COC: WEB

Date Reported 6/19/2017
Report ID S1705190001

WorkOrder: S1705190
CollectionDate: 5/3/2017 12:55:00 PM
DateReceived: 5/9/2017 11:24:00 AM
FieldSampler:
Matrix: Water

Comments

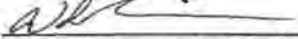
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	05/30/2017 1242	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	05/30/2017 1242	MB
Radium 228	ND	pCi/L		2	Ga-Tech	06/04/2017 900	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	06/04/2017 900	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager

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Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 6/19/2017
Report ID S1705190001

ProjectName: Ottertail Power Big Stone
Lab ID: S1705190-010
ClientSample ID: A18626 Slag-7
COC: WEB

WorkOrder: S1705190
CollectionDate: 5/3/2017 11:55:00 AM
DateReceived: 5/9/2017 11:24:00 AM
FieldSampler:
Matrix: Water

Comments


Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	05/30/2017 1242 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	05/30/2017 1242 MB
Radium 228	ND	pCi/L		2	Ga-Tech	06/04/2017 1204 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	06/04/2017 1204 MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager

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Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottetail Power Big Stone
Lab ID: S1705190-011
ClientSample ID: A18627 Slag-8
COC: WEB

Date Reported 6/19/2017
Report ID S1705190001

WorkOrder: S1705190
CollectionDate: 5/3/2017 2:21:00 PM
DateReceived: 5/9/2017 11:24:00 AM
FieldSampler:
Matrix: Water

Comments

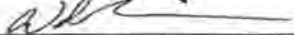
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	05/30/2017 1242	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	05/30/2017 1242	MB
Radium 228	ND	pCi/L		2	Ga-Tech	06/04/2017 1507	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	06/04/2017 1507	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager



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Your Environmental Monitoring Partner

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Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 6/19/2017
Report ID S1705190001

ProjectName: Ottertail Power Big Stone
Lab ID: S1705190-012
ClientSample ID: A18628 Slag-9
COC: WEB

WorkOrder: S1705190
CollectionDate: 5/3/2017 3:38:00 PM
DateReceived: 5/9/2017 11:24:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	05/30/2017 1242	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	05/30/2017 1242	MB
Radium 228	ND	pCi/L		2	Ga-Tech	06/04/2017 1810	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	06/04/2017 1810	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 12 of 13



Inter-Mountain Labs

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Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 6/19/2017
Report ID S1705190001

ProjectName: Ottertail Power Big Stone
Lab ID: S1705190-013
ClientSample ID: A18629 Slag-2B
COC: WEB

WorkOrder: S1705190
CollectionDate: 5/3/2017 12:26:00 PM
DateReceived: 5/9/2017 11:24:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	05/30/2017 1242	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	05/30/2017 1242	MB
Radium 228	ND	pCi/L		2	Ga-Tech	06/04/2017 2113	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	06/04/2017 2113	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: Wade Nieuwsma
Wade Nieuwsma, Assistant Laboratory Manager

Page 13 of 13



Inter-Mountain Labs

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ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Inc
Work Order: S1705190
Project: Ottertail Power Big Stone

Date: 6/19/2017
Report ID: S1705190001

Radium 228 by Ga/Tech

Sample Type MBLK

Units: pCi/L

MB-440 (06/03/17 11:39)	RunNo: 146325	PrepDate: 05/24/17 14:00	BatchID 13229					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Total Radium 228

ND 1

MB-439 (06/16/17 21:41)	RunNo: 146951	PrepDate: 05/22/17 13:02	BatchID 13303					
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-440 (06/03/17 14:42)	RunNo: 146325	PrepDate: 05/24/17 14:00	BatchID 13229					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Total Radium 228

43 1 40.1 108 65.9 - 132

LCS-439 (06/17/17 00:44)	RunNo: 146951	PrepDate: 05/22/17 13:02	BatchID 13303					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Total Radium 228

43 1 40.1 108 65.9 - 132

Radium 228 by Ga/Tech

Sample Type LCSD

Units: pCi/L

LCSD-439 (06/17/17 03:47)	RunNo: 146951	PrepDate: 05/22/17 13:02	BatchID 13303					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	

Total Radium 228

46 1 43 6.54 115 20

Radium 228 by Ga/Tech

Sample Type MS

Units: pCi/L

MS-440 (06/03/17 20:48)	RunNo: 146325	PrepDate: 05/24/17 14:00	BatchID 13229					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Total Radium 228

45 1 40.1 ND 111 50 - 139

S1705188-004AMS (06/19/17 01:34)	RunNo: 146951	PrepDate: 05/22/17 13:02	BatchID 13303					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Total Radium 228

86 1 80.1 1 105 50 - 139

Radium 228 by Ga/Tech

Sample Type MSD

Units: pCi/L

MSD-440 (06/03/17 23:51)	RunNo: 146325	PrepDate: 05/24/17 14:00	BatchID 13229					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	

Total Radium 228

44 1 45 2.64 108 20

S1705188-004AMSD (06/19/17 04:37)	RunNo: 146951	PrepDate: 05/22/17 13:02	BatchID 13303					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	

Total Radium 228

73 1 86 15.7 89.7 20

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

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



Inter-Mountain Labs

Your Environmental Monitoring Partner

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ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTI Inc
Work Order: S1705190
Project: Ottertail Power Big Stone

Date: 6/19/2017
Report ID: S1705190001

Radium 226 In Water -

Sample Type MBLK

Units: pCi/L

MB-1754 (05/30/17 09:52)	RunNo: 146341	PrepDate: 05/22/17 0:00	BatchID 13230
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226

ND

0.2

Radium 226 In Water -

Sample Type LCS

Units: pCi/L

LCS-1754 (05/30/17 09:52)	RunNo: 146341	PrepDate: 05/22/17 0:00	BatchID 13230
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226

5.8

0.2

6.41

90.6

67.1 - 122

Radium 226 In Water -

Sample Type LCSD

Units: pCi/L

LCSD-1754 (05/30/17 09:52)	RunNo: 146341	PrepDate: 05/22/17 0:00	BatchID 13230
Analyte	Result	RL	Conc %RPD %REC % RPD Limits Qual

Radium 226

6.4

0.2

5.8

9.14

98.8

20

Radium 226 In Water -

Sample Type MS

Units: pCi/L

S1705189-003AMS (05/30/17 09:52)	RunNo: 146341	PrepDate: 05/22/17 0:00	BatchID 13230
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226

11

1

12.8

ND

83.2

65 - 131

Qualifiers:

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

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

Quality Control Report

Lab IDs: 17-A18617 to 17-A18629

Project: BIG STONE PLANT

Work Order: 201731-0190

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 ug/L	25.0	104	85-115	25.0	17A18619q	<2.5	27.3	109	75-125	27.3	27.9	112	2.2	10	102	90-110	<0.5
	25.0	104	85-115	25.0	17A18628q	<5	24.4	98	75-125	24.4	24.9	100	2.0	10	104	90-110	<0.5
Arsenic ug/L	25.0	104	85-115	25.0	17A18619q	<2.5	28.2	113	75-125	28.2	29.5	118	4.5	10	100	90-110	<0.5
	25.0	106	85-115	25.0	17A18628q	<2.5	25.8	103	75-125	25.8	27.5	110	6.4	10	102	90-110	<0.5
Barium mg/L	1.000	102	85-115	1.00	17A18619q	0.011	0.949	94	75-125	0.949	1.040	103	9.2	10	101	90-110	<0.005
				1.00	17A18629q	0.101	1.050	95	75-125	1.050	1.070	97	1.9	10	100	90-110	<0.005
Beryllium ug/L	2.50	114	85-115	2.50	17A18619q	<0.25	2.50	100	75-125	2.50	2.54	102	1.6	10	106	90-110	<0.05
	2.50	114	85-115	2.50	17A18628q	<0.5	2.45	98	75-125	2.45	2.39	96	2.5	10	110	90-110	<0.05
Boron mg/L	1.000	102	85-115	1.00	17A18619q	0.428	1.280	85	75-125	1.280	1.400	97	9.0	10	98	90-110	<0.1
				1.00	17A18629q	3.660	4.690	103	75-125	4.690	4.730	107	0.8	10	99	90-110	<0.1
Cadmium ug/L	5.00	105	85-115	5.00	17A18619q	<0.5	5.47	109	75-125	5.47	5.39	108	1.5	10	100	90-110	<0.1
	5.00	105	85-115	5.00	17A18628q	<0.5	4.85	97	75-125	4.85	5.34	107	9.6	10	103	90-110	<0.1
Calcium mg/L	50.00	104	85-115	50.0	17A18619q	316.0	329.0	26	75-125	329.0	360.0	88	9.0	10	107	90-110	<0.5
				50.0	17A18629q	248.0	294.0	92	75-125	294.0	298.0	100	1.4	10	100	90-110	<0.5
Chloride mg/L	-	-	-	60.0	17-A18619	47.9	108	100	85-121	108	110	104	1.8	5	97	90-110	<3
	-	-	-	60.0	17-A18629	35.7	98.5	105	85-121	98.5	101	109	2.5	5	97	90-110	<3
Chromium mg/L	1.000	104	85-115	1.00	17A18619q	<0.01	0.894	89	75-125	0.894	0.977	98	8.9	10	103	90-110	<0.01
				1.00	17A18629q	0.015	0.898	88	75-125	0.898	0.910	90	1.3	10	101	90-110	<0.01
Cobalt mg/L	1.000	105	85-115	1.00	17A18619q	0.009	0.864	86	75-125	0.864	0.945	94	9.0	10	104	90-110	<0.005
				1.00	17A18629q	0.009	0.870	86	75-125	0.870	0.880	87	1.1	10	101	90-110	<0.005
Fluoride mg/L	-	-	-	0.20	a18619qc	0.540	0.720	90	75-125	0.720	0.720	90	0.0	10	101	90-110	<0.02
	-	-	-	0.20	a18627qc	0.540	0.740	100	75-125	0.740	0.750	105	1.3	10	96	90-110	<0.02
Lead ug/L	25.0	101	85-115	25.0	17A18619q	<2.5	24.9	100	75-125	24.9	27.0	108	8.1	10	100	90-110	<0.5
	25.0	102	85-115	25.0	17A18628q	<2.5	24.4	98	75-125	24.4	26.5	106	8.3	10	102	90-110	<0.5
Lithium mg/L	1.000	101	85-115	1.00	17-A18619	0.105	1.100	100	75-125	1.100	1.170	106	6.2	10	102	90-110	<0.005
	1.000	101	85-115	1.00	17-A18629	0.036	1.030	99	75-125	1.030	1.030	99	0.0	10	103	90-110	<0.005



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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

MEMBER
ACIL

Page: 2 of 2

Quality Control Report

Lab IDs: 17-A18617 to 17-A18629

Project: BIG STONE PLANT

Work Order: 201731-0190

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Mercury ug/L	-	-	-	0.10	17-A18618	< 0.005	0.101	101	63-111	0.101	0.102	102	1.0	18	94	76-113	< 0.005
	-	-	-	0.10	17-A18627	< 0.005	0.103	103	63-111	0.103	0.105	105	1.9	18	98	76-113	< 0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.005
Molybdenum ug/L	25.0	102	85-115	25.0	17A18619q	4.12	30.1	104	75-125	30.1	30.7	106	2.0	10	102	90-110	< 0.5
	25.0	102	85-115	25.0	17A18628q	9.54	31.8	89	75-125	31.8	34.8	101	9.0	10	102	90-110	< 0.5
pH units	-	-	-	-	-	-	-	-	-	7.0	7.0	-	0.0	2.5	101	90-110	-
	-	-	-	-	-	-	-	-	-	7.1	7.1	-	0.0	2.5	101	90-110	-
	-	-	-	-	-	-	-	-	-	8.1	8.1	-	0.0	2.5	101	90-110	-
Selenium ug/L	25.0	107	85-115	25.0	17A18619q	< 5	31.2	125	75-125	31.2	29.5	118	5.6	10	102	90-110	< 0.5
	25.0	107	85-115	25.0	17A18628q	< 5	27.0	108	75-125	27.0	26.6	106	1.5	10	103	90-110	< 0.5
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	2160	2260	-	4.5	8	102	85-115	< 10
	-	-	-	-	-	-	-	-	-	1790	1770	-	1.1	8	-	-	-
Sulfate mg/L	-	-	-	500	17-A18609	140	651	102	74-128	651	674	107	3.5	5	101	80-120	< 5
	-	-	-	500	17-A18620	71.1	550	96	74-128	550	557	97	1.3	5	101	80-120	< 5
Thallium ug/L	5.00	102	85-115	5.00	17A18619q	< 0.5	5.10	102	75-125	5.10	5.69	114	10.9	10	99	90-110	< 0.1
	5.00	102	85-115	5.00	17A18628q	< 0.5	4.96	99	75-125	4.96	5.10	102	2.8	10	102	90-110	< 0.1

The calcium matrix spike recovery was outside the acceptance limits, see narrative.

The thallium duplicate RPD was outside the acceptance limits, see narrative.

The beryllium known was outside the acceptance limits, see narrative.

Approved by: _____

Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003
Phone: 800 782 3557 Fax: 507 359 2890

Field Service Chain of Custody Record

This is an exact copy of
the original document

By AS Date 4 May 17
pages 1-21

Project Otter Tail Power Company	Project Type: Big Stone Plant CCR	Name of Samplers: DF, MS
Report: Otter Tail Power Company	Carbon Copy:	Quote Number:
Attn: Paul Vukonich	Attn:	Work Order Number: 31-0190
Address: P.O. Box 496	Address:	Lab Numbers:
Fergus Falls, MN 56538-0496		
Phone: 218-739-8349		

Sample Information					Bottle Type												Analysis		
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
A1867	H2OX		3 May 17	1056	GW		2	N	1	1	N								See Attached
18	H3OX		I	1139	GW		2	N	1	1	N								
19	H4OX			1214	GW		2	N	1	1	N								
20	H-6			1253	GW		2	N	1	1	N								
21	H-8			1348	GW		2	N	1	1	N								
22	H-9			1450	GW		2	N	1	1	N								
←	Slag 1			GW			2	N	1	1	N								
23	Slag 4			1110	GW		2	N	1	1	N								
24	Slag 5			1536	GW		2	N	1	1	N								
25	Slag 6			1255	GW		2	N	1	1	N								

Comments:

WORK ORDER #2

Samples Relinquished By: <u>DF</u>			Samples Received By: <u>G. Audin</u>		
Date: <u>3 May 17</u>	Time: <u>1847</u>	Temp: <u>0.0</u>	Date: <u>4 May 17</u>	Time: <u>1:15</u>	Temp: <u>1.00</u>
Samples Relinquished into: <u>Fridge</u> Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: <u>Samplers</u>	Other:		Seal Number(s) - If Used		
Transport: <u>Ambient</u>	<u>Ice</u>	Other:	Seals Intact? Yes No		

Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003

Phone: 800 782 3557 Fax: 507 359 2890

Field Service Chain of Custody Record

Project Otter Tail Power Company	Project Type: Big Stone Plant CCR	Name of Samplers: DF, MS
Report: Otter Tail Power Company	Carbon Copy:	Quote Number:
Attn: Paul Vukonich	Attn:	Work Order Number:
Address: P.O. Box 496	Address:	Lab Numbers:
Fergus Falls, MN 56538-0496		
Phone: 218-739-8349		

Sample Information						Bottle Type												Analysis	
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other 150 None	Analysis Required
26	Slag 7		3 May 17	1155	GW		2	N	1	1	N								See Attached
27	Slag 8		I	1421	GW		2	N	1	1	N								
28	Slag 9			1532	GW		2	N	1	1	N								
—	Slag 9 Deep			—	GW		2	N	1	1	N								
29	Slag 2B			1226	GW		2	N	1	1	N								

Comments:

WORK ORDER #2

Samples Relinquished By: <i>DF</i>			Samples Received By: <i>DF</i>		
Date: 3 May 17	Time: 1847	Temp: 0.0	Date: 4 May 17	Time: 715	Temp: 1-0C
Samples Relinquished into: <i>Ridge</i> Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: <i>Samplers</i> Other:			Seal Number(s) - If Used		
Transport: Ambient <i>Ice</i> Other:			Seals Intact? Yes No		

Big Stone Sampling 2017

Spring 2017

A=3 500 HNO₃
500 H₂SO₄
1000 None

B=4 1000 None
500 HNO₃
500 H₂SO₄
500 H₂SO₄

C=3 1000 None
500 H₂SO₄
500 HNO₃ Filter
500 HNO₃

C=3 "Pond"
1000 None
500 H₂SO₄
500 HNO₃

CCR=4
2-1000 HNO₃
1000 None
500 HNO₃

Site	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (ml/minute)	Goes Dry?	Sampling Seasons**
WELL10	A	47.43	4	1098.70	Keck/Tsunami	No	3,000	No	1,3
WELL11	A	127.22	4	1104.00	Other Pump	Yes	35,000	No	1,3
WELL12	A	112.40	4	1071.89	Other Pump	Yes	20,000	No	1,3
S1	B	32.50	2	1102.17	Bailer	Yes	N/A	Yes	1,3
S2	B	43.12	2	1102.39	Bailer	Yes	N/A	Yes	1,3
S3	B	62.50	2	1102.65	Bailer	Yes	N/A	No	1,3
S4	B	27.70	2	1090.57	Bailer	Yes	N/A	Yes	1,3
S5	B	46.72	2	1091.40	Bailer	Yes	N/A	Yes	1,3
S6	B	62.05	2	1090.71	Bailer	Yes	N/A	No	1,3
H1OX	C	32.91	2	1115.89	Bailer	Yes	100	Yes	1,3
H1INT	C	60.11	2	1115.81	Keck/Tsunami	No	1500	No	1,3
H2OX	C, CCR	32.20	2	1103.91	Bladder	Yes	100	Yes	1,3
H2INT	C	62.30	2	1103.91	Bailer	Yes	N/A	Yes	1,3
H3OX	C, CCR	22.55	2	1095.18	Bladder	Yes	100	Yes	1,3
H3INT	C	54.31	2	1095.17	Whale	No	2000	No	1,3
H4OX	C, CCR	27.20	2	1108.22	Bladder	Yes	100	No	1,3
H4INT	C	60.01	2	1108.61	Keck/Tsunami	No	2000	Yes	1,3
H5	C	43.30	2	1122.80	Whale	No	1000	No	1,3
H6	C, CCR	15.00	2	1097.76	Bladder	Yes	100	Yes	1,3
H7	C	33.20	2	1108.06	Whale	No	1000	Yes	1,3
H8	C, CCR	22.05	2	1081.23	Bladder	Yes	100	No	1,3
H9	C, CCR	30.20	2	1086.21	Bladder	Yes	100	No	1,3
BC1	B	16.26	2	1118.46	Bailer	Yes	N/A	No	1,3
BC101	B	39.30	2	1118.70	Bailer	Yes	N/A	Yes	1,3
BC2R	B	32.48	2	1116.28	Bailer	Yes	N/A	No	1,3
BC3R	B	35.15	2	1114.42	Bailer	Yes	N/A	Yes	1,3
BC4R	B	34.60	2	1113.86	Bailer	Yes	N/A	Yes	1,3
BC5R	B	37.32	2	1123.02	Bailer	Yes	N/A	No	1,3
BC6R	B	33.95	2	1121.58	Bailer	Yes	N/A	No	1,3
SLAG1		34.90	2	TBD	LOW FLOW	No	100	Yes	1,3
SLAG2			2	4444.06			400		
SLAG3			2				400		
SLAG4	CCR	39.00	2	TBD	LOW FLOW	No	100	No	1,3
SLAG5	CCR	38.80	2	1107.30	LOW FLOW	No	100	Yes	1,3
SLAG6	CCR	37.30	2	1111.51	LOW FLOW	No	100	Yes	1,3
SLAG7	CCR	48.70	2	1114.39	LOW FLOW	No	100	Yes	1,3
SLAG8	CCR	52.09	2	1127.26	LOW FLOW	No	100	No	1,3
SLAG9	CCR	49.80	2	1122.35	LOW FLOW	No	100	No	1,3
SLAGS DEEP		68.00	2	1121.92	LOW FLOW	No	100	Yes	
SLAG2B	CCR	40.80	2	1111.26	LOW FLOW	No	100	Yes	
COOLING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
EVAPORATION POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
HOLDING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
RECLAIM POND	C	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3

** 1 = Spring (March 28 - April 28), 2 = Summer (July 1 - August 7), 3 = Fall (October 14 - November 14)

1000 HNO₃
500 H₂SO₄
500 HNO₃

Big Stone Plant CCR Appendix III Parameters



CCR - Appendix III Detection Monitoring

Field Parameters

pH*

* Field and Laboratory Measurements

Total Concentration Parameters

Boron

Calcium

Chloride

Fluoride

pH

Sulfate

Dissolved Solids, Total



Big Stone CCR Appendix IV Parameters



CCR - Appendix IV - Assessment Monitoring

Total Concentration Parameters

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium, Total
Cobalt
Fluoride
Lead
Lithium
Mercury
Molybdenum
Selenium
Thallium
Radium 226 + 228



Big Stone Parameter List "A"

Field Parameters

Field pH
Field Temperature
Field Conductivity

Lab Parameters

Lab pH
Lab Conductivity
Total Alkalinity
Chloride
Hardness, Calcium
Hardness, Total
Nitrate-Nitrite as N
Potassium - Total
Sodium - Total
Sulfate

Big Stone Parameter List "B"

Field Parameters

Field pH

Field Temperature

Field Conductivity

Lab Parameters

Lab pH

Lab Conductivity

Total Alkalinity

Chloride

Hardness, Calcium

Hardness, Total

Nitrate-Nitrite as N

Potassium - Total

Sodium - Total

Sulfate

Arsenic - dissolved

Boron - dissolved

Cadmium - dissolved

Lead - dissolved

Manganese - dissolved

Strontium - dissolved

Big Stone Parameter List "C"

Field Parameters

Field pH
Field Temperature
Field Conductivity

Lab Parameters

Lab pH
Lab Conductivity
Total Alkalinity
Chloride
Hardness, Calcium
Hardness, Total
Nitrate-Nitrite as N
Potassium - Total
Sodium - Total
Sulfate
Arsenic - Dissolved
Arsenic - Total **
Barium - Dissolved
Barium - Total **
Boron - Dissolved
Boron - Total **
Cadmium - Dissolved
Cadmium - Total **
Chromium - Dissolved
Chromium - Total **
Copper - Dissolved
Copper - Total **
Lead - Dissolved
Lead - Total **
Manganese - Dissolved
Manganese - Total **
Mercury - Dissolved
Mercury - Total **
Selenium - Dissolved
Selenium - Total **
Silver - Dissolved
Silver - Total **
Strontium - Dissolved
Strontium - Total **
Vanadium - Dissolved
Vanadium - Total **
Zinc - Dissolved
Zinc - Total **

**** NOTE: ONLY Reclaim Pond is required to have Total metals run.
The groundwater samples are required to have the Dissolved metals run only.**

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Fabyan

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: 3 May 17

Unique Station ID: —

Sample ID: Slag 4

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary: —

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☐ Yes ☒ No

Grout Seal Intact? ☐ Yes ☒ No

Well Information

Well Depth: 39.24

Constructed Depth: 39.00

Casing Diameter: 2"

Water Level Before Purge: 17.95

Well Volume: 3.47 Gallons

Well Casing Elevation: NA

Static Water Elevation: —

Previous Static: —

Water Level After Sam: 21.35

Measurement Method: ☒ Elec. WL ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 58 Wind: W 8 Sky: Mostly Cloudy

Sampling Method: Grundfos ☒ Ladder Disp. B&Whale ☐ Grab ☐ Other: —

Dedicated Equipment: Yes ☒ No ☐

Pumping Rate: 0.25 gpm

Well Purged Dry? Yes ☒ No ☐

Time Pump Began: 1028 am / pm

Time Purged Dry? —

Time of Sampling: 1055 am / pm

Duplicate Sample? Yes ☒ No ☐ ID: —

Sample EH: 193.0

Sample Appearance: General: Sl. Cloudy Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SE Q #	Comments:
<u>1042</u>	<u>6.56</u>	<u>2996</u>	<u>11.60</u>	<u>NA</u>	<u>NA</u>	<u>3.5</u>	<u>1</u>	
<u>1056</u>	<u>6.58</u>	<u>2989</u>	<u>11.36</u>	<u>—</u>	<u>—</u>	<u>7</u>	<u>2</u>	
<u>1110</u>	<u>6.59</u>	<u>2984</u>	<u>11.78</u>	<u>—</u>	<u>—</u>	<u>10.5</u>	<u>3</u>	
				<u>—</u>	<u>—</u>		<u>4</u>	
				<u>—</u>	<u>—</u>		<u>5</u>	

Stabilized? ☒ Yes ☐ No

Amount Water R 10.5 Gallons

Comments: —

Exceptions to Protocol: —

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 560

507 354 8517

Groundwater Assessor

Sampling Person:

Matt Sten

Site:

Otter Tail Power Co./ Big Stone

Facility ID:

Date: *3 May 17*

Unique Station ID:

Sample ID:

Slag 5

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: *39.00*

Constructed Depth: *38.80*

Casing Diameter: *2"*

Water Level Before Purge: *24.81*

Well Volume: *2.31* Gallons

Well Casing Elevation: *1107.30*

Static Water Elevation: *1082.49*

Previous Static: *1083.89*

Water Level After Sample: *36.27*

Measurement Method: ☒ Elec. VLI ☐ Steel Tape

Sampling Information

Weather Condition Temp: *63*

Wind: *W @ 10*

Sky: *Rain*

Sampling Method: Grundfos Bladder SST Disp. Bailer ☒ Whate Grab Other:

Dedicated Equipm Yes ☒ No

Pumping Rate: *0.25* gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began: *1521* am / ☒ pm

Time Purged Dry? *1531*

Time of Sampling: *1536* am / ☒ pm

Duplicate Sample? Yes ☒ No ID: *—*

Sample EH: *162.9*

Sample Appearance General: *Clear* Color: *none* Phase: *1st sediment* Odor: *none*

ID	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1531	7.11	859	10.48	1A	NA	2.5	1	
							2	
1536	7.15	861	10.75				3	recharge
							4	
							5	

Stabilize Yes ☒ No

Amount Water Removed: *2.5* Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Farnsworth

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: 3 May 17

Unique Station ID: —

Sample ID: Slag 6

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? Yes ☒ No ☐

Grout Seal Intact? Yes ☒ No ☐

Well Information

Well Depth: 37.50

Constructed Depth: 37.30

Casing Diameter: 2"

Water Level Before Purge: 24.46

Well Volume: 2.13 Gallons

Well Casing Elevation: NA

Static Water Elevation: 1

Previous Static: 1

Water Level After Samp: 31.39

Measurement Method: ☒ Elec. Wbl ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 63 Wind: NW 7 Sky: Pily. Cloudy

Sampling Method: Grundfos ☒ Bladder SST ☐ Disp. Bailer ☐ Whale ☐ Grab ☐ Other:

Dedicated Equipment: Yes ☒ No ☐ Pumping Rate: 0.25 gpm

Well Purged Dry? ☒ Yes ☐ No Time Pump Began: 1241 am / ☒ pm

Time Purged Dry: 1250 Time of Sampling: 1255 am / ☒ pm

Duplicate Sample? Yes ☒ No ☐ ID: — Sample EH: 161.5

Sample Appearance: General: Cloudy Color: Tan Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1250	6.90	1409	13.99	NA	NA	2.25	1	
				I	I		2	
							3	
							4	
1255	6.97	1394	13.50	I	I	2.25	5	Recharge

Stabilized Yes ☒ No ☐ Amount Water Remove: 2.25 Gallons

Comments:

* Good Recharge

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Forsgren

Site: Otter Tail Power Co./ Big Stone

Facility ID: -

Date: 3 May 17

Unique Station ID: -

Sample ID: Slag 7

Well Condition

Well Locked? ☒ Yes No

Well Labeled? ☒ Yes No

Casing Straight? ☒ Yes No

Repairs Necessary:

Protective Posts? ☒ Yes No

State ID Tag? Yes ☒ No

Grout Seal Intact? Yes ☒ No

Well Information

Well Depth: 49.05

Constructed Depth: 48.70

Casing Diameter: 2"

Water Level Before Purge: 12.48

Well Volume: 5.88 Gallons

Well Casing Elevation: NA

Static Water Elevation: 1

Previous Static: 1

Water Level After Sample: 39.40

Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 61 Wind: WNW 8 Sky: Mostly Cloudy

Sampling Method: Grundfos ☒ Bladder SSD Disp. Bailer Whale Grab Other:

Dedicated Equipment Yes ☒ No

Pumping Rate: 0.25 gpm

Well Purged Dry? ☒ Yes No

Time Pump Began 1124 am / pm

Time Purged Dry? 1150

Time of Sampling: 1153 am / pm

Duplicate Sample? Yes ☒ No ID: -

Sample EH: 162.5

Sample Appearance: General: Sl. Cloudy Color: None Phase: None Odor: None

(24)							S E Q	
Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	#	Comments:
1150	6.90	1650	10.54	NA	NA	6	1	
				1	1		2	
							3	
							4	
1155	6.90	1703	11.87	1	1	6	5	Recharge

Stabilized? Yes ☒ No

Amount Water Removed: 6 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Farsyn

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: 3 May 17

Unique Station ID: —

Sample ID: Slag 8

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? Yes ☒ No ☐

Repairs Necessary: well bent

Protective Posts? ☒ Yes ☐ No

State ID Tag? Yes ☐ No ☒

Grout Seal Intact? Yes ☐ No ☒

Well Information

Well Depth: 52.26

Constructed Depth: 52.09

Casing Diameter: 2"

Water Level Before Purge: 17.34

Well Volume: 5.70 Gallons

Well Casing Elevation: NA

Static Water Elevation: I

Previous Static: I

Water Level After Sample: 30.10

Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 63

Wind: WNW 10

Sky: Mostly Cloudy

Sampling Method: Grundfos Bladder SS/T Disp. Bailer ☒ Whale Grab Other: ☐

Dedicated Equipment? Yes ☐ No ☒

Pumping Rate: 0.25 gpm

Well Purged Dry? Yes ☐ No ☒

Time Pump Began: 1312 am / ☒ pm

Time Purged Dry? —

Time of Sampling: 1421 am / ☒ pm

Duplicate Sample? Yes ☐ No ☒

ID: —

Sample EH: 141.5

Sample Appearance: General: Clear

Color: None

Phase: None

Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1335</u>	<u>7.00</u>	<u>1383</u>	<u>12.05</u>	<u>NA</u>	<u>NA</u>	<u>5.75</u>	<u>1</u>	
<u>1358</u>	<u>6.98</u>	<u>1398</u>	<u>12.42</u>	<u>I</u>	<u>I</u>	<u>11.5</u>	<u>2</u>	
<u>1421</u>	<u>6.99</u>	<u>1404</u>	<u>12.07</u>	<u>I</u>	<u>I</u>	<u>17.25</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 17.25 Gallons

Comments:

Exceptions to Protocol:

- well appears to have gotten hit by machinery
- Need to use whale pump for purging/sampling

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Frisvold

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: 3 May 17

Unique Station ID: —

Sample ID: Slag 9

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? Yes ☒ No

Grout Seal Intact? Yes ☒ No

Well Information

Well Depth: 51.25

Constructed Depth: 49.80

Casing Diameter: 2"

Water Level Before Purge: 14.98

Well Volume: 5.92 Gallons

Well Casing Elevation: NA

Static Water Elevation: 1

Previous Static: 1

Water Level After Sample: 23.42

Measurement Method: Elec. W Steel Tape

Sampling Information

Weather Conditions: Temp: 64

Wind: NW 3

Sky: Mostly Cloudy

Sampling Method: Grundfos Bladder SSR

Disp. Bailer Whale Grab Other:

Dedicated Equipment: Yes ☒ No

Pumping Rate: 0.25 gpm

Well Purged Dry? Yes ☒ No

Time Pump Began 1426 am / pm

Time Purged Dry? —

Time of Sampling: 1538 am / pm

Duplicate Sample? Yes ☒ No

ID: —

Sample EH: 126.5

Sample Appearance: General: Clear

Color: None

Phase: None

Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1450	6.81	2390	12.05	NA	NA	6	1	
1514	6.79	2380	11.67	1	1	12	2	
1538	6.80	2285	11.60	1	1	18	3	
							4	
							5	

Stabilized: ☒ Yes ☐ No

Amount Water Removed: 18

Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607

507 354 8517

Groundwater Assessor

Sampling Personne

Dusty Ferguson

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: 3 May 17

Unique Station ID: —

Sample ID: Slag 2B

Well Condition

Well Locked? Yes ☒ No ☐

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary

Protective Posts? ☒ Yes ☐ No

State ID Tag? Yes ☐ No ☒

Grout Seal Intact? Yes ☐ No ☒

Well Information

Well Depth: 40.94

Constructed Depth: 40.80

Casing Diameter: 2"

Water Level Before Purge 17.78

Well Volume: 3.78 Gallons

Well Casing Elevation: NA

Static Water Elevation: L

Previous Static: L

Water Level After Sample 39.45

Measurement Method: Elec. Well Steel Tape

Sampling Information

Weather Condition: Temp: 62

Wind: NW 7

Sky: PHy, Cloudy

Sampling Method: Grundfos Bladder SRT Disp. Baller Whale Grab Other:

Dedicated Equipment Yes ☒ No ☐

Pumping Rate: 0.25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began 1205 am / pm

Time Purged Dry? 1221

Time of Sampling: 1226 am / pm

Duplicate Sample? Yes ☒ No ☐ ID: —

Sample EH: 149.5

Sample Appearance General: Cloudy Color: Tan

Phase: Lt. Sol. Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1221	7.95	1880	10.75	NA	NA	4	1	
							2	
							3	
							4	
1226	7.02	1991	12.20	L	L	4	5	Recharge

Stabilized Yes ☒ No ☐

Amount Water Removed: 4

Gallons

Comments:

* Slow Recharge

Exceptions to Protocol:



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FINAL REPORT COMPLETION DATE: 18 Jul 17 AK

Date Reported: 12 Jul 2017

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 31-0261
Account #: 006106
PO #: 48680

Project Name: BIG STONE PLANT CCR

T. J. H. 12 Jul 17
Field Service Manager/Date Reviewed
D. O. C. 13 July 2017
Chemistry Lab Manager/Date Reviewed
David Smith for 13 July 2017
Quality Assurance Director/Date Reviewed

RL = Reporting Limits
NQ = Not Present, Qualitative Only
PQ = Present, Qualitative Only
ND = Not Determined

All data for this report has been approved by MVT Laboratory Management.

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



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 4

Report Date: 12 Jul 2017
 Lab Number: 17-A25511
 Work Order #: 31-0261
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 6 Jun 2017 11:18
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 6 Jun 2017 19:07
 PO #: 48680

Temp at Receipt: 0.8C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				8 Jun 17	JMS
Water Digestions				8 Jun 17	JMS
Radium 226	SEE ATTACHED			10 Jul 17 14:26	ABL
Radium 228	SEE ATTACHED		EPA M9320	10 Jul 17 14:26	ABL
pH, Field	6.58 units	1.00	I-1586-85	6 Jun 17 11:18	BMW
pH	* 6.8 units	1.0	SM 4500 H+ B-2000	8 Jun 17 11:31	JFG
Sulfate	1420 ~ mg/L	5.0	ASTM D516-07	21 Jun 17 7:17	AKF
Chloride	53.0 mg/L	3.0	SM 4500 Cl E	8 Jun 17 9:39	MRW
Mercury	0.006 ug/L	0.005	EPA 245.7	15 Jun 17 15:04	RMB
Solids, Total Dissolved	2470 mg/L	10	SM 2540 C-97	9 Jun 17 13:12	RC
Calcium	424.0 ~ mg/L	0.500	SW6010C	13 Jun 17 13:05	KAM
Lithium	0.146 mg/L	0.005	SW6010C	12 Jun 17 11:28	KAM
Barium	0.024 mg/L	0.005	SW6010C	12 Jun 17 11:28	KAM
Chromium	< 0.02 ~ mg/L	0.01	SW6010C	12 Jun 17 11:28	KAM
Cobalt	< 0.005 mg/L	0.005	SW6010C	12 Jun 17 11:28	KAM
Boron	0.663 mg/L	0.100	SW6010C	12 Jun 17 11:28	KAM
Antimony	< 1 @ ug/L	0.5	SW6020A	14 Jun 17 14:52	RMV
Arsenic	1.73 @ ug/L	0.50	SW6020A	14 Jun 17 14:52	RMV
Beryllium	< 0.25 ug/L	0.05	SW6020A	14 Jun 17 14:52	RMV
	@See Narrative				
Cadmium	0.21 @ ug/L	0.10	SW6020A	14 Jun 17 14:52	RMV
Lead	< 1 ug/L	0.5	SW6020A	14 Jun 17 14:52	RMV
	@See Narrative				
Molybdenum	1.36 @ ug/L	0.50	SW6020A	14 Jun 17 14:52	RMV
Selenium	< 2 @^ ug/L	0.5	SW6020A	14 Jun 17 14:52	RMV
Thallium	< 0.2 ug/L	0.1	SW6020A	14 Jun 17 14:52	RMV
	@ See Narrative				
Fluoride	0.330 @ mg/L	0.020	EPA 300.0	9 Jun 17 10:17	RC

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
 The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040

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

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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 4

Report Date: 12 Jul 2017
Lab Number: 17-A25511
Work Order #: 31-0261
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 6 Jun 2017 11:18
Sampled By: MVTI FIELD PERSONNEL
Date Received: 6 Jun 2017 19:07
PO #: 48680

Temp at Receipt: 0.8C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
-----------------------	--------------	---------------------	------------------	---------

* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

RD = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:

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

CERTIFICATION: MN LAB # 027-015-125 MI LAB # 999447680 ND MICRO # 1013-M ND WAH/CWH # R-040

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 12 Jul 2017
 Lab Number: 17-A25512
 Work Order #: 31-0261
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 6 Jun 2017 14:53
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 6 Jun 2017 19:07
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 5

Temp at Receipt: 0.8C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					8 Jun 17	JMS
Water Digestions					8 Jun 17	JMS
Radium 226	SEE ATTACHED				10 Jul 17 14:27	ABL
Radium 228	SEE ATTACHED				10 Jul 17 14:27	ABL
pH, Field	7.09 units		1.00	EPA M9320	6 Jun 17 14:53	MS
pH	7.2 units		1.0	SM 4500 H+ B-2000	8 Jun 17 11:31	JFG
Sulfate	84.5 mg/L		5.0	ASTM D516-07	21 Jun 17 7:17	AKF
Chloride	9.0 mg/L		3.0	SM 4500 Cl E	8 Jun 17 9:39	MRW
Mercury	< 0.005 ug/L		0.005	EPA 245.7	15 Jun 17 15:04	RMB
Solids, Total Dissolved	472 mg/L		10	SM 2540 C-97	9 Jun 17 13:12	RC
Calcium	107.0 mg/L		0.500	SW6010C	13 Jun 17 13:05	KAM
Lithium	0.022 mg/L		0.005	SW6010C	12 Jun 17 11:28	KAM
Barium	0.132 mg/L		0.005	SW6010C	12 Jun 17 11:28	KAM
Chromium	< 0.02 ^ mg/L		0.01	SW6010C	12 Jun 17 11:28	KAM
Cobalt	< 0.005 mg/L		0.005	SW6010C	12 Jun 17 11:28	KAM
Boron	0.495 mg/L		0.100	SW6010C	12 Jun 17 11:28	KAM
Antimony	< 1 @ ug/L		0.5	SW6020A	14 Jun 17 14:52	RMV
Arsenic	< 1 @ ug/L		0.5	SW6020A	14 Jun 17 14:52	RMV
Beryllium	< 0.25 ug/L		0.05	SW6020A	14 Jun 17 14:52	RMV
	@See Narrative					
Cadmium	< 0.2 @ ug/L		0.1	SW6020A	14 Jun 17 14:52	RMV
Lead	1.14 ug/L		0.50	SW6020A	14 Jun 17 14:52	RMV
	@See Narrative					
Molybdenum	11.8 @ ug/L		0.50	SW6020A	14 Jun 17 14:52	RMV
Selenium	< 2 @^ ug/L		0.5	SW6020A	14 Jun 17 14:52	RMV
Thallium	< 0.2 ug/L		0.1	SW6020A	14 Jun 17 14:52	RMV
	@ See Narrative					
Fluoride	0.240 mg/L		0.020	EPA 300.0	9 Jun 17 10:17	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL - Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards. The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-H ND WH/DH # R-040

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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 12 Jul 2017
 Lab Number: 17-A25513
 Work Order #: 31-0261
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 6 Jun 2017 12:22
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 6 Jun 2017 19:07
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 6

Temp at Receipt: 0.8C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				8 Jun 17	JMS
Water Digestions				8 Jun 17	JMS
Radium 226	SEE ATTACHED			10 Jul 17 14:27	ABL
Radium 228	SEE ATTACHED			10 Jul 17 14:27	ABL
pH, Field	7.15 units	1.00	I-1586-85	6 Jun 17 12:22	BMW
pH	* 7.2 units	1.0	SM 4500 H+ B-2000	8 Jun 17 11:31	JFG
Sulfate	374 ~ mg/L	5.0	ASTM D516-07	21 Jun 17 7:17	AKF
Chloride	8.8 mg/L	3.0	SM 4500 Cl E	8 Jun 17 9:39	MRW
Mercury	0.014 ug/L	0.005	EPA 245.7	15 Jun 17 15:04	RMB
Solids, Total Dissolved	1060 mg/L	10	SM 2540 C-97	9 Jun 17 13:12	RC
Calcium	182.0 mg/L	0.500	SW6010C	13 Jun 17 13:05	KAM
Lithium	0.076 mg/L	0.005	SW6010C	12 Jun 17 11:28	KAM
Barium	0.069 mg/L	0.005	SW6010C	12 Jun 17 11:28	KAM
Chromium	< 0.02 ^ mg/L	0.01	SW6010C	12 Jun 17 11:28	KAM
Cobalt	< 0.005 mg/L	0.005	SW6010C	12 Jun 17 11:28	KAM
Boron	1.550 mg/L	0.100	SW6010C	12 Jun 17 11:28	KAM
Antimony	< 1 @ ug/L	0.5	SW6020A	14 Jun 17 14:52	RMV
Arsenic	3.01 @ ug/L	0.50	SW6020A	14 Jun 17 14:52	RMV
Beryllium	< 0.25 ug/L	0.05	SW6020A	14 Jun 17 14:52	RMV
	@See Narrative				
Cadmium	0.25 @ ug/L	0.10	SW6020A	14 Jun 17 14:52	RMV
Lead	3.62 ug/L	0.50	SW6020A	14 Jun 17 14:52	RMV
	@See Narrative				
Molybdenum	7.38 @ ug/L	0.50	SW6020A	14 Jun 17 14:52	RMV
Selenium	4.08 @^ ug/L	0.50	SW6020A	14 Jun 17 14:52	RMV
Thallium	< 0.2 ug/L	0.1	SW6020A	14 Jun 17 14:52	RMV
	@ See Narrative				
Fluoride	0.500 @ mg/L	0.020	EPA 300.0	9 Jun 17 10:17	RC

RL = Reporting Limit

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

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

@ = Due to sample matrix

! = Due to sample quantity

= Due to concentration of other analytes

* = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WH/DW # R-040

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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 12 Jul 2017
Lab Number: 17-A25513
Work Order #: 31-0261
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 6 Jun 2017 12:22
Sampled By: MVTL FIELD PERSONNEL
Date Received: 6 Jun 2017 19:07
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 6

Temp at Receipt: 0.8C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
-----------------------	--------------	---------------------	------------------	---------

* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
Q = Due to sample matrix # = Due to concentration of other analytes
I = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND W8/DW # R-040

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



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 12 Jul 2017
 Lab Number: 17-A25514
 Work Order #: 31-0261
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 6 Jun 2017 11:59
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 6 Jun 2017 19:07
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 7

Temp at Receipt: 0.8C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				8 Jun 17	JMS
Water Digestions				8 Jun 17	JMS
Radium 226	SEE ATTACHED			10 Jul 17 14:27	ABL
Radium 228	SEE ATTACHED		EPA M9320	10 Jul 17 14:27	ABL
pH, Field	7.04 units	1.00	I-1586-85	6 Jun 17 11:59	BMW
pH	* 7.3 units	1.0	SM 4500 H+ B-2000	8 Jun 17 11:31	JFG
Sulfate	513 ~ mg/L	5.0	ASTM D516-07	21 Jun 17 7:17	AKF
Chloride	5.5 mg/L	3.0	SM 4500 Cl E	8 Jun 17 9:39	MRW
Mercury	0.012 ug/L	0.005	EPA 245.7	15 Jun 17 15:04	RMB
Solids, Total Dissolved	1170 mg/L	10	SM 2540 C-97	9 Jun 17 13:12	RC
Calcium	365.0 ~ mg/L	0.500	SW6010C	13 Jun 17 17:26	KAM
Lithium	0.086 mg/L	0.005	SW6010C	12 Jun 17 12:02	KAM
Barium	0.062 mg/L	0.005	SW6010C	12 Jun 17 12:02	KAM
Chromium	< 0.02 ^ mg/L	0.01	SW6010C	12 Jun 17 12:02	KAM
Cobalt	< 0.005 mg/L	0.005	SW6010C	12 Jun 17 12:02	KAM
Boron	1.090 mg/L	0.100	SW6010C	12 Jun 17 12:02	KAM
Antimony	< 1 @ ug/L	0.5	SW6020A	14 Jun 17 14:52	RMV
Arsenic	2.32 @ ug/L	0.50	SW6020A	14 Jun 17 14:52	RMV
Beryllium	< 0.25 ug/L	0.05	SW6020A	14 Jun 17 14:52	RMV
	@See Narrative				
Cadmium	0.31 @ ug/L	0.10	SW6020A	14 Jun 17 14:52	RMV
Lead	2.32 ug/L	0.50	SW6020A	14 Jun 17 14:52	RMV
	@See Narrative				
Molybdenum	4.56 @ ug/L	0.50	SW6020A	14 Jun 17 14:52	RMV
Selenium	2.07 @^ ug/L	0.50	SW6020A	14 Jun 17 14:52	RMV
Thallium	< 0.2 ug/L	0.1	SW6020A	14 Jun 17 14:52	RMV
	@ See Narrative				
Fluoride	0.430 @ mg/L	0.020	EPA 300.0	9 Jun 17 10:17	RC

RL = Reporting Limit

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

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

@ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN IAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

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

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

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 12 Jul 2017
Lab Number: 17-A25514
Work Order #: 31-0261
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 6 Jun 2017 11:59
Sampled By: MVTI FIELD PERSONNEL
Date Received: 6 Jun 2017 19:07
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 7

Temp at Receipt: 0.8C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
-----------------------	--------------	---------------------	------------------	---------

* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
| = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040

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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 12 Jul 2017
 Lab Number: 17-A25515
 Work Order #: 31-0261
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 6 Jun 2017 13:50
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 6 Jun 2017 19:07
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 8

Temp at Receipt: 0.8C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				8 Jun 17	JMS
Water Digestions				8 Jun 17	JMS
Radium 226	SEE ATTACHED			10 Jul 17 14:27	ABL
Radium 228	SEE ATTACHED		EPA M9320	10 Jul 17 14:28	ABL
pH, Field	7.14 units	1.00	I-1586-85	6 Jun 17 13:50	BMW
pH	* 7.2 units	1.0	SM 4500 H+ B-2000	8 Jun 17 11:50	JFG
Sulfate	253 @ mg/L	5.0	ASTM D516-07	21 Jun 17 7:35	AKF
Chloride	40.9 mg/L	3.0	SM 4500 Cl E	8 Jun 17 9:39	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	15 Jun 17 15:47	RMB
Solids, Total Dissolved	896 mg/L	10	SM 2540 C-97	9 Jun 17 13:12	RC
Calcium	113.0 mg/L	0.500	SW6010C	13 Jun 17 17:26	KAM
Lithium	0.054 mg/L	0.005	SW6010C	12 Jun 17 12:02	KAM
Barium	0.044 mg/L	0.005	SW6010C	12 Jun 17 12:02	KAM
Chromium	< 0.02 ^ mg/L	0.01	SW6010C	12 Jun 17 12:02	KAM
Cobalt	< 0.005 mg/L	0.005	SW6010C	12 Jun 17 12:02	KAM
Boron	0.510 mg/L	0.100	SW6010C	12 Jun 17 12:02	KAM
Antimony	< 1 @ ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
Arsenic	1.06 @ ug/L	0.50	SW6020A	14 Jun 17 16:10	RMV
Beryllium	< 0.1 ug/L	0.05	SW6020A	14 Jun 17 16:10	RMV
	@See Narrative				
Cadmium	< 0.2 @ ug/L	0.1	SW6020A	14 Jun 17 16:10	RMV
Lead	< 1 ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
	@See Narrative				
Molybdenum	8.36 @ ug/L	0.50	SW6020A	14 Jun 17 16:10	RMV
Selenium	18.1 @ ^ ug/L	0.50	SW6020A	14 Jun 17 16:10	RMV
Thallium	< 0.2 ug/L	0.1	SW6020A	14 Jun 17 16:10	RMV
	@ See Narrative				
Fluoride	0.530 mg/L	0.020	EPA 300.0	9 Jun 17 17:08	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
 Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
 The reporting limit was elevated for any analyte requiring a dilution as coded below:
 @ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response
 CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DN # R-040

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

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www.mvmt.com



CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 12 Jul 2017
Lab Number: 17-A25516
Work Order #: 31-0261
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 6 Jun 2017 15:15
Sampled By: MVTI FIELD PERSONNEL
Date Received: 6 Jun 2017 19:07
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 9

Temp at Receipt: 0.8C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					8 Jun 17	JMS
Water Digestions					8 Jun 17	JMS
Radium 226	SEE ATTACHED				10 Jul 17 14:28	ABL
Radium 228	SEE ATTACHED			EPA M9320	10 Jul 17 14:28	ABL
pH, Field	6.87	units	1.00	I-1586-85	6 Jun 17 15:15	BMW
pH	* 7.0	units	1.0	SM 4500 H+ B-2000	8 Jun 17 11:50	JFG
Sulfate	1010 ~	mg/L	5.0	ASTM D516-07	21 Jun 17 7:35	AKF
Chloride	7.4	mg/L	3.0	SM 4500 Cl E	8 Jun 17 9:39	MRW
Mercury	< 0.005	ug/L	0.005	EPA 245.7	15 Jun 17 15:47	RMB
Solids, Total Dissolved	1740	mg/L	10	SM 2540 C-97	9 Jun 17 13:12	RC
Calcium	364.0 ~	mg/L	0.500	SW6010C	13 Jun 17 17:26	KAM
Lithium	0.115	mg/L	0.005	SW6010C	12 Jun 17 12:02	KAM
Barium	0.025	mg/L	0.005	SW6010C	12 Jun 17 12:02	KAM
Chromium	< 0.02 ^	mg/L	0.01	SW6010C	12 Jun 17 12:02	KAM
Cobalt	< 0.005	mg/L	0.005	SW6010C	12 Jun 17 12:02	KAM
Boron	0.234	mg/L	0.100	SW6010C	12 Jun 17 12:02	KAM
Antimony	< 1 @	ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
Arsenic	< 1 @	ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
Beryllium	< 0.25	ug/L	0.05	SW6020A	14 Jun 17 16:10	RMV
	@See Narrative					
Cadmium	< 0.2 @	ug/L	0.1	SW6020A	14 Jun 17 16:10	RMV
Lead	< 1	ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
	@See Narrative					
Molybdenum	9.02 @	ug/L	0.50	SW6020A	14 Jun 17 16:10	RMV
Selenium	< 2 @^	ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
Thallium	< 0.2	ug/L	0.1	SW6020A	14 Jun 17 16:10	RMV
	@ See Narrative					
Fluoride	0.250	mg/L	0.020	EPA 300.0	9 Jun 17 17:08	RC

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards. The reporting limit was elevated for any analyte requiring a dilution as coded below:

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

@ = Due to sample matrix	# = Due to concentration of other analytes
! = Due to sample quantity	* = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

MYTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MYTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MYTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 12 Jul 2017
Lab Number: 17-A25516
Work Order #: 31-0261
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 6 Jun 2017 15:15
Sampled By: MVTI FIELD PERSONNEL
Date Received: 6 Jun 2017 19:07
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 9

Temp at Receipt: 0.8C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
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* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
I = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND HW/DW # R-040

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



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 12 Jul 2017
 Lab Number: 17-A25517
 Work Order #: 31-0261
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 6 Jun 2017 15:38
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 6 Jun 2017 19:07
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 2B

Temp at Receipt: 0.8C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				8 Jun 17	JMS
Water Digestions				8 Jun 17	JMS
Radium 226	SEE ATTACHED			10 Jul 17 14:28	ABL
Radium 228	SEE ATTACHED			10 Jul 17 14:28	ABL
pH, Field	7.84 units	1.00	EPA M9320	6 Jun 17 15:38	BMW
pH	* 7.4 units	1.0	I-1586-85	8 Jun 17 11:50	JFG
Sulfate	802 ~ mg/L	5.0	SM 4500 H+ B-2000	21 Jun 17 7:35	AKF
Chloride	33.3 mg/L	3.0	ASTM D516-07	8 Jun 17 9:39	MRW
Mercury	< 0.005 ug/L	0.005	SM 4500 Cl E	15 Jun 17 15:47	RMB
Solids, Total Dissolved	1440 mg/L	10	EPA 245.7	9 Jun 17 13:12	RC
Calcium	226.0 ~ mg/L	0.500	SM 2540 C-97	13 Jun 17 17:26	KAM
Lithium	0.117 mg/L	0.005	SW6010C	12 Jun 17 12:02	KAM
Barium	0.095 mg/L	0.005	SW6010C	12 Jun 17 12:02	KAM
Chromium	< 0.02 ^ mg/L	0.01	SW6010C	12 Jun 17 12:02	KAM
Cobalt	0.005 mg/L	0.005	SW6010C	12 Jun 17 12:02	KAM
Boron	3.360 mg/L	0.100	SW6010C	12 Jun 17 12:02	KAM
Antimony	< 1 @ ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
Arsenic	1.14 @ ug/L	0.50	SW6020A	14 Jun 17 16:10	RMV
Beryllium	< 0.25 ug/L	0.05	SW6020A	14 Jun 17 16:10	RMV
	@See Narrative				
Cadmium	< 0.2 @ ug/L	0.1	SW6020A	14 Jun 17 16:10	RMV
Lead	< 1 ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
	@See Narrative				
Molybdenum	5.27 @ ug/L	0.50	SW6020A	14 Jun 17 16:10	RMV
Selenium	< 2 @^ ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
Thallium	< 0.2 ug/L	0.1	SW6020A	14 Jun 17 16:10	RMV
	@ See Narrative				
Fluoride	< 0.2 @ mg/L	0.02	EPA 300.0	9 Jun 17 17:08	RC

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
 The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 MI LAB # 999447680 ND MICRO # 1013-M ND NW/DN # R-040

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



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 12 Jul 2017
Lab Number: 17-A25517
Work Order #: 31-0261
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 6 Jun 2017 15:38
Sampled By: MVTL FIELD PERSONNEL
Date Received: 6 Jun 2017 19:07
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 2B

Temp at Receipt: 0.8C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
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* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

0 = Due to sample matrix # = Due to concentration of other analytes
1 = Due to sample quantity * = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NM/DM # R-040

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



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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
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Page: 24 of 24

Date Reported: 12 Jul 2017

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 201731-0261
Account Number: 006106
PO #: 48680

Project Name: BIG STONE PLANT CCR

LABORATORY NARRATIVE

INORGANIC AND METALS ANALYSES:

Beryllium recovery was elevated in the laboratory control spike associated with samples 17-A25505 through 17-A25517. Data that was below the reporting limit was reported.

The internal standard counts for lead and thallium were outside of limits in the laboratory control spike associated with samples 17-A25505 through 17-A25517. Data was reported based on the acceptable recovery of lead and thallium in the laboratory control spike.

No other problems were encountered with these analyses.

Quality Control Report

Lab IDs: 17-A25505 to 17-A25517

Project: BIG STONE PLANT CCR

Work Order: 201731-0261

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 ug/L	25.0	99	85-115	25.0	17A25514q	< 1	21.5	86	75-125	21.5	23.1	92	7.2	10	100	90-110	< 0.5
	25.0	99	85-115	25.0	a25082qc	< 0.5	25.5	102	75-125	25.5	25.5	102	0.0	10	98	90-110	< 0.5
Arsenic ug/L	25.0	99	85-115	25.0	17A25514q	2.32	27.1	99	75-125	27.1	29.3	108	7.8	10	98	90-110	< 0.5
	25.0	99	85-115	25.0	a25082qc	2.64	29.1	106	75-125	29.1	28.8	105	1.0	10	100	90-110	< 0.5
Barium mg/L	1.000	98	85-115	1.00	17A25512q	0.132	1.150	102	75-125	1.150	1.140	101	0.9	10	99	90-110	< 0.005
	1.000	98	85-115	1.00	17A25012q	0.068	1.040	97	75-125	1.040	1.070	100	2.8	10	100	90-110	< 0.005
Beryllium ug/L	2.50	121	85-115	2.50	17A25514q	< 0.25	2.36	94	75-125	2.36	2.30	92	2.6	10	107	90-110	< 0.05
	2.50	121	85-115	2.50	a25082qc	< 0.5	2.47	99	75-125	2.47	2.50	100	1.2	10	93	90-110	< 0.05
Boron mg/L	1.000	98	85-115	1.00	17A25512q	0.495	1.570	108	75-125	1.570	1.540	104	1.9	10	95	90-110	< 0.1
	1.000	98	85-115	1.00	17A25012q	< 0.1	1.000	100	75-125	1.000	1.040	104	3.9	10	96	90-110	< 0.1
Cadmium ug/L	5.00	100	85-115	5.00	17A25514q	0.31	4.79	90	75-125	4.79	5.27	99	9.5	10	98	90-110	< 0.1
	5.00	100	85-115	5.00	a25082qc	< 0.1	5.14	103	75-125	5.14	5.09	102	1.0	10	102	90-110	< 0.1
Calcium mg/L	50.00	106	85-115	50.0	A25512q	107.0	164.0	114	75-125	164.0	169.0	124	3.0	10	105	90-110	< 0.5
	50.00	110	85-115	50.0	a25012qc	79.60	139.0	119	75-125	139.0	140.0	121	0.7	10	106	90-110	< 0.5
Chloride mg/L	-	-	-	60.0	17-A25509	4.1	62.6	98	85-121	62.6	62.1	97	0.8	5	96	90-110	< 3
	-	-	-	60.0	17-A25519	12.4	72.5	100	85-121	72.5	72.5	100	0.0	5	96	90-110	< 3
Chromium mg/L	1.000	101	85-115	1.00	17A25512q	< 0.01	1.010	101	75-125	1.010	0.996	100	1.4	10	102	90-110	< 0.01
	1.000	101	85-115	1.00	17A25012q	< 0.01	0.981	98	75-125	0.981	1.020	102	3.9	10	102	90-110	< 0.01
Cobalt mg/L	1.000	101	85-115	1.00	17A25512q	< 0.005	0.957	96	75-125	0.957	0.948	95	0.9	10	100	90-110	< 0.005
	1.000	101	85-115	1.00	17A25012q	< 0.005	0.956	96	75-125	0.956	0.988	99	3.3	10	100	90-110	< 0.005
Fluoride mg/L	-	-	-	0.20	17-A25512	0.240	0.420	90	75-125	0.420	0.420	90	0.0	10	95	90-110	< 0.02
	-	-	-	0.20	17-A25523	0.240	0.450	105	75-125	0.450	0.450	105	0.0	10	100	90-110	< 0.02
Lead ug/L	25.0	100	85-115	25.0	17A25514q	2.32	25.4	92	75-125	25.4	27.6	101	8.3	10	100	90-110	< 0.5
	25.0	100	85-115	25.0	a25082qc	1.78	28.1	105	75-125	28.1	27.7	104	1.4	10	101	90-110	< 0.5
Lithium mg/L	1.000	99	85-115	1.00	17-A25512	0.022	1.060	104	75-125	1.060	1.050	103	0.9	10	102	90-110	< 0.005
	1.000	99	85-115	1.00	a25012qc	0.007	0.979	97	75-125	0.979	1.000	99	2.1	10	105	90-110	< 0.005

**MINNESOTA VALLEY TESTING LABORATORIES, INC.**

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

MEMBER
ACIL

Page: 2 of 2

Quality Control Report

Lab IDs: 17-A25505 to 17-A25517

Project: BIG STONE PLANT CCR

Work Order: 201731-0261

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (≤)	Known Rec (%)	Known % Rec Limits	Method Blank
Mercury ug/L	-	-	-	0.10	17-A25505	<0.005	0.098	98	63-111	0.098	0.099	99	1.0	18	106	76-113	<0.005
	-	-	-	0.10	17-A25524	<0.005	0.093	93	63-111	0.093	0.104	104	11.2	18	99	76-113	<0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.005
Molybdenum ug/L	25.0	102	85-115	25.0	17A25514q	4.56	24.9	81	75-125	24.9	26.9	89	7.7	10	105	90-110	<0.5
	25.0	102	85-115	25.0	a25082qc	1.20	26.6	102	75-125	26.6	26.2	100	1.5	10	98	90-110	<0.5
pH units	-	-	-	-	-	-	-	-	-	7.3	7.4	-	1.4	2.5	100	90-110	-
	-	-	-	-	-	-	-	-	-	7.0	7.1	-	1.4	2.5	100	90-110	-
Selenium ug/L	25.0	104	85-115	25.0	17A25514q	2.07	29.8	111	75-125	29.8	30.6	114	2.6	10	102	90-110	<0.5
	25.0	104	85-115	25.0	a25082qc	<1	27.0	108	75-125	27.0	27.5	110	1.8	10	107	90-110	<0.5
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	1170	1170	-	0.0	8	93	85-115	<10
	-	-	-	-	-	-	-	-	-	561	550	-	2.0	8	-	-	-
Sulfate mg/L	-	-	-	500	17-A25514	513	1070	111	74-128	1070	1040	105	2.8	5	99	80-120	<5
	-	-	-	500	17-A25524	97.4	647	110	74-128	647	647	110	0.0	5	99	80-120	<5
Thallium ug/L	5.00	98	85-115	5.00	17A25514q	<0.2	4.91	98	75-125	4.91	5.29	106	7.5	10	100	90-110	<0.1
	5.00	98	85-115	5.00	a25082qc	<0.1	5.24	105	75-125	5.24	5.18	104	1.2	10	102	90-110	<0.1

The beryllium LCS recoveries were outside the acceptance limits, see narrative.

Approved by:



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Date: 7/10/2017

CLIENT: MVTI Inc
Project: Ottertail Power Big Stone
Lab Order: S1706214

CASE NARRATIVE
Report ID: S1706214001

Samples H-6 A25508, H-8 A25509, H2OX A25505, H3OX A25506, H4OX A25507, H9 A25510, Slag-2B A25517, Slag-4 A25511, Slag-5 A25512, Slag-6 A25513, Slag-7 A25514, Slag-8 A25515, and Slag-9 A25516 were received on June 9, 2017.

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

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

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 1



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported: 7/10/2017
Report ID: S1706214001

ProjectName: Ottertail Power Big Stone
Lab ID: S1706214-007
ClientSample ID: Slag-4 A25511
COC: WEB

WorkOrder: S1706214
CollectionDate: 6/7/2017 11:18:00 AM
DateReceived: 6/9/2017 11:43:00 AM
FieldSampler:
Matrix: Water

Comments

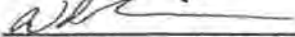
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	06/21/2017 1048 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	06/21/2017 1048 MB
Radium 228	ND	pCi/L		2	Ga-Tech	07/05/2017 948 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	07/05/2017 948 MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Big Stone
Lab ID: S1706214-008
ClientSample ID: Slag-5 A25512
COC: WEB

Date Reported 7/10/2017
Report ID S1706214001

WorkOrder: S1706214
CollectionDate: 6/7/2017 2:53:00 PM
DateReceived: 6/9/2017 11:43:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	06/21/2017 1048	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	06/21/2017 1048	MB
Radium 228	ND	pCi/L		2	Ga-Tech	07/05/2017 1252	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	07/05/2017 1252	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

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Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Big Stone
Lab ID: S1706214-009
ClientSample ID: Slag-6 A25513
COC: WEB

Date Reported 7/10/2017
Report ID S1706214001

WorkOrder: S1706214
CollectionDate: 6/7/2017 12:22:00 PM
DateReceived: 6/9/2017 11:43:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	06/21/2017 1048	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	06/21/2017 1048	MB
Radium 228	ND	pCi/L		2	Ga-Tech	07/05/2017 1555	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	07/05/2017 1555	MB

These results apply only to the samples tested.

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

RL - Reporting Limit

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

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Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 7/10/2017
Report ID S1706214001

ProjectName: Ottertail Power Big Stone
Lab ID: S1706214-010
ClientSample ID: Slag-7 A25514
COC: WEB

WorkOrder: S1706214
CollectionDate: 6/7/2017 11:59:00 AM
DateReceived: 6/9/2017 11:43:00 AM
FieldSampler:
Matrix: Water

Comments


Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	06/21/2017 1048	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	06/21/2017 1048	MB
Radium 228	ND	pCi/L		2	Ga-Tech	07/05/2017 1858	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	07/05/2017 1858	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 7/10/2017
Report ID S1706214001

ProjectName: Ottertail Power Big Stone
Lab ID: S1706214-011
ClientSample ID: Slag-8 A25515
COC: WEB

WorkOrder: S1706214
CollectionDate: 6/7/2017 1:50:00 PM
DateReceived: 6/9/2017 11:43:00 AM
FieldSampler:
Matrix: Water

Comments


Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	06/21/2017 1048	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	06/21/2017 1048	MB
Radium 228	ND	pCi/L		2	Ga-Tech	07/05/2017 2200	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	07/05/2017 2200	MB

These results apply only to the samples tested.

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

RL - Reporting Limit

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

Your Environmental Monitoring Partner

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Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 7/10/2017
Report ID S1706214001

ProjectName: Ottertail Power Big Stone
Lab ID: S1706214-012
ClientSample ID: Slag-9 A25516
COC: WEB

WorkOrder: S1706214
CollectionDate: 6/7/2017 3:15:00 PM
DateReceived: 6/9/2017 11:43:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	06/21/2017 1048	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	06/21/2017 1048	MB
Radium 228	ND	pCi/L		2	Ga-Tech	07/06/2017 103	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	07/06/2017 103	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

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Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Big Stone
Lab ID: S1706214-013
ClientSample ID: Slag-2B A25517
COC: WEB

Date Reported 7/10/2017
Report ID S1706214001

WorkOrder: S1706214
CollectionDate: 6/7/2017 3:38:00 PM
DateReceived: 6/9/2017 11:43:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	06/21/2017 1443	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	06/21/2017 1443	MB
Radium 228	ND	pCi/L		2	Ga-Tech	07/06/2017 406	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	07/06/2017 406	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

Your Environmental Monitoring Partner

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

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Inc
Work Order: S1706214
Project: Ottortail Power Big Stone

Date: 7/10/2017
Report ID: S1706214001

Radium 228 by Ga/Tech

Sample Type MBLK

Units: pCi/L

MB-444 (06/28/17 22:40)	RunNo: 147536	PrepDate: 06/12/17 14:00	BatchID 13368					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228	ND	1						

MB-445 (07/04/17 18:34)	RunNo: 147649	PrepDate: 06/14/17 12:00	BatchID 13385					
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-444 (06/29/17 01:43)	RunNo: 147536	PrepDate: 06/12/17 14:00	BatchID 13368					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228	43	1	40.1		107	65.9 - 132		

LCS-445 (07/04/17 15:31)	RunNo: 147649	PrepDate: 06/14/17 12:00	BatchID 13385					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228	44	1	39.3		112	65.9 - 132		

Radium 228 by Ga/Tech

Sample Type MS

Units: pCi/L

MS-444 (06/29/17 07:49)	RunNo: 147536	PrepDate: 06/12/17 14:00	BatchID 13368					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228	47	1	40.1	ND	116	65.9 - 132		

MS-445 (07/04/17 21:37)	RunNo: 147649	PrepDate: 06/14/17 12:00	BatchID 13385					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228	42	1	39.1	2	104	50 - 139		

Radium 228 by Ga/Tech

Sample Type MSD

Units: pCi/L

MSD-444 (06/29/17 10:53)	RunNo: 147536	PrepDate: 06/12/17 14:00	BatchID 13368					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228	47	1	47	0.532	117	20		

MSD-445 (07/05/17 00:40)	RunNo: 147649	PrepDate: 06/14/17 12:00	BatchID 13385					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228	47	1	42	11.4	117	20		

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

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



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Inc
Work Order: S1706214
Project: Ottortail Power Big Stone

Date: 7/10/2017
Report ID: S1706214001

Radium 226 in Water -

Sample Type MBLK

Units: pCi/L

MB-1761 (06/20/17 11:47)	RunNo: 147123	PrepDate: 06/12/17 0:00	BatchID 13322
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226 ND 0.2

MB-1762 (06/21/17 10:48)	RunNo: 147141	PrepDate: 06/14/17 0:00	BatchID 13329
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226 ND 0.2

Radium 226 in Water -

Sample Type LCS

Units: pCi/L

LCS-1761 (06/20/17 11:47)	RunNo: 147123	PrepDate: 06/12/17 0:00	BatchID 13322
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226 5.4 0.2 6.41 84.7 67.1 - 122

LCS-1762 (06/21/17 10:48)	RunNo: 147141	PrepDate: 06/14/17 0:00	BatchID 13329
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226 5.7 0.2 6.41 89.1 67.1 - 122

Radium 226 in Water -

Sample Type LCSD

Units: pCi/L

LCSD-1761 (06/20/17 11:47)	RunNo: 147123	PrepDate: 06/12/17 0:00	BatchID 13322
Analyte	Result	RL	Conc %RPD %REC % RPD Limits Qual

Radium 226 6.0 0.2 5.4 9.83 93.5 20

LCSD-1762 (06/21/17 10:48)	RunNo: 147141	PrepDate: 06/14/17 0:00	BatchID 13329
Analyte	Result	RL	Conc %RPD %REC % RPD Limits Qual

Radium 226 6.0 0.2 5.7 5.31 93.9 20

Radium 226 in Water -

Sample Type MS

Units: pCi/L

S1706157-004AMS (06/20/17 11:47)	RunNo: 147123	PrepDate: 06/12/17 0:00	BatchID 13322
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226 6.5 0.2 6.41 0.3 97.8 65 - 131

S1706214-002AMS (06/21/17 10:48)	RunNo: 147141	PrepDate: 06/14/17 0:00	BatchID 13329
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226 12 1 12.8 ND 85.8 65 - 131

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

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

Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003
Phone: 800 782 3557 Fax: 507 359 2890

Field Service Chain of Custody Record

This is an exact copy of
the original document

By AK Date 6 Jun 17
pages 1-16

Project Otter Tail Power Company	Project Type: Big Stone Plant CCR	Name of Samplers: Ben Wolf Matt Stein
Report: Otter Tail Power Company	Carbon Copy:	Quote Number:
Attn: Paul Vukonich	Attn:	Work Order Number: 31-0261
Address: P.O. Box 496 Fergus Falls, MN 56538-0496	Address:	Lab Numbers:
Phone: 218-739-8349		

Sample Information						Bottle Type												Analysis	
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other 150 None	Analysis Required
A2005	H2OX		6 June 17	1056	GW		2	N	1	1	N								See Attached
06	H3OX			1131	GW		2	N	1	1	N								
07	H4OX			1203	GW		2	N	1	1	N								
08	H-6			1240	GW		2	N	1	1	N								
09	H-8			1325	GW		2	N	1	1	N								
10	H-9			1419	GW		2	N	1	1	N								
11	Slag 1			---	GW		2	N	1	1	N								
11	Slag 4			1118	GW		2	N	1	1	N								
12	Slag 5			1453	GW		2	N	1	1	N								
13	Slag 6			1222	GW		2	N	1	1	N								

Comments:

WORK ORDER #2

Samples Relinquished By: <u>Ben Wolf</u>			Samples Received By: <u>A. Huder</u>		
Date: <u>6 Jun 17</u>	Time: <u>1907</u>	Temp: <u>87.65</u>	Date: <u>6 Jun 17</u>	Time: <u>1907</u>	Temp: <u>0-30</u>
Samples Relinquished into: <u>Fridge</u> Log In Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery:	Samplers	Other:	Seal Number(s) - If Used		
Transport:	Ambient	Ice	Other:	Seals Intact?	Yes No

Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003

Phone: 800 782 3557

Fax: 507 359 2890

Field Service Chain of Custody Record

Project Otter Tail Power Company	Project Type: Big Stone Plant CCR	Name of Samplers: Ben wolf matt stein
Report Otter Tail Power Company	Carbon Copy:	Quote Number:
Attn: Paul Vukonich	Attn:	Work Order Number:
Address P.O. Box 496	Address:	Lab Numbers:
Fergus Falls, MN 56538-0496		
Phone: 218-739-8349		

Sample Information						Bottle Type												Analysis	
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other 150 None	Analysis Required
14	Slag 7		6 Jun 17	1159	GW		2	N	1	1	N								See Attached
15	Slag 8			1350	GW		2	N	1	1	N								
16	Slag 9			1515	GW		2	N	1	1	N								
	Slag 9 Deep				GW		2	N	1	1	N								
17	Slag 2B			1538	GW		2	N	1	1	N								

Comments:

WORK ORDER #2

Samples Relinquished By: Ben Wolf			Samples Received By: D. Stead		
Date: 6 Jun 17	Time: 1907	Temp: 87.4	Date: 6 Jun 17	Time: 1907	Temp: 0.8C
Samples Relinquished into: Fridge		Log in Cart	Other:		
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery:	Samplers	Other:	Seal Number(s) - If Used		
Transport:	Ambient	Ice	Other:	Seals Intact?	Yes No

Big Stone Plant CCR Appendix III Parameters

CCR - Appendix III Detection Monitoring

Field Parameters

pH*

* Field and Laboratory Measurements

Total Concentration Parameters

Boron

Calcium

Chloride

Fluoride

pH

Sulfate

Dissolved Solids, Total

Big Stone CCR Appendix IV Parameters

CCR - Appendix IV - Assessment Monitoring

Total Concentration Parameters

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium, Total
Cobalt
Fluoride
Lead
Lithium
Mercury
Molybdenum
Selenium
Thallium
Radium 226 + 228

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site:

Otter Tail Power Co./ Big Stone

Facility ID:

Date: 6 June 17

Unique Station ID

Sample ID:

Slag 4

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: 39.22

Constructed Depth: 39.00

Casing Diameter: 2"

Water Level Before Purge: 17.34

Well Volume: 3.57 Gallons

Well Casing Elevation: NA

Static Water Elevation:

Previous Static:

Water Level After Sam: 21.11

Measurement Method: Elec. WLI Steel Tape

Sampling Information

Weather Conditions: Temp: 73 Wind: LQU Sky: Sunny

Sampling Method: Grundfos ☒ Bladder ☐ Disp. Bt Whale ☐ Grab ☐ Other:

Dedicated Equipment: Yes ☐ No ☒ Pumping Rate: 25 gpm

Well Purged Dry? Yes ☐ No ☒ Time Pump Began: 1033 am pm

Time Purged Dry: Time of Sampling: 1118 am/pm

Duplicate Sample? Yes ☐ No ☒ ID: Sample E 208.4

Sample Appearance: General: Cloudy Color: Tan Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SE Q #	Comments:
1048	6.33	2956	10.97	NA	NA	3.75	1	
1103	6.49	2955	11.16	I	I	7.50	2	
1118	6.58	2949	11.19			11.25	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water R: 11.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 560

507 354 8517

Groundwater Assessor

Sampling Person

Mark S. Kim

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 6 Jun 17

Unique Station ID:

Sample ID: Slag 5

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: 39.00

Constructed Depth: 38.80

Casing Diameter: 2"

Water Level Before Purge: 21.57

Well Volume: 2.84 Gallons

Well Casing Elevation: 1107.30

Static Water Elevation: 1185.73

Previous Static: 1082.49

Water Level After Sample: 36.45

Measurement Method: ☒ Elec. WLL ☐ Steel Tape

Sampling Information

Weather Condition Temp: 85

Wind: SE 8-10

Sky: Sunny

Sampling Method: Grundfos

Bladder SS/T

Disp. Bailer ☒ Whale

Grab ☐ Other:

Dedicated Equipm Yes ☐ No ☒

Pumping Rate: 0.25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began: 2 1436 am ☒ (pm)

Time Purged Dry? 1448

Time of Sampling: 1453 am ☒ (pm)

Duplicate Sample? Yes ☐ No ☒ ID:

Sample EH: 170.0

Sample Appearance General: clear

Color: none

Phase: none

Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1448	7.09	863	12.46	NA	NA	3	1	
							2	
							3	
1453	7.09	861	13.42				4	recheck
							5	

Stabilize Yes ☒ No ☐

Amount Water Removed: 3

Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site:

Otter Tail Power Co./ Big Stone

Facility ID:

Date: 6 June 17

Unique Station ID:

Sample ID:

Slag 6

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: 37.50

Constructed Depth: 37.30

Casing Diameter: 2"

Water Level Before Purge: 23.39

Well Volume: 2.30 Gallons

Well Casing Elevation: NA

Static Water Elevation:

Previous Static:

Water Level After Samp: 30.89

Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 74

Wind: LLV

Sky: Sunny

Sampling Method: Grundfos

Bladder SS/T

Disp. Bailer

Whale

Grab

Other:

Dedicated Equipment: ☒ Yes ☐ No

Pumping Rate: 2.5 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began: 1207 am / pm

Time Purged Dry? 1217

Time of Sampling: 1223 am / pm

Duplicate Sample? ☒ Yes ☐ No

ID:

Sample EH: 199.8

Sample Appearance: General: Cloudy

Color: Tan

Phase: None

Odor: None

10 Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1217	7.20	1273	12.35	NA	NA	2.5	1	
							2	
							3	
							4	
1222	7.15	1392	12.41	+	+	2.5	5	Recharge

Stabilized Yes

☒ No

Amount Water Remove: 2.5

Gallons

Comments:

* good Recharge

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site:

Otter Tail Power Co./ Big Stone

Facility ID:

Date: 6/5/17

Unique Station ID:

Sample ID:

Slag 7

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: 49.04

Constructed Depth: 48.70

Casing Diameter: 2"

Water Level Before Purge: 13.38

Well Volume: 6.82 Gallons

Well Casing Elevation: NA

Static Water Elevation:

Previous Static:

Water Level After Sample: 29.77

Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 73

Wind: LW

Sky: Scary

Sampling Method: Grundfos

Bladder SS/T

Disp. Bailer

Whale

Grab

Other:

Dedicated Equipment Yes ☒ No

Well Purged Dry? ☒ Yes ☐ No

Time Purged Dry? 11:54

Duplicate Sample? Yes ☒ No

ID:

Sample Appearance: General: Slightly cloudy

Color: Tan

Pumping Rate: 25 gpm

Time Pump Began 11:30 am

Time of Sampling: 11:59 am

Sample EH: 203.0

Phase: none

Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
24								
11:54	7.04	1622	9.95	NA	NA	6	1	
							2	
							3	
							4	
11:59	7.04	1635	10.00			6	5	Recharge
Stabilized? Yes <input checked="" type="radio"/> No				Amount Water Removed: 6		Gallons		

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 6 June 17

Unique Station ID:

Sample ID: Slag 8

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? Yes ☒ No ☐

Repairs Necessary: well bent

Protective Posts? ☒ Yes ☐ No

State ID Tag? Yes ☒ No ☐

Grout Seal Intact? Yes ☒ No ☐

Well Information

Well Depth: 52.25

Constructed Depth: 52.09

Casing Diameter: 2"

Water Level Before Purge: 16.73

Well Volume: 5.79 Gallons

Well Casing Elevation: 114

Static Water Elevation:

Previous Static:

Water Level After Sample: 28.39

Measurement Method: ☒ Elec. Wb ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 73

Wind: LEW

Sky: Sunny

Sampling Method: Grundfos

Bladder SS/T

Disp. Bailer

☒ Whale

Grab Other:

Dedicated Equipment Yes ☒ No ☐

Well Purged Dry? Yes ☒ No ☐

Time Purged Dry: -

Duplicate Sample? Yes ☒ No ☐ ID: -

Sample Appearance: General: clear

Color: none

Phase: none

Odor: none

Pumping Rate: .25 gpm

Time Pump Began: 1238

am / pm ☒

Time of Sampling: 1350

am / pm ☒

Sample EH: 147.0

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1302</u>	<u>6.97</u>	<u>1415</u>	<u>11.76</u>	<u>NA</u>	<u>NA</u>	<u>6</u>	<u>1</u>	
<u>1326</u>	<u>7.09</u>	<u>1408</u>	<u>11.77</u>	<u>I</u>	<u>I</u>	<u>12</u>	<u>2</u>	
<u>1350</u>	<u>7.14</u>	<u>1411</u>	<u>11.85</u>	<u>I</u>	<u>I</u>	<u>18</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 18

Gallons

Comments:

-use whale pump because well is bent

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 6 June 17

Unique Station ID:

Sample ID: Slag 9

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☐ Yes ☒ No

Grout Seal Intact? ☐ Yes ☒ No

Well Information

Well Depth: 51.25

Constructed Depth: 49.80

Casing Diameter: 2"

Water Level Before Purge: 14.02

Well Volume: 6.07 Gallons

Well Casing Elevation: NA

Static Water Elevation:

Previous Static:

Water Level After Sample 23.08

Measurement Method: Elec. W Steel Tape

Sampling Information

Weather Conditions: Temp: 73 Wind: LEV Sky: Sunny

Sampling Method: Grundfos Bladder SS/T Disp. Bailer Whale Grab Other:

Dedicated Equipment: ☒ Yes ☐ No

Pumping Rate: 2.25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began 1400 am / pm

Time Purged Dry?

Time of Sampling: 1515 am / pm

Duplicate Sample? ☒ Yes ☐ No

ID:

Sample EH: 161.6

Sample Appearance: General: Clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1425	6.90	2398	10.74	NA	NA	6.25	1	
1450	6.87	2381	10.81	I	I	12.50	2	
1515	6.87	2383	10.84	I	I	18.75	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 18.75 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607

507 354 8517

Groundwater Assessor

Sampling Personnel

Ber Wolf
Matt Stein

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 6 June 17

Unique Station ID:

Sample ID: Slag 2B

Well Condition

Well Locked? Yes ☒ No ☒

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary

Protective Posts? ☒ Yes ☐ No

State ID Tag? Yes ☐ No ☒

Grout Seal Intact? Yes ☐ No ☒

Well Information

Well Depth: 40.94

Constructed Depth: 40.80

Casing Diameter: 2"

Water Level Before Purge 17.52

Well Volume: 3.78 Gallons

Well Casing Elevation: NA

Static Water Elevation:

Previous Static:

Water Level After Sample 39.56

Measurement Method: Elec. Well Steel Tape

Sampling Information

Weather Conditions: Temp: 74

Wind: LBV

Sky: Sunny

Sampling Method: Grundfos Bladder SS

Disp. Bailer

Whale

Grab

Other:

Dedicated Equipment Yes ☒ No ☐

Pumping Rate: .25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began 1517 am / ☒ pm

Time Purged Dry? 1533

Time of Sampling: 1538 am / ☒ pm

Duplicate Sample? Yes ☒ No ☐ ID:

Sample EH: 123.6

Sample Appearance General: sl. cloudy

Color: none

Phase: none

Odor: sulfurous

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1533</u>	<u>7.79</u>	<u>1845</u>	<u>13.04</u>	<u>NA</u>	<u>NA</u>	<u>4</u>	<u>1</u>	
<u>1538</u>	<u>7.84</u>	<u>1856</u>	<u>13.29</u>				<u>2</u>	<u>recharge</u>
							<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized Yes ☒ No ☐

Amount Water Removed: 4

Gallons

Comments:

*Slow Recharge

Exceptions to Protocol:



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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



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FINAL REPORT COMPLETION DATE: 21 Aug 17 AX

Date Reported: 16 Aug 2017

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 31-0334
Account #: 006106
PO #: 48680

Project Name: BIG STONE PLANT CCR

T. J. [Signature] 12 Aug 17
Field Service Manager/Date Reviewed
[Signature] 16 Aug 17
Chemistry Lab Manager/Date Reviewed
[Signature] 16 August 2017
Quality Assurance Director/Date Reviewed

RL = Reporting Limits
NQ = Not Present, Qualitative Only
PQ = Present, Qualitative Only
ND = Not Determined

All data for this report has been approved by MVTL Laboratory Management

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



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 16 Aug 2017
 Lab Number: 17-A32932
 Work Order #: 31-0334
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 11 Jul 2017 11:07
 Sampled By: MVTl FIELD PERSONNEL
 Date Received: 11 Jul 2017 17:46
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 4

Temp at Receipt: 4.2C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				17 Jul 17	JMS
Water Digestions				17 Jul 17	JMS
Radium 226	See Attached			15 Aug 17 15:59	ABL
Radium 228	See Attached			15 Aug 17 15:59	ABL
pH, Field	6.30 units	1.00	EPA M9320	11 Jul 17 11:07	BMW
pH	* 6.9 units	1.0	I-1586-85	12 Jul 17 10:25	AJM
Sulfate	1370 ~ mg/L	5.0	SM 4500 H+ B-2000	18 Jul 17 8:59	MRW
Chloride	52.7 mg/L	3.0	ASTM D516-07	14 Jul 17 8:48	MRW
Mercury	0.008 ug/L	0.005	SM 4500 Cl E	24 Jul 17 15:19	RMB
Solids, Total Dissolved	2590 mg/L	10	EPA 245.7	13 Jul 17 9:14	AJM
Calcium	369.0 mg/L	0.500	SM 2540 C-97	19 Jul 17 13:58	KAM
	~ See narrative		SW6010C		
Lithium	0.189 mg/L	0.005	SW6010C	20 Jul 17 14:04	KAM
Barium	0.050 mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Chromium	< 0.01 mg/L	0.01	SW6010C	19 Jul 17 13:58	KAM
Cobalt	< 0.005 mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Boron	0.721 mg/L	0.100	SW6010C	19 Jul 17 13:58	KAM
Antimony	< 5 @ ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	1 Aug 17 20:10	RMV
Beryllium	< 0.25 ug/L	0.05	SW6020A	2 Aug 17 13:07	RMV
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	1 Aug 17 20:10	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	1 Aug 17 20:10	RMV
Selenium	< 2.5 @ ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	2 Aug 17 13:07	RMV
Fluoride	0.410 # mg/L	0.020	EPA 300.0	12 Jul 17 13:24	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

@ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN IAB # 027-015-125 WI IAB # 999447680 ND MICRO # 1013-M ND WA/DW # R-040

MVTl guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTl to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTl. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

MINNESOTA VALLEY TESTING LABORATORIES, INC.

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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 16 Aug 2017
Lab Number: 17-A32933
Work Order #: 31-0334
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 11 Jul 2017 14:33
Sampled By: MVTI FIELD PERSONNEL
Date Received: 11 Jul 2017 17:46
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 5

Temp at Receipt: 4.2C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				17 Jul 17	JMS
Water Digestions				17 Jul 17	JMS
Radium 226	See Attached			15 Aug 17 15:59	ABL
Radium 228	See Attached		EPA M9320	15 Aug 17 15:59	ABL
pH, Field	7.04 units	1.00	I-1586-85	11 Jul 17 14:33	MS
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	12 Jul 17 10:25	AJM
Sulfate	84.0 mg/L	5.0	ASTM D516-07	18 Jul 17 8:59	MRW
Chloride	8.9 mg/L	3.0	SM 4500 Cl E	14 Jul 17 8:48	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	24 Jul 17 16:02	RMB
Solids, Total Dissolved	487 mg/L	10	SM 2540 C-97	13 Jul 17 9:14	AJM
Calcium	110.0 mg/L	0.500	SW6010C	19 Jul 17 13:58	KAM
	See Narrative				
Lithium	0.023 mg/L	0.005	SW6010C	20 Jul 17 14:04	KAM
Barium	0.148 mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Chromium	< 0.01 mg/L	0.01	SW6010C	19 Jul 17 13:58	KAM
Cobalt	< 0.005 mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Boron	0.512 mg/L	0.100	SW6010C	19 Jul 17 13:58	KAM
Antimony	< 2 @^ ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Arsenic	< 1 @ ug/L	0.5	SW6020A	1 Aug 17 20:10	RMV
Beryllium	< 0.1 ug/L	0.05	SW6020A	2 Aug 17 13:07	RMV
	@See Narrative				
Cadmium	0.24 @ ug/L	0.10	SW6020A	1 Aug 17 20:10	RMV
Lead	< 1 @ ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Molybdenum	11.8 @ ug/L	0.50	SW6020A	1 Aug 17 20:10	RMV
Selenium	< 4 @^ ug/L	0.5	SW6020A	1 Aug 17 20:10	RMV
Thallium	< 0.2 @ ug/L	0.1	SW6020A	2 Aug 17 13:07	RMV
Fluoride	0.250 # mg/L	0.020	EPA 300.0	12 Jul 17 13:24	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

* The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards,
The reporting limit was elevated for any analyte requiring a dilution as coded below:
0 = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DH # R-040

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



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 www.mvttl.com



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 16 Aug 2017
 Lab Number: 17-A32934
 Work Order #: 31-0334
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 11 Jul 2017 12:34
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 11 Jul 2017 17:46
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 6

Temp at Receipt: 4.2C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				17 Jul 17	JMS
Water Digestions				17 Jul 17	JMS
Radium 226	See Attached			15 Aug 17 15:59	ABL
Radium 228	See Attached		EPA M9320	15 Aug 17 15:59	ABL
pH, Field	7.05 units	1.00	I-1586-85	11 Jul 17 12:34	BMW
pH	* 7.2 units	1.0	SM 4500 H+ B-2000	12 Jul 17 12:30	AJM
Sulfate	250 @ mg/L	5.0	ASTM D516-07	18 Jul 17 8:59	MRW
Chloride	7.6 mg/L	3.0	SM 4500 Cl E	14 Jul 17 8:48	MRW
Mercury	0.012 ug/L	0.005	EPA 245.7	24 Jul 17 16:02	RMB
Solids, Total Dissolved	876 mg/L	10	SM 2540 C-97	13 Jul 17 9:14	AJM
Calcium	154.0 mg/L	0.500	SW6010C	19 Jul 17 13:58	KAM
	See Narrative				
Lithium	0.112 mg/L	0.005	SW6010C	20 Jul 17 14:04	KAM
Barium	0.077 mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Chromium	< 0.01 mg/L	0.01	SW6010C	19 Jul 17 13:58	KAM
Cobalt	< 0.005 mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Boron	1.850 mg/L	0.100	SW6010C	19 Jul 17 13:58	KAM
Antimony	< 2 @^ ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Arsenic	3.59 @ ug/L	0.50	SW6020A	1 Aug 17 20:10	RMV
Beryllium	0.20 @ ug/L	0.05	SW6020A	9 Aug 17 12:36	RMV
Cadmium	0.28 @ ug/L	0.10	SW6020A	1 Aug 17 20:10	RMV
Lead	3.49 @ ug/L	0.50	SW6020A	2 Aug 17 13:07	RMV
Molybdenum	6.85 @ ug/L	0.50	SW6020A	1 Aug 17 20:10	RMV
Selenium	5.15 @^ ug/L	0.50	SW6020A	1 Aug 17 20:10	RMV
Thallium	< 0.2 @ ug/L	0.1	SW6020A	2 Aug 17 13:07	RMV
Fluoride	0.770 # mg/L	0.020	EPA 300.0	12 Jul 17 13:24	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

* The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

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

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

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040

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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 16 Aug 2017
Lab Number: 17-A32935
Work Order #: 31-0334
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 11 Jul 2017 12:12
Sampled By: MVTL FIELD PERSONNEL
Date Received: 11 Jul 2017 17:46
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 7

Temp at Receipt: 4.2C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				17 Jul 17	JMS
Water Digestions				17 Jul 17	JMS
Radium 226	See Attached			15 Aug 17 15:59	ABL
Radium 228	See Attached		EPA M9320	15 Aug 17 16:00	ABL
pH, Field	6.84 units	1.00	I-1586-85	11 Jul 17 12:12	BMW
pH	* 7.3 units	1.0	SM 4500 H+ B-2000	12 Jul 17 12:30	AJM
Sulfate	541 ~ mg/L	5.0	ASTM D516-07	18 Jul 17 8:59	MRW
Chloride	5.5 mg/L	3.0	SM 4500 Cl E	14 Jul 17 8:48	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	24 Jul 17 16:02	RMB
Solids, Total Dissolved	1200 mg/L	10	SM 2540 C-97	13 Jul 17 9:14	AJM
Calcium	229.0 mg/L	0.500	SW6010C	19 Jul 17 13:58	KAM
	~ See narrative				
Lithium	0.081 mg/L	0.005	SW6010C	20 Jul 17 14:04	KAM
Barium	0.036 mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Chromium	< 0.01 mg/L	0.01	SW6010C	19 Jul 17 13:58	KAM
Cobalt	< 0.005 mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Boron	1.110 mg/L	0.100	SW6010C	19 Jul 17 13:58	KAM
Antimony	< 2 @^ ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Arsenic	< 1 @ ug/L	0.5	SW6020A	1 Aug 17 20:10	RMV
Beryllium	< 0.1 ug/L	0.05	SW6020A	2 Aug 17 13:07	RMV
	@See Narrative				
Cadmium	0.40 @ ug/L	0.10	SW6020A	1 Aug 17 20:10	RMV
Lead	1.34 @ ug/L	0.50	SW6020A	2 Aug 17 13:07	RMV
Molybdenum	4.65 @ ug/L	0.50	SW6020A	1 Aug 17 20:10	RMV
Selenium	< 4 @^ ug/L	0.5	SW6020A	1 Aug 17 20:10	RMV
Thallium	< 0.2 @ ug/L	0.1	SW6020A	2 Aug 17 13:07	RMV
Fluoride	0.600 # mg/L	0.020	EPA 300.0	12 Jul 17 13:24	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analysis requiring a dilution as coded below:
Q = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

Small print: MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 16 Aug 2017
Lab Number: 17-A32936
Work Order #: 31-0334
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 11 Jul 2017 15:09
Sampled By: MVTI FIELD PERSONNEL
Date Received: 11 Jul 2017 17:46
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 8

Temp at Receipt: 4.2C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					17 Jul 17	JMS
Water Digestions					17 Jul 17	JMS
Radium 226	See Attached				15 Aug 17 16:00	ABL
Radium 228	See Attached			EPA M9320	15 Aug 17 16:00	ABL
pH, Field	6.96	units	1.00	I-1586-85	11 Jul 17 15:09	BMW
pH	* 7.2	units	1.0	SM 4500 H+ B-2000	12 Jul 17 12:30	AJM
Sulfate	264 @	mg/L	5.0	ASTM D516-07	18 Jul 17 8:59	MRW
Chloride	43.2	mg/L	3.0	SM 4500 Cl E	14 Jul 17 8:48	MRW
Mercury	< 0.005	ug/L	0.005	EPA 245.7	24 Jul 17 16:02	RMB
Solids, Total Dissolved	881	mg/L	10	SM 2540 C-97	13 Jul 17 9:14	AJM
Calcium	113.0	mg/L	0.500	SW6010C	19 Jul 17 14:40	KAM
Lithium	0.056	mg/L	0.005	SW6010C	20 Jul 17 14:32	KAM
Barium	0.045	mg/L	0.005	SW6010C	19 Jul 17 14:40	KAM
Chromium	< 0.01	mg/L	0.01	SW6010C	19 Jul 17 14:40	KAM
Cobalt	< 0.005	mg/L	0.005	SW6010C	19 Jul 17 14:40	KAM
Boron	0.485	mg/L	0.100	SW6010C	19 Jul 17 14:40	KAM
Antimony	< 2 @^	ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Arsenic	< 1 @	ug/L	0.5	SW6020A	1 Aug 17 20:10	RMV
Beryllium	< 0.1	ug/L	0.05	SW6020A	2 Aug 17 13:07	RMV
	@See Narrative					
Cadmium	< 0.2 @	ug/L	0.1	SW6020A	1 Aug 17 20:10	RMV
Lead	< 1 @	ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Molybdenum	8.62 @	ug/L	0.50	SW6020A	1 Aug 17 20:10	RMV
Selenium	21.2 @^	ug/L	0.50	SW6020A	1 Aug 17 20:10	RMV
Thallium	< 0.2 @	ug/L	0.1	SW6020A	2 Aug 17 13:07	RMV
Fluoride	0.340 #	mg/L	0.020	EPA 300.0	13 Jul 17 10:50	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL - Reporting Limit

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

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 quantization

* = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125

WI LAB # 999447680

ND MICRO # 1013-M

ND WW/DW H R-040

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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 16 Aug 2017
 Lab Number: 17-A32937
 Work Order #: 31-0334
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 11 Jul 2017 13:55
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 11 Jul 2017 17:46
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 9

Temp at Receipt: 4.2C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				17 Jul 17	JMS
Water Digestions				17 Jul 17	JMS
Radium 226	See Attached			15 Aug 17 16:00	ABL
Radium 228	See Attached		EPA M9320	15 Aug 17 16:00	ABL
pH, Field	6.84 units	1.00	I-1586-85	11 Jul 17 13:55	BMN
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	12 Jul 17 12:30	AJM
Sulfate	977 ~ mg/L	5.0	ASTM D516-07	18 Jul 17 9:17	MRW
Chloride	7.6 mg/L	3.0	SM 4500 Cl E	14 Jul 17 8:48	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	24 Jul 17 16:02	RMB
Solids, Total Dissolved	1800 mg/L	10	SM 2540 C-97	13 Jul 17 9:14	AJM
Calcium	345.0 ~ mg/L	0.500	SW6010C	19 Jul 17 14:40	KAM
Lithium	0.132 mg/L	0.005	SW6010C	20 Jul 17 14:32	KAM
Barium	0.027 mg/L	0.005	SW6010C	19 Jul 17 14:40	KAM
Chromium	< 0.01 mg/L	0.01	SW6010C	19 Jul 17 14:40	KAM
Cobalt	< 0.005 mg/L	0.005	SW6010C	19 Jul 17 14:40	KAM
Boron	0.222 mg/L	0.100	SW6010C	19 Jul 17 14:40	KAM
Antimony	< 5 @^ ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	1 Aug 17 20:10	RMV
Beryllium	< 0.25 ug/L	0.05	SW6020A	2 Aug 17 13:07	RMV
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	1 Aug 17 20:10	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Molybdenum	9.24 @ ug/L	0.50	SW6020A	1 Aug 17 20:10	RMV
Selenium	< 2.5 @ ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	2 Aug 17 13:07	RMV
Fluoride	0.250 # mg/L	0.020	EPA 300.0	13 Jul 17 10:50	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

@ = Due to sample matrix

= Due to concentration of other analytes

! = Due to sample quantity

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 MI LAB # 999447680 ND MICRO # 1013-M ND WH/DW # R-040

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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 16 Aug 2017
 Lab Number: 17-A32938
 Work Order #: 31-0334
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 11 Jul 2017 11:37
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 11 Jul 2017 17:46
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: SLAG 2B

Temp at Receipt: 4.2C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				17 Jul 17	JMS
Water Digestions				17 Jul 17	JMS
Radium 226	See Attached			15 Aug 17 16:00	ABL
Radium 228	See Attached		EPA M9320	15 Aug 17 16:00	ABL
pH, Field	7.09 units	1.00	I-1586-85	11 Jul 17 11:37	BMW
pH	* 7.3 units	1.0	SM 4500 H+ B-2000	12 Jul 17 12:30	AJM
Sulfate	804 ~ mg/L	5.0	ASTM D516-07	18 Jul 17 9:17	MRW
Chloride	33.3 mg/L	3.0	SM 4500 Cl E	14 Jul 17 8:48	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	24 Jul 17 16:02	RMB
Solids, Total Dissolved	1530 mg/L	10	SM 2540 C-97	13 Jul 17 9:14	AJM
Calcium	258.0 ~ mg/L	0.500	SW6010C	19 Jul 17 14:40	KAM
Lithium	0.064 mg/L	0.005	SW6010C	20 Jul 17 14:32	KAM
Barium	0.102 mg/L	0.005	SW6010C	19 Jul 17 14:40	KAM
Chromium	< 0.01 mg/L	0.01	SW6010C	19 Jul 17 14:40	KAM
Cobalt	0.008 mg/L	0.005	SW6010C	19 Jul 17 14:40	KAM
Boron	3.580 mg/L	0.100	SW6010C	19 Jul 17 14:40	KAM
Antimony	< 5 @ ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Arsenic	1.60 @ ug/L	0.50	SW6020A	1 Aug 17 20:10	RMV
Beryllium	< 0.25 ug/L	0.05	SW6020A	2 Aug 17 13:07	RMV
	@See Narrative				
Cadmium	0.25 @ ug/L	0.10	SW6020A	1 Aug 17 20:10	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Molybdenum	5.29 @ ug/L	0.50	SW6020A	1 Aug 17 20:10	RMV
Selenium	< 4 @ ^ ug/L	0.5	SW6020A	1 Aug 17 20:10	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	2 Aug 17 13:07	RMV
Fluoride	< 0.2 # mg/L	0.02	EPA 300.0	13 Jul 17 10:50	RC

* Holding Time Exceeded

Radium 226 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

Radium 228 subcontracted to:
 Inter-Mountain Labs
 1673 Terra Ave
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

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

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

@ = Due to sample matrix # = Due to concentration of other analytes
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-R ND WQ/DW # R-040

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



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



Page: 18 of 18

INORGANIC & METALS ANALYSES:

Due to the high concentration of calcium in the spiked sample, the recovery for calcium was outside the acceptance range in the matrix spike duplicate for samples 17-A32926 through 17-A32935. The data was reported based on the acceptable recoveries of the blank spike and relative percent difference of the matrix spikes.

The internal standard associated with beryllium was outside of acceptance range in the blank spike, matrix spike, and matrix spike duplicate in samples 17-A32926 through 17-A32933 and 17-A32935 through 17-A32938. Data was reported based on the acceptable recovery of beryllium in the blank spike, matrix spike, and matrix spike duplicate.

For samples 17-A32929 through 17-A32933 and 17-A32935 through 17-A32938, the beryllium recovery was elevated outside of acceptance range in the knowns. Data that was below the reporting limit was reported.

Lead was detected in the blank associated with samples 17-A32926 through 17-A32928 at 1.57 ug/L. Data that was below the reporting limit was reported.

No other problems were encountered with these analyses.

Quality Control Report

Lab IDs: 17-A32926 to 17-A32938

Project: BIG STONE PLANT CCR

Work Order: 201731-0334

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 ug/L	25.0	98	85-115	25.0	17A32928q	< 5	26.3	105	75-125	26.3	27.8	111	5.5	10	102	90-110	< 0.5
	25.0	98	85-115	25.0	17A32938q	< 5	26.4	106	75-125	26.4	26.3	105	0.4	10	102	90-110	< 0.5
Arsenic ug/L	25.0	98	85-115	25.0	17A32928q	< 2.5	28.1	112	75-125	28.1	29.6	118	5.2	10	98	90-110	< 0.5
	25.0	98	85-115	25.0	17A32938q	1.60	28.4	107	75-125	28.4	28.1	106	1.1	10	100	90-110	< 0.5
Barium mg/L	1.000	100	85-115	1.00	17A32935q	0.036	1.050	101	75-125	1.050	1.060	102	0.9	10	97	90-110	< 0.005
				1.00	17A32945q	0.070	1.080	101	75-125	1.080	1.090	102	0.9	10	99 98	90-110 90-110	
Beryllium ug/L	2.50	98	85-115	2.50	17A32928q	< 0.25	2.36	94	75-125	2.36	2.56	102	8.1	10	104	90-110	< 0.05
	2.50	98	85-115	2.50	17A32938q	< 0.25	2.53	101	75-125	2.53	2.54	102	0.4	10	110	90-110	< 0.05
	2.50	102	85-115	2.50	a32938qc	< 0.25	2.63	105	75-125	2.63	2.58	103	1.9	10	108	90-110	< 0.05
Boron mg/L	1.000	96	85-115	1.00	17A32935q	1.110	2.230	112	75-125	2.230	2.330	122	4.4	10	94	90-110	< 0.1
				1.00	17A32945q	< 0.1	1.040	104	75-125	1.040	1.050	105	1.0	10	96 95	90-110 90-110	
Cadmium ug/L	5.00	98	85-115	5.00	17A32928q	< 0.5	5.35	107	75-125	5.35	5.65	113	5.5	10	99	90-110	< 0.1
	5.00	98	85-115	5.00	17A32938q	0.25	5.35	102	75-125	5.35	5.37	102	0.4	10	98	90-110	< 0.1
Calcium mg/L	50.00	98	85-115	50.0	17A32935q	229.0	279.0	100	75-125	279.0	303.0	148	8.2	10	94	90-110	< 0.5
				50.0	17A32945q	117.0	170.0	106	75-125	170.0	169.0	104	0.6	10	97 96	90-110 90-110	
Chloride mg/L	-	-	-	60.0	17-A32901	15.6	82.0	111	85-121	82.0	79.4	106	3.2	5	95	90-110	< 3
	-	-	-	60.0	17-A32939	< 3	61.3	102	85-121	61.3	61.6	103	0.5	5	95	90-110	< 3
Chromium mg/L	1.000	101	85-115	1.00	17A32935q	< 0.01	0.994	99	75-125	0.994	1.010	101	1.6	10	98	90-110	< 0.01
				1.00	17A32945q	< 0.01	1.020	102	75-125	1.020	1.010	101	1.0	10	102 100	90-110 90-110	
Cobalt mg/L	1.000	102	85-115	1.00	17A32935q	< 0.005	0.923	92	75-125	0.923	0.944	94	2.2	10	96	90-110	< 0.005
				1.00	17A32945q	< 0.005	0.959	96	75-125	0.959	0.962	96	0.3	10	100 100	90-110 90-110	
Fluoride mg/L	-	-	-	2.00	17-A32935	0.600	2.54	97	75-125	2.54	2.54	97	0.0	10	99	90-110	< 0.02
	-	-	-	2.00	17-A32945	0.320	2.13	91	75-125	2.13	2.21	94	3.7	10	97	90-110	< 0.02

Quality Control Report

Lab IDs: 17-A32926 to 17-A32938

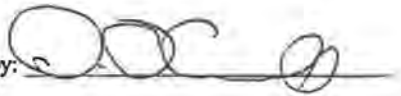
Project: BIG STONE PLANT CCR

Work Order: 201731-0334

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Lead ug/L	25.0	91	85-115	25.0	17A32928q	<2.5	26.3	105	75-125	26.3	27.8	111	5.5	10	97	90-110	1.57
	25.0	101	85-115	25.0	17A32938q	<2.5	26.7	107	75-125	26.7	27.0	108	1.1	10	102	90-110	<0.5
Lithium mg/L	1.000	105	85-115	1.00	17-A32935	0.081	1.200	112	75-125	1.200	1.200	112	0.0	10	105	90-110	<0.005
				1.00	17-A32944	0.025	1.140	112	75-125	1.140	1.140	112	0.0	10	106 107	90-110 90-110	
Mercury ug/L	-	-	-	0.10	17-A32931	<0.005	0.102	102	63-111	0.102	0.102	102	0.0	18	103	76-113	<0.005
	-	-	-	0.10	17-A32942	<0.005	0.099	99	63-111	0.099	0.099	99	0.0	18	99	76-113	<0.005
	-	-	-														<0.005
	-	-	-														<0.005
	-	-	-														<0.005
Molybdenum ug/L	25.0	101	85-115	25.0	17A32928q	4.48	30.5	104	75-125	30.5	32.7	113	7.0	10	99	90-110	<0.5
	25.0	101	85-115	25.0	17A32938q	5.29	30.4	100	75-125	30.4	29.9	98	1.7	10	100	90-110	<0.5
pH units	-	-	-	-	-	-	-	-	-	7.1	7.1	-	0.0	2.5	101	90-110	-
	-	-	-	-	-	-	-	-	-	7.1	7.1	-	0.0	2.5	101	90-110	-
Selenium ug/L	25.0	98	85-115	25.0	17A32928q	<5	30.3	121	75-125	30.3	30.6	122	1.0	10	98	90-110	<2
	25.0	94	85-115	25.0	17A32938q	<4	29.4	118	75-125	29.4	27.5	110	6.7	10	102	90-110	<2
	25.0	98	85-115	25.0	17A32928q	<2.5	27.5	110	75-125	27.5	28.0	112	1.8	10	101	90-110	<0.5
	25.0	94	85-115	25.0	17A32938q	<2.5	26.7	107	75-125	26.7	26.8	107	0.4	10	100	90-110	<0.5
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	878	876	-	0.2	8	100	85-115	<10
	-	-	-	-	-	-	-	-	-	645	649	-	0.6	8	88	85-115	
Sulfate mg/L	-	-	-	50.0	17-A33239	57.6	107	99	74-128	107	109	103	1.9	5	100	80-120	<5
	-	-	-	5000	17-A32926	2510	8350	117	74-128	8350	8360	117	0.1	5	105	80-120	<5
	-	-	-	500	17-A32936	264	816	110	74-128	816	823	112	0.9	5	102	80-120	<5
	-	-	-	500	17-A32946	305	917	122	74-128	917	909	121	0.9	5			
Thallium ug/L	5.00	99	85-115	5.00	17A32928q	<0.5	5.38	108	75-125	5.38	5.54	111	2.9	10	105	90-110	<0.1
	5.00	99	85-115	5.00	17A32938q	<0.5	5.32	106	75-125	5.32	5.38	108	1.1	10	104	90-110	<0.1

The calcium matrix spike duplicate recovery was outside the acceptance limits, see narrative
Lead was found in the laboratory blank at 1.57 ug/L, see narrative.

Approved by:

A handwritten signature in black ink, consisting of several loops and a final flourish, written over a horizontal line.



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Date: 8/15/2017

CLIENT: MVTL Inc
Project: Ottertail Power Big Stone
Lab Order: S1707202

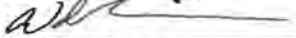
CASE NARRATIVE
Report ID: S1707202001

Samples H-6-A32929, H-8-A32930, H-9-A32931, H2OX-A32926, H3OX-A32927, H4OX-A32928, SLAG-4-A32932, SLAG-5-A32933, SLAG-6-A32934, SLAG-7-A32935, SLAG-8-A32936, SLAG-9-A32937, and SLAG2B-A32938 were received on July 14, 2017.

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

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

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

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 1



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Big Stone
Lab ID: S1707202-007
ClientSample ID: SLAG-4-A32932
COC: wo#31-0334

Date Reported 8/15/2017
Report ID S1707202001

WorkOrder: S1707202
CollectionDate: 7/11/2017 11:07:00 AM
DateReceived: 7/14/2017 11:21:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	1.4	pCi/L		1	SM 7500 Ra-B	08/11/2017 1610 MB
Radium 226 Precision (±)	0.2	pCi/L			SM 7500 Ra-B	08/11/2017 1610 MB
Radium 228	ND	pCi/L		2	Ga-Tech	08/12/2017 1424 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/12/2017 1424 MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 7 of 13



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Big Stone
Lab ID: S1707202-008
ClientSample ID: SLAG-5-A32933
COC: wo#31-0334

Date Reported: 8/15/2017
Report ID: S1707202001

WorkOrder: S1707202
CollectionDate: 7/11/2017 2:33:00 PM
DateReceived: 7/14/2017 11:21:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	08/11/2017 1610 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	08/11/2017 1610 MB
Radium 228	ND	pCi/L		2	Ga-Tech	08/12/2017 1727 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/12/2017 1727 MB

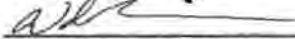
These results apply only to the samples tested.

RL - Reporting Limit

Qualifiers:

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

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

Reviewed by: 
Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 8/15/2017
Report ID S1707202001

ProjectName: Ottertail Power Big Stone
Lab ID: S1707202-009
ClientSample ID: SLAG-6-A32934
COC: wo#31-0334

WorkOrder: S1707202
CollectionDate: 7/11/2017 12:34:00 PM
DateReceived: 7/14/2017 11:21:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	08/11/2017 1610	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	08/11/2017 1610	MB
Radium 228	ND	pCi/L		2	Ga-Tech	08/12/2017 2030	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/12/2017 2030	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 8/15/2017
Report ID S1707202001

ProjectName: Ottertail Power Big Stone
Lab ID: S1707202-010
ClientSample ID: SLAG-7-A32935
COC: wo#31-0334

WorkOrder: S1707202
CollectionDate: 7/11/2017 12:12:00 PM
DateReceived: 7/14/2017 11:21:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	08/11/2017 1610	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	08/11/2017 1610	MB
Radium 228	ND	pCi/L		2	Ga-Tech	08/12/2017 2333	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/12/2017 2333	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: Wade Nieuwsma
Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Big Stone
Lab ID: S1707202-011
ClientSample ID: SLAG-8-A32936
COC: wo#31-0334

Date Reported: 8/15/2017
Report ID: S1707202001

WorkOrder: S1707202
CollectionDate: 7/11/2017 3:09:00 PM
DateReceived: 7/14/2017 11:21:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	08/11/2017 1610 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	08/11/2017 1610 MB
Radium 228	ND	pCi/L		2	Ga-Tech	08/13/2017 236 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/13/2017 236 MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: Wade Nieuwsma
Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 8/15/2017
Report ID S1707202001

ProjectName: Ottertail Power Big Stone
Lab ID: S1707202-012
ClientSample ID: SLAG-9-A32937
COC: wo#31-0334

WorkOrder: S1707202
CollectionDate: 7/11/2017 1:55:00 PM
DateReceived: 7/14/2017 11:21:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	08/11/2017 1610	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	08/11/2017 1610	MB
Radium 228	ND	pCi/L		2	Ga-Tech	08/13/2017 539	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/13/2017 539	MB

These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

Your Environmental Monitoring Partner

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

Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Big Stone
Lab ID: S1707202-013
ClientSample ID: SLAG2B-A32938
COC: wo#31-0334

Date Reported 8/15/2017
Report ID S1707202001

WorkOrder: S1707202
CollectionDate: 7/11/2017 11:37:00 AM
DateReceived: 7/14/2017 11:21:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	08/11/2017 1610	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	08/11/2017 1610	MB
Radium 228	ND	pCi/L		2	Ga-Tech	08/13/2017 842	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/13/2017 842	MB

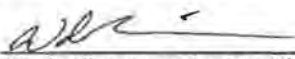
These results apply only to the samples tested.

RL - Reporting Limit

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

C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by:


Wade Nieuwsma, Assistant Laboratory Manager

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Inter-Mountain Labs

Your Environmental Monitoring Partner

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

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTI Inc
Work Order: S1707202
Project: Ottertail Power Big Stone

Date: 8/15/2017
Report ID: S1707202001

Radium 228 by Ga/Tech		Sample Type	MBLK		Units: pCi/L				
MB-452 (08/10/17 22:43)		RunNo: 148962		PrepDate: 07/19/17 12:00		BatchID 13543			
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-452 (08/11/17 01:46)		RunNo: 148962		PrepDate: 07/19/17 12:00		BatchID 13543			
Analyte		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		33	1	39.5		83.8	65.9 - 132		
Radium 228 by Ga/Tech		Sample Type	MS		Units: pCi/L				
MS-452 (08/11/17 07:52)		RunNo: 148962		PrepDate: 07/19/17 12:00		BatchID 13543			
Analyte		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		44	1	39.5	ND	111	50 - 139		
Radium 228 by Ga/Tech		Sample Type	MSD		Units: pCi/L				
MSD-452 (08/11/17 10:55)		RunNo: 148962		PrepDate: 07/19/17 12:00		BatchID 13543			
Analyte		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228		42	1	44	4.14	106	20		
Radium 226 in Water -		Sample Type	MBLK		Units: pCi/L				
MB-1778 (08/11/17 11:29)		RunNo: 148977		PrepDate: 07/31/17 0:00		BatchID 13532			
Analyte		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226		ND	0.2						
Radium 226 in Water -		Sample Type	LCS		Units: pCi/L				
LCS-1778 (08/11/17 11:29)		RunNo: 148977		PrepDate: 07/31/17 0:00		BatchID 13532			
Analyte		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226		5.8	0.2	6.41		90.6	67.1 - 122		
Radium 226 in Water -		Sample Type	MS		Units: pCi/L				
MS-1778 (08/11/17 11:29)		RunNo: 148977		PrepDate: 07/31/17 0:00		BatchID 13532			
Analyte		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226		5.8	0.2	6.41	ND	89.5	65 - 131		
Radium 226 in Water -		Sample Type	MSD		Units: pCi/L				
MSD-1778 (08/11/17 11:29)		RunNo: 148977		PrepDate: 07/31/17 0:00		BatchID 13532			
Analyte		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Radium 226		6.2	0.2	5.8	7.76	96.7	20		

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



Inter-Mountain Labs
Sheridan, WY and Gillette, WY

CHAIN OF CUSTODY RECORD

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All shaded fields must be completed.

#WEB

This is a legal document; any misrepresentation may be construed as fraud.

Client Name MVTL		Project Identification Offertail Power Big Stone		Sampler (Signature/Attestation of Authenticity)		Telephone #	
Report Address 1126 North Front St New Ulm, Mn 56073		Contact Name Tim Portner		ANALYSES / PARAMETERS			
Invoice Address Same		Email tportner@mvtl.com					
Phone 507-276-8089		Purchase Order #		Quote #		REMARKS	
LAB ID (Lab Use Only)		DATE SAMPLED		TIME			
ITEM					Matrix	# of Containers	
1	51707202-01	11 Jun 17	1116	H2OX - A32926	WT	2	x
2	-002		1149	H3OX - A32927	WT	2	x
3	-003		1209	H4OX - A32928	WT	2	x
4	-004		1237	H-6 - A32929	WT	2	x
5	-005		1317	H-8 - A32930	WT	2	x
6	-006		1403	H-9 - A32931	WT	2	x
7				Slag-1 No Sample	WT	2	x
8	-007		1107	Slag-4 A32932	WT	2	x
9	-008		1433	Slag-5 A32933	WT	2	x
10	-009		1234	Slag-6 A32934	WT	2	x
11	-010		1212	Slag-7 A32935	WT	2	x
12	-011		1509	Slag-8 A32936	WT	2	x
13							
14							
LAB COMMENTS		Relinquished By (Signature/Printed)		DATE	TIME	Received By (Signature/Printed)	
23.5°C						7/14/17 11:22	
SHIPPING INFO		MATRIX CODES		TURN AROUND TIMES		COMPLIANCE INFORMATION	
<input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> USPS <input type="checkbox"/> Hand Carried <input type="checkbox"/> Other		Water WT Soil SL Solid SD Filter FT Other OT		Check desired service <input type="checkbox"/> Standard turnaround <input checked="" type="checkbox"/> RUSH - 5 Working Days <input checked="" type="checkbox"/> URGENT - < 2 Working Days <i>Rush & Urgent Surcharges will be applied</i>		Compliance Monitoring ? Y / N Program (SDWA, NPDES,...) PWSID / Permit # Chlorinated? Y / N Sample Disposal: Lab Client	
						ADDITIONAL REMARKS	



Inter-Mountain Labs
Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

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All shaded fields must be completed.

#WEB

This is a legal document; any misrepresentation may be construed as fraud.

Client Name MVTL		Project Identification Ottertail Power Big Stone		Sampler (Signature/Attestation of Authenticity)		Telephone #	
Report Address 1126 North Front St. New Ulm, Mn 56073		Contact Name Tim Portner		Email tportner@mytl.com		ANALYSES / PARAMETERS	
Invoice Address Same		Phone 507-276-8089		Purchase Order #		Quote #	
LAB ID (Lab Use Only)		DATE SAMPLED		TIME SAMPLED		SAMPLE IDENTIFICATION	
Matrix		# of Containers		Radium 226 + 228		REMARKS	
1	-02	11/20/17	1355	Slag 9 - A32937	WT	2	x
2				Slag 9 Deep - No Sample	WT	2	x
3	-03	11/27	1137	Slag 2B - A32938	WT	2	x
4				MVTL WO# 31-D334			x
5							x
6							x
7							x
8							x
9							x
10							x
11							x
12							x
13							x
14							x
LAB COMMENTS		Relinquished By (Signature/Printed)		DATE	TIME	Received By (Signature/Printed)	
23.5°C						Tim Portner 11/27/17 11:21	
SHIPPING INFO		MATRIX CODES		TURN AROUND TIMES		COMPLIANCE INFORMATION	
<input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> USPS <input type="checkbox"/> Hand Carried <input type="checkbox"/> Other		Water WT Soil SL Solid SD Filter FT Other OT		Check desired service <input type="checkbox"/> Standard turnaround <input checked="" type="checkbox"/> RUSH - 5 Working Days <input checked="" type="checkbox"/> URGENT - < 2 Working Days Rush & Urgent Surcharges will be applied		Compliance Monitoring ? Y / N Program (SDWA, NPDES,...) PWSID / Permit # Chlorinated? Y / N Sample Disposal: Lab Client	
ADDITIONAL REMARKS							

Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003
Phone: 800 782 3557 Fax: 507 359 2890

Field Service Chain of Custody Record

This is an exact copy of
the original document

By AS Date 12 Jul 17
pages 1-17

Project Otter Tail Power Company	Project Type: Big Stone Plant CCR	Name of Samplers: Ben Wolf, Matt Stein
Report Otter Tail Power Company	Carbon Copy:	Quote Number:
Attn: Paul Vukonich	Attn:	Work Order Number: 310334
Address P.O. Box 496	Address:	Lab Numbers:
Fergus Falls, MN 56538-0496		
Phone: 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
A32926	H2OX		11 July 17	1116	GW		2	N	1	1	N								See Attached
21	H3OX			1149	GW		2	N	1	1	N								
28	H4OX			1209	GW		2	N	1	1	N								
29	H-6			1237	GW		2	N	1	1	N								
30	H-8			1317	GW		2	N	1	1	N								
31	H-9			1402	GW		2	N	1	1	N								
—	Slag 1			—	GW		2	N	1	1	N								
32	Slag 4			1107	GW		2	N	1	1	N								
33	Slag 5			1433	GW		2	N	1	1	N								
34	Slag 6			1234	GW		2	N	1	1	N								

Comments:

WORK ORDER #2

Samples Relinquished By: <u>Ben Wolf</u>			Samples Received By: <u>Dr. Greding</u>		
Date: <u>11 Jul 17</u>	Time: <u>1746</u>	Temp: <u>27.6</u>	Date: <u>12 Jul 17</u>	Time: <u>900</u>	Temp: <u>4.20</u>
Samples Relinquished into: <u>Bridge</u> Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery:	Samplers	Other:	Seal Number(s) - If Used		
Transport:	Ambient	Ice	Other:	Seals Intact?	Yes No

Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003

Phone: 800 782 3557 Fax: 507 359 2890

Field Service Chain of Custody Record

Project Otter Tail Power Company	Project Type: Big Stone Plant CCR	Name of Samplers: Ben Wolf, Matt Stein
Report Otter Tail Power Company	Carbon Copy:	Quote Number:
Attn: Paul Vukonich	Attn:	Work Order Number:
Address P.O. Box 496	Address:	Lab Numbers:
Fergus Falls, MN 56538-0496		
Phone: 218-739-8349		

Sample Information						Bottle Type												Analysis	
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other 150 None	Analysis Required
35	Slag 7		11 July 17	1212	GW		2	N	1	1	N								See Attached
36	Slag 8			1509	GW		2	N	1	1	N								
37	Slag 9			1355	GW		2	N	1	1	N								
	Slag 9 Deep				GW		2	N	1	1	N								
38	Slag 2B			1137	GW		2	N	1	1	N								

Comments:

WORK ORDER #2

Samples Relinquished By: Ben Wolf			Samples Received By: A. Stein		
Date: 11 JUL 17	Time: 1746	Temp: 24.15	Date: 12 Jul 17	Time: 900	Temp: 4.30
Samples Relinquished into: Fridge Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery:	Samplers	Other:	Seal Number(s) - If Used		
Transport:	Ambient	Ice	Other:	Seals Intact?	Yes No

Big Stone Plant CCR Appendix III Parameters

CCR - Appendix III Detection Monitoring

Field Parameters

pH*

* Field and Laboratory Measurements

Total Concentration Parameters

Boron

Calcium

Chloride

Fluoride

pH

Sulfate

Dissolved Solids, Total

Big Stone CCR Appendix IV Parameters

CCR - Appendix IV - Assessment Monitoring

Total Concentration Parameters

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium, Total
Cobalt
Fluoride
Lead
Lithium
Mercury
Molybdenum
Selenium
Thallium
Radium 226 + 228

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: *11 July 17*

Unique Station ID

Sample ID: *Slag 4*

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: *39.22*

Constructed Depth: 39.00

Casing Diameter: 2"

Water Level Before Purge: *19.04*

Well Volume: *3.29* Gallons

Well Casing Elevation: *NA*

Static Water Elevation:

Previous Static:

Water Level After Sam: *22.77*

Measurement Method: *Elec. Well Steel Tape*

Sampling Information

Weather Conditions: Temp: *81* Wind: *LLV* Sky: *cloudy*

Sampling Method: Grundfos ☒ Bladder ☐ Disp. Bz Whale ☐ Grab ☐ Other:

Dedicated Equipment: Yes ☒ No ☐ Pumping Rate: *.25* gpm

Well Purged Dry? Yes ☒ No ☐ Time Pump Began: *1025* am/pm

Time Purged Dry? *-* Time of Sampling: *1107* am/pm

Duplicate Sample? Yes ☒ No ☐ ID: *-* Sample E: *185.7*

Sample Appearance: General: *Cloudy* Color: *tan* Phase: *Light Sed.* Odor: *None*

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SE Q #	Comments:
<i>1024</i>	<i>6.22</i>	<i>3147</i>	<i>10.88</i>	<i>NA</i>	<i>NA</i>	<i>3.5</i>	1	
<i>1053</i>	<i>6.26</i>	<i>3198</i>	<i>10.81</i>	<i>I</i>	<i>I</i>	<i>7.0</i>	2	
<i>1107</i>	<i>6.30</i>	<i>3192</i>	<i>10.96</i>	<i>I</i>	<i>I</i>	<i>10.5</i>	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No Amount Water R: *10.5* Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 560

507 354 8517

Groundwater Assessor

Sampling Person

Matt Stan

Site:

Otter Tail Power Co./ Big Stone

Facility ID:

Date: 11 July 17

Unique Station ID:

Sample ID:

Slag 5

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☐ Yes ☒ No

Grout Seal Intact? ☐ Yes ☒ No

Well Information

Well Depth: 39.00

Constructed Depth 38.80

Casing Diameter: 2"

Water Level Before Purge 21.74

Well Volume: 2.84 Gallons

Well Casing Elevation: 1107.30

Static Water Elevation: 1085.52

Previous Static: 1185.73

Water Level After Sample: 36.10

Measurement Method: ☒ Elec. W/L ☐ Steel Tape

Sampling Information

Weather Condition Temp: 88

Wind: SO 17

Sky: Sunny

Sampling Method: Grundfos

Bladder SS/T

Disp. Baljer

☒ Whale

Grab

Other:

Dedicated Equipm Yes ☒ No

Pumping Rate: 0.25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began: 1417 am / pm

Time Purged Dry? 1429

Time of Sampling: 1433 am / pm

Duplicate Sample: Yes ☒ No

Sample EH: 68.6

Sample Appearance General: clear

Color: none

Phase: none

Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1429	7.24	933	15.02	NA	NA	3	1	
1433	7.04	831	12.42				2	recharge
							3	
							4	
							5	

Stabilize Yes ☒ No

Amount Water Removed: 3

Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 11 July 17

Unique Station ID:

Sample ID: Slag 6

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: 37.50

Constructed Depth: 37.30

Casing Diameter: 2"

Water Level Before Purge: 23.96

Well Volume: 2.2 Gallons

Well Casing Elevation: NA

Static Water Elevation:

Previous Static:

Water Level After Samp: 31.08

Measurement Method: Elec. W/L Steel Tape

Sampling Information

Weather Conditions: Temp: 83 Wind: LNW Sky: cloudy

Sampling Method: Grundfos Bladder SS/T Disp. Bailer Whale Grab Other:

Dedicated Equipment: Yes ☐ No ☒ Pumping Rate: .25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Purged Dry: 12:29

Duplicate Sample? Yes ☐ No ☒ ID: -

Sample Appearance: General: cloudy Color: Turbidity Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
12:29	7.11	1427	12.32	NA	NA	2.25	1	
							2	
							3	
							4	
12:34	7.05	1433	12.71	2	↓	-	5	Recharge

Stabilized Yes ☐ No ☒ Amount Water Remove: 2.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 11 July 17

Unique Station ID:

Sample ID: Slag 7

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: 49.04

Constructed Depth: 48.70

Casing Diameter: 2"

Water Level Before Purge: 15.74

Well Volume: 543 Gallons

Well Casing Elevation: NA

Static Water Elevation:

Previous Static:

Water Level After Sample: 38.94

Measurement Method: Elec. W/ Steel Tape

Sampling Information

Weather Conditions: Temp: 83

Wind: WV

Sky: cloudy

Sampling Method: Grundfos Bladder SST Disp. Bailer Whale Grab Other:

Dedicated Equipment? ☒ Yes ☐ No

Pumping Rate: 25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began: 1145 am / pm

Time Purged Dry? 1207

Time of Sampling: 1212 am / pm

Duplicate Sample? ☒ Yes ☐ No ID: —

Sample EH: 93.5

Sample Appearance: General: sl. cloudy Color: Ycr Phase: none Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1207	6.80	1736	10.30	NA	NA	5.5	1	
							2	
							3	
1212	6.84	1779	10.97			—	4	Recharge
							5	

Stabilized? Yes ☒ No

Amount Water Removed: 5.5 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 11 July 17

Unique Station IC

Sample ID: Slag 8

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? Yes ☒ No ☐

Repairs Necessary: Well and grout seal fixed, but casing still bent

Protective Posts ☒ Yes ☐ No

State ID Tag? Yes ☒ No ☐

Grout Seal Intact ☒ Yes ☐ No ☒ 11 July 17

Well Information

Well Depth: 52.25

Constructed Depth: 52.09

Casing Diameter: 2"

Water Level Before Purge: 17.87

Well Volume: 5.61 Gallons

Well Casing Elevation: NA

Static Water Elevation:

Previous Static:

Water Level After Sam: 29.11

Measurement Method: Elec. Well Steel Tape

Sampling Information

Weather Conditions: Temp: 84

Wind: LLL

Sky: cloudy

Sampling Method: Grundfos Bladder SS/T Disp. Bailer ☒ Whale Grab Other:

Dedicated Equipmen Yes ☒ No ☐

Well Purged Dry? Yes ☒ No ☐

Time Purged Dry?

Duplicate Sample? Yes ☒ No ☐ ID:

Sample Appearance: General: clear Color: none Phase: none Odor: none

Pumping Rate: 2.25 gpm

Time Pump Bega 1400 am / pm

Time of Sampling 1504 am / pm

Sample EH: 139.7

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1423	7.07	1504	11.50	NA	NA	5.75	1	
1446	7.04	1514	11.36	I	I	11.5	2	
1509	6.96	1526	11.39	I	I	12.25	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 17.25 Gallons

Comments:

- use whale pump

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site:

Otter Tail Power Co./ Big Stone

Facility ID:

Date: 11/26/17

Unique Station ID:

Sample ID:

Slag 9

Well Condition

Well Locked? ☒ Yes ☐ No

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: 51.25

Constructed Depth: 49.80

Casing Diameter: 2"

Water Level Before Purge: 14.48

Well Volume: 6.00 Gallons

Well Casing Elevation: N/A

Static Water Elevation:

Previous Static:

Water Level After Sample: 23.27

Measurement Method: Elec. W Steel Tape

Sampling Information

Weather Conditions: Temp: 84

Wind: LHV

Sky: Cloudy

Sampling Method: Grundfos ☒ Bladder SS ☐ Disp. Bailer ☐ Whale ☐ Grab ☐ Other:

Dedicated Equipment: Yes ☒ No ☐

Pumping Rate: 2.5 gpm

Well Purged Dry? Yes ☒ No ☐

Time Pump Began: 1243 am / pm

Time Purged Dry? -

Time of Sampling: 1355 am / pm

Duplicate Sample? Yes ☒ No ☐ ID: -

Sample EH: 102.8

Sample Appearance: General: Clear Color: none Phase: none Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1307	6.81	2548	11.65	N/A	N/A	6	1	
1331	6.84	2567	11.82	I	I	12	2	
1355	6.84	2537	11.95	I	I	18	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 18

Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607

507 354 8517

Groundwater Assessor

Sampling Personne

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID: _____

Date: 11 July 17

Unique Station ID: _____

Sample ID: Slag 2B

Well Condition

Well Locked? Yes ☒ No ☐

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary _____

Protective Posts? ☒ Yes ☐ No

State ID Tag? ☒ Yes ☐ No

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: 40.94

Constructed Depth: 40.80

Casing Diameter: 2"

Water Level Before Purge 18.98

Well Volume: 2.58 Gallons

Well Casing Elevation: NA

Static Water Elevation: _____

Previous Static: _____

Water Level After Sample 39.42

Measurement Method: Elec. Well Steel Tape

Sampling Information

Weather Condition: Temp: 82

Wind: LLW

Sky: cloudy

Sampling Method: Grundfos ☒ Bladder SS/T ☐ Disp. Bailer ☐ Whale ☐ Grab ☐ Other: _____

Dedicated Equipment Yes ☒ No ☐

Pumping Rate: 2.25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began 1117 ☒ am ☐ pm

Time Purged Dry? 1133

Time of Sampling: 1137 ☒ am ☐ pm

Duplicate Sample? Yes ☒ No ☐ ID: _____

Sample EH: -85.4

Sample Appearance General: Clear Color: None Phase: None Odor: chemical

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
15								
1132	6.99	2098	11.31	NA	NA	3.75	1	
							2	
1137	7.09	2107	11.71	I	I	—	3	Recharge
							4	
							5	

Stabilizer Yes ☒ No ☐

Amount Water Removed: 3.75 Gallons

Comments: _____

★ Slow Recharge

Exceptions to Protocol: _____