

2017 Annual Groundwater Monitoring and Corrective Action Report

CCR Annual Monitoring Report

Hoot Lake Plant

Fergus Falls, Minnesota

Prepared for
Otter Tail Power Company

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 Hoot Lake Plant, a coal-fired generation unit in Fergus Falls, Minnesota (Figure 1). Coal combustion residuals (CCR) from plant operations are placed in an on-site landfill, referred to as the Ash Landfill. The Ash Landfill 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 landfills. The vicinity of the CCR unit (Ash Landfill) is shown on Figure 1.

This 2017 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) describes the monitoring program and results for the Ash Landfill at the Hoot Lake 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
- Project 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 began on October 17, 2017.

1.3 CCR Rule Requirements

This Annual Report was prepared in accordance with the requirements of §257.90(e) of the CCR Rule, as outlined in 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 2.1.1 Documentation
§257.90(e)(4)	Discuss any transition between monitoring programs	Section 2.2 Monitoring and Analytical Results
§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 CCR unit for the period starting with the effective date of the 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, which 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, Ash Landfill, Hoot Lake Plant* (Barr, 2016).

2.1.2 Changes to Monitoring System

The CCR 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 Groundwater Statistical Analysis Plan (McCain, 2017).
- Continue the groundwater monitoring program in accordance with the CCR rule.

3.0 References

Barr Engineering Co., 2016. Groundwater Monitoring System Report, Ash Landfill, Hoot Lake Plant.
Prepared for Otter Tail Power Company.

Carlson McCain, 2017. CCR Groundwater Sampling and Analysis Plan, Ash Landfill – Hoot Lake Plant,
Fergus Falls, Minnesota. Prepared for Otter Tail Power Company.

Figures



- CCR Monitoring Program Well
- Existing CCR Landfill (IL002)

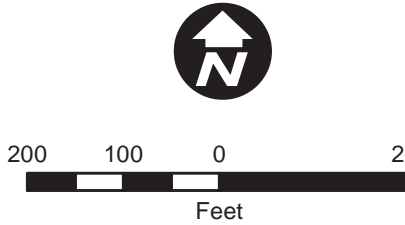


Figure 1

SITE MAP AND CCR
GROUNDWATER
MONITORING SYSTEM
Hoot Lake Ash Landfill
Otter Tail Power Company
Fergus Falls, MN

Appendices

Appendix A

Laboratory Reports and Field Sheets



MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
2 North German St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
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www.mvttl.com



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FINAL REPORT COMPLETION DATE: 13 Oct 16 AX

Date Reported: 7 Oct 2016

T J NEWKIRK
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 31-0470
Account #: 006106
PO #: 48679

Project Name: HOOT LAKE PLANT

TJ Newkirk 12 Oct 16
Field Service Manager/Date Reviewed
[Signature] 10 Oct 16
Chemistry Lab Manager/Date Reviewed
[Signature] for 10 Oct 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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T J NEWKIRK
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 7 Oct 2016
 Lab Number: 16-A47617
 Work Order #: 31-0470
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 13 Sep 2016 12:17
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 14 Sep 2016 11:47
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S2A

Temp at Receipt: 0.1C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					16 Sep 16	JMS
Water Digestions					17 Sep 16	JMS
Appearance, Field	Clear		NA	SM 2110	13 Sep 16 12:17	BMW
Water Elevation	1197.39		NA	NA	13 Sep 16 12:17	BMW
Temperature - Field	11.36	deg. C	NA	170.1	13 Sep 16 12:17	BMW
Specific Conductance, Fld	1002	umhos/cm	1	120.1	13 Sep 16 12:17	BMW
pH, Field	6.94	units	1.00	I-1586-85	13 Sep 16 12:17	BMW
pH	* 7.2	units	1.0	SM 4500 H+B-96	16 Sep 16 11:51	RC
EH, Field	150.4	units	NA	SM 2580B	13 Sep 16 12:17	BMW
Dissolved Oxygen, Field	1.22	mg/L	0.10	SM 4500-O G	13 Sep 16 12:17	BMW
Turbidity, Field	9.9	NTU	0.1	180.1	13 Sep 16 12:17	BMW
Radium 226	See Attached				6 Oct 16 6:11	ABL
Radium 228	See Attached			EPA M9320	6 Oct 16 6:11	ABL
Sulfate	174 @	mg/L	4.0	ASTM D516-02	22 Sep 16 7:08	AKF
Chloride	< 3	mg/L	3	SM 4500 Cl E	22 Sep 16 8:20	KCJ
Mercury	< 0.005	ug/L	0.005	EPA 245.7	22 Sep 16 12:01	RMB
Solids, Total Dissolved	621	mg/L	10	SM 2540 C-97	16 Sep 16 15:00	RC
Calcium	149.0	mg/L	0.500	SW6010C	22 Sep 16 11:46	RMV
Lithium	0.036	mg/L	0.005	SW6010C	22 Sep 16 11:46	RMB
Barium	0.064	mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
Beryllium	< 0.005	mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
Chromium	< 0.01	mg/L	0.01	SW6010C	22 Sep 16 11:46	RMV
	See Narrative					
Cobalt	< 0.005	mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
	See Narrative					
Molybdenum	< 0.015	mg/L	0.015	SW6010C	22 Sep 16 11:46	RMV
Boron	0.218	mg/L	0.100	SW6010C	22 Sep 16 11:46	RMV
Antimony	< 1 @	ug/L	0.5	SW6020A	22 Sep 16 11:33	RMV
Arsenic	< 1 @	ug/L	0.5	SW6020A	21 Sep 16 14:05	RMV
Cadmium	< 0.2 @	ug/L	0.1	SW6020A	21 Sep 16 14:05	RMV
Lead	< 1 @	ug/L	0.5	SW6020A	21 Sep 16 14:05	RMV
Selenium	< 1 @	ug/L	0.5	SW6020A	21 Sep 16 14:05	RMV
Thallium	< 0.2 @	ug/L	0.1	SW6020A	21 Sep 16 14:05	RMV
Fluoride	0.190	mg/L	0.020	EPA 300.0	23 Sep 16 12:44	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

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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T J NEWKIRK
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 7 Oct 2016
 Lab Number: 16-A47618
 Work Order #: 31-0470
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 13 Sep 2016 13:04
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 14 Sep 2016 11:47
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S3AR

Temp at Receipt: 0.1C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				16 Sep 16	JMS
Water Digestions				17 Sep 16	JMS
Appearance, Field	Clear	NA	SM 2110	13 Sep 16 13:04	BMW
Water Elevation	1203.59	NA	NA	13 Sep 16 13:04	BMW
Temperature - Field	9.11 deg. C	NA	170.1	13 Sep 16 13:04	BMW
Specific Conductance, Fld	964 umhos/cm	1	120.1	13 Sep 16 13:04	BMW
pH, Field	6.54 units	1.00	I-1586-85	13 Sep 16 13:04	BMW
pH	* 7.3 units	1.0	SM 4500 H+B-96	16 Sep 16 11:51	RC
EH, Field	-32.5 units	NA	SM 2580B	13 Sep 16 13:04	BMW
Dissolved Oxygen, Field	1.53 mg/L	0.10	SM 4500-O G	13 Sep 16 13:04	BMW
Turbidity, Field	< 0.1 NTU	0.1	180.1	13 Sep 16 13:04	BMW
Radium 226	See Attached			6 Oct 16 6:11	ABL
Radium 228	See Attached		EPA M9320	6 Oct 16 6:11	AEL
Sulfate	156 @ mg/L	4.0	ASTM D516-02	22 Sep 16 7:08	AKF
Chloride	11.6 mg/L	3.0	SM 4500 Cl E	22 Sep 16 8:20	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	22 Sep 16 12:01	RMB
Solids, Total Dissolved	550 mg/L	10	SM 2540 C-97	16 Sep 16 15:00	RC
Calcium	119.0 mg/L	0.500	SW6010C	22 Sep 16 11:46	RMV
Lithium	0.022 mg/L	0.005	SW6010C	22 Sep 16 11:46	RMB
Barium	0.044 mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
Beryllium	< 0.005 mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
Chromium	< 0.01 mg/L	0.01	SW6010C	22 Sep 16 11:46	RMV
	See Narrative				
Cobalt	< 0.005 mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
	See Narrative				
Molybdenum	< 0.015 mg/L	0.015	SW6010C	22 Sep 16 11:46	RMV
Boron	0.221 mg/L	0.100	SW6010C	22 Sep 16 11:46	RMV
Antimony	< 1 @ ug/L	0.5	SW6020A	22 Sep 16 11:33	RMV
Arsenic	< 1 @ ug/L	0.5	SW6020A	21 Sep 16 14:05	RMV
Cadmium	< 0.2 @ ug/L	0.1	SW6020A	21 Sep 16 14:05	RMV
Lead	< 1 @ ug/L	0.5	SW6020A	21 Sep 16 14:05	RMV
Selenium	3.32 @ ug/L	0.50	SW6020A	21 Sep 16 14:05	RMV
Thallium	< 0.2 @ ug/L	0.1	SW6020A	21 Sep 16 14:05	RMV
Fluoride	0.170 mg/L	0.020	EPA 300.0	23 Sep 16 12:44	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

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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T J NEWKIRK
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 7 Oct 2016
Lab Number: 16-A47619
Work Order #: 31-0470
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 13 Sep 2016 16:04
Sampled By: MVT L FIELD PERSONNEL
Date Received: 14 Sep 2016 11:47
PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S51

Temp at Receipt: 0.1C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				16 Sep 16	JMS
Water Digestions				17 Sep 16	JMS
Appearance, Field	Slightly Cloudy	NA	SM 2110	13 Sep 16 16:04	BMW
Water Elevation	1237.17	NA	NA	13 Sep 16 16:04	BMW
Temperature - Field	8.55 deg. C	NA	170.1	13 Sep 16 16:04	BMW
Specific Conductance, Fld	877 umhos/cm	1	120.1	13 Sep 16 16:04	BMW
pH, Field	6.70 units	1.00	I-1586-85	13 Sep 16 16:04	BMW
pH	* 7.2 units	1.0	SM 4500 H+B-96	16 Sep 16 11:51	RC
EH, Field	-26.0 units	NA	SM 2580B	13 Sep 16 16:04	BMW
Dissolved Oxygen, Field	1.44 mg/L	0.10	SM 4500-O G	13 Sep 16 16:04	BMW
Turbidity, Field	38.6 NTU	0.1	180.1	13 Sep 16 16:04	BMW
Radium 226	See Attached			6 Oct 16 6:11	ABL
Radium 228	See Attached		EPA M9320	6 Oct 16 6:12	ABL
Sulfate	81.9 @ mg/L	4.0	ASTM D516-02	22 Sep 16 7:08	AKF
Chloride	16.8 mg/L	3.0	SM 4500 Cl E	22 Sep 16 8:20	KCU
Mercury	< 0.005 ug/L	0.005	EPA 245.7	22 Sep 16 12:01	RMB
Solids, Total Dissolved	474 mg/L	10	SM 2540 C-97	16 Sep 16 15:00	RC
Calcium	127.0 mg/L	0.500	SW6010C	22 Sep 16 11:46	RMV
Lithium	0.025 mg/L	0.005	SW6010C	22 Sep 16 11:46	RMB
Barium	0.080 mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
Beryllium	< 0.005 mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
Chromium	< 0.01 mg/L	0.01	SW6010C	22 Sep 16 11:46	RMV
	See Narrative				
Cobalt	< 0.005 mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
	See Narrative				
Molybdenum	< 0.015 mg/L	0.015	SW6010C	22 Sep 16 11:46	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	22 Sep 16 11:46	RMV
Antimony	< 1 @ ug/L	0.5	SW6020A	22 Sep 16 11:33	RMV
Arsenic	< 1 @ ug/L	0.5	SW6020A	21 Sep 16 14:05	PMV
Cadmium	< 0.2 @ ug/L	0.1	SW6020A	21 Sep 16 14:05	RMV
Lead	< 1 @ ug/L	0.5	SW6020A	21 Sep 16 14:05	RMV
Selenium	< 1 @ ug/L	0.5	SW6020A	21 Sep 16 14:05	RMV
Thallium	< 0.2 @ ug/L	0.1	SW6020A	21 Sep 16 14:05	RMV
Fluoride	0.220 mg/L	0.020	EPA 300.0	23 Sep 16 12:44	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

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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T J NEWKIRK
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 7 Oct 2016
 Lab Number: 16-A47620
 Work Order #: 31-0470
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 13 Sep 2016 16:43
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 14 Sep 2016 11:47
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S52

Temp at Receipt: 0.1C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				16 Sep 16	JMS
Water Digestions				17 Sep 16	JMS
Appearance, Field	Clear	NA	SM 2110	13 Sep 16 16:43	BMW
Water Elevation	1216.03	NA	NA	13 Sep 16 16:43	BMW
Temperature - Field	8.53 deg. C	NA	170.1	13 Sep 16 16:43	BMW
Specific Conductance, Fld	843 umhos/cm	1	120.1	13 Sep 16 16:43	BMW
pH, Field	6.69 units	1.00	I-1586-85	13 Sep 16 16:43	BMW
pH	* 7.2 units	1.0	SM 4500 H+B-96	16 Sep 16 11:51	RC
EH, Field	-93.6 units	NA	SM 2580B	13 Sep 16 16:43	BMW
Dissolved Oxygen, Field	0.53 mg/L	0.10	SM 4500-O G	13 Sep 16 16:43	BMW
Turbidity, Field	< 0.1 NTU	0.1	180.1	13 Sep 16 16:43	BMW
Radium 226	See Attached		EPA M9320	6 Oct 16 6:12	ABL
Radium 228	See Attached		ASTM D516-02	6 Oct 16 6:12	ABL
Sulfate	75.4 @ mg/L	4.0	SM 4500 Cl E	22 Sep 16 7:08	AKF
Chloride	14.9 mg/L	3.0	EPA 245.7	22 Sep 16 8:20	KCJ
Mercury	< 0.005 ug/L	0.005	SM 2540 C-97	22 Sep 16 12:01	RMB
Solids, Total Dissolved	456 mg/L	10	SW6010C	16 Sep 16 15:00	RC
Calcium	112.0 mg/L	0.500	SW6010C	22 Sep 16 11:46	RMV
Lithium	0.021 mg/L	0.005	SW6010C	22 Sep 16 11:46	RMB
Barium	0.113 mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
Beryllium	< 0.005 mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
Chromium	< 0.01 mg/L	0.01	SW6010C	22 Sep 16 11:46	RMV
Cobalt	See Narrative				
	< 0.005 mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
Molybdenum	See Narrative				
	< 0.015 mg/L	0.015	SW6010C	22 Sep 16 11:46	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	22 Sep 16 11:46	RMV
Antimony	< 1 @ ug/L	0.5	SW6020A	22 Sep 16 11:33	RMV
Arsenic	1.65 @ ug/L	0.50	SW6020A	21 Sep 16 14:05	RMV
Cadmium	< 0.2 @ ug/L	0.1	SW6020A	21 Sep 16 14:05	RMV
Lead	< 1 @ ug/L	0.5	SW6020A	21 Sep 16 14:05	RMV
Selenium	< 1 @ ug/L	0.5	SW6020A	21 Sep 16 14:05	RMV
Thallium	< 0.2 @ ug/L	0.1	SW6020A	21 Sep 16 14:05	RMV
Fluoride	0.180 mg/L	0.020	EPA 300.0	23 Sep 16 12:44	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

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



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 www.mvttl.com



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T J NEWKIRK
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 7 Oct 2016
 Lab Number: 16-A47621
 Work Order #: 31-0470
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 13 Sep 2016 13:51
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 14 Sep 2016 11:47
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S10R

Temp at Receipt: 0.1C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					16 Sep 16	JMS
Water Digestions					17 Sep 16	JMS
Appearance, Field	Clear		NA	SM 2110	13 Sep 16 13:51	BMW
Water Elevation	1209.43		NA	NA	13 Sep 16 13:51	BMW
Temperature - Field	9.31	deg. C	NA	170.1	13 Sep 16 13:51	BMW
Specific Conductance, Fld	914	umhos/cm	1	120.1	13 Sep 16 13:51	BMW
pH, Field	6.60	units	1.00	I-1586-85	13 Sep 16 13:51	EMW
pH	* 7.2	units	1.0	SM 4500 H+B-96	16 Sep 16 11:51	RC
EH, Field	-17.7	units	NA	SM 2580B	13 Sep 16 13:51	BMW
Dissolved Oxygen, Field	1.67	mg/L	0.10	SM 4500-O G	13 Sep 16 13:51	BMW
Turbidity, Field	< 0.1	NTU	0.1	180.1	13 Sep 16 13:51	BMW
Radium 226	See Attached				6 Oct 16 6:12	ABL
Radium 228	See Attached			EPA M9320	6 Oct 16 6:12	ABL
Sulfate	128 @	mg/L	4.0	ASTM D516-02	22 Sep 16 7:08	AKF
Chloride	11.8	mg/L	3.0	SM 4500 Cl E	22 Sep 16 8:20	KCJ
Mercury	< 0.005	ug/L	0.005	EPA 245.7	22 Sep 16 12:01	RMB
Solids, Total Dissolved	519	mg/L	10	SM 2540 C-97	16 Sep 16 15:00	RC
Calcium	120.0	mg/L	0.500	SW6010C	22 Sep 16 11:46	RMV
Lithium	0.023	mg/L	0.005	SW6010C	22 Sep 16 11:46	RMB
Barium	0.107	mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
Beryllium	< 0.005	mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
Chromium	< 0.01	mg/L	0.01	SW6010C	22 Sep 16 11:46	RMV
	See Narrative					
Cobalt	< 0.005	mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
	See Narrative					
Molybdenum	< 0.015	mg/L	0.015	SW6010C	22 Sep 16 11:46	RMV
Boron	< 0.1	mg/L	0.1	SW6010C	22 Sep 16 11:46	RMV
Antimony	< 1 @	ug/L	0.5	SW6020A	22 Sep 16 11:33	RMV
Arsenic	4.42 @	ug/L	0.50	SW6020A	21 Sep 16 14:05	RMV
Cadmium	< 0.2 @	ug/L	0.1	SW6020A	21 Sep 16 14:05	RMV
Lead	< 1 @	ug/L	0.5	SW6020A	21 Sep 16 14:05	RMV
Selenium	< 1 @	ug/L	0.5	SW6020A	21 Sep 16 14:05	RMV
Thallium	< 0.2 @	ug/L	0.1	SW6020A	21 Sep 16 14:05	RMV
Fluoride	0.160	mg/L	0.020	EPA 300.0	23 Sep 16 12:44	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

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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Page: 7 of 9

T J NEWKIRK
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 7 Oct 2016
 Lab Number: 16-A47622
 Work Order #: 31-0470
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 13 Sep 2016 15:10
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 14 Sep 2016 11:47
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S13

Temp at Receipt: 0.1C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					16 Sep 16	JMS
Water Digestions					17 Sep 16	JMS
Appearance, Field	Clear		NA	SM 2110	13 Sep 16 15:10	BMW
Water Elevation	1210.94		NA	NA	13 Sep 16 15:10	BMW
Temperature - Field	9.98	deg. C	NA	170.1	13 Sep 16 15:10	BMW
Specific Conductance, Fld	866	umhos/cm	1	120.1	13 Sep 16 15:10	BMW
pH, Field	6.82	units	1.00	I-1586-85	13 Sep 16 15:10	BMW
pH	* 7.3	units	1.0	SM 4500 H+B-96	16 Sep 16 11:51	RC
EH, Field	-80.5	units	NA	SM 2580B	13 Sep 16 15:10	BMW
Dissolved Oxygen, Field	1.07	mg/L	0.10	SM 4500-O G	13 Sep 16 15:10	BMW
Turbidity, Field	< 0.1	NTU	0.1	180.1	13 Sep 16 15:10	BMW
Radium 226	See Attached				6 Oct 16 6:12	ABL
Radium 228	See Attached			EPA M9320	6 Oct 16 6:13	ABL
Sulfate	104 @	mg/L	4.0	ASTM D516-02	22 Sep 16 7:08	AKF
Chloride	8.4	mg/L	3.0	SM 4500 Cl E	22 Sep 16 8:20	KCJ
Mercury	< 0.005	ug/L	0.005	EPA 245.7	22 Sep 16 12:01	RMV
Solids, Total Dissolved	476	mg/L	10	SM 2540 C-97	16 Sep 16 15:00	RC
Calcium	111.0	mg/L	0.500	SW6010C	22 Sep 16 11:46	RMV
Lithium	0.023	mg/L	0.005	SW6010C	22 Sep 16 11:46	RMB
Barium	0.059	mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
Beryllium	< 0.005	mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
Chromium	< 0.01	mg/L	0.01	SW6010C	22 Sep 16 11:46	RMV
	See Narrative					
Cobalt	< 0.005	mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
	See Narrative					
Molybdenum	< 0.015	mg/L	0.015	SW6010C	22 Sep 16 11:46	RMV
Boron	< 0.1	mg/L	0.1	SW6010C	22 Sep 16 11:46	RMV
Antimony	< 1 @	ug/L	0.5	SW6020A	22 Sep 16 11:33	RMV
Arsenic	< 1 @	ug/L	0.5	SW6020A	21 Sep 16 14:05	RMV
Cadmium	< 0.2 @	ug/L	0.1	SW6020A	21 Sep 16 14:05	RMV
Lead	< 1 @	ug/L	0.5	SW6020A	21 Sep 16 14:05	RMV
Selenium	< 1 @	ug/L	0.5	SW6020A	21 Sep 16 14:05	RMV
Thallium	< 0.2 @	ug/L	0.1	SW6020A	21 Sep 16 14:05	RMV
Fluoride	0.200	mg/L	0.020	EPA 300.0	23 Sep 16 12:44	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

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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T J NEWKIRK
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 7 Oct 2016
 Lab Number: 16-A47623
 Work Order #: 31-0470
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 13 Sep 2016 14:29
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 14 Sep 2016 11:47
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S14R

Temp at Receipt: 0.1C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				16 Sep 16	JMS
Water Digestions				17 Sep 16	JMS
Appearance, Field	Clear	NA	SM 2110	13 Sep 16 14:29	BMW
Water Elevation	1201.24	NA	NA	13 Sep 16 14:29	BMW
Temperature - Field	9.63 deg. C	NA	170.1	13 Sep 16 14:29	BMW
Specific Conductance, Fld	974 umhos/cm	1	120.1	13 Sep 16 14:29	BMW
pH, Field	6.91 units	1.00	I-1586-85	13 Sep 16 14:29	BMW
pH	* 7.3 units	1.0	SM 4500 H+B-96	16 Sep 16 11:51	RC
EH, Field	-111.8 units	NA	SM 2580B	13 Sep 16 14:29	BMW
Dissolved Oxygen, Field	0.58 mg/L	0.10	SM 4500-O G	13 Sep 16 14:29	BMW
Turbidity, Field	< 0.1 NTU	0.1	180.1	13 Sep 16 14:29	BMW
Radium 226	See Attached			6 Oct 16 6:13	ABL
Radium 228	See Attached		EPA M9320	6 Oct 16 6:13	ABL
Sulfate	127 @ mg/L	4.0	ASTM D516-02	22 Sep 16 7:08	AKF
Chloride	5.0 mg/L	3.0	SM 4500 Cl E	22 Sep 16 8:20	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	22 Sep 16 12:01	RMB
Solids, Total Dissolved	558 mg/L	10	SM 2540 C-97	16 Sep 16 15:00	RC
Calcium	134.0 mg/L	0.500	SW6010C	22 Sep 16 11:46	RMV
Lithium	0.028 mg/L	0.005	SW6010C	22 Sep 16 11:46	RMB
Barium	0.083 mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
Beryllium	< 0.005 mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
Chromium	< 0.01 mg/L	0.01	SW6010C	22 Sep 16 11:46	RMV
	See Narrative				
Cobalt	< 0.005 mg/L	0.005	SW6010C	22 Sep 16 11:46	RMV
	See Narrative				
Molybdenum	< 0.015 mg/L	0.015	SW6010C	22 Sep 16 11:46	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	22 Sep 16 11:46	RMV
Antimony	< 1 @ ug/L	0.5	SW6020A	22 Sep 16 11:33	RMV
Arsenic	2.35 @ ug/L	0.50	SW6020A	21 Sep 16 14:05	RMV
Cadmium	< 0.2 @ ug/L	0.1	SW6020A	21 Sep 16 14:05	RMV
Lead	< 1 @ ug/L	0.5	SW6020A	21 Sep 16 14:05	RMV
Selenium	< 1 @ ug/L	0.5	SW6020A	21 Sep 16 14:05	RMV
Thallium	< 0.2 @ ug/L	0.1	SW6020A	21 Sep 16 14:05	RMV
Fluoride	0.200 mg/L	0.020	EPA 300.0	23 Sep 16 12:44	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

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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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
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Page: 9 of 9

Date Reported: 7 Oct 2016

T J NEWKIRK
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 201631-0470
Account Number: 006106
PO #: 48679

Project Name: HOOT LAKE PLANT

LABORATORY NARRATIVE

INORGANIC & METALS ANALYSES:

The initial known recovery for cobalt and chromium was elevated above acceptance range for samples 16-A47617 through 16-A47623. Data below the reporting limit was reported.

No other problems were encountered with these analyses.

Page: 1 of 1

Quality Control Report

Lab IDs: 16-A47617 to 16-A47623

Project: HOOT LAKE PLANT

Work Order: 201631-0470

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 25.0	106 105	85-115 85-115	25.0 25.0	a47628qc a47755qc	< 0.5 < 0.5	26.4 27.2	106 109	75-125 75-125	26.4 27.2	26.8 27.3	107 109	1.5 0.4	10 10	100	90-110	< 0.5 < 0.5
Arsenic ug/L	25.0	106	85-115	25.0	16A47628q	3.57	29.8	105	75-125	29.8	30.0	106	0.7	10	101	90-110	< 0.5
Barium mg/L	1.000	105	85-115	1.00	16A47627q	0.042	1.080	104	75-125	1.080	1.110	107	2.7	10	103	90-110	< 0.005
Beryllium mg/L	1.000	102	85-115	1.00	16A47627q	< 0.005	1.030	103	75-125	1.030	1.080	108	4.7	10	102	90-110	< 0.005
Boron mg/L	1.000	106	85-115	1.00	16A47627q	0.187	1.250	106	75-125	1.250	1.310	112	4.7	10	98	90-110	< 0.1
Cadmium ug/L	5.00	106	85-115	5.00	16A47628q	< 0.2	5.20	104	75-125	5.20	5.35	107	2.8	10	101	90-110	< 0.1
Calcium mg/L	50.00	106	85-115	50.0	16A47627q	128.0	177.0	98	75-125	177.0	187.0	118	5.5	10	101	90-110	< 0.5
Chloride mg/L	-	-	-	60.0	16-A47626	< 3	60.4	101	85-120	60.4	57.9	96	4.2	5	105	90-110	< 3
Chromium mg/L	1.000	108	85-115	1.00	16A47627q	< 0.01	1.060	106	75-125	1.060	1.100	110	3.7	10	105	90-110	< 0.01
Cobalt mg/L	1.000	109	85-115	1.00	16A47627q	< 0.005	1.040	104	75-125	1.040	1.080	108	3.8	10	105	90-110	< 0.005
Fluoride mg/L	0.200	95	85-115	0.20 0.20	16-A47623 16-A46834	0.200 0.120	0.360 0.330	80 105	75-125 75-125	0.360 0.330	0.360 0.320	80 100	0.0 3.1	10 10	99	90-110	< 0.02
Lead ug/L	25.0	107	85-115	25.0	16A47628q	< 1	25.6	102	75-125	25.6	26.8	107	4.6	10	101	90-110	< 0.5
Lithium mg/L	1.000	106	85-115	1.00	A47627qc	0.012	1.080	107	75-125	1.080	1.100	109	1.8	10	105	90-110	< 0.005
Mercury ug/L	-	-	-	0.10	16-A47623	< 0.005	0.096	96	67-106	0.096	0.098	98	2.1	9	97	76-113	< 0.005
Molybdenum mg/L	1.000	104	85-115	1.00	16A47627q	< 0.015	1.030	103	75-125	1.030	1.090	109	5.7	10	102	90-110	< 0.015
pH units	-	-	-	-	-	-	-	-	-	7.4	7.3	-	1.4	2.5	101	90-110	-
Selenium ug/L	25.0	111	85-115	25.0	16A47628q	< 1	26.8	107	75-125	26.8	27.3	109	1.8	10	101	90-110	< 0.5
Solids, Total Dissolved mg/L	- -	- -	- -	- -	- -	- -	- -	- -	- -	424 550	427 529	- -	0.7 3.9	13 10	86	85-115	< 10
Sulfate mg/L	-	-	-	60.0	16-A47626	< 4	62.2	104	78-126	62.2	60.0	100	3.6	5	99	90-110	< 4
Thallium ug/L	5.00	107	85-115	5.00	16A47628q	< 0.2	5.18	104	75-125	5.18	5.44	109	4.9	10	102	90-110	< 0.1

Approved by: 



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Date: 10/4/2016

CLIENT: MVTL Laboratories, Inc.
Project: Work Order 31-0470
Lab Order: S1609274

CASE NARRATIVE

Report ID: S1609274001

Samples A47617 S2A, A47618 S3AR, A47619 S51, A47620 S52, A47621 S10R, A47622 S13, and A47623 S14R were received on September 16, 2016.

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

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

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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

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

ProjectName: Work Order 31-0470
Lab ID: S1609274-001
ClientSample ID: A47617 S2A
COC:

Date Reported 10/4/2016
Report ID S1609274001

WorkOrder: S1609274
CollectionDate: 9/13/2016 12:17:00 PM
DateReceived: 9/16/2016 10:46:00 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	09/28/2016 916 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/28/2016 916 MB
Radium 228	ND	pCi/L		2	Ga-Tech	09/29/2016 031 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	09/29/2016 031 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

Page 1 of 7



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Sample Analysis Report

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

ProjectName: Work Order 31-0470
Lab ID: S1609274-002
ClientSample ID: A47618 S3AR
COC:

Date Reported 10/4/2016
Report ID S1609274001

WorkOrder: S1609274
CollectionDate: 9/13/2016 1:04:00 PM
DateReceived: 9/16/2016 10:46:00 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	09/28/2016 916	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/28/2016 916	MB
Radium 228	ND	pCi/L		2	Ga-Tech	09/29/2016 332	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	09/29/2016 332	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
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
2616 E Broadway Ave.
Bismarck, ND 58501

ProjectName: Work Order 31-0470
Lab ID: S1609274-003
ClientSample ID: A47619 S51
COC:

Date Reported 10/4/2016
Report ID S1609274001

WorkOrder: S1609274
CollectionDate: 9/13/2016 4:04:00 PM
DateReceived: 9/16/2016 10:46:00 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	09/29/2016 1316	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/29/2016 1316	MB
Radium 228	ND	pCi/L		2	Ga-Tech	09/29/2016 633	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	09/29/2016 633	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: MVTI Inc
2616 E Broadway Ave.
Bismarck, ND 58501

ProjectName: Work Order 31-0470
Lab ID: S1609274-004
ClientSample ID: A47620 S52
COC:

Date Reported 10/4/2016
Report ID S1609274001

WorkOrder: S1609274
CollectionDate: 9/13/2016 4:43:00 PM
DateReceived: 9/16/2016 10:46:00 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	09/29/2016 1316	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/29/2016 1316	MB
Radium 228	5.8	pCi/L		2	Ga-Tech	09/29/2016 935	MB
Radium 228 Precision (±)	3.2	pCi/L			Ga-Tech	09/29/2016 935	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
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
2616 E Broadway Ave.
Bismarck, ND 58501

ProjectName: Work Order 31-0470
Lab ID: S1609274-005
ClientSample ID: A47621 S10R
COC:

Date Reported 10/4/2016
Report ID S1609274001

WorkOrder: S1609274
CollectionDate: 9/13/2016 1:51:00 PM
DateReceived: 9/16/2016 10:46:00 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	09/29/2016 1316	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/29/2016 1316	MB
Radium 228	ND	pCi/L		2	Ga-Tech	09/30/2016 1851	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	09/30/2016 1851	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
2616 E Broadway Ave.
Bismarck, ND 58501

ProjectName: Work Order 31-0470
Lab ID: S1609274-006
ClientSample ID: A47622 S13
COC:

Date Reported 10/4/2016
Report ID S1609274001

WorkOrder: S1609274
CollectionDate: 9/13/2016 3:10:00 PM
DateReceived: 9/16/2016 10:46:00 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	09/29/2016 1316	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/29/2016 1316	MB
Radium 228	7.7	pCi/L		2	Ga-Tech	09/30/2016 2152	MB
Radium 228 Precision (±)	3.1	pCi/L			Ga-Tech	09/30/2016 2152	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
2616 E Broadway Ave.
Bismarck, ND 58501

ProjectName: Work Order 31-0470
Lab ID: S1609274-007
ClientSample ID: A47623 S14R
COC:

Date Reported 10/4/2016
Report ID S1609274001

WorkOrder: S1609274
CollectionDate: 9/13/2016 2:29:00 PM
DateReceived: 9/16/2016 10:46:00 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	09/29/2016 1316	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/29/2016 1316	MB
Radium 228	ND	pCi/L		2	Ga-Tech	10/01/2016 053	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	10/01/2016 053	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
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 Laboratories, Inc.
Work Order: S1609274
Project: Work Order 31-0470

Date: 10/4/2016
Report ID: S1609274001

Radium 228 by Ga/Tech		Sample Type	MBLK	Units: pCi/L				
MB-387 (09/26/16 12:08)	Analyte	RunNo:	139305	PrepDate:	09/19/16 12:00	BatchID:	12349	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		ND	1					
MB-388 (09/30/16 12:49)	Analyte	RunNo:	139392	PrepDate:	09/26/16 12:00	BatchID:	12360	
		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-387 (09/26/16 15:09)	Analyte	RunNo:	139305	PrepDate:	09/19/16 12:00	BatchID:	12349	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		32	1	38.5		82.7	61.3 - 120	
LCS-388 (09/30/16 15:50)	Analyte	RunNo:	139392	PrepDate:	09/26/16 12:00	BatchID:	12360	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		40	1	38.5		105	61.3 - 120	
Radium 228 by Ga/Tech		Sample Type	MS	Units: pCi/L				
S1609197-003AMS (09/27/16 00:12)	Analyte	RunNo:	139305	PrepDate:	09/19/16 12:00	BatchID:	12349	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		79	1	77	ND	102	61.3 - 120	
S1609279-001AMS (10/01/16 06:55)	Analyte	RunNo:	139392	PrepDate:	09/26/16 12:00	BatchID:	12360	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		74	1	77	ND	96.6	64.3 - 120	
Radium 228 by Ga/Tech		Sample Type	MSD	Units: pCi/L				
S1609197-003AMSD (09/27/16 03:14)	Analyte	RunNo:	139305	PrepDate:	09/19/16 12:00	BatchID:	12349	
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228		69	1	79	12.6	90.1	20	
S1609279-001AMSD (10/01/16 09:56)	Analyte	RunNo:	139392	PrepDate:	09/26/16 12:00	BatchID:	12360	
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228		72	1	74	2.73	83.1	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: MVTL Laboratories, Inc.

Date: 10/4/2016

Work Order: S1609274

Report ID: S1609274001

Project: Work Order 31-0470

Radium 226 in Water - Total by SM7500RA_B		Sample Type	MBLK		Units: pCi/L				
MB-1665 (09/29/16 13:16)	RunNo: 139301	PrepDate: 09/21/16 0:00	BatchID: 12353						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual		
Radium 226	ND	0.2							
MB-1664 (10/03/16 12:43)	RunNo: 139353	PrepDate: 09/19/16 0:00	BatchID: 12351						
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-1665 (09/29/16 13:16)	RunNo: 139301	PrepDate: 09/21/16 0:00	BatchID: 12353						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual		
Radium 226	5.1	0.2	5.99		85.8	67.1 - 122			
LCS-1664 (09/26/16 11:28)	RunNo: 139353	PrepDate: 09/19/16 0:00	BatchID: 12351						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual		
Radium 226	5.7	0.2	5.99		95.2	67.1 - 122			
Radium 226 in Water - Total by SM7500RA_B		Sample Type	MS		Units: pCi/L				
S1609270-001CMS (09/29/16 13:16)	RunNo: 139301	PrepDate: 09/21/16 0:00	BatchID: 12353						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual		
Radium 226	43.2	0.2	12	30.0	111	65 - 131			
S1609197-003AMS (09/26/16 11:28)	RunNo: 139353	PrepDate: 09/19/16 0:00	BatchID: 12351						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual		
Radium 226	13.0	0.2	12	ND	108	65 - 131			
Radium 226 in Water - Total by SM7500RA_B		Sample Type	MSD		Units: pCi/L				
S1609197-003AMSD (09/26/16 11:28)	RunNo: 139353	PrepDate: 09/19/16 0:00	BatchID: 12351						
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual		
Radium 226	11.7	0.2	13.0	10.1	98.0	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
Phone: 800 782 3557

New Ulm, MN 56003
Fax: 507 359 2890

Field Service Chain of Custody Record

This is an exact copy of
the original document

By BS Date 14 Sept 16

pages 1-11

Project Name: Otter Tail Power Co. Hoot Lake Plant	Project Type: Hoot Lake Plant	Name of Samplers: Ben Wolf
Report To: Otter Tail Power Company Attn: Paul Vukonich Address: P.O. Box 496 Fergus Falls, MN 56038-0496 Phone: 218-739-8314	Carbon Copy: Attn: Address:	Quote Number: Work Order Number: 31-0470 Lab Numbers:

Sample Information							Bottle Type										Analysis		
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	VOC Set	500 none 1000 H2O	1000 none	500 HNO3	Filter? Y or N	500 HNO3	Filter? Y or N	500 H2SO4	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
A47617	S2A		13 Sept 16	1217	GW			X			N								See Attachment
18	S3AR			1304	GW														
19	S51			1604	GW														
20	S52			1643	GW														
21	S10R			1351	GW														
22	S13			1510	GW														
23	S14R			1429	GW														
					GW														
					GW														
					GW														

Comments:

Samples Relinquished By: <u>Ben Wolf</u>				Samples Received By: <u>A. Reeder</u>			
Date: <u>14 Sept 16</u>	Time: <u>1147</u>	Temp: <u>15.83</u>		Date: <u>14 Sept 16</u>	Time: <u>1147</u>	Temp: <u>0.1C</u>	
Samples Relinquished into: <u>Fridge</u> Log in Cart Other:							
Samples Relinquished By:				Samples Received By:			
Date:	Time:	Temp:		Date:	Time:	Temp:	
Deliver	Samplers	Other:		Seal Number(s) - If Used			
Transp.	Ambient	Ice	Other:	Seals Intact?	Yes	No	

Hoot Lake Site CCR Background Sampling

Site	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (gal/minute)	Goes Dry?
S2A	HLP H, HLP I	79.63	2	1273.776	Bladder	Yes	< 0.25	No
S3AR	HLP H, HLP I	78.42	2	1271.562	Bladder	Yes	< 0.25	No
S51	HLP H, HLP I	55.6	2	1286.904	Bladder	Yes	< 0.25	No
S52	HLP H, HLP I	88.3	2	1286.623	Bladder	Yes	< 0.25	No
S10R	HLP H, HLP I	57.00	2	1281.47	Bladder	Yes	< 0.25	No
S13	HLP H, HLP I	90.19	2	1296.423	Bladder	Yes	< 0.25	No
S14R	HLP H, HLP I	70.86	2	1280.61	Bladder	Yes	< 0.25	Yes

All CCR wells should be low flow purges with turbidity <10 NTU

HLP "H" Monitoring 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

1-Liter

HLP "I" Monitoring 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 ~ 2-1000 HNO₃

500 HNO₃

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 13 Sept '16

Unique Station ID:

Sample ID: S-2A

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: 79.61

Well Casing Elevation: 1273.776

Constructed Depth: 79.63

Static Water Elevation: 1197.39

Casing Diameter: 2"

Previous Static: 1196.67

Water Level Before Purge: 76.39

Water Level After Sample: Below Pump

Well Volume: 5.3 Gallons

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 58 Wind: L&V Sky: Cloudy

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

Dedicated Equipment: ☒ Yes ☐ No

Pumping Rate: 2 gpm

Well Purged Dry? Yes ☒ No

Time Pump Began: 1208 am / pm

Time Purged Dry?

Time of Sampling: 1217 am / pm

Duplicate Sample? Yes ☒ No ID: —

Sample EH: 150.4

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:
1211	6.84	996	11.41	1.13	5.8	.6	1	
1214	6.92	1000	11.37	1.19	5.7	1.2	2	
1217	6.94	1002	11.36	1.22	9.9	1.8	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 1.8 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./ Hoot Lake

Facility ID: SW-211

Date: 13 Sept 16

Unique Station ID:

Sample ID: S-3A-R

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: 78.40

Well Casing Elevation: 1271.562

Constructed Depth: 78.42

Static Water Elevation: 1203.59

Casing Diameter: 2"

Previous Static: 1203.46

Water Level Before Purge: 67.47

Water Level After Sample: 67.99

Well Volume: 1.70 Gallons

Measurement Method: ☒ Elec. WLD ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 58 Wind: L&V Sky: cloudy

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: 1243 am 1 (pm)

Time Purged Dry?

Time of Sampling: 1304 am 1 (pm)

Duplicate Sample? Yes ☒ No ID: -

Sample EH: -32.5

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:
1250	6.64	965	9.15	1.42	0.0	1.75	1	
1257	6.54	965	9.11	1.47	0.0	3.50	2	
1304	6.54	964	9.11	1.53	0.0	5.25	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 5.25 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./ Hoot Lake

Facility ID: SW-211

Date: 13 Sept 16

Unique Station ID: 814830

Sample ID: S-51

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: 55.60

Constructed Depth: 55.60

Casing Diameter: 2"

Water Level Before Purge: 49.73

Well Volume: 96 Gallons

Well Casing Elevation: 1286.9

Static Water Elevation: 1237.17

Previous Static: —

Water Level After Sample: 49.77

Measurement Method: (Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 60 Wind: LL 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 Pump Began: 1544 am / (pm)

Time Purged Dry?

Time of Sampling: 1604 am / (pm)

Duplicate Sample? ☐ Yes ☒ No ID: —

Sample EH: -26.0

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1548	6.91	869	8.87	2.45	338.9	1	1	
1552	6.77	876	8.62	1.64	165.5	2	2	
1556	6.75	877	8.59	1.68	67.3	3	3	
1600	6.72	877	8.57	1.53	43.5	4	4	
1604	6.70	877	8.55	1.44	38.6	5	5	

Stabilized? Yes ☒ No

Amount Water Removed: 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./ Hoot Lake

Facility ID: SW-211

Date: 13 Sept 16

Unique Station ID: 806342 822/55

Sample ID: S-52

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: 88.30

Constructed Depth: 88.30

Casing Diameter: 2" ^{3 Sept 16} _{BW}

Water Level Before Purge: ~~79.37~~ 70.59

Well Volume: 2.89 Gallons

Well Casing Elevation: 1286.62

Static Water Elevation: 1216.03

Previous Static: —

Water Level After Sample: 70.60

Measurement Method: Elec. WLI Steel Tape

Sampling Information

Weather Conditions: Temp: 64 Wind: L&V 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 Pump Began: 1607 am / pm

Time Purged Dry?

Time of Sampling: 1643 am / pm

Duplicate Sample? Yes ☒ No ID: —

Sample EH: -93.6

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:
12 1619	6.72	842	8.57	.65	0.0	3	1	
1631	6.70	842	8.55	.57	0.0	6	2	
1643	6.69	843	8.53	.53	0.0	9	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 9 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./ Hoot Lake

Facility ID: SW-211

Date: 13 Sept 16

Unique Station ID: 806241

Sample ID: S-10R

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: 80.62

Well Casing Elevation: 1281.47

Constructed Depth: 57.00

Static Water Elevation: 1209.43

Casing Diameter: 2"

Previous Static: —

Water Level Before Purge: 72.04

Water Level After Sample: 72.19

Well Volume: 1.40 Gallons

Measurement Method: Elec. WLP Steel Tape

Sampling Information

Weather Conditions: Temp: 63 Wind: Lgt Sky: cloudy

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: 1333 am / pm

Time Purged Dry?

Time of Sampling: 1351 am / pm

Duplicate Sample? Yes ☒ No ☐ ID: —

Sample EH: -17.7

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1339	6.63	911	9.36	1.80	8.0	1.5	1	
1345	6.61	914	9.30	1.65	2.2	3.0	2	
1351	6.60	914	9.31	1.67	0.0	4.5	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 4.5 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./ Hoot Lake

Facility ID: SW-211

Date: 13 Sept 16

Unique Station ID:

Sample ID: S-13

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: 90.27

Constructed Depth: 90.19

Casing Diameter: 2"

Water Level Before Purge: 85.48

Well Volume: .78 Gallons

Well Casing Elevation: 1296.423

Static Water Elevation: 1210.94

Previous Static: 1210.64

Water Level After Sample: 85.48

Measurement Method: Elec. WLL Steel Tape

Sampling Information

Weather Conditions: Temp: 60 Wind: L&V 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 Pump Began: 1450 am / pm

Time Purged Dry?

Time of Sampling: 1510 am / pm

Duplicate Sample? Yes ☒ No ID:

Sample EH: -80.5

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:
1454	6.93	863	15.44	2.38	0.0	1	1	
1458	6.88	863	10.16	1.49	0.0	2	2	
1502	6.84	864	10.09	1.18	0.0	3	3	
1506	6.84	866	10.07	1.16	0.0	4	4	
1510	6.82	866	9.98	1.07	0.0	5	5	

Stabilized? ☒ Yes No

Amount Water Removed: 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./ Hoot Lake

Facility ID: SW-211

Date: 13 Sept 16

Unique Station ID: 806342

Sample ID: S-14R

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: 87.11

Well Casing Elevation: 1280.61

Constructed Depth: 70.86

Static Water Elevation: 1201.24

Casing Diameter: 2"

Previous Static: -

Water Level Before Purge: 79.37

Water Level After Sample: 79.37

Well Volume: 1.26 Gallons

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

Sampling Information

Weather Conditions: Temp: 65 Wind: L6V 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 Pump Began: 1411 am / ☒ pm

Time Purged Dry?

Time of Sampling: 1429 am / ☒ pm

Duplicate Sample? Yes ☒ No ☐ ID: -

Sample EH: -111.8

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1417	7.00	1000	9.80	.69	8.8	1.5	1	
1423	6.94	988	9.71	.62	0.0	3.0	2	
1429	6.91	974	9.63	.58	0.0	4.5	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 4.5 Gallons

Comments:

Exceptions to Protocol:



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www.mvttl.com



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FINAL REPORT COMPLETION DATE: 20 Dec 16 RH

Date Reported: 14 Dec 2016

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

Work Order #: 31-0548
Account #: 006106
PO #: 48679

Project Name: HOOT LAKE PLANT

[Signature] 19 Dec 16
Field Service Manager/Date Reviewed
[Signature] 16 Dec 2016
Chemistry Lab Manager/Date Reviewed
[Signature] 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: 14 Dec 2016
 Lab Number: 16-A56674
 Work Order #: 31-0548
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 19 Oct 2016 14:16
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 20 Oct 2016 14:45
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-51

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				24 Oct 16	TWB
Water Digestions				24 Oct 16	TWB
Radium 226	See Attached			2 Dec 16 15:54	ABL
Radium 228	See Attached		EPA M9320	2 Dec 16 15:54	ABL
pH, Field	6.90 units	1.00	I-1586-85	19 Oct 16 14:16	BMW
pH	* 7.0 units	1.0	SM 4500 H+B-96	21 Oct 16 11:07	DK
Sulfate	65.3 mg/L	4.0	ASTM D516-02	27 Oct 16 7:37	AKF
Chloride	14.2 mg/L	3.0	SM 4500 Cl E	27 Oct 16 8:53	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	27 Oct 16 11:59	TWB
Solids, Total Dissolved	422 mg/L	10	SM 2540 C-97	24 Oct 16 8:00	RC
Calcium	105.0 mg/L	0.500	SW6010C	27 Oct 16 13:26	RMV
Lithium	0.021 mg/L	0.005	SW6010C	27 Oct 16 16:26	RMV
Barium	0.118 mg/L	0.005	SW6010C	27 Oct 16 13:26	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	27 Oct 16 13:26	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	27 Oct 16 13:26	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	11 Nov 16 19:32	RMB
Arsenic	2.80 @ ug/L	0.50	SW6020A	11 Nov 16 19:32	RMB
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	14 Nov 16 14:52	RMB
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	11 Nov 16 19:32	RMB
Chromium	0.67 ug/L	0.50	SW6020A	27 Oct 16 23:40	RMB
Lead	See Narrative				
	< 0.5 ug/L	0.5	SW6020A	3 Nov 16 20:27	RMB
Molybdenum	See Narrative				
	8.24 ug/L	0.50	SW6020A	27 Oct 16 23:40	RMB
Selenium	See Narrative				
	< 2.5 @ ug/L	0.5	SW6020A	15 Nov 16 12:16	RMB
Thallium	< 0.1 ug/L	0.1	SW6020A	3 Nov 16 20:27	RMB
Fluoride	See Narrative				
	0.240 mg/L	0.020	EPA 300.0	26 Oct 16 0:28	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

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 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: 14 Dec 2016
 Lab Number: 16-A56675
 Work Order #: 31-0548
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 19 Oct 2016 14:38
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 20 Oct 2016 14:45
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-52

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				24 Oct 16	TWB
Water Digestions				24 Oct 16	TWB
Radium 226	See Attached			2 Dec 16 15:55	ABL
Radium 228	See Attached		EPA M9320	2 Dec 16 15:55	ABL
pH, Field	6.54 units	1.00	I-1586-85	19 Oct 16 14:38	BMW
pH	* 7.1 units	1.0	SM 4500 H+B-96	21 Oct 16 11:07	DK
Sulfate	63.5 mg/L	4.0	ASTM D516-02	27 Oct 16 7:37	AKF
Chloride	14.4 mg/L	3.0	SM 4500 Cl E	27 Oct 16 8:53	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	27 Oct 16 11:59	TWB
Solids, Total Dissolved	416 mg/L	10	SM 2540 C-97	24 Oct 16 8:00	RC
Calcium	105.0 mg/L	0.500	SW6010C	27 Oct 16 13:26	RMV
Lithium	0.021 mg/L	0.005	SW6010C	27 Oct 16 16:26	RMV
Barium	0.114 mg/L	0.005	SW6010C	27 Oct 16 13:26	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	27 Oct 16 13:26	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	27 Oct 16 13:26	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	11 Nov 16 19:32	RMB
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	11 Nov 16 19:32	RMB
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	14 Nov 16 14:52	RMB
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	11 Nov 16 19:32	RMB
Chromium	< 0.5 ug/L	0.5	SW6020A	27 Oct 16 23:40	RMB
Lead	See Narrative < 2.5 ug/L	0.5	SW6020A	3 Nov 16 20:27	RMB
Molybdenum	See Narrative 6.80 @ ug/L	0.50	SW6020A	11 Nov 16 19:32	RMB
Selenium	< 2.5 @ ug/L	0.5	SW6020A	15 Nov 16 12:16	RMB
Thallium	< 0.5 ug/L	0.1	SW6020A	3 Nov 16 20:27	RMB
Fluoride	See Narrative 0.260 mg/L	0.020	EPA 300.0	26 Oct 16 0:28	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

RL = Reporting Limit
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 ! = 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: 14 Dec 2016
 Lab Number: 16-A56676
 Work Order #: 31-0548
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 19 Oct 2016 13:03
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 20 Oct 2016 14:45
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-2A

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				24 Oct 16	TWB
Water Digestions				24 Oct 16	TWB
Radium 226	See Attached			2 Dec 16 15:55	ABL
Radium 228	See Attached		EPA M9320	2 Dec 16 15:55	ABL
pH, Field	6.49 units	1.00	I-1586-85	19 Oct 16 13:03	BMW
pH	* 7.1 units	1.0	SM 4500 H+B-96	21 Oct 16 11:07	DK
Sulfate	172 mg/L	4.0	ASTM D516-02	27 Oct 16 7:55	AKF
Chloride	< 3 mg/L	3	SM 4500 Cl E	27 Oct 16 8:53	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	27 Oct 16 11:59	TWB
Solids, Total Dissolved	569 mg/L	10	SM 2540 C-97	24 Oct 16 8:00	RC
Calcium	134.0 mg/L	0.500	SW6010C	27 Oct 16 13:26	RMV
Lithium	0.032 mg/L	0.005	SW6010C	27 Oct 16 16:26	RMV
Barium	0.050 mg/L	0.005	SW6010C	27 Oct 16 13:26	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	27 Oct 16 13:26	RMV
Boron	0.200 mg/L	0.100	SW6010C	27 Oct 16 13:26	RMV
Antimony	< 0.5 ug/L	0.5	SW6020A	28 Oct 16 0:53	RMB
	See Narrative				
Arsenic	< 0.5 ug/L	0.5	SW6020A	28 Oct 16 0:53	RMB
	See Narrative				
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	14 Nov 16 14:52	RMB
Cadmium	< 0.1 ug/L	0.1	SW6020A	28 Oct 16 0:53	RMB
	See Narrative				
Chromium	< 0.5 ug/L	0.5	SW6020A	28 Oct 16 0:53	RMB
	See Narrative				
Lead	< 0.5 ug/L	0.5	SW6020A	3 Nov 16 21:32	RMB
	See Narrative				
Molybdenum	2.38 ug/L	0.50	SW6020A	28 Oct 16 0:53	RMB
Selenium	1.10 ug/L	0.50	SW6020A	28 Oct 16 0:53	RMB
	See Narrative				
Thallium	< 0.1 ug/L	0.1	SW6020A	3 Nov 16 21:32	RMB
	See Narrative				
Fluoride	0.270 mg/L	0.020	EPA 300.0	26 Oct 16 0:28	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

RL = Reporting Limit

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

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 ! = 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

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

Report Date: 14 Dec 2016
 Lab Number: 16-A56677
 Work Order #: 31-0548
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 19 Oct 2016 16:34
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 20 Oct 2016 14:45
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-3A-R

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				24 Oct 16	TWB
Water Digestions				24 Oct 16	TWB
Radium 226	See Attached		EPA M9320	2 Dec 16 15:55	ABL
Radium 228	See Attached		I-1586-85	2 Dec 16 15:55	ABL
pH, Field	6.90 units	1.00	SM 4500 H+B-96	19 Oct 16 16:34	JLH
pH	* 7.2 units	1.0	ASTM D516-02	21 Oct 16 11:07	DK
Sulfate	143 mg/L	4.0	SM 4500 Cl E	27 Oct 16 7:55	AKF
Chloride	11.6 mg/L	3.0	EPA 245.7	27 Oct 16 8:53	AKF
Mercury	< 0.005 ug/L	0.005	SM 2540 C-97	27 Oct 16 11:59	TWB
Solids, Total Dissolved	530 mg/L	10	SW6010C	24 Oct 16 8:00	RC
Calcium	110.0 mg/L	0.500	SW6010C	27 Oct 16 13:26	RMV
Lithium	0.022 mg/L	0.005	SW6010C	27 Oct 16 16:26	RMV
Barium	0.043 mg/L	0.005	SW6010C	27 Oct 16 13:26	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	27 Oct 16 13:26	RMV
Boron	0.203 mg/L	0.100	SW6020A	27 Oct 16 13:26	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	11 Nov 16 20:30	RMB
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	11 Nov 16 20:30	RMB
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	14 Nov 16 14:52	RMB
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	11 Nov 16 20:30	RMB
Chromium	< 0.5 ug/L	0.5	SW6020A	28 Oct 16 0:53	RMB
Lead	See Narrative < 0.5 ug/L	0.5	SW6020A	3 Nov 16 21:32	RMB
Molybdenum	See Narrative 1.55 ug/L	0.50	SW6020A	28 Oct 16 0:53	RMB
Selenium	3.84 @ ug/L	0.50	SW6020A	18 Nov 16 10:32	RMB
Thallium	< 0.1 ug/L	0.1	SW6020A	3 Nov 16 21:32	RMB
Fluoride	See Narrative 0.220 mg/L	0.020	EPA 300.0	26 Oct 16 0:28	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

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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 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: 14 Dec 2016
 Lab Number: 16-A56678
 Work Order #: 31-0548
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 19 Oct 2016 15:51
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 20 Oct 2016 14:45
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-10R

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				24 Oct 16	TWB
Water Digestions				24 Oct 16	TWB
Radium 226	See Attached			2 Dec 16 15:55	ABL
Radium 228	See Attached		EPA M9320	2 Dec 16 15:55	ABL
pH, Field	6.83 units	1.00	I-1586-85	19 Oct 16 15:51	JLH
pH	* 7.1 units	1.0	SM 4500 H+B-96	21 Oct 16 11:07	DK
Sulfate	108 mg/L	4.0	ASTM D516-02	27 Oct 16 7:55	AKF
Chloride	11.5 mg/L	3.0	SM 4500 Cl E	27 Oct 16 9:11	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	27 Oct 16 11:59	TWB
Solids, Total Dissolved	501 mg/L	10	SM 2540 C-97	24 Oct 16 8:00	RC
Calcium	117.0 mg/L	0.500	SW6010C	27 Oct 16 13:26	RMV
Lithium	0.022 mg/L	0.005	SW6010C	27 Oct 16 16:26	RMV
Barium	0.103 mg/L	0.005	SW6010C	27 Oct 16 13:26	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	27 Oct 16 13:26	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	27 Oct 16 13:26	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	11 Nov 16 20:30	RMB
Arsenic	4.46 @ ug/L	0.50	SW6020A	11 Nov 16 20:30	RMB
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	14 Nov 16 14:52	RMB
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	11 Nov 16 20:30	RMB
Chromium	< 0.5 ug/L	0.5	SW6020A	28 Oct 16 0:53	RMB
Lead	See Narrative < 0.5 ug/L	0.5	SW6020A	3 Nov 16 21:32	RMB
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	11 Nov 16 20:30	RMB
Selenium	< 2.5 @ ug/L	0.5	SW6020A	18 Nov 16 10:32	RMB
Thallium	< 0.1 ug/L	0.1	SW6020A	3 Nov 16 21:32	RMB
Fluoride	See Narrative 0.210 mg/L	0.020	EPA 300.0	26 Oct 16 0:28	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

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: 14 Dec 2016
Lab Number: 16-A56679
Work Order #: 31-0548
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 19 Oct 2016 17:41
Sampled By: MVTL FIELD PERSONNEL
Date Received: 20 Oct 2016 14:45
PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-13

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				24 Oct 16	TWB
Water Digestions				24 Oct 16	TWB
Radium 226	See Attached			2 Dec 16 15:56	ABL
Radium 228	See Attached		EPA M9320	2 Dec 16 15:56	ABL
pH, Field	6.79 units	1.00	I-1586-85	19 Oct 16 17:41	JLH
pH	* 7.1 units	1.0	SM 4500 H+B-96	21 Oct 16 11:07	DK
Sulfate	87.7 mg/L	4.0	ASTM D516-02	27 Oct 16 7:55	AKF
Chloride	8.4 mg/L	3.0	SM 4500 Cl E	27 Oct 16 9:11	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	27 Oct 16 11:59	TWB
Solids, Total Dissolved	471 mg/L	10	SM 2540 C-97	24 Oct 16 8:00	RC
Calcium	116.0 mg/L	0.500	SW6010C	27 Oct 16 13:26	RMV
Lithium	0.025 mg/L	0.005	SW6010C	27 Oct 16 16:26	RMV
Barium	0.067 mg/L	0.005	SW6010C	27 Oct 16 13:26	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	27 Oct 16 13:26	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	27 Oct 16 13:26	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	11 Nov 16 20:30	RMB
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	11 Nov 16 20:30	RMB
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	14 Nov 16 14:52	RMB
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	11 Nov 16 20:30	RMB
Chromium	< 0.5 ug/L	0.5	SW6020A	28 Oct 16 0:53	RMB
Lead	See Narrative < 0.5 ug/L	0.5	SW6020A	3 Nov 16 21:32	RMB
Molybdenum	See Narrative < 2.5 @ ug/L	0.5	SW6020A	11 Nov 16 20:30	RMB
Selenium	< 2.5 @ ug/L	0.5	SW6020A	18 Nov 16 10:32	RMB
Thallium	< 0.1 ug/L	0.1	SW6020A	3 Nov 16 21:32	RMB
Fluoride	See Narrative 0.280 mg/L	0.020	EPA 300.0	26 Oct 16 6:51	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

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

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CERTIFICATE of ANALYSIS - CCR

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

Report Date: 14 Dec 2016
Lab Number: 16-A56680
Work Order #: 31-0548
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 19 Oct 2016 17:18
Sampled By: MVTL FIELD PERSONNEL
Date Received: 20 Oct 2016 14:45
PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-14R

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				24 Oct 16	TWB
Water Digestions				24 Oct 16	TWB
Radium 226	See Attached			2 Dec 16 15:56	ABL
Radium 228	See Attached		EPA M9320	2 Dec 16 15:56	ABL
pH, Field	6.90 units	1.00	I-1586-85	19 Oct 16 17:18	JLH
pH	* 7.1 units	1.0	SM 4500 H+B-96	21 Oct 16 11:07	DK
Sulfate	116 mg/L	4.0	ASTM D516-02	27 Oct 16 7:55	AKF
Chloride	5.1 mg/L	3.0	SM 4500 Cl E	27 Oct 16 9:11	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	27 Oct 16 11:59	TWB
Solids, Total Dissolved	534 mg/L	10	SM 2540 C-97	25 Oct 16 15:20	RC
Calcium	129.0 mg/L	0.500	SW6010C	27 Oct 16 13:26	RMV
Lithium	0.030 mg/L	0.005	SW6010C	27 Oct 16 16:26	RMV
Barium	0.082 mg/L	0.005	SW6010C	27 Oct 16 13:26	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	27 Oct 16 13:26	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	27 Oct 16 13:26	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	11 Nov 16 20:30	RMB
Arsenic	3.39 @ ug/L	0.50	SW6020A	11 Nov 16 20:30	RMB
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	14 Nov 16 14:52	RMB
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	11 Nov 16 20:30	RMB
Chromium	0.86 ug/L	0.50	SW6020A	28 Oct 16 0:53	RMB
Lead	See Narrative < 0.5 ug/L	0.5	SW6020A	3 Nov 16 21:32	RMB
Molybdenum	See Narrative 3.17 @ ug/L	0.50	SW6020A	11 Nov 16 20:30	RMB
Selenium	< 2.5 @ ug/L	0.5	SW6020A	18 Nov 16 10:32	RMB
Thallium	< 0.1 ug/L	0.1	SW6020A	3 Nov 16 21:32	RMB
Fluoride	See Narrative 0.280 mg/L	0.020	EPA 300.0	26 Oct 16 6:51	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

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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Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Date: 12/22/2016

CLIENT: MVTL Inc
Project: 31-0548
Lab Order: S1610371

CASE NARRATIVE

Report ID: S1610371002
(Replaces S1610371001)

Samples AS6674 S51, AS6675 S52, AS6676 S2A, AS6677 S3AR, AS6678 S10R, AS6679 S13, and AS6680 S14R were received on October 25, 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.

Report S1610371002 replaces report S1610371001 client sample id's were incorrect on the COC.

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: 31-0548
Lab ID: S1610371-001
ClientSample ID: AS6674 S51
COC: 31-0548

Date Reported 12/22/2016
Report ID S1610371002
(Replaces S1610371001)
WorkOrder: S1610371
CollectionDate: 10/19/2016 4:42:00 PM
DateReceived: 10/25/2016 2:22:00 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	11/08/2016 1625	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	11/08/2016 1625	MB
Radium 228	ND	pCi/L		2	Ga-Tech	11/25/2016 2140	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	11/25/2016 2140	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 1 of 7



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: 31-0548
Lab ID: S1610371-002
ClientSample ID: AS6675 S52
COC: 31-0548

Date Reported 12/22/2016
Report ID S1610371002
(Replaces S1610371001)

WorkOrder: S1610371
CollectionDate: 10/19/2016 3:55:00 PM
DateReceived: 10/25/2016 2:22:00 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	11/08/2016 1625	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	11/08/2016 1625	MB
Radium 228	ND	pCi/L		2	Ga-Tech	11/26/2016 044	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	11/26/2016 044	MB

These results apply only to the samples tested.

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

RL - Reporting Limit

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 2 of 7



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: 31-0548
Lab ID: S1610371-003
ClientSample ID: AS6676 S2A
COC: 31-0548

Date Reported: 12/22/2016
Report ID: S1610371002
(Replaces S1610371001)
WorkOrder: S1610371
CollectionDate: 10/19/2016 3:20:00 PM
DateReceived: 10/25/2016 2:22:00 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	11/08/2016 1625	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	11/08/2016 1625	MB
Radium 228	ND	pCi/L		2	Ga-Tech	11/26/2016 349	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	11/26/2016 349	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: 31-0548
Lab ID: S1610371-004
ClientSample ID: AS6677 S3AR
COC: 31-0548

Date Reported: 12/22/2016
Report ID: S1610371002
(Replaces S1610371001)
WorkOrder: S1610371
CollectionDate: 10/19/2016 2:16:00 PM
DateReceived: 10/25/2016 2:22:00 PM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Int	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	11/08/2016 1625	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	11/08/2016 1625	MB
Radium 228	ND	pCi/L		2	Ga-Tech	11/26/2016 653	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	11/26/2016 653	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

ProjectName: 31-0548
Lab ID: S1610371-005
ClientSample ID: AS6678 S10R
COC: 31-0548

Date Reported 12/22/2016
Report ID S1610371002
(Replaces S1610371001)
WorkOrder: S1610371
CollectionDate: 10/19/2016 2:38:00 PM
DateReceived: 10/25/2016 2:22:00 PM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Int
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	11/08/2016 1625 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	11/08/2016 1625 MB
Radium 228	ND	pCi/L		2	Ga-Tech	11/26/2016 958 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	11/26/2016 958 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 5 of 7



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: 31-0548
Lab ID: S1610371-006
ClientSample ID: AS6679 S13
COC: 31-0548

Date Reported 12/22/2016
Report ID S1610371002
(Replaces S1610371001)
WorkOrder: S1610371
CollectionDate: 10/19/2016 1:03:00 PM
DateReceived: 10/25/2016 2:22:00 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	11/08/2016 1625	MB
Radium 226 Precision (\pm)	NA	pCi/L			SM 7500 Ra-B	11/08/2016 1625	MB
Radium 228	2.3	pCi/L		2	Ga-Tech	11/27/2016 623	MB
Radium 228 Precision (\pm)	3.2	pCi/L			Ga-Tech	11/27/2016 623	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 6 of 7



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: 31-0548
Lab ID: S1610371-007
ClientSample ID: AS6680 S14R
COC: 31-0548

Date Reported 12/22/2016
Report ID S1610371002
(Replaces S1610371001)
WorkOrder: S1610371
CollectionDate: 10/19/2016 4:34:00 PM
DateReceived: 10/25/2016 2:22:00 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	11/08/2016 1625	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	11/08/2016 1625	MB
Radium 228	ND	pCi/L		2	Ga-Tech	11/27/2016 928	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	11/27/2016 928	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 7 of 7



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTI Inc

Date: 11/30/2016

Work Order: S1610371

Report ID: S1610371001

Project: 31-0548

Radium 228 by Ga/Tech

Sample Type MBLK

Units: pCi/L

MB-399 (11/26/16 13:02)	RunNo: 141245	PrepDate: 11/07/16 14:00	BatchID: 12572
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Total Radium 228

ND 1

MB-400 (11/26/16 21:11)	RunNo: 141282	PrepDate: 11/09/16 0:00	BatchID: 12587
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-399 (11/23/16 14:21)	RunNo: 141245	PrepDate: 11/07/16 14:00	BatchID: 12572
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Total Radium 228

35 1 39.1 89.8 61.3 - 120

LCS-400 (11/27/16 00:15)	RunNo: 141282	PrepDate: 11/09/16 0:00	BatchID: 12587
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Total Radium 228

37 1 39.1 95.0 61.3 - 120

Radium 228 by Ga/Tech

Sample Type LCSD

Units: pCi/L

LCSD-399 (11/23/16 17:25)	RunNo: 141245	PrepDate: 11/07/16 14:00	BatchID: 12572
Analyte	Result	RL	Conc %RPD %REC % RPD Limits Qual

Total Radium 228

41 1 35 14.8 104 20

LCSD-400 (11/27/16 03:19)	RunNo: 141282	PrepDate: 11/09/16 0:00	BatchID: 12587
Analyte	Result	RL	Conc %RPD %REC % RPD Limits Qual

Total Radium 228

37 1 37 1.70 93.4 20

Radium 228 by Ga/Tech

Sample Type MS

Units: pCi/L

S1610375-002AMS (11/24/16 05:43)	RunNo: 141245	PrepDate: 11/07/16 14:00	BatchID: 12572
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Total Radium 228

62 2 78.2 ND 79.7 64.3 - 120

Radium 228 by Ga/Tech

Sample Type MSD

Units: pCi/L

S1610375-002AMSD (11/24/16 08:47)	RunNo: 141245	PrepDate: 11/07/16 14:00	BatchID: 12572
Analyte	Result	RL	Conc %RPD %REC % RPD Limits Qual

Total Radium 228

65 2 62 3.77 82.8 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: MVTL Inc
Work Order: S1610371
Project: 31-0548

Date: 11/30/2016
Report ID: S1610371001

Radium 226 In Water - Total by SM7500RA_B

Sample Type MBLK

Units: pCi/L

MB-1684 (11/11/16 08:57)	RunNo: 140833	PrepDate: 11/02/16 0:00	BatchID: R140833
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-1683 (11/08/16 16:25)	RunNo: 140833	PrepDate: 11/02/16 0:00	BatchID: R140833
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Radium 226

25.9

0.2

26.5

97.6

67.1 - 122

Radium 226 In Water - Total by SM7500RA_B

Sample Type LCSD

Units: pCi/L

LCSD-1683 (11/08/16 16:25)	RunNo: 140833	PrepDate: 11/02/16 0:00	BatchID: R140833
Analyte	Result	RL	Conc %RPD %REC % RPD Limits Qual

Radium 226

27.2

0.2

25.9

4.89

102

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, INC.

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



Page: 9 of 9

Date Reported: 5 Dec 2016

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

Work Order #: 201631-0548
Account Number: 006106
PO #: 48679

Project Name: HOOT LAKE PLANT

LABORATORY NARRATIVE

INORGANIC AND METALS ANALYSES:

The internal standard count recoveries associated with chromium failed in the reporting limit checks for samples 16-A56674 through 16-A56680. The data was reported based on the acceptable recovery of the reporting limit checks.

The internal standard count recoveries associated with molybdenum failed in the unspiked sample, matrix spike, and matrix spike duplicate for sample 16-A56674. The data was reported based on acceptable recoveries of the matrix spikes.

The internal standard count recoveries associated with arsenic, selenium, cadmium and antimony failed in the unspiked sample, matrix spike, and matrix spike duplicate for sample 16-A56676. That data was reported based on acceptable recoveries of the matrix spikes.

The internal standard count recoveries associated with chromium failed in the known for samples 16-A56676 through 16-A56680. The data was reported based on the acceptable recovery of the knowns.

Internal standard counts associated with thallium and lead failed in the reporting limit checks for samples 16-A56674 through 16-A56680. Data was reported based on acceptable recoveries of the reporting limit checks.



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Page: 1 of 3

Quality Control Report

Lab IDs: 16-A56674 to 16-A56680

Project: HOOT LAKE PLANT CCR

Work Order: 201631-0548

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	109	85-115	25.0	16A56673q	< 0.5	26.7	107	75-125	26.7	27.5	110	3.0	10	102	90-110	< 0.5
	25.0	106	85-115	25.0	16A56675q	< 2.5	27.6	110	75-125	27.6	27.8	111	0.7	10	110	90-110	
				25.0	16A56673q	< 2.5	26.8	107	75-125	26.8	27.8	111	3.7	10	108	90-110	
Arsenic ug/L	25.0	102	85-115	25.0	16A56673q	1.41	28.8	110	75-125	28.8	29.1	111	1.0	10	103	90-110	< 0.5
	25.0	108	85-115	25.0	16A56675q	< 2.5	29.0	116	75-125	29.0	30.4	122	4.7	10	102	90-110	
				25.0	16A56673q	< 2.5	27.8	111	75-125	27.8	28.7	115	3.2	10	104	90-110	
Barium mg/L	1.000	105	85-115	1.00	16A56674q	0.118	1.240	112	75-125	1.240	1.250	113	0.8	10	102	90-110	< 0.005
Beryllium ug/L	2.50	110	85-115	2.50	16-A56675	< 0.25	2.59	104	75-125	2.59	2.78	111	7.1	10	105	90-110	< 0.05
				2.50	A56673qc	< 0.25	2.93	117	75-125	2.93	2.64	106	10.4	10			
Boron mg/L	1.000	102	85-115	1.00	16A56674q	< 0.1	1.160	116	75-125	1.160	1.160	116	0.0	10	103	90-110	< 0.1
Cadmium ug/L	5.00	106	85-115	5.00	16A56673q	< 0.1	5.34	107	75-125	5.34	5.46	109	2.2	10	100	90-110	< 0.1
	5.00	108	85-115	5.00	16A56675q	< 0.5	5.51	110	75-125	5.51	5.70	114	3.4	10	106	90-110	
				5.00	16A56673q	< 0.5	5.25	105	75-125	5.25	5.40	108	2.8	10	108	90-110	
Calcium mg/L	50.00	104	85-115	50.0	16A56674q	105.0	161.0	112	75-125	161.0	163.0	116	1.2	10	99	90-110	< 0.5
Chloride mg/L	-	-	-	60.0	16-A56669	< 3	56.5	94	85-120	56.5	55.3	92	2.1	5	92	90-110	< 3
	-	-	-	600	16-A56716	137	719	97	85-120	719	721	97	0.3	5	92	90-110	< 3
Chromium ug/L	25.0	113	85-115	25.0	16A56675q	< 0.5	21.5	86	75-125	21.5	23.0	92	6.7	10	106	90-110	< 0.5
				25.0	16A56673q	< 0.5	23.6	94	75-125	23.6	24.4	98	3.3	10	104	90-110	
Cobalt mg/L	1.000	106	85-115	1.00	16A56674q	< 0.005	1.040	104	75-125	1.040	1.070	107	2.8	10	106	90-110	< 0.005
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
				0.20	A56680qc	0.280	0.450	85	75-125	0.450	0.440	80	2.2	10	98	90-110	

Quality Control Report

Lab IDs: 16-A56674 to 16-A56680

Project: HOOT LAKE PLANT CCR

Work Order: 201631-0548

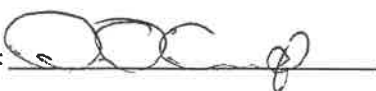
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Lead ug/L	25.0	101	85-115	25.0 25.0	A56675qc A56673qc	< 2.5 < 2.5	25.4 25.9	102 104	75-125 75-125	25.4 25.9	24.9 25.5	100 102	2.0 1.6	10 10	100 98	90-110 90-110	< 0.5
Lithium mg/L	1.000	106	85-115	1.00	16-A56674	0.021	1.150	113	75-125	1.150	1.170	115	1.7	10	106	90-110	< 0.005
Mercury ug/L	- -	- -	- -	0.10	16-A56680	< 0.005	0.092	92	67-106	0.092	0.089	89	3.3	9	102	76-113	< 0.005 < 0.005
Molybdenum ug/L	25.0 25.0	98 107	85-115 85-115	25.0 25.0 25.0 25.0	16A56675q 16A56673q 16A56675q 16A56673q	6.07 0.60 6.80 < 2.5	30.9 25.2 34.4 27.5	99 98 110 110	75-125 75-125 75-125 75-125	30.9 25.2 34.4 27.5	30.5 25.3 34.6 28.4	98 99 111 114	1.3 0.4 0.6 3.2	10 10 10 10	95 94 104 106	90-110 90-110 90-110 90-110	< 0.5 < 0.5
pH units	-	-	-	-	-	-	-	-	-	7.1	7.1	-	0.0	2.5	101	90-110	-
Selenium ug/L	25.0 25.0 25.0	111 112 104	85-115 85-115 85-115	25.0 25.0 25.0	16A56673q 16A56675q A56673qc	< 0.5 < 2.5 < 2.5	28.9 28.5 27.5	116 114 110	75-125 75-125 75-125	28.9 28.5 27.5	28.7 28.6 25.9	115 114 104	0.7 0.4 6.0	10 10 10	101 108 101	90-110 90-110 90-110	< 0.5 < 0.5
Solids, Total Dissolved mg/L	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	592 471 181	576 471 174	- - -	2.7 0.0 3.9	10 13 13	101 94	85-115 85-115	< 10 < 10
Sulfate mg/L	- -	- -	- -	60.0 60.0	16-A56675 16-A57754	63.5 11.0	123 72.7	99 103	78-126 78-126	123 72.7	127 72.5	106 102	3.2 0.3	5 5	98 100	90-110 90-110	< 4 < 4
Thallium ug/L	5.00	102	85-115	5.00 5.00	A56675qc A56673qc	< 0.5 < 0.5	5.13 5.23	103 105	75-125 75-125	5.13 5.23	5.06 5.14	101 103	1.4 1.7	10 10	100 99	90-110 90-110	< 0.1

Page: 3 of 3

*** Due to result < 15 mg/L, data reported based on acceptance criteria of Relative % Difference of ± 4 mg/L.

The beryllium matrix spike duplicate RPD was above the 10% limit at 10.4%, this result would be rounded down to 10% and meet the criteria.

Approved by:

A handwritten signature in black ink, consisting of several loops and a final flourish, is written over a horizontal line.

Minnesota Valley Testing Laboratories

1126 North Front Street
Phone: 800 782 3557

New Ulm, MN 56003
Fax: 507 359 2890

Field Service Chain of Custody Record

This is an exact copy of
the original document

By RS Date 20 Oct 16
pages 1-31

Project Name: Otter Tail Power Co. Hoot Lake Plant		Project Type: Hoot Lake Plant	Name of Samplers: Jeff Hoffman Ben Wolf
Report To: Otter Tail Power Company		Carbon Copy:	Quote Number:
Attn: T. J. Newkirk		Attn:	Work Order Number: 31-0548
Address: P.O. Box 496 Fergus Falls, MN 56038-0496		Address:	Lab Numbers:
Phone: 218-739-8314			

Sample Information							Bottle Type											Analysis	
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	VOC Set	500 none	1000 none	500 HNO3	Filter? Y or N	500 HNO3	Filter? Y or N	500H2SO4	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
81	M-1		19 Oct 16	WL	GW														
82	M-3			WL	GW														
AS 6663	S-1			1231	GW				1	1	Y								E
AS 6676	S-2A *			1303	GW				1	1	Y								E, H, I
83	S-3			WL	GW														
77	S-3A-R *			1634	GW				1	1	Y								E, H, I
84	S-4			WL	GW														
64	S-5			1339	GW				1	1	Y								E
65	S-6			1252	GW				1	1	Y								E
78	S-10R *			1551	GW				1	1	Y								E, H, I

Comments: Submit electronically to MPCA

Comments: Submit electronically to MPCA
Work Order #1

Samples Relinquished By: <u>Jeff Hoffman</u>				Samples Received By: <u>A. Rudin</u>			
Date: <u>20 Oct 16</u>		Time: <u>1445</u>		Date: <u>20 Oct 16</u>		Time: <u>1445</u>	
Samples Relinquished into: <u>Fridge</u>		Log in Cart		Temp: <u>583</u>		Temp: <u>0.0C</u>	
Samples Relinquished By:				Samples Received By:			
Date:		Time:		Date:		Time:	
Deliv:		Other:		Seal Number(s) - If Used		Temp:	
Trans:		Other:		Seals Intact?		Yes No	

Minnesota Valley Testing Laboratories

1126 North Front Street

Phone: 800 782 3557

New Ulm, MN 56003

Fax: 507 359 2890

Field Service Chain of Custody Record

Project Name: Otter Tail Power Co. Hoot Lake Plant		Project Type: Hoot Lake Plant	Name of Samplers: Jeff Hoffman Bun Wolf
Report To: Otter Tail Power Company Attn: T. J. Newkirk Address: P.O. Box 496 Fergus Falls, MN 56038-0496 Phone: 218-739-8314		Carbon Copy: Attn: Address:	Quote Number: Work Order Number: Lab Numbers:

Sample Information							Bottle Type											Analysis		
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	VOC Set	500 none	1000 none	500 HNO3	Filter? Y or N	500 HNO3	Filter? Y or N	500 H2SO4	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required	
66	S-11		19 Oct 16	1233	GW				1	1	Y									E
79	S-13 *		}	1741	GW				1	1	Y									E, H, I
80	S-14R *			1718	GW				1	1	Y									E, H, I
67	S-50			1419	GW				1	1	Y									E
68	S-2014			1503	GW				1	1	Y									E
71	Leachate			1642					1	1	N			1						G
85	Leachate LDS			no sample																
72	SW-1 Upstream			1555																F
73	SW-2 Downstream			1520																F
69	Equipment Blank			1210					1	1	Y									E
70	Duplicate			1339					1	1	Y									E

Comments: Work Order #1

Comments: Work Order #1

Samples Relinquished By: [Signature]				Samples Received By: [Signature]			
Date: 20 Oct 16		Time: 1445		Date: 20 Oct 16		Time: 1443	
Temp: 0° F		Temp: 58.3		Temp: 0° C		Temp: 0° C	
Samples Relinquished into: Fridge				Samples Relinquished into: Log in Cart			
Samples Relinquished By:				Samples Received By:			
Date:		Time:		Date:		Time:	
Temp:		Temp:		Temp:		Temp:	
Deliv: Samplers				Seal Number(s) - If Used			
Transport: Ambient				Seals Intact? Yes No			

Minnesota Valley Testing Laboratories

1126 North Front Street
Phone: 800 782 3557

New Ulm, MN 56003
Fax: 507 359 2890

Field Service Chain of Custody Record

Project Name: Otter Tail Power Co. Hoot Lake Plant		Project Type: Hoot Lake Plant	Name of Samplers: Jeff Hoffmann Ben Wolf
Report To: Otter Tail Power Company		Carbon Copy:	Quote Number:
Attn: Paul Vukonich		Attn:	Work Order Number:
Address: P.O. Box 496 Fergus Falls, MN 56038-0496		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	VOC Set	1000 none	1000 HNO3	500 HNO3	Filter? Y or N	500 HNO3	Filter? Y or N	500H2SO4	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required	
A96676	S2A		19 Oct 16	1303	GW			1	2	1	n								see attachment H, I	E
77	S3AR			1634	GW			1	2	1	n									E
A56674	S51			1416	GW			1	2	1	n									E
75	S52			1438	GW			1	2	1	n									E
78	S10R			1551	GW			1	2	1	n									E
79	S13			1741	GW			1	2	1	n									E
80	S14R			1718	GW			1	2	1	n									E

Comments: 325 null

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Comments: CCR wells
Work Order #2

Samples Relinquished By: [Signature]				Samples Received By: [Signature]			
Date: 20 Oct 16		Time: 1445		Date: 20 Oct 16		Time: 1443	
Temp: 58.3				Temp: 0-0C			
Samples Relinquished into: Fridge Log in Cart Other:							
Samples Relinquished By:				Samples Received By:			
Date:		Time:		Date:		Time:	
Temp:				Temp:			
Delivery: Samplers Other:				Seal Number(s) - If Used			
Transport: Ambient Ice Other:				Seals Intact? Yes No			

work order "C"

Oct 2016

Hoot Lake Site CCR Background Sampling

Site	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (gal/minute)	Goes Dry?
S2A	HLP H, HLP I	79.63	2	1273.776	Bladder	Yes	< 0.25	No
S3AR	HLP H, HLP I	78.42	2	1271.562	Bladder	Yes	< 0.25	No
S51	HLP H, HLP I	55.6	2	1286.904	Bladder	Yes	< 0.25	No
S52	HLP H, HLP I	88.3	2	1286.623	Bladder	Yes	< 0.25	No
S10R	HLP H, HLP I	57.00	2	1281.47	Bladder	Yes	< 0.25	No
S13	HLP H, HLP I	90.19	2	1296.423	Bladder	Yes	< 0.25	No
S14R	HLP H, HLP I	70.86	2	1280.61	Bladder	Yes	< 0.25	Yes

All CCR wells should be low flow purges with turbidity <10 NTU

HLP "H" Monitoring 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 ✓

1-LITER

~~#1~~ Hoot Lake Oct 2016

HLP "E" Monitoring Parameters

S1, S10R, S11, S13, S14R, S2A, S3AR, S5, S50, S6, S2014 FALL ONLY

Field Parameters

pH*

Specific Conductance*

Temperature

Appearance*

Dissolved Oxygen

Turbidity

500 4103 Filtered

1000 NOAC

* Field and Laboratory Measurements

Routine Parameters

Alkalinity, Total as CaCO_3

Arsenic

Boron

Chloride

Dissolved Solids, Total

Selenium

Static Water Elevation

Sulfate

Suspended Solids, Total

NOTE: Equipment Blank and the Duplicate should be analyzed for this list in the Fall event

HLP "I" Monitoring 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 ~ 2-1000 HNO₃

500 HNO₃

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co./ Hoot L

Facility ID: SW-211

Date: 19 Oct 16

Unique Station ID:

Sample ID: S-51

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: 55.60

Constructed Depth: -

Casing Diameter: 2"

Water Level Before Purge: 49.65

Well Volume: .97 Gallons

Well Casing Elevation: 1286.9

Static Water Elevation: 1237.25

Previous Static: -

Water Level After Sample: 50.63

Measurement Method: ☒ Elec. WL ☐ Steel T

Sampling Information

Weather Conditions: Temp: 50

Wind: L6V

Sky: Cloudy

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

Dedicated Equipment: ☒ Yes ☐ No

Pumping Rate: .9

Well Purged Dry? Yes ☒ No ☐

Time Pump Began: 1407 am 10

Time Purged Dry?

Time of Sampling: 1416 am 10

Duplicate Sample? Yes ☒ No ☐ ID: -

Sample EH: -77.8

Sample Appearance: General: Slightly cloudy Color: None Phase: Light red odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	ments
1410	6.91	861	8.48	.91	10.7	1.2	1	
1413	6.91	855	8.53	.88	9.9	2.4	2	
1416	6.90	852	8.55	.86	9.9	3.6	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 3.6

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./ Hoot L

Facility ID: SW-211

Date: 19 Oct 16

Unique Station ID:

Sample ID: S-52

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: 88.30

Constructed Depth: —

Casing Diameter: 2"

Water Level Before Purge: 70.63

Well Volume: 2.88 Gallons

Well Casing Elevation: 1286.62

Static Water Elevation: 1215.99

Previous Static: —

Water Level After Sample: 72.04

Measurement Method: Elec. WLI Steel T

Sampling Information

Weather Conditions: Temp: 50 Wind: LLV 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: 0.6

Time Pump Began: 1418 am 10

Time of Sampling: 1438 am 10

Sample EH: -94.1

Sample Appearance: General: clear Color: none Phase: Light red. odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	ments
1423	6.60	1081	8.22	.87	0.0	3	1	
1428	6.56	973	8.21	.75	0.0	6	2	
1433	6.55	973	8.20	.70	0.0	9	3	
1438	6.54	972	8.19	.65	0.0	12	4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 12

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./ Hoot Lake

Facility ID: SW-211

Date: 19 Oct 16

Unique Station ID:

Sample ID: S-2A

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: 79.61

Constructed Depth: 79.63

Casing Diameter: 2"

Water Level Before Purge: 76.65

Well Volume: 48 Gallons

Well Casing Elevation: 1273.776

Static Water Elevation: 1197.37

Previous Static: 1196.69

Water Level After Sample: Below pump

Measurement Method: ☒ Elec. WL ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 49

Wind: L6V

Sky: cloudy

Sampling Method: Grundfos

☒ Bladder SST

☐ Disp. Baller

☐ Whale

☐ Grab

☐ Other:

Dedicated Equipment: ☒ Yes ☐ No

Pumping Rate: 2 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began: 1254 am / pm

Time Purged Dry?

Time of Sampling: 1303 am / pm

Duplicate Sample? ☒ Yes ☐ No ID: -

Sample EH: 147.3

Sample Appearance: General:

Color:

Phase:

Odor:

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1257	6.46	1155	9.01	4.89	0.0	.6	1	
1300	6.43	1163	8.94	4.95	0.0	1.2	2	
1303	6.49	1167	8.92	4.79	0.0	1.8	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 1.8

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./ Hoot Lake

Facility ID: SW-211

Date: 19 Oct 16

Unique Station ID: 674671

Sample ID: S-3A-R

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: 78.40

Constructed Depth: 78.42

Casing Diameter: 2"

Water Level Before Purge: 68.03

Well Volume: 1.69 Gallons

Well Casing Elevation: 1271.562

Static Water Elevation: 1203.53

Previous Static: 1203.46

Water Level After Sample: 68.16

Measurement Method: ☒ Elec. WL ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 45° Wind: NW-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: 1613 am ☐ pm

Time Purged Dry? ☐ Yes ☒ No

Time of Sampling: 1634 am ☐ pm

Duplicate Sample? ☐ Yes ☒ No ID: _____

Sample EH: -86.5

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:
1620	6.97	912	8.89	1.52	10.2	1.75	1	
1627	6.94	913	8.89	1.57	9.2	3.50	2	
1634	6.90	914	8.88	1.75	7.1	3.25	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 5.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 19 Oct 16

Unique Station ID: 806341

Sample ID: S-10R

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: 80.62

Well Casing Elevation: NA

Constructed Depth:

Static Water Elevation:

Casing Diameter: 2"

Previous Static:

Water Level Before Purge: 72.12

Water Level After Sample: 72.13

Well Volume: Gallons

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 45° Wind: NW-10 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: 15:21 am / ☒ pm

Time Purged Dry?

Time of Sampling: 15:51 am / ☒ pm

Duplicate Sample? Yes ☒ No ID:

Sample EH: -62.3

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

<u>6</u> Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1527	6.87	864	8.88	1.03	30.4	1.5	1	
1533	6.86	866	8.88	0.90	21.4	3.0	2	
1539	6.85	867	8.90	0.83	13.1	4.5	3	
1545	6.83	869	8.90	0.76	6.6	6.0	4	
1551	6.83	869	8.85	0.73	5.2	7.5	5	

Stabilized? Yes ☒ No

Amount Water Removed: 7.5 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 19 Oct 16

Unique Station ID:

Sample ID: S-13

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: 90.27

Constructed Depth: 90.19

Casing Diameter: 2"

Water Level Before Purge: 84.81

Well Volume: .89 Gallons

Well Casing Elevation: 1296.423

Static Water Elevation: 1211.61

Previous Static: 1210.64

Water Level After Sample: 85.60

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 45° Wind: NW-10 Sky: Cloudy

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

Dedicated Equipment: ☒ Yes ☐ No

Pumping Rate: .25 gpm

Well Purged Dry? ☒ Yes ☐ No

Time Pump Began: 1729 am / ☒ pm

Time Purged Dry?

Time of Sampling: 1741 am / ☒ pm

Duplicate Sample? ☒ Yes ☐ No ID: —

Sample EH: -71.3

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>4</u> 1733	<u>6.97</u>	<u>1007</u>	<u>8.87</u>	<u>1.20</u>	<u>0.0</u>	<u>1</u>	<u>1</u>	
1737	<u>6.85</u>	<u>1004</u>	<u>8.89</u>	<u>1.09</u>	<u>0.0</u>	<u>2</u>	<u>2</u>	
1741	<u>6.79</u>	<u>1003</u>	<u>8.91</u>	<u>.91</u>	<u>0.0</u>	<u>3</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ 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:

Jeff Hoffman

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 19 Oct 16

Unique Station ID: 806342

Sample ID: S-14R

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: 87.11

Well Casing Elevation: NA

Constructed Depth:

Static Water Elevation: 1

Casing Diameter: 2"

Previous Static:

Water Level Before Purge: 79.39

Water Level After Sample: 79.39

Well Volume: 1.26 Gallons

Measurement Method: ☒ Elec. WL ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 45° Wind: NW-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: 1649 am ☒ pm

Time Purged Dry?

Time of Sampling: 1718 am ☒ pm

Duplicate Sample? ☒ Yes ☐ No ID: —

Sample EH: -142.5

Sample Appearance: General: Clear Color: none Phase: none Odor: subtle

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1655	7.05	954	8.87	1.23	47.4	1.5	1	
1701	6.95	922	8.86	0.86	24.3	3.0	2	
1707	6.92	914	8.86	0.78	17.8	4.5	3	
1713	6.91	907	8.84	0.74	13.5	6.0	4	
1718	6.90	905	8.83	0.75	12.8	7.5	5	

Stabilized? Yes ☒ No ☐

Amount Water Removed: 7.5 Gallons

Comments:

Exceptions to Protocol:



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



Page: 1 of 16

FINAL REPORT COMPLETION DATE: 5 Jan 17 *AK*

Date Reported: 3 Jan 2017

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

Work Order #: 31-0617
Account #: 006106
PO #: 48679

Project Name: HOOT LAKE PLANT

T. T. T. 04 Jan 17
Field Service Manager/Date Reviewed

[Signature] 03 Jan 2017
Chemistry Lab Manager/Date Reviewed

[Signature] 03 Jan 17
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

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

Report Date: 3 Jan 2017
 Lab Number: 16-A62797
 Work Order #: 31-0617
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 21 Nov 2016 12:06
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 21 Nov 2016 16:46
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-2A

Temp at Receipt: 2.3C

	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			3 Jan 17 8:47	ABL
Radium 228	See Attached		EPA M9320	3 Jan 17 8:48	ABL
pH, Field	7.14 units	1.00	I-1586-85	21 Nov 16 12:06	TJP
pH	* 7.0 units	1.0	SM 4500 H+B-96	22 Nov 16 10:25	DK
Sulfate	186 @ mg/L	4.0	ASTM D516-02	1 Dec 16 7:51	AKF
Chloride	< 3 mg/L	3	SM 4500 Cl E	1 Dec 16 9:07	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	5 Dec 16 9:40	TWB
	See Narrative				
Solids, Total Dissolved	588 mg/L	10	SM 2540 C-97	22 Nov 16 15:25	RC
Calcium	147.0 mg/L	0.500	SW6010C	29 Nov 16 13:26	RMV
	See Narrative				
Lithium	0.033 ^ mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Barium	0.050 mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Boron	0.236 mg/L	0.100	SW6010C	29 Nov 16 13:26	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
Arsenic	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Beryllium	< 0.25 ug/L	0.05	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 Dec 16 9:10	RMV
Chromium	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 9:10	RMV
Lead	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 9:10	RMV
Selenium	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Thallium	< 0.5 ug/L	0.1	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Fluoride	0.270 mg/L	0.020	EPA 300.0	23 Nov 16 12:35	RMB

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TSI 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

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

Report Date: 3 Jan 2017
Lab Number: 16-A62797
Work Order #: 31-0617
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 21 Nov 2016 12:06
Sampled By: MVTL FIELD PERSONNEL
Date Received: 21 Nov 2016 16:46
PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-2A

Temp at Receipt: 2.3C

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

^ 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
! = 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

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

Report Date: 3 Jan 2017
 Lab Number: 16-A62798
 Work Order #: 31-0617
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 21 Nov 2016 12:44
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 21 Nov 2016 16:46
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-3A-R

Temp at Receipt: 2.3C

	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			3 Jan 17 8:48	ABL
Radium 228	See Attached		EPA M9320	3 Jan 17 8:48	ABL
pH, Field	7.28 units	1.00	I-1586-85	21 Nov 16 12:44	TJP
pH	* 7.2 units	1.0	SM 4500 H+B-96	22 Nov 16 10:25	DK
Sulfate	150 @ mg/L	4.0	ASTM D516-02	1 Dec 16 7:51	AKF
Chloride	12.4 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:07	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	5 Dec 16 9:40	TWB
	See Narrative				
Solids, Total Dissolved	562 mg/L	10	SM 2540 C-97	22 Nov 16 15:25	RC
Calcium	118.0 mg/L	0.500	SW6010C	29 Nov 16 13:26	RMV
	See Narrative				
Lithium	0.025 ^ mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Barium	0.043 mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Boron	0.227 mg/L	0.100	SW6010C	29 Nov 16 13:26	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
Arsenic	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Beryllium	< 0.25 ug/L	0.05	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 Dec 16 9:10	RMV
Chromium	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 9:10	RMV
Lead	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 9:10	RMV
Selenium	< 5 ug/L	0.5	SW6020A	9 Dec 16 9:10	RMV
	@^See Narrative				
Thallium	< 0.5 ug/L	0.1	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Fluoride	0.230 mg/L	0.020	EPA 300.0	23 Nov 16 12:35	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

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CERTIFICATE of ANALYSIS - CCR

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

Report Date: 3 Jan 2017
Lab Number: 16-A62798
Work Order #: 31-0617
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 21 Nov 2016 12:44
Sampled By: MVTL FIELD PERSONNEL
Date Received: 21 Nov 2016 16:46
PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-3A-R

Temp at Receipt: 2.3C

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

^ 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 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: 3 Jan 2017
 Lab Number: 16-A62799
 Work Order #: 31-0617
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 21 Nov 2016 12:24
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 21 Nov 2016 16:46
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-51

Temp at Receipt: 2.3C

	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			3 Jan 17 8:48	ABL
Radium 228	See Attached		EPA M9320	3 Jan 17 8:48	ABL
pH, Field	7.01 units	1.00	I-1586-85	21 Nov 16 12:24	JLH
pH	* 7.1 units	1.0	SM 4500 H+B-96	22 Nov 16 10:25	DK
Sulfate	83.2 @ mg/L	4.0	ASTM D516-02	1 Dec 16 7:51	AKF
Chloride	17.7 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:07	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	5 Dec 16 9:40	TWB
	See Narrative				
Solids, Total Dissolved	474 mg/L	10	SM 2540 C-97	22 Nov 16 15:25	RC
Calcium	120.0 mg/L	0.500	SW6010C	29 Nov 16 13:26	RMV
	See Narrative				
Lithium	0.023 ^ mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Barium	0.077 mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	29 Nov 16 13:26	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
Arsenic	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Beryllium	< 0.25 ug/L	0.05	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 Dec 16 9:10	RMV
Chromium	3.34 @ ug/L	0.50	SW6020A	9 Dec 16 9:10	RMV
Lead	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 9:10	RMV
Selenium	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Thallium	< 0.5 ug/L	0.1	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Fluoride	0.290 mg/L	0.020	EPA 300.0	23 Nov 16 12:35	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

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CERTIFICATE of ANALYSIS - CCR

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

Report Date: 3 Jan 2017
Lab Number: 16-A62799
Work Order #: 31-0617
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 21 Nov 2016 12:24
Sampled By: MVTL FIELD PERSONNEL
Date Received: 21 Nov 2016 16:46
PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-51

Temp at Receipt: 2.3C

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

^ 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

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

Report Date: 3 Jan 2017
 Lab Number: 16-A62800
 Work Order #: 31-0617
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 21 Nov 2016 13:08
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 21 Nov 2016 16:46
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-52

Temp at Receipt: 2.3C

	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			3 Jan 17 8:48	ABL
Radium 228	See Attached		EPA M9320	3 Jan 17 8:49	ABL
pH, Field	6.99 units	1.00	I-1586-85	21 Nov 16 13:08	JLH
pH	* 7.1 units	1.0	SM 4500 H+B-96	22 Nov 16 10:25	DK
Sulfate	77.8 @ mg/L	4.0	ASTM D516-02	1 Dec 16 7:51	AKF
Chloride	15.5 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:07	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	5 Dec 16 9:40	TWB
	See Narrative				
Solids, Total Dissolved	468 mg/L	10	SM 2540 C-97	22 Nov 16 15:25	RC
Calcium	103.0 mg/L	0.500	SW6010C	29 Nov 16 13:26	RMV
	See Narrative				
Lithium	0.019 ^ mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Barium	0.106 mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	29 Nov 16 13:26	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
Arsenic	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Beryllium	< 0.25 ug/L	0.05	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 Dec 16 9:10	RMV
Chromium	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 9:10	RMV
Lead	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Molybdenum	2.68 @ ug/L	0.50	SW6020A	9 Dec 16 9:10	RMV
Selenium	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Thallium	< 0.5 ug/L	0.1	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Fluoride	0.220 mg/L	0.020	EPA 300.0	23 Nov 16 12:35	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:

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 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: 3 Jan 2017
Lab Number: 16-A62800
Work Order #: 31-0617
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 21 Nov 2016 13:08
Sampled By: MVTI FIELD PERSONNEL
Date Received: 21 Nov 2016 16:46
PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-52

Temp at Receipt: 2.3C

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 # 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: 3 Jan 2017
Lab Number: 16-A62801
Work Order #: 31-0617
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 21 Nov 2016 11:48
Sampled By: MVTL FIELD PERSONNEL
Date Received: 21 Nov 2016 16:46
PO #: 48679

Temp at Receipt: 2.3C

Project Name: HOOT LAKE PLANT

Sample Description: S-10R

	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			3 Jan 17 8:49	ABL
Radium 228	See Attached		EPA M9320	3 Jan 17 8:49	ABL
pH, Field	6.98 units	1.00	I-1586-85	21 Nov 16 11:48	JLH
pH	* 7.1 units	1.0	SM 4500 H+B-96	22 Nov 16 10:25	DK
Sulfate	129 @ mg/L	4.0	ASTM D516-02	1 Dec 16 7:51	AKF
Chloride	12.5 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:07	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	5 Dec 16 9:40	TWB
	See Narrative				
Solids, Total Dissolved	526 mg/L	10	SM 2540 C-97	22 Nov 16 15:25	RC
Calcium	121.0 mg/L	0.500	SW6010C	29 Nov 16 13:26	RMV
	See Narrative				
Lithium	0.024 ^ mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Barium	0.107 mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	29 Nov 16 13:26	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
Arsenic	4.10 @ ug/L	0.50	SW6020A	9 Dec 16 9:10	RMV
Beryllium	< 0.25 ug/L	0.05	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 Dec 16 9:10	RMV
Chromium	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 9:10	RMV
Lead	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 9:10	RMV
Selenium	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Thallium	< 0.5 ug/L	0.1	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Fluoride	0.210 mg/L	0.020	EPA 300.0	23 Nov 16 12:35	RMB

RL = Reporting Limit

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

Analyses performed under our Minnesota Department of Health Accreditation conform to 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



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CERTIFICATE of ANALYSIS - CCR

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

Report Date: 3 Jan 2017
Lab Number: 16-A62801
Work Order #: 31-0617
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 21 Nov 2016 11:48
Sampled By: MVTL FIELD PERSONNEL
Date Received: 21 Nov 2016 16:46
PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-10R

Temp at Receipt: 2.3C

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 # 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: 3 Jan 2017
 Lab Number: 16-A62802
 Work Order #: 31-0617
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 21 Nov 2016 13:14
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 21 Nov 2016 16:46
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-13

Temp at Receipt: 2.3C

	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			3 Jan 17 8:49	ABL
Radium 228	See Attached		EPA M9320	3 Jan 17 8:49	ABL
pH, Field	7.16 units	1.00	I-1586-85	21 Nov 16 13:14	TJP
pH	* 7.1 units	1.0	SM 4500 H+B-96	22 Nov 16 10:25	DK
Sulfate	108 @ mg/L	4.0	ASTM D516-02	1 Dec 16 7:51	AKF
Chloride	8.9 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:07	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	5 Dec 16 9:40	TWB
	See Narrative				
Solids, Total Dissolved	477 mg/L	10	SM 2540 C-97	23 Nov 16 10:30	RC
Calcium	119.0 mg/L	0.500	SW6010C	29 Nov 16 13:26	RMV
	See Narrative				
Lithium	0.024 ^ mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Barium	0.061 mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	29 Nov 16 13:26	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
Arsenic	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Beryllium	< 0.25 ug/L	0.05	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 Dec 16 9:10	RMV
Chromium	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 9:10	RMV
Lead	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 9:10	RMV
Selenium	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Thallium	< 0.5 ug/L	0.1	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Fluoride	0.260 mg/L	0.020	EPA 300.0	23 Nov 16 12:35	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

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CERTIFICATE of ANALYSIS - CCR

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

Report Date: 3 Jan 2017
Lab Number: 16-A62802
Work Order #: 31-0617
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 21 Nov 2016 13:14
Sampled By: MVTL FIELD PERSONNEL
Date Received: 21 Nov 2016 16:46
PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-13

Temp at Receipt: 2.3C

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 # 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: 3 Jan 2017
 Lab Number: 16-A62803
 Work Order #: 31-0617
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 21 Nov 2016 11:42
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 21 Nov 2016 16:46
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-14R

Temp at Receipt: 2.3C

	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			3 Jan 17 8:49	ABL
Radium 228	See Attached		EPA M9320	3 Jan 17 8:49	ABL
pH, Field	7.14 units	1.00	I-1586-85	21 Nov 16 11:42	TJP
pH	* 7.1 units	1.0	SM 4500 H+B-96	22 Nov 16 10:25	DK
Sulfate	132 @ mg/L	4.0	ASTM D516-02	1 Dec 16 7:51	AKF
Chloride	5.1 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:07	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	5 Dec 16 10:36	TWB
	See Narrative				
Solids, Total Dissolved	600 mg/L	10	SM 2540 C-97	23 Nov 16 10:30	RC
Calcium	134.0 mg/L	0.500	SW6010C	2 Dec 16 9:36	RMV
Lithium	0.027 ^ mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Barium	0.074 mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	29 Nov 16 13:26	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	29 Nov 16 13:26	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 9:10	RMV
Beryllium	< 0.25 ug/L	0.05	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 Dec 16 9:10	RMV
Chromium	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 9:10	RMV
Lead	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 9:10	RMV
Selenium	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Thallium	< 0.5 ug/L	0.1	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Fluoride	0.240 mg/L	0.020	EPA 300.0	23 Nov 16 12:35	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-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: 3 Jan 2017
Lab Number: 16-A62803
Work Order #: 31-0617
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 21 Nov 2016 11:42
Sampled By: MVTFL FIELD PERSONNEL
Date Received: 21 Nov 2016 16:46
PO #: 48679

Temp at Receipt: 2.3C

Project Name: HOOT LAKE PLANT

Sample Description: S-14R

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

^ 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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Date Reported: 3 Jan 2017

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

Work Order #: 201631-0617
Account Number: 006106
PO #: 48679

Project Name: HOOT LAKE PLANT

LABORATORY NARRATIVE

INORGANIC AND METALS ANALYSES:

Due to the sample matrix of the spike sample, the matrix spike recovery was outside of acceptance range for calcium for samples 16-A62797 through 16-A62802. Data was reported based on the acceptable recoveries of the laboratory control spike and relative percent difference between the matrix spikes.

The matrix spike recoveries for mercury associated with samples 16-A62797 through 16-A62803 were above the acceptance limits. Only results less than the reporting limit were reported.

The knowns and laboratory control spike were above the acceptance limits for beryllium for samples 16-A62797 through 16-A62803. Data below the reporting limit were reported.

The matrix spike recoveries for beryllium, arsenic, selenium, thallium, and lead were above the acceptance limits for samples 16-A62797, 16-A62799, 16-A62800 and 16-A62802. Data below the reporting limit were reported.

The matrix spike recoveries for beryllium, arsenic, thallium, and lead were above the acceptance limits for sample 16-A62798. Data below the reporting limit were reported.

The matrix spike recoveries for beryllium, selenium, thallium, and lead were above the acceptance limits for samples 16-A62801 and 16-A62803. 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-A62798. Data was reported based on the acceptable recoveries of the blank spike and relative percent difference between the matrix spikes.

No other problems were encountered with these analyses.

Quality Control Report

Lab IDs: 16-A62797 to 16-A62803

Project: HOOT LAKE PLANT CCR

Work Order: 201631-0617

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
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	113	85-115	25.0	16A63072q	< 2.5	29.1	116	75-125	29.1	29.6	118	1.7	10	106	90-110	< 0.5
Barium mg/L	1.000	102	85-115	1.00	16A62803q	0.074	1.140	107	75-125	1.140	1.040	97	9.2	10	95	90-110	< 0.005
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
Boron mg/L	1.000	102	85-115	1.00	16A62803q	< 0.1	1.180	118	75-125	1.180	1.090	109	7.9	10	98	90-110	< 0.1
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
Calcium mg/L	50.00	105	85-115	50.0	16A62803q	125.0	190.0	130	75-125	190.0	173.0	96	9.4	10	100	90-110	< 0.5
	50.00	109	85-115	50.0	16A62903q	14.50	67.00	105	75-125	67.00	68.40	108	2.1	10	101	90-110	< 0.5
	50.00	107	85-115	50.0	16A62803q	134.0	193.0	118	75-125	193.0	186.0	104	3.7	10			< 0.5
Chloride mg/L	-	-	-	60.0	16-A63072	80.9	142	102	85-120	142	139	97	2.1	5	100	90-110	< 3
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
Cobalt mg/L	1.000	106	85-115	1.00	16A62803q	< 0.005	1.050	105	75-125	1.050	0.969	97	8.0	10	99	90-110	< 0.005
Fluoride mg/L	0.200	105	85-115	0.20	16-A62802	0.260	0.440	90	75-125	0.440	0.440	90	0.0	10	105	90-110	< 0.02
				0.20	16-A62737	0.160	0.340	90	75-125	0.340	0.360	100	5.7	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
Lithium mg/L	1.000	104	85-115	1.00	16-A62803	0.027	1.110	108	75-125	1.110	1.020	99	8.5	10	97	90-110	< 0.005
Mercury ug/L	-	-	-	0.10	16-A62797	< 0.005	0.110	110	67-106	0.110	0.112	112	1.8	9	86	76-113	< 0.005
	-	-	-	0.10	16-A63071	< 0.005	0.112	112	67-106	0.112	0.112	112	0.0	9	112	76-113	< 0.005
	-	-	-														< 0.005
	-	-	-														< 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
pH units	-	-	-	-	-	-	-	-	-	7.1	7.1	-	0.0	2.5	101	90-110	-
Selenium ug/L	25.0	98	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	113	85-115	25.0	16A63072q	< 5	31.3	125	75-125	31.3	34.0	136	8.3	10	109	90-110	< 0.5

Quality Control Report

Lab IDs: 16-A62797 to 16-A62803

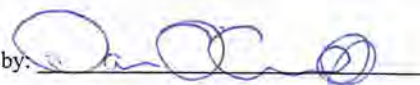
Project: HOOT LAKE PLANT CCR

Work Order: 201631-0617

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	-	-	-	-	-	-	-	-	-	526	512	-	2.7	10	96	85-115	< 10
	-	-	-	-	-	-	-	-	-	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
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

The arsenic matrix spike recoveries were outside the acceptance limits, see narrative.
The beryllium matrix spike recoveries were outside the acceptance limits, see narrative.
The beryllium LCS recovery was above the acceptance limits, see narrative.
The beryllium known recovery was above the acceptance limit, see narrative.
The calcium matrix spike recovery was 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.

Approved by:





Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Date: 12/30/2016

CLIENT: MVTL Inc
Project: Hoot Lake Plant
Lab Order: S1611425

CASE NARRATIVE
Report ID: S1611425001

Samples A62797 S-2A, A62798 S-3A-R, A62799 S-51, A62800 S-52, A62801 S-10R, A62802 S-13, and A62803 S-14R were received on November 28, 2016.

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

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

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

Reviewed by:

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 12/30/2016
Report ID S1611425001

ProjectName: Hoot Lake Plant
Lab ID: S1611425-001
ClientSample ID: A62797 S-2A
COC: WEB

WorkOrder: S1611425
CollectionDate: 11/21/2016 12:06:00 PM
DateReceived: 11/28/2016 11:35:00 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	12/09/2016 1453	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	12/09/2016 1453	MB
Radium 228	ND	pCi/L		2	Ga-Tech	12/23/2016 455	WN
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	12/23/2016 455	WN

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

Page 1 of 7



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 12/30/2016
Report ID S1611425001

ProjectName: Hoot Lake Plant
Lab ID: S1611425-002
ClientSample ID: A62798 S-3A-R
COC: WEB

WorkOrder: S1611425
CollectionDate: 11/21/2016 12:44:00 PM
DateReceived: 11/28/2016 11:35:00 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	12/09/2016 1453	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	12/09/2016 1453	MB
Radium 228	ND	pCi/L		2	Ga-Tech	12/23/2016 759	WN
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	12/23/2016 759	WN

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

Date Reported 12/30/2016
Report ID S1611425001

ProjectName: Hoot Lake Plant
Lab ID: S1611425-003
ClientSample ID: A62799 S-51
COC: WEB

WorkOrder: S1611425
CollectionDate: 11/21/2016 12:24:00 PM
DateReceived: 11/28/2016 11:35:00 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	12/12/2016 903	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	12/12/2016 903	MB
Radium 228	ND	pCi/L		2	Ga-Tech	12/24/2016 839	WN
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	12/24/2016 839	WN

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
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 12/30/2016
Report ID S1611425001

ProjectName: Hoot Lake Plant
Lab ID: S1611425-004
ClientSample ID: A62800 S-52
COC: WEB

WorkOrder: S1611425
CollectionDate: 11/21/2016 1:08:00 PM
DateReceived: 11/28/2016 11:35:00 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	12/12/2016 903	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	12/12/2016 903	MB
Radium 228	ND	pCi/L		2	Ga-Tech	12/24/2016 1141	WN
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	12/24/2016 1141	WN

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 12/30/2016
Report ID S1611425001

ProjectName: Hoot Lake Plant
Lab ID: S1611425-005
ClientSample ID: A62801 S-10R
COC: WEB

WorkOrder: S1611425
CollectionDate: 11/21/2016 11:48:00 AM
DateReceived: 11/28/2016 11:35:00 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	12/12/2016 903	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	12/12/2016 903	MB
Radium 228	ND	pCi/L		2	Ga-Tech	12/24/2016 1443	WN
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	12/24/2016 1443	WN

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 12/30/2016
Report ID S1611425001

ProjectName: Hoot Lake Plant
Lab ID: S1611425-006
ClientSample ID: A62802 S-13
COC: WEB

WorkOrder: S1611425
CollectionDate: 11/21/2016 1:14:00 PM
DateReceived: 11/28/2016 11:35:00 AM
FieldSampler:
Matrix: Water

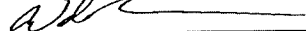
Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	12/12/2016 903	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	12/12/2016 903	MB
Radium 228	ND	pCi/L		2	Ga-Tech	12/24/2016 1746	WN
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	12/24/2016 1746	WN

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 12/30/2016
Report ID S1611425001

ProjectName: Hoot Lake Plant
Lab ID: S1611425-007
ClientSample ID: A62803 S-14R
COC: WEB

WorkOrder: S1611425
CollectionDate: 11/21/2016 11:42:00 AM
DateReceived: 11/28/2016 11:35:00 AM
FieldSampler:
Matrix: Water

Comments

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	12/12/2016 903	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	12/12/2016 903	MB
Radium 228	ND	pCi/L		2	Ga-Tech	12/24/2016 2047	WN
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	12/24/2016 2047	WN

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: S1611425
Project: Hoot Lake Plant

Date: 12/30/2016
Report ID: S1611425001

Radium 228 by Ga/Tech		Sample Type	MBLK	Units: pCi/L				
MB-405 (12/20/16 10:04)	RunNo: 142088	PrepDate: 12/01/16 14:00	BatchID: 12688					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228	ND	1						
MB-406 (12/23/16 14:28)	RunNo: 142089	PrepDate: 12/01/16 14:00	BatchID: 12689					
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-405 (12/20/16 13:06)	RunNo: 142088	PrepDate: 12/01/16 14:00	BatchID: 12688					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228	38	1	40.3		94.9	64.4 - 99.5		
LCS-406 (12/23/16 17:29)	RunNo: 142089	PrepDate: 12/01/16 14:00	BatchID: 12689					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228	42	1	40.3		103	63.8 - 119		
Radium 228 by Ga/Tech		Sample Type	LCSD	Units: pCi/L				
LCSD-405 (12/20/16 16:08)	RunNo: 142088	PrepDate: 12/01/16 14:00	BatchID: 12688					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228	40	1	38	4.02	98.8	20		
LCSD-406 (12/23/16 20:31)	RunNo: 142089	PrepDate: 12/01/16 14:00	BatchID: 12689					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228	40	1	42	3.05	100	20		
Radium 228 by Ga/Tech		Sample Type	MS	Units: pCi/L				
S1611336-003AMS (12/21/16 13:22)	RunNo: 142088	PrepDate: 12/01/16 14:00	BatchID: 12688					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228	63	1	80.6	2	76.2	55 - 113		
Radium 228 by Ga/Tech		Sample Type	MSD	Units: pCi/L				
S1611336-003AMSD (12/21/16 16:24)	RunNo: 142088	PrepDate: 12/01/16 14:00	BatchID: 12688					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228	76	1	63	18.6	92.4	30		

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

Your Environmental Monitoring Partner

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

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTI Inc
Work Order: S1611425
Project: Hoot Lake Plant

Date: 12/30/2016
Report ID: S1611425001

Radium 226 in Water -		Sample Type	MBLK	Units: pCi/L			
MB-1699 (12/12/16 09:03)	RunNo: 141709	PrepDate: 12/15/16 0:00	BatchID: 12639				
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	ND	0.2					
MB-1698 (12/09/16 11:50)	RunNo: 141728	PrepDate: 12/05/16 0:00	BatchID: 12642				
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-1699 (12/12/16 09:03)	RunNo: 141709	PrepDate: 12/15/16 0:00	BatchID: 12639				
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	6.5	0.2	5.89		111	67.1 - 122	
LCS-1698 (12/09/16 11:50)	RunNo: 141728	PrepDate: 12/05/16 0:00	BatchID: 12642				
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	5.9	0.2	5.89		100	67.1 - 122	
Radium 226 in Water -		Sample Type	LCSD	Units: pCi/L			
LCSD-1699 (12/12/16 09:03)	RunNo: 141709	PrepDate: 12/15/16 0:00	BatchID: 12639				
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 226	6.2	0.2	6.5	4.53	106	20	
LCSD-1698 (12/09/16 11:50)	RunNo: 141728	PrepDate: 12/05/16 0:00	BatchID: 12642				
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 226	5.8	0.2	5.9	0.876	99.1	20	
Radium 226 in Water -		Sample Type	MS	Units: pCi/L			
S1611442-003AMS (12/12/16 09:03)	RunNo: 141709	PrepDate: 12/15/16 0:00	BatchID: 12639				
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	12.9	0.2	11.8	ND	110	65 - 131	
S1611363-001CMS (12/09/16 11:50)	RunNo: 141728	PrepDate: 12/05/16 0:00	BatchID: 12642				
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	14.6	0.2	11.8	4.9	82.3	65 - 131	
Radium 226 in Water -		Sample Type	MSD	Units: pCi/L			
S1611442-003AMSD (12/12/16 09:03)	RunNo: 141709	PrepDate: 12/15/16 0:00	BatchID: 12639				
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 226	12.4	0.2	12.9	4.56	105	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 AS Date 21 Nov 16

Pages 1-11

Project Name: Otter Tail Power Co. Hoot Lake Plant		Project Type: Hoot Lake Plant	Name of Samplers: Tim Porter Jeff Mathew
Report To: Otter Tail Power Company		Carbon Copy:	Quote Number:
Attn: Paul Vukonich		Attn:	Work Order Number: 31-617
Address: P.O. Box 496 Fergus Falls, MN 56038-0496		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	VOC Set	1000 none	1000 HNO3	500 HNO3	Filter? Y or N	500 HNO3	Filter? Y or N	500H2SO4	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
A62797	S2A		21 Nov 16	1206	GW			1	2	1	n								see attachment
98	S3AR			1244	GW			1	2	1	n								
99	S51			1224	GW			1	2	1	n								
A62800	S52			1308	GW			1	2	1	n								
01	S10R			1148	GW			1	2	1	n								
02	S13			1314	GW			1	2	1	n								
03	S14R		✓	1142	GW			1	2	1	n								

Comments: CCR wells
Work Order #2

Samples Relinquished By: <u>T. Porter</u>			Samples Received By: <u>D. Auer</u>		
Date: <u>21 Nov 16</u>	Time: <u>1646</u>	Temp: <u>2.3</u>	Date: <u>21 Nov 16</u>	Time: <u>1646</u>	Temp: <u>2.3C</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		
Transpo. <u>Ambient</u>	<u>Ice</u>	Other:	Seals Intact? Yes No		

Dec

Hoot Lake Site CCR Background Sampling

Site	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (gal/minute)	Goes Dry?
S2A	HLP H, HLP I	79.63	2	1273.776	Bladder	Yes	< 0.25	No
S3AR	HLP H, HLP I	78.42	2	1271.562	Bladder	Yes	< 0.25	No
S51	HLP H, HLP I	55.6	2	1286.904	Bladder	Yes	< 0.25	No
S52	HLP H, HLP I	88.3	2	1286.623	Bladder	Yes	< 0.25	No
S10R	HLP H, HLP I	57.00	2	1281.47	Bladder	Yes	< 0.25	No
S13	HLP H, HLP I	90.19	2	1296.423	Bladder	Yes	< 0.25	No
S14R	HLP H, HLP I	70.86	2	1280.61	Bladder	Yes	< 0.25	Yes

All CCR wells should be low flow purges with turbidity <10 NTU

HLP "H" Monitoring 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

1-LITER

HLP "I" Monitoring 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 ~ 2-1000 HNO₃

500 HNO₃

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Tim Postur

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date:

Unique Station ID: 2100016

Sample ID: S-2A

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: * cap does not fit over dedicated pump

Well Information

Well Depth: 79.61

Constructed Depth: 79.63

Casing Diameter: 2"

Water Level Before Purge: 76.83

Well Volume: 0.95 Gallons

Well Casing Elevation: 1273.776

Static Water Elevation: 1196.94

Previous Static: 1197.37

Water Level After Sample: Below Pump

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 29 Wind: SE @ 10 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: 0.2 gpm

Time Pump Began: 1157 am / ☒ pm

Time of Sampling: 1206 am / ☒ pm

Sample EH: -18.9

Sample Appearance: General: Clear Color: no-c Phase: no-c Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1200	7.20	883	7.90	3.16	12.3	0.6	1	
1203	7.17	886	7.95	2.97	14.8	1.2	2	
1206	7.14	887	7.97	2.84	10.1	1.8	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 1.8 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Tim Portner

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 2/10/06

Unique Station ID: 6074671

Sample ID: S-3A-R

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: 78.40

Constructed Depth: 78.42

Casing Diameter: 2"

Water Level Before Purge: 60.71

Well Volume: 1.9 Gallons

Well Casing Elevation: 1271.562

Static Water Elevation: 1204.85

Previous Static: 1203.53

Water Level After Sample: 60.01

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 31 Wind: SE @ 10 Sky: Sunny

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: 1220 am 1pm

Time Purged Dry?

Time of Sampling: 1244 am 1pm

Duplicate Sample? ☐ Yes ☒ No ID:

Sample EH: -31.7

Sample Appearance: General: clear Color: none Phase: none Odor: Sulfurous

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1228	7.28	820	8.40	1.88	14.8	2.0	1	
1236	7.24	824	8.40	1.70	12.2	4.0	2	
1244	7.28	826	8.42	1.65	10.7	6.0	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 6.0 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 21 Nov 18

Unique Station ID: 814830

Sample ID: S-51

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: 55.60

Well Casing Elevation: 1286.9

Constructed Depth: —

Static Water Elevation: 1236.99

Casing Diameter: 2"

Previous Static: 1237.25

Water Level Before Purge: 49.91

Water Level After Sample: 50.01

Well Volume: 192 Gallons

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 30° Wind: SE 16 Sky: Sunny

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: 12:04 am / ☒ pm

Time Purged Dry?

Time of Sampling: 12:24 am / ☒ pm

Duplicate Sample? ☐ Yes ☒ No ID: —

Sample EH: -69.2

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:
12:08	6.94	824	8.12	1.64	303.4	1	1	
12:12	6.98	828	8.10	.91	176.3	2	2	
12:16	7.03	829	8.02	.88	91.9	3	3	
12:20	7.00	830	8.07	.81	80.4	4	4	
12:24	7.01	831	8.09	.82	41.6	5	5	

Stabilized? Yes ☒ No

Amount Water Removed: 5 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 21 Nov 16

Unique Station ID:

Sample ID: S-52

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: 88.30

Well Casing Elevation: 1286.62

Constructed Depth:

Static Water Elevation: 1216.13

Casing Diameter: 2"

Previous Static: 1215

Water Level Before Purge: 70.49

Water Level After Sample: 70.61

Well Volume: 2.90 Gallons

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 30° Wind: SE 16 Sky: Sunny

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

Dedicated Equipment: ☒ Yes ☐ No

Pumping Rate: 1.25 gpm

Well Purged Dry? Yes ☒ No ☐

Time Pump Began: 12:32 am / ☒ pm

Time Purged Dry? ☐ Yes ☒ No

Time of Sampling: 1308 am / ☒ pm

Duplicate Sample? Yes ☒ No ☐ ID: —

Sample EH: -169.6

Sample Appearance: General: Clear Color: none Phase: none Odor: Sulfur

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1244	7.00	805	8.06	0.70	3.3	3	1	
1256	6.96	804	8.07	0.65	1.5	6	2	
1308	6.99	804	8.00	0.64	0.4	9	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 9 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 21 Nov 16

Unique Station ID: 806341

Sample ID: S-10R

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: 80.62
Constructed Depth: -
Casing Diameter: 2"
Water Level Before Purge: 72.19
Well Volume: 1.37 Gallons

Well Casing Elevation: NA
Static Water Elevation: L
Previous Static: L
Water Level After Sample: 72.20
Measurement Method: Elec. WLI Steel Tape

Sampling Information

Weather Conditions: Temp: 30° Wind: SE 16 Sky: Sunny
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: 11:18 am / pm
Time Purged Dry? Time of Sampling: 11:48 am / pm
Duplicate Sample? Yes No ID: - Sample EH: -15.4
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:
1124	6.85	862	8.44	1.45	281.0	1.5	1	
1130	6.92	861	8.48	1.25	175.3	3.0	2	
1136	6.94	862	8.50	1.21	147.3	4.5	3	
1142	6.97	864	8.48	1.12	71.2	6.0	4	
1148	6.98	866	8.48	1.04	75.5	7.5	5	

Stabilized? Yes No

Amount Water Removed: 7.5 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Tim Portner

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 21 Nov 16

Unique Station ID:

Sample ID: S-13

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: 90.27

Well Casing Elevation: 1296.423

Constructed Depth: 90.19

Static Water Elevation: 1212.07

Casing Diameter: 2"

Previous Static: 1211.61

Water Level Before Purge: 84.35

Water Level After Sample:

Well Volume: 0.97 Gallons

Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 31 Wind: SF@10 Sky: Sunny

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: 1258 am 1pm

Time Purged Dry?

Time of Sampling: 1314 am 1pm

Duplicate Sample? Yes No ID: —

Sample EH: 21.3

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1302	7.33	746	8.29	2.32	0	1.0	1	
1306	7.21	748	8.37	1.08	0	2.0	2	
1310	7.17	748	8.40	0.86	0	3.0	3	
1314	7.16	750	8.44	0.79	0	4.0	4	
							5	

Stabilized? Yes No

Amount Water Removed: 4.0 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Tim Parker

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 2/20/16

Unique Station ID:

Sample ID: S-14R

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: 87.11

Constructed Depth:

Casing Diameter: 2"

Water Level Before Purge: 28.46

Well Volume: 1.4 Gallons

Well Casing Elevation: N/A

Static Water Elevation:

Previous Static:

Water Level After Sample: 29.71

Measurement Method: ☒ Elec. WLP Steel Tape

Sampling Information

Weather Conditions: Temp: 29 Wind: SE 2-10 Sky: Sunny

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: 1124 ☒ am ☐ pm

Time Purged Dry:

Time of Sampling: 1142 ☒ am ☐ pm

Duplicate Sample? Yes ☒ No ID: —

Sample EH: -17.5

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1130	7.16	864	8.42	2.04	0	1.5	1	
1136	7.13	860	8.34	1.83	0	3.0	2	
1142	7.14	859	8.39	1.96	0	4.5	3	
							4	
							5	

Stabilized? ☒ Yes No

Amount Water Removed: 9.5 Gallons

Comments:

Exceptions to Protocol:



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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
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Page: 1 of 16

FINAL REPORT COMPLETION DATE: 3 Apr 17 *AK*

Date Reported: 27 Mar 2017

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

Work Order #: 31-0068
Account #: 006106
PO #: 48679

Project Name: HOOT LAKE PLANT

T. J. D. 31 Mar 17
Field Service Manager/Date Reviewed
[Signature] 27 Mar 2017
Chemistry Lab Manager/Date Reviewed
[Signature] 27 Mar 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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Page: 2 of 16

CERTIFICATE of ANALYSIS - CCR

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

Report Date: 27 Mar 2017
 Lab Number: 17-A6219
 Work Order #: 31-0068
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 23 Feb 2017 11:30
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 23 Feb 2017 17:12
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-2A

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				24 Feb 17	JMS
Water Digestions				24 Feb 17	JMS
Radium 226	SEE ATTACHED		EPA M9320	23 Mar 17 16:06	ABL
Radium 228	SEE ATTACHED			23 Mar 17 16:06	ABL
pH, Field	6.70 units	1.00	I-1586-85	23 Feb 17 11:30	DGF
pH	* 7.0 units	1.0	SM 4500 H+B-96	24 Feb 17 10:00	DK
Sulfate	127 @ mg/L	4.0	ASTM D516-02	9 Mar 17 9:29	KCJ
Chloride	< 3 mg/L	3	SM 4500 Cl E	2 Mar 17 9:29	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	24 Feb 17 9:48	TWB
Solids, Total Dissolved	602 mg/L	10	SM 2540 C-97	24 Feb 17 8:22	RC
Calcium	142.0 mg/L	0.500	SW6010C	27 Feb 17 17:06	RMB
Lithium	0.032 mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Barium	0.048 mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Boron	0.198 mg/L	0.100	SW6010C	27 Feb 17 17:06	RMB
Antimony	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Arsenic	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Beryllium	< 0.25 ug/L	0.05	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Cadmium	< 0.5 ug/L	0.1	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Chromium	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 9:17	RMV
Lead	< 0.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Molybdenum	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Selenium	< 5 @^ ug/L	0.5	SW6020A	3 Mar 17 9:17	RMV
Thallium	< 0.5 ug/L	0.1	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Fluoride	0.250 mg/L	0.020	EPA 300.0	27 Feb 17 12:11	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/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: 27 Mar 2017
Lab Number: 17-A6219
Work Order #: 31-0068
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Feb 2017 11:30
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Feb 2017 17:12
PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-2A

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 # 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: 27 Mar 2017
Lab Number: 17-A6220
Work Order #: 31-0068
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Feb 2017 12:15
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Feb 2017 17:12
PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-3A-R

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				24 Feb 17	JMS
Water Digestions				24 Feb 17	JMS
Radium 226	SEE ATTACHED			23 Mar 17 16:07	ABL
Radium 228	SEE ATTACHED		EPA M9320	23 Mar 17 16:07	ABL
pH, Field	6.91 units	1.00	I-1586-85	23 Feb 17 12:15	DGF
pH	* 7.2 units	1.0	SM 4500 H+B-96	24 Feb 17 10:00	DK
Sulfate	111 @ mg/L	4.0	ASTM D516-02	9 Mar 17 9:29	KCJ
Chloride	12.2 mg/L	3.0	SM 4500 Cl E	2 Mar 17 9:29	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	24 Feb 17 9:48	TWB
Solids, Total Dissolved	553 mg/L	10	SM 2540 C-97	24 Feb 17 8:22	RC
Calcium	116.0 mg/L	0.500	SW6010C	27 Feb 17 17:06	RMB
Lithium	0.024 mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Barium	0.044 mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Boron	0.203 mg/L	0.100	SW6010C	27 Feb 17 17:06	RMB
Antimony	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Arsenic	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Beryllium	< 0.25 ug/L	0.05	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Cadmium	< 0.5 ug/L	0.1	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Chromium	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 9:17	RMV
Lead	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Molybdenum	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Selenium	< 5 @^ ug/L	0.5	SW6020A	3 Mar 17 9:17	RMV
Thallium	< 0.5 ug/L	0.1	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Fluoride	0.210 mg/L	0.020	EPA 300.0	27 Feb 17 12:11	RMB

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:

@ = 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: 27 Mar 2017
Lab Number: 17-A6220
Work Order #: 31-0068
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Feb 2017 12:15
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Feb 2017 17:12
PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-3A-R

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 # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

Page: 6 of 16

CERTIFICATE of ANALYSIS - CCR

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

Report Date: 27 Mar 2017
Lab Number: 17-A6221
Work Order #: 31-0068
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Feb 2017 12:18
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Feb 2017 17:12
PO #: 48679

Temp at Receipt: 0.0C

Project Name: HOOT LAKE PLANT

Sample Description: S-51

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					24 Feb 17	JMS
Water Digestions					24 Feb 17	JMS
Radium 226	SEE ATTACHED				23 Mar 17 16:07	ABL
Radium 228	SEE ATTACHED			EPA M9320	23 Mar 17 16:07	ABL
pH, Field	6.93	units	1.00	I-1586-85	23 Feb 17 12:18	JLH
pH	* 7.2	units	1.0	SM 4500 H+B-96	24 Feb 17 10:00	DK
Sulfate	53.9 @	mg/L	4.0	ASTM D516-02	9 Mar 17 9:29	KCJ
Chloride	16.0	mg/L	3.0	SM 4500 Cl E	2 Mar 17 9:29	KCJ
Mercury	0.007	ug/L	0.005	EPA 245.7	24 Feb 17 9:48	TWB
Solids, Total Dissolved	476	mg/L	10	SM 2540 C-97	24 Feb 17 8:22	RC
Calcium	126.0	mg/L	0.500	SW6010C	27 Feb 17 17:06	RMB
Lithium	0.025	mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Barium	0.087	mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Cobalt	< 0.01 ^	mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Boron	< 0.1	mg/L	0.1	SW6010C	27 Feb 17 17:06	RMB
Antimony	< 2.5	ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative					
Arsenic	< 2.5	ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative					
Beryllium	< 0.25	ug/L	0.05	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative					
Cadmium	< 0.5	ug/L	0.1	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative					
Chromium	4.08 @	ug/L	0.50	SW6020A	3 Mar 17 9:17	RMV
Lead	< 2.5	ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative					
Molybdenum	2.56	ug/L	0.50	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative					
Selenium	< 5 @^	ug/L	0.5	SW6020A	3 Mar 17 9:17	RMV
Thallium	< 0.5	ug/L	0.1	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative					
Fluoride	0.270	mg/L	0.020	EPA 300.0	27 Feb 17 12:11	RMB

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:

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 WWS/EN # 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: 27 Mar 2017
Lab Number: 17-A6221
Work Order #: 31-0068
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Feb 2017 12:18
Sampled By: MVTIL FIELD PERSONNEL
Date Received: 23 Feb 2017 17:12
PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-51

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 (LOQ). 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 HW/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: 27 Mar 2017
 Lab Number: 17-A6222
 Work Order #: 31-0068
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 23 Feb 2017 13:02
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 23 Feb 2017 17:12
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-52

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				24 Feb 17	JMS
Water Digestions				24 Feb 17	JMS
Radium 226	SEE ATTACHED			23 Mar 17 16:07	ABL
Radium 228	SEE ATTACHED		EPA M9320	23 Mar 17 16:07	ABL
pH, Field	6.89 units	1.00	I-1586-85	23 Feb 17 13:02	JLH
pH	* 7.2 units	1.0	SM 4500 H+B-96	24 Feb 17 10:00	DK
Sulfate	55.1 @ mg/L	4.0	ASTM D516-02	9 Mar 17 9:29	KCJ
Chloride	15.0 mg/L	3.0	SM 4500 Cl E	2 Mar 17 9:29	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	24 Feb 17 9:48	TWB
Solids, Total Dissolved	440 mg/L	10	SM 2540 C-97	24 Feb 17 8:22	RC
Calcium	104.0 mg/L	0.500	SW6010C	27 Feb 17 17:06	RMB
Lithium	0.019 mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Barium	0.111 mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Boron	< 0.1 mg/L	0.1	SW6010C	27 Feb 17 17:06	RMB
Antimony	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
Arsenic	@See Narrative < 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
Beryllium	@See Narrative < 0.25 ug/L	0.05	SW6020A	2 Mar 17 13:58	RMV
Cadmium	@See Narrative < 0.5 ug/L	0.1	SW6020A	2 Mar 17 13:58	RMV
Chromium	@See Narrative < 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 9:17	RMV
Lead	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
Molybdenum	@See Narrative < 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
Selenium	@See Narrative < 5 @^ ug/L	0.5	SW6020A	3 Mar 17 9:17	RMV
Thallium	< 0.5 ug/L	0.1	SW6020A	2 Mar 17 13:58	RMV
Fluoride	@See Narrative 0.210 mg/L	0.020	EPA 300.0	27 Feb 17 12:11	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 W/DW # R-040

CERTIFICATE of ANALYSIS - CCR

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

Report Date: 27 Mar 2017
Lab Number: 17-A6222
Work Order #: 31-0068
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Feb 2017 13:02
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Feb 2017 17:12
PO #: 48679

Temp at Receipt: 0.0C

Project Name: HOOT LAKE PLANT

Sample Description: S-52

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 # 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: 27 Mar 2017
 Lab Number: 17-A6223
 Work Order #: 31-0068
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 23 Feb 2017 11:40
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 23 Feb 2017 17:12
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-10R

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				24 Feb 17	JMS
Water Digestions				24 Feb 17	JMS
Radium 226	SEE ATTACHED			23 Mar 17 16:07	ABL
Radium 228	SEE ATTACHED		EPA M9320	23 Mar 17 16:07	ABL
pH, Field	6.91 units	1.00	I-1586-85	23 Feb 17 11:40	JLH
pH	* 7.1 units	1.0	SM 4500 H+B-96	24 Feb 17 10:00	DK
Sulfate	86.5 @ mg/L	4.0	ASTM D516-02	9 Mar 17 9:29	KCJ
Chloride	11.3 mg/L	3.0	SM 4500 Cl E	2 Mar 17 9:29	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	24 Feb 17 9:48	TWB
Solids, Total Dissolved	507 mg/L	10	SM 2540 C-97	24 Feb 17 8:22	RC
Calcium	126.0 mg/L	0.500	SW6010C	27 Feb 17 17:06	RMB
Lithium	0.023 mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Barium	0.117 mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Boron	< 0.1 mg/L	0.1	SW6010C	27 Feb 17 17:06	RMB
Antimony	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
Arsenic	@See Narrative 5.27 ug/L	0.50	SW6020A	2 Mar 17 13:58	RMV
Beryllium	@See Narrative < 0.25 ug/L	0.05	SW6020A	2 Mar 17 13:58	RMV
Cadmium	@See Narrative < 0.5 ug/L	0.1	SW6020A	2 Mar 17 13:58	RMV
Chromium	@See Narrative 3.06 @ ug/L	0.50	SW6020A	3 Mar 17 9:17	RMV
Lead	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
Molybdenum	@See Narrative < 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
Selenium	@See Narrative < 5 @^ ug/L	0.5	SW6020A	3 Mar 17 9:17	RMV
Thallium	< 0.5 ug/L	0.1	SW6020A	2 Mar 17 13:58	RMV
Fluoride	@See Narrative 0.230 mg/L	0.020	EPA 300.0	27 Feb 17 12:11	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

CERTIFICATE of ANALYSIS - CCR

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

Report Date: 27 Mar 2017
Lab Number: 17-A6223
Work Order #: 31-0068
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Feb 2017 11:40
Sampled By: MVTI FIELD PERSONNEL
Date Received: 23 Feb 2017 17:12
PO #: 48679

Temp at Receipt: 0.0C

Project Name: HOOT LAKE PLANT

Sample Description: S-10R

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

^ 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 WR/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: 27 Mar 2017
Lab Number: 17-A6224
Work Order #: 31-0068
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Feb 2017 12:41
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Feb 2017 17:12
PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-13

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				24 Feb 17	JMS
Water Digestions				24 Feb 17	JMS
Radium 226	SEE ATTACHED			23 Mar 17 16:08	ABL
Radium 228	SEE ATTACHED		EPA M9320	23 Mar 17 16:08	ABL
pH, Field	6.92 units	1.00	I-1586-85	23 Feb 17 12:41	DGF
pH	* 7.2 units	1.0	SM 4500 H+B-96	24 Feb 17 10:00	DK
Sulfate	70.3 @ mg/L	4.0	ASTM D516-02	9 Mar 17 9:29	KCJ
Chloride	7.5 mg/L	3.0	SM 4500 Cl E	2 Mar 17 9:29	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	24 Feb 17 9:48	TWB
Solids, Total Dissolved	464 mg/L	10	SM 2540 C-97	24 Feb 17 8:22	RC
Calcium	118.0 mg/L	0.500	SW6010C	27 Feb 17 17:06	RMB
Lithium	0.024 mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Barium	0.066 mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Boron	< 0.1 mg/L	0.1	SW6010C	27 Feb 17 17:06	RMB
Antimony	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Arsenic	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Beryllium	< 0.25 ug/L	0.05	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Cadmium	< 0.5 ug/L	0.1	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Chromium	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 9:17	RMV
Lead	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Molybdenum	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Selenium	< 5 @ ^ ug/L	0.5	SW6020A	3 Mar 17 9:17	RMV
Thallium	< 0.5 ug/L	0.1	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Fluoride	0.290 mg/L	0.020	EPA 300.0	27 Feb 17 12:11	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:

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

TRANSFORMATION: MN LAB # 027-015-125, NI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

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



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
www.mvttl.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: 27 Mar 2017
Lab Number: 17-A6224
Work Order #: 31-0068
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Feb 2017 12:41
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Feb 2017 17:12
PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-13

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

^ 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



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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 2 North German St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
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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: 27 Mar 2017
 Lab Number: 17-A6225
 Work Order #: 31-0068
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 23 Feb 2017 13:28
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 23 Feb 2017 17:12
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-14R

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				24 Feb 17	JMS
Water Digestions				24 Feb 17	JMS
Radium 226	SEE ATTACHED			23 Mar 17 16:08	ABL
Radium 228	SEE ATTACHED		EPA M9320	23 Mar 17 16:08	ABL
pH, Field	6.94 units	1.00	I-1586-85	23 Feb 17 13:28	DGF
pH	* 7.2 units	1.0	SM 4500 H+B-96	24 Feb 17 10:00	DK
Sulfate	93.2 @ mg/L	4.0	ASTM D516-02	9 Mar 17 9:29	KCJ
Chloride	5.2 mg/L	3.0	SM 4500 Cl E	2 Mar 17 9:29	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	24 Feb 17 9:48	TWB
Solids, Total Dissolved	561 mg/L	10	SM 2540 C-97	24 Feb 17 8:22	RC
Calcium	132.0 mg/L	0.500	SW6010C	27 Feb 17 17:06	RMB
Lithium	0.030 mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Barium	0.078 mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	27 Feb 17 17:06	RMB
Boron	< 0.1 mg/L	0.1	SW6010C	27 Feb 17 17:06	RMB
Antimony	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Arsenic	2.93 ug/L	0.50	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Beryllium	< 0.25 ug/L	0.05	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Cadmium	< 0.5 ug/L	0.1	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Chromium	< 2.5 @ ug/L	0.5	SW6020A	3 Mar 17 9:17	RMV
Lead	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Molybdenum	< 2.5 ug/L	0.5	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Selenium	< 5 @^ ug/L	0.5	SW6020A	3 Mar 17 9:17	RMV
Thallium	< 0.5 ug/L	0.1	SW6020A	2 Mar 17 13:58	RMV
	@See Narrative				
Fluoride	0.250 mg/L	0.020	EPA 300.0	27 Feb 17 12:11	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

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CERTIFICATE of ANALYSIS - CCR

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

Report Date: 27 Mar 2017
Lab Number: 17-A6225
Work Order #: 31-0068
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Feb 2017 13:28
Sampled By: MVTFL FIELD PERSONNEL
Date Received: 23 Feb 2017 17:12
PO #: 48679

Temp at Receipt: 0.0C

Project Name: HOOT LAKE PLANT

Sample Description: S-14R

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

^ 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 WW/DW # R-040



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www.mvttl.com



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Date Reported: 27 Mar 2017

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

Work Order #: 201731-0068
Account Number: 006106
PO #: 48679

Project Name: HOOT LAKE PLANT

LABORATORY NARRATIVE

INORGANIC & METALS ANALYSES:

The internal standards counts associated with beryllium, arsenic, molybdenum, cadmium, antimony, thallium, and lead were outside of acceptance range in the low checks for samples 17-A6219 through 17-A6225. The data was reported based on the acceptable recoveries of all of the analytes in the low checks.

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: 3/23/2017

CLIENT: MVTI Inc
Project: Ottertail Power Hoot Lake
Lab Order: S1702327

CASE NARRATIVE
Report ID: S1702327001

Samples 17-A6219 S2A, 17-A6220 S3AR, 17-A6221 S51, 17-A6222 S52, 17-A6223 S10R, 17-A6224 S13, and 17-A6225 S14R were received on February 28, 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: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 3/23/2017
Report ID S1702327001

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1702327-001
ClientSample ID: 17-A6219 S2A
COC: WEB

WorkOrder: S1702327
CollectionDate: 2/23/2017 11:30:00 AM
DateReceived: 2/28/2017 12:26:00 PM
FieldSampler: DF
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	03/20/2017 1131	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	03/20/2017 1131	MB
Radium 228	ND	pCi/L		2	Ga-Tech	03/17/2017 840	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	03/17/2017 840	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
Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 7



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Sample Analysis Report

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

Date Reported 3/23/2017
Report ID S1702327001

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1702327-002
ClientSample ID: 17-A6220 S3AR
COC: WEB

WorkOrder: S1702327
CollectionDate: 2/23/2017 12:15:00 PM
DateReceived: 2/28/2017 12:26:00 PM
FieldSampler: DF
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	03/20/2017 1131	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	03/20/2017 1131	MB
Radium 228	ND	pCi/L		2	Ga-Tech	03/17/2017 1144	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	03/17/2017 1144	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

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Sample Analysis Report

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

Date Reported 3/23/2017
Report ID S1702327001

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1702327-003
ClientSample ID: 17-A6221 S51
COC: WEB

WorkOrder: S1702327
CollectionDate: 2/23/2017 12:18:00 PM
DateReceived: 2/28/2017 12:26:00 PM
FieldSampler: DF
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	03/20/2017 1131	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	03/20/2017 1131	MB
Radium 228	ND	pCi/L		2	Ga-Tech	03/17/2017 1448	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	03/17/2017 1448	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
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 3/23/2017
Report ID S1702327001

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1702327-004
ClientSample ID: 17-A6222 S52
COC: WEB

WorkOrder: S1702327
CollectionDate: 2/23/2017 1:02:00 PM
DateReceived: 2/28/2017 12:26:00 PM
FieldSampler: DF
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	03/20/2017 1131	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	03/20/2017 1131	MB
Radium 228	3.7	pCi/L		2	Ga-Tech	03/19/2017 758	MB
Radium 228 Precision (±)	3.3	pCi/L			Ga-Tech	03/19/2017 758	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



Sample Analysis Report

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

Date Reported 3/23/2017
Report ID S1702327001

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1702327-005
ClientSample ID: 17-A6223 S10R
COC: WEB

WorkOrder: S1702327
CollectionDate: 2/23/2017 11:40:00 AM
DateReceived: 2/28/2017 12:26:00 PM
FieldSampler: DF
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	03/21/2017 1151	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	03/21/2017 1151	MB
Radium 228	ND	pCi/L		2	Ga-Tech	03/19/2017 1102	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	03/19/2017 1102	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
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 3/23/2017
Report ID S1702327001

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1702327-006
ClientSample ID: 17-A6224 S13
COC: WEB

WorkOrder: S1702327
CollectionDate: 2/23/2017 12:41:00 PM
DateReceived: 2/28/2017 12:26:00 PM
FieldSampler: DF
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	03/21/2017 1151	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	03/21/2017 1151	MB
Radium 228	4.9	pCi/L		2	Ga-Tech	03/19/2017 1405	MB
Radium 228 Precision (±)	2.9	pCi/L			Ga-Tech	03/19/2017 1405	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 6 of 7



Sample Analysis Report

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

Date Reported 3/23/2017
Report ID S1702327001

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1702327-007
ClientSample ID: 17-A6225 S14R
COC: WEB

WorkOrder: S1702327
CollectionDate: 2/23/2017 1:28:00 PM
DateReceived: 2/28/2017 12:26:00 PM
FieldSampler: DF
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	03/21/2017 1151	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	03/21/2017 1151	MB
Radium 228	ND	pCi/L		2	Ga-Tech	03/19/2017 1709	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	03/19/2017 1709	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

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ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Inc
Work Order: S1702327
Project: Ottertail Power Hoot Lake

Date: 3/23/2017
Report ID: S1702327001

Radium 228 by Ga/Tech		Sample Type MBLK		Units: pCi/L				
MB-422 (03/14/17 16:01)	RunNo: 143940	PrepDate: 03/08/17 12:00	BatchID 12935					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228	ND	1						
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-422 (03/14/17 19:05)	RunNo: 143940	PrepDate: 03/08/17 12:00	BatchID 12935					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228	36	1	40.1		89.7	65.9 - 132		
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-422 (03/15/17 01:15)	RunNo: 143940	PrepDate: 03/08/17 12:00	BatchID 12935					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228	37	1	40.1	ND	93.0	65.9 - 132		
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-422 (03/15/17 04:20)	RunNo: 143940	PrepDate: 03/08/17 12:00	BatchID 12935					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228	43	1	37	13.5	106	20		
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
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: S1702327
Project: Ottertail Power Hoot Lake

Date: 3/23/2017
Report ID: S1702327001

Radium 226 in Water -		Sample Type	MBLK	Units: pCi/L				
MB-1726 (03/20/17 09:18)	RunNo: 143948	PrepDate: 03/13/17 0:00	BatchID 12943					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226	ND	0.2						
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						
Radium 226 in Water -		Sample Type	LCS	Units: pCi/L				
LCS-1726 (03/20/17 09:18)	RunNo: 143948	PrepDate: 03/13/17 0:00	BatchID 12943					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226	5.7	0.2	5.89		96.2	67.1 - 122		
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		
Radium 226 in Water -		Sample Type	LCSD	Units: pCi/L				
LCSD-1726 (03/20/17 09:18)	RunNo: 143948	PrepDate: 03/13/17 0:00	BatchID 12943					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Radium 226	6.4	0.2	5.7	12.3	109	20		
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	6.6	0.2	5.8	12.4	112	20		
Radium 226 in Water -		Sample Type	MS	Units: pCi/L				
S1702301-006AMS (03/20/17 09:19)	RunNo: 143948	PrepDate: 03/13/17 0:00	BatchID 12943					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226	11.8	0.2	11.8	0.5	95.9	65 - 131		
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		

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

MVTL**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
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Page: 1 of 1


Quality Control Report

Lab IDs: 17-A6219 to 17-A6225

Project: HOOT LAKE PLANT

Work Order: 201731-0068

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	a6224qc	< 2.5	25.5	102	75-125	25.5	25.7	103	0.8	10	97	90-110	< 0.5
Arsenic ug/L	25.0	101	85-115	25.0	a6224qc	< 2.5	26.2	105	75-125	26.2	25.6	102	2.3	10	96	90-110	< 0.5
Barium mg/L	1.000	106	85-115	1.00	17A6120q	< 0.005	1.120	112	75-125	1.120	1.130	113	0.9	10	102	90-110	< 0.005
Beryllium ug/L	2.50	99	85-115	2.50	a6224qc	< 0.25	2.44	98	75-125	2.44	2.39	96	2.1	10	99	90-110	< 0.05
Boron mg/L	1.000	102	85-115	1.00	17A6120q	0.230	1.290	106	75-125	1.290	1.300	107	0.8	10	97	90-110	< 0.1
Cadmium ug/L	5.00	103	85-115	5.00	a6224qc	< 0.5	5.02	100	75-125	5.02	5.15	103	2.6	10	96	90-110	< 0.1
Calcium mg/L	50.00	108	85-115	50.0	17A6120q	58.30	111.0	105	75-125	111.0	112.0	107	0.9	10	99	90-110	< 0.5
Chloride mg/L	-	-	-	60.0	17-A6380	45.5	103	96	85-121	103	99.3	90	3.7	5	95	90-110	< 3
Chromium ug/L	25.0	100	85-115	25.0	17-A6224	< 2.5	23.7	95	75-125	23.7	24.5	98	3.3	10	102	90-110	< 0.5
Cobalt mg/L	1.000	107	85-115	1.00	17A6120q	< 0.01	1.070	107	75-125	1.070	1.070	107	0.0	10	100	90-110	< 0.005
Fluoride mg/L	0.200	105	85-115	0.20	17-A6225	0.250	0.440	95	75-125	0.440	0.440	95	0.0	10	99	90-110	< 0.02
Lead ug/L	25.0	96	85-115	25.0	a6224qc	< 2.5	24.5	98	75-125	24.5	24.6	98	0.4	10	94	90-110	< 0.5
Lithium mg/L	1.000	106	85-115	1.00	A6120qc	0.081	1.220	114	75-125	1.220	1.230	115	0.8	10	103	90-110	< 0.005
Mercury ug/L	-	-	-	0.10	17-A6219	< 0.005	0.083	83	63-111	0.083	0.080	80	3.7	18	89	76-113	< 0.005
Molybdenum ug/L	25.0	99	85-115	25.0	a6224qc	< 2.5	26.0	104	75-125	26.0	26.2	105	0.8	10	97	90-110	< 0.5
Nickel ug/L	25.0	100	85-115	25.0	a6224qc	< 2.5	27.0	108	75-125	27.0	27.2	109	0.7	10	102	90-110	< 0.5
pH units	-	-	-	-	-	-	-	-	-	7.6	7.6	-	0.0	2.5	100	90-110	-
Selenium ug/L	25.0	100	85-115	25.0	17-A6224	< 5	26.4	106	75-125	26.4	25.6	102	3.1	10	95	90-110	< 0.5
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	561	554	-	1.3	8	97	85-115	< 10
Sulfate mg/L	-	-	-	500	17-A6380	1200	1640	88	74-128	1640	1660	92	1.2	5	111	80-120	< 5
Thallium ug/L	5.00	98	85-115	5.00	a6224qc	< 0.5	5.15	103	75-125	5.15	5.06	101	1.8	10	95	90-110	< 0.1

Approved by: 

Minnesota Valley Testing Laboratories

1126 North Front Street

Phone: 800 782 3557

New Ulm, MN 56003

Fax: 507 359 2890

Field Service Chain of Custody Record

This is an exact copy of
the original document

By AS Date 23 Feb 17
pages 1-11

Project Name: Otter Tail Power Co. Hoot Lake Plant	Project Type: Hoot Lake Plant	Name of Samplers: Dusty Fergusyn Jeff Hoffman
Report To: Otter Tail Power Company	Carbon Copy:	Quote Number:
Attn: Paul Vukonich	Attn:	Work Order Number: 31-0068
Address: P.O. Box 496 Fergus Falls, MN 56038-0496	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	VOC Set	1000 none	1000 HNO3	500 HNO3	Filter? Y or N	500 HNO3	Filter? Y or N	500H2SO4	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other 150 None	Analysis Required
A6219	S2A		23 Feb 17	1130	GW			1	2	1	n								see attachment
20	S3AR		I	125	GW			1	2	1	n								
21	S51			1218	GW			1	2	1	n								
22	S52			1302	GW			1	2	1	n								
23	S10R			1140	GW			1	2	1	n								
24	S13			1241	GW			1	2	1	n								
25	S14R			1328	GW			1	2	1	n								

Comments: CCR wells

Work Order #2

Samples Relinquished By: <u>Ant Pn</u>	Samples Received By: <u>Alice Kudin</u>		
Date: <u>23 Feb 17</u>	Time: <u>1712</u>	Temp: <u>0.0</u>	Date: <u>23 Feb 17</u>
Samples Relinquished into: <u>Fridge</u>	Log in Cart	Other:	Time: <u>1810</u>
Samples Relinquished By:	Samples Received By:		
Date:	Time:	Temp:	Date:
Deliv: <u>Samplers</u>	Other:		Seal Number(s) - If Used
Transp: <u>Ambient</u>	Other: <u>Ice</u>		Seals Intact? <u>Yes</u> <u>No</u>

HLP "H" Monitoring 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

1-LITER

HLP "I" Monitoring 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 HNO₃

~ 2-1000 HNO₃

6-7-2011 ~~See~~
(make copy)

Hoot Lake Site CCR Background Sampling

Site	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (gal/minute)	Goes Dry?
S2A	HLP H, HLP I	79.63	2	1273.776	Bladder	Yes	< 0.25	No
S3AR	HLP H, HLP I	78.42	2	1271.562	Bladder	Yes	< 0.25	No
S51	HLP H, HLP I	55.6	2	1286.904	Bladder	Yes	< 0.25	No
S52	HLP H, HLP I	88.3	2	1286.623	Bladder	Yes	< 0.25	No
S10R	HLP H, HLP I	57.00	2	1281.47	Bladder	Yes	< 0.25	No
S13	HLP H, HLP I	90.19	2	1296.423	Bladder	Yes	< 0.25	No
S14R	HLP H, HLP I	70.86	2	1280.61	Bladder	Yes	< 0.25	Yes

All CCR wells should be low flow purges with turbidity <10 NTU

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Farasyn

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 23 Feb 17

Unique Station ID: —

Sample ID: S-2A

Well Condition

Well Locked? Yes ☒ No ☐

Well Labeled? ☒ Yes ☐ No

Casing Straight? ☒ Yes ☐ No

Repairs Necessary:

cap does not fit over dedicated pump

Protective Posts? ☒ Yes ☐ No

State ID Tag? Yes ☐ No ☒

Grout Seal Intact? ☒ Yes ☐ No

Well Information

Well Depth: 79.55

Constructed Depth: 79.63

Casing Diameter: 2"

Water Level Before Purge: 76.06

Well Volume: 0.57 Gallons

Well Casing Elevation: 1273.776

Static Water Elevation: 1197.716

Previous Static: 1196.94

Water Level After Sample: Below Pump

Measurement Method: ☒ Elec. WLL ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 28 Wind: NNE @ 12 Sky: Mostly Cloudy

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

Dedicated Equipment: ☒ Yes ☐ No

Pumping Rate: 0.2 gpm

Well Purged Dry? Yes ☒ No ☐

Time Pump Began: 1118 ☒ am ☐ pm

Time Purged Dry? —

Time of Sampling: 1130 ☒ am ☐ pm

Duplicate Sample? Yes ☒ No ☐ ID: —

Sample EH: 64.0

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

③ Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1121	6.64	1000	8.58	4.65	8.3	0.6	1	
1124	6.68	994	8.52	2.54	0.0	1.2	2	
1127	6.69	992	8.41	2.06	0.0	1.8	3	
1130	6.70	989	8.31	2.05	0.0	2.4	4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 2.4 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./ Hoot Lake

Facility ID: SW-211

Date: 23 Feb 17

Unique Station ID: 674671

Sample ID: S-3A-R

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: 78.40

Constructed Depth: 78.42

Casing Diameter: 2"

Water Level Before Purge: 67.64

Well Volume: 1.75 Gallons

Well Casing Elevation: 1271.562

Static Water Elevation: 1203.922

Previous Static: 1204.85

Water Level After Sample: 67.90

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 28 Wind: NNE @ 12 Sky: Mostly Cloudy

Sampling Method: Grundfos ☒ ~~Bladder SSP~~ 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: 1154 am / pm

Time of Sampling: 1215 am / pm

Sample EH: 2.7

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1201</u>	<u>7.03</u>	<u>927</u>	<u>8.52</u>	<u>1.95</u>	<u>9.2</u>	<u>1.75</u>	<u>1</u>	
<u>1208</u>	<u>6.95</u>	<u>929</u>	<u>8.52</u>	<u>1.90</u>	<u>0.8</u>	<u>3.5</u>	<u>2</u>	
<u>1215</u>	<u>6.91</u>	<u>930</u>	<u>8.51</u>	<u>1.85</u>	<u>0.0</u>	<u>5.25</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes No

Amount Water Removed: 5.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 23 Feb 17

Unique Station ID: 814830

Sample ID: S-51

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: 55.60

Constructed Depth: —

Casing Diameter: 2"

Water Level Before Purge: 50.02

Well Volume: 0.91 Gallons

Well Casing Elevation: 1286.9

Static Water Elevation: 1236.88

Previous Static: 1236.99

Water Level After Sample: 50.09

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 29° Wind: N-10 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: 11:58 ☒ am ☐ pm

Time Purged Dry? —

Time of Sampling: 12:18 ☐ am ☒ pm

Duplicate Sample? ☐ Yes ☒ No ID: —

Sample EH: -159.5

Sample Appearance: General: Slightly Cloudy Color: gray Phase: none Odor: Sulfurous

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1202	6.88	824	7.70	0.97	305.1	1	1	
1206	6.93	836	7.77	0.57	154.2	2	2	
1210	6.94	848	7.79	0.41	73.4	3	3	
1214	6.93	849	7.79	0.40	60.9	4	4	
1218	6.93	852	7.77	0.37	40.9	5	5	

Stabilized? Yes ☒ No

Amount Water Removed: 5.0 Gallons

Comments:

Exceptions to Protocol:

check-ball in pump was stuck

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 23 Feb 17

Unique Station ID: 822155

Sample ID: S-52

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: 88.30

Constructed Depth: —

Casing Diameter: 2"

Water Level Before Purge: 70.58

Well Volume: 2.89 Gallons

Well Casing Elevation: 1286.62

Static Water Elevation: 1216.04

Previous Static: 1216.13

Water Level After Sample: 70.67

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 30° Wind: N-10 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: 1226 am ☒ pm ☐

Time Purged Dry? —

Time of Sampling: 1302 am ☐ pm ☒

Duplicate Sample? Yes ☒ No ☐ ID: —

Sample EH: -192.5

Sample Appearance: General: Clear Color: none Phase: none Odor: Sulfurous

12 Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
12:38	6.94	827	7.97	0.37	4.1	3	1	
12:50	6.90	826	8.00	0.21	1.2	6	2	
13:02	6.89	828	7.98	0.16	0.3	9	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 9.0 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 23 Feb 17

Unique Station ID: 806341

Sample ID: S-10R

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: 80.62

Well Casing Elevation: NA

Constructed Depth: —

Static Water Elevation: L

Casing Diameter: 2"

Previous Static: L

Water Level Before Purge: 72.08

Water Level After Sample: 72.10

Well Volume: 1.39 Gallons

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 29° Wind: N-10 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: 11:10 ☒ am ☐ pm

Time Purged Dry? —

Time of Sampling: 11:40 ☒ am ☐ pm

Duplicate Sample? ☒ Yes ☐ No ID: —

Sample EH: -17.7

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1116	6.86	892	8.47	1.05	273.4	1.5	1	
1122	6.90	896	8.37	0.71	141.3	3.0	2	
1128	6.90	899	8.35	0.61	104.4	4.5	3	
1134	6.90	902	8.36	0.50	48.3	6.0	4	
1140	6.91	904	8.34	0.44	31.7	7.5	5	

Stabilized? Yes ☒ No ☐

Amount Water Removed: 7.5 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Farasyn

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 23 Feb 17

Unique Station ID: 632810

Sample ID: S-13

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: 90.27

Constructed Depth: 90.19

Casing Diameter: 2"

Water Level Before Purge: 85.85

Well Volume: 0.72 Gallons

Well Casing Elevation: 1296.423

Static Water Elevation: 1210.573

Previous Static: 1212.07

Water Level After Sample: 85.85

Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 28 Wind: NNE @ 12 Sky: Mostly Cloudy

Sampling Method: Grundfos Bladder SST 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: 1232 am / pm

Time of Sampling: 1241 am / pm

Sample EH: -33.3

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

③ Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1235</u>	<u>7.02</u>	<u>840</u>	<u>8.50</u>	<u>2.12</u>	<u>0.0</u>	<u>0.75</u>	<u>1</u>	
<u>1238</u>	<u>6.97</u>	<u>843</u>	<u>8.54</u>	<u>2.07</u>	<u>0.0</u>	<u>1.50</u>	<u>2</u>	
<u>1241</u>	<u>6.92</u>	<u>845</u>	<u>8.59</u>	<u>1.67</u>	<u>0.0</u>	<u>2.25</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 2.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Farnsyn

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 23 Feb 17

Unique Station ID: 806342

Sample ID: S-14R

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: 87.11

Constructed Depth: —

Casing Diameter: 2"

Water Level Before Purge: 79.15

Well Volume: 1.29 Gallons

Well Casing Elevation: NA

Static Water Elevation: 1

Previous Static: 1

Water Level After Sample: 79.22

Measurement Method: (Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 28 Wind: NNE @12 Sky: Mostly Cloudy

Sampling Method: Grundfos Bladder SST 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: 1310 am / PM

Time of Sampling: 1328 am / PM

Sample EH: -115.0

Sample Appearance: General: Clear Color: None Phase: Lt. Sed. Odor: Sulfurous

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1316</u>	<u>7.03</u>	<u>987</u>	<u>8.39</u>	<u>1.74</u>	<u>8.7</u>	<u>1.5</u>	<u>1</u>	
<u>1322</u>	<u>6.99</u>	<u>961</u>	<u>8.41</u>	<u>1.48</u>	<u>0.0</u>	<u>3</u>	<u>2</u>	
<u>1328</u>	<u>6.94</u>	<u>948</u>	<u>8.44</u>	<u>1.39</u>	<u>0.0</u>	<u>4.5</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes No

Amount Water Removed: 4.5 Gallons

Comments:

Exceptions to Protocol:



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www.mvttl.com



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FINAL REPORT COMPLETION DATE:


~~19 May 16~~ (A) 19 May 17
19 May 17 AS

Date Reported: 9 May 2017


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

Work Order #: 31-0135
Account #: 006106
PO #: 48679

Project Name: HOOT LAKE PLANT


Field Service Manager/Date Reviewed 17 May 17


Chemistry Lab Manager/Date Reviewed 16 May 17


Quality Assurance Director/Date Reviewed 16 May 2017

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

Project Name: HOOT LAKE PLANT

Sample Description: S-2A

Report Date: 9 May 2017
 Lab Number: 17-A11961
 Work Order #: 31-0135
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 Apr 2017 16:16
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 4 Apr 2017 13:33
 PO #: 48679

Temp at Receipt: 1.2C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				6 Apr 17	JMS
Water Digestions				6 Apr 17	JMS
Radium 226	SEE ATTACHED			2 May 17 16:12	ABL
Radium 228	SEE ATTACHED		EPA M9320	2 May 17 16:12	ABL
pH, Field	6.73 units	1.00	I-1586-85	3 Apr 17 16:16	BMW
pH	* 7.0 units	1.0	SM 4500 H+ B-2000	6 Apr 17 8:40	CEH
Sulfate	125 @ mg/L	5.0	ASTM D516-07	6 Apr 17 9:50	KCJ
Chloride	< 3 mg/L	3	SM 4500 Cl E	13 Apr 17 7:56	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	19 Apr 17 12:27	RMB
Solids, Total Dissolved	578 mg/L	10	SM 2540 C-97	6 Apr 17 14:35	RC
Calcium	130.0 mg/L	0.500	SW6010C	12 Apr 17 13:01	RMV
Lithium	0.028 mg/L	0.005	SW6010C	12 Apr 17 13:01	RMV
Barium	0.040 mg/L	0.005	SW6010C	12 Apr 17 13:01	RMV
Chromium	< 0.01 mg/L	0.01	SW6010C	17 Apr 17 12:27	RMV
Boron	0.161 mg/L	0.100	SW6010C	12 Apr 17 13:01	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 13:25	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 13:25	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	10 Apr 17 13:25	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	10 Apr 17 13:25	RMV
Cobalt	< 2.5 @ ug/L	0.5	SW6020A	19 Apr 17 17:25	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 13:25	RMV
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 13:25	RMV
Selenium	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 13:25	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	20 Apr 17 16:28	RMV
Fluoride	0.230 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

RL = Reporting Limit
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 ! = 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: 9 May 2017
 Lab Number: 17-A11962
 Work Order #: 31-0135
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 Apr 2017 12:06
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 4 Apr 2017 13:33
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-3A-R

Temp at Receipt: 1.2C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				6 Apr 17	JMS
Water Digestions				6 Apr 17	JMS
Radium 226	SEE ATTACHED			2 May 17 16:12	ABL
Radium 228	SEE ATTACHED		EPA M9320	2 May 17 16:12	ABL
pH, Field	6.88 units	1.00	I-1586-85	3 Apr 17 12:06	JLH
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	6 Apr 17 8:40	CEH
Sulfate	112 @ mg/L	5.0	ASTM D516-07	6 Apr 17 9:50	KCJ
Chloride	12.3 mg/L	3.0	SM 4500 Cl E	13 Apr 17 7:56	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	19 Apr 17 12:27	RMB
Solids, Total Dissolved	563 mg/L	10	SM 2540 C-97	6 Apr 17 14:35	RC
Calcium	114.0 mg/L	0.500	SW6010C	12 Apr 17 13:01	RMV
Lithium	0.021 mg/L	0.005	SW6010C	12 Apr 17 13:01	RMV
Barium	0.042 mg/L	0.005	SW6010C	12 Apr 17 13:01	RMV
Chromium	< 0.01 mg/L	0.01	SW6010C	17 Apr 17 12:27	RMV
Boron	0.190 mg/L	0.100	SW6010C	12 Apr 17 13:01	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	10 Apr 17 14:24	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	10 Apr 17 14:24	RMV
Cobalt	< 2.5 @ ug/L	0.5	SW6020A	19 Apr 17 17:25	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Selenium	4.80 @ ug/L	0.50	SW6020A	10 Apr 17 14:24	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	20 Apr 17 16:28	RMV
Fluoride	0.160 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

RL = Reporting Limit
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 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

Project Name: HOOT LAKE PLANT

Sample Description: S-51

Report Date: 9 May 2017
 Lab Number: 17-A11963
 Work Order #: 31-0135
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 Apr 2017 17:20
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 4 Apr 2017 13:33
 PO #: 48679

Temp at Receipt: 1.2C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				6 Apr 17	JMS
Water Digestions				6 Apr 17	JMS
Radium 226	SEE ATTACHED			2 May 17 16:13	ABL
Radium 228	SEE ATTACHED		EPA M9320	2 May 17 16:13	ABL
pH, Field	6.81 units	1.00	I-1586-85	3 Apr 17 17:20	BMW
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	6 Apr 17 8:40	CEH
Sulfate	52.3 @ mg/L	5.0	ASTM D516-07	6 Apr 17 9:50	KCJ
Chloride	16.1 mg/L	3.0	SM 4500 Cl E	13 Apr 17 7:56	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	19 Apr 17 12:27	RMB
Solids, Total Dissolved	467 mg/L	10	SM 2540 C-97	6 Apr 17 14:35	RC
Calcium	106.0 mg/L	0.500	SW6010C	12 Apr 17 13:01	RMV
Lithium	0.020 mg/L	0.005	SW6010C	12 Apr 17 13:01	RMV
Barium	0.059 mg/L	0.005	SW6010C	12 Apr 17 13:01	RMV
Chromium	< 0.01 mg/L	0.01	SW6010C	17 Apr 17 12:27	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	12 Apr 17 13:01	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	10 Apr 17 14:24	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	10 Apr 17 14:24	RMV
Cobalt	< 2.5 @ ug/L	0.5	SW6020A	19 Apr 17 17:25	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Selenium	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	20 Apr 17 16:28	RMV
Fluoride	0.220 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

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:
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 ! = Due to sample quantity + = Due to internal standard response
 CERTIFICATION: MN LAB # 027-015-125 NI LAB # 999447680 ND MICRO # 1013-M ND NW/DN # 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: 9 May 2017
 Lab Number: 17-A11964
 Work Order #: 31-0135
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 Apr 2017 18:02
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 4 Apr 2017 13:33
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-52

Temp at Receipt: 1.2C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				6 Apr 17	JMS
Water Digestions				6 Apr 17	JMS
Radium 226	SEE ATTACHED			2 May 17 16:13	ABL
Radium 228	SEE ATTACHED		EPA M9320	2 May 17 16:13	ABL
pH, Field	6.93 units	1.00	I-1586-85	3 Apr 17 18:02	BMW
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	6 Apr 17 8:40	CEH
Sulfate	55.2 @ mg/L	5.0	ASTM D516-07	6 Apr 17 9:50	KCJ
Chloride	14.8 mg/L	3.0	SM 4500 Cl E	13 Apr 17 7:56	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	19 Apr 17 12:27	RMB
Solids, Total Dissolved	452 mg/L	10	SM 2540 C-97	6 Apr 17 14:35	RC
Calcium	99.80 mg/L	0.500	SW6010C	12 Apr 17 13:01	RMV
Lithium	0.019 mg/L	0.005	SW6010C	12 Apr 17 13:01	RMV
Barium	0.106 mg/L	0.005	SW6010C	12 Apr 17 13:01	RMV
Chromium	< 0.01 mg/L	0.01	SW6010C	17 Apr 17 12:27	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	12 Apr 17 13:01	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	10 Apr 17 14:24	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	10 Apr 17 14:24	RMV
Cobalt	< 2.5 @ ug/L	0.5	SW6020A	19 Apr 17 17:25	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Molybdenum	3.24 @ ug/L	0.50	SW6020A	10 Apr 17 14:24	RMV
Selenium	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	20 Apr 17 16:28	RMV
Fluoride	0.160 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

RL = Reporting Limit
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 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: 9 May 2017
 Lab Number: 17-A11965
 Work Order #: 31-0135
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 Apr 2017 14:04
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 4 Apr 2017 13:33
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-10R

Temp at Receipt: 1.2C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				6 Apr 17	JMS
Water Digestions				6 Apr 17	JMS
Radium 226	SEE ATTACHED			2 May 17 16:13	ABL
Radium 228	SEE ATTACHED		EPA M9320	2 May 17 16:13	ABL
pH, Field	6.84 units	1.00	I-1586-85	3 Apr 17 14:04	JLH
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	6 Apr 17 8:40	CEH
Sulfate	93.9 @ mg/L	5.0	ASTM D516-07	6 Apr 17 9:50	KCF
Chloride	11.4 mg/L	3.0	SM 4500 Cl E	13 Apr 17 7:56	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	19 Apr 17 12:27	RMB
Solids, Total Dissolved	527 mg/L	10	SM 2540 C-97	6 Apr 17 14:35	RC
Calcium	118.0 mg/L	0.500	SW6010C	12 Apr 17 13:01	RMV
Lithium	0.022 mg/L	0.005	SW6010C	12 Apr 17 13:01	RMV
Barium	0.104 mg/L	0.005	SW6010C	12 Apr 17 13:01	RMV
Chromium	< 0.01 mg/L	0.01	SW6010C	17 Apr 17 12:27	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	12 Apr 17 13:01	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Arsenic	4.60 @ ug/L	0.50	SW6020A	10 Apr 17 14:24	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	10 Apr 17 14:24	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	10 Apr 17 14:24	RMV
Cobalt	< 2.5 @ ug/L	0.5	SW6020A	19 Apr 17 17:25	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Selenium	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	20 Apr 17 16:28	RMV
Fluoride	0.160 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

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 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: 9 May 2017
 Lab Number: 17-A11966
 Work Order #: 31-0135
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 Apr 2017 12:34
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 4 Apr 2017 13:33
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-13

Temp at Receipt: 1.2C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				6 Apr 17	JMS
Water Digestions				7 Apr 17	JMS
Radium 226	SEE ATTACHED			2 May 17 16:13	ABL
Radium 228	SEE ATTACHED		EPA M9320	2 May 17 16:13	ABL
pH, Field	6.93 units	1.00	I-1586-85	3 Apr 17 12:34	JLH
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	6 Apr 17 9:07	CEH
Sulfate	73.0 @ mg/L	5.0	ASTM D516-07	6 Apr 17 10:25	KCJ
Chloride	7.0 mg/L	3.0	SM 4500 Cl E	13 Apr 17 7:56	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	19 Apr 17 12:27	RMB
Solids, Total Dissolved	488 mg/L	10	SM 2540 C-97	6 Apr 17 14:35	RC
Calcium	112.0 mg/L	0.500	SW6010C	12 Apr 17 16:58	RMV
	see narrative				
Lithium	0.026 mg/L	0.005	SW6010C	12 Apr 17 16:58	RMV
Barium	0.071 mg/L	0.005	SW6010C	12 Apr 17 16:58	RMV
Chromium	< 0.01 mg/L	0.01	SW6010C	17 Apr 17 12:27	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	12 Apr 17 16:58	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	10 Apr 17 14:24	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	10 Apr 17 14:24	RMV
Cobalt	< 2.5 @ ug/L	0.5	SW6020A	19 Apr 17 17:25	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Selenium	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	20 Apr 17 16:28	RMV
Fluoride	0.180 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

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

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

Report Date: 9 May 2017
 Lab Number: 17-A11967
 Work Order #: 31-0135
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 Apr 2017 13:18
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 4 Apr 2017 13:33
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-14R

Temp at Receipt: 1.2C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				6 Apr 17	JMS
Water Digestions				7 Apr 17	JMS
Radium 226	SEE ATTACHED			2 May 17 16:14	ABL
Radium 228	SEE ATTACHED		EPA M9320	2 May 17 16:14	ABL
pH, Field	6.85 units	1.00	I-1586-85	3 Apr 17 13:18	JLH
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	6 Apr 17 9:07	CEH
Sulfate	113 @ mg/L	5.0	ASTM D516-07	6 Apr 17 10:25	KCJ
Chloride	5.1 mg/L	3.0	SM 4500 Cl E	13 Apr 17 7:56	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	19 Apr 17 12:27	RMB
Solids, Total Dissolved	582 mg/L	10	SM 2540 C-97	6 Apr 17 14:35	RC
Calcium	124.0 mg/L	0.500	SW6010C	12 Apr 17 16:58	RMV
	see narrative				
Lithium	0.029 mg/L	0.005	SW6010C	12 Apr 17 16:58	RMV
Barium	0.074 mg/L	0.005	SW6010C	12 Apr 17 16:58	RMV
Chromium	< 0.01 mg/L	0.01	SW6010C	17 Apr 17 12:27	RMV
Boron	< 0.1 mg/L	0.1	SW6010C	12 Apr 17 16:58	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Arsenic	2.94 @ ug/L	0.50	SW6020A	10 Apr 17 14:24	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	10 Apr 17 14:24	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	10 Apr 17 14:24	RMV
Cobalt	< 2.5 @ ug/L	0.5	SW6020A	19 Apr 17 17:25	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Selenium	< 2.5 @ ug/L	0.5	SW6020A	10 Apr 17 14:24	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	20 Apr 17 16:28	RMV
Fluoride	0.170 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

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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INORGANIC AND METALS ANALYSES:

Due to the sample matrix of the spiked sample, the matrix spike duplicate recovery was outside of acceptance limits for calcium in samples 17-A11966 and 17-A11967. Data was reported based on the acceptable recoveries of the laboratory control spike and relative percent difference between the matrix spikes.

No other problems were encountered with these analyses.



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Quality Control Report

Lab IDs: 17-A11961 to 17-A11967

Project: HOOT LAKE PLANT CCR

Work Order: 201731-0135

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	105	85-115	25.0	17A11961q	< 2.5	25.9	104	75-125	25.9	27.1	108	4.5	10	100	90-110	< 0.5
	25.0	105	85-115	25.0	17A11967q	< 2.5	26.5	106	75-125	26.5	27.5	110	3.7	10	100	90-110	< 0.5
Arsenic ug/L	25.0	103	85-115	25.0	17A11961q	< 2.5	26.5	106	75-125	26.5	27.3	109	3.0	10	98	90-110	< 0.5
	25.0	102	85-115	25.0	17A11967q	2.94	29.4	106	75-125	29.4	30.0	108	2.0	10	98	90-110	< 0.5
Barium mg/L	1.000	106	85-115	1.00	17A11965q	0.104	1.120	102	75-125	1.120	1.100	100	1.8	10	97	90-110	< 0.005
	1.000	100	85-115	1.00	17A11966q	0.071	1.130	106	75-125	1.130	1.050	98	7.3	10	99	90-110	< 0.005
Beryllium ug/L	2.50	109	85-115	2.50	17A11961q	< 0.25	2.63	105	75-125	2.63	2.61	104	0.8	10	102	90-110	< 0.05
	2.50	108	85-115	2.50	17A11967q	< 0.25	2.58	103	75-125	2.58	2.61	104	1.2	10	103	90-110	< 0.05
Boron mg/L	1.000	104	85-115	1.00	17A11965q	< 0.1	1.100	110	75-125	1.100	1.100	110	0.0	10	94	90-110	< 0.1
	1.000	94	85-115	1.00	17A11966q	< 0.1	1.120	112	75-125	1.120	1.030	103	8.4	10	97	90-110	< 0.1
Cadmium ug/L	5.00	103	85-115	5.00	17A11961q	< 0.5	4.96	99	75-125	4.96	5.35	107	7.6	10	98	90-110	< 0.1
	5.00	103	85-115	5.00	17A11967q	< 0.5	5.42	108	75-125	5.42	5.31	106	2.1	10	98	90-110	< 0.1
Calcium mg/L	50.00	105	85-115	50.0	17A11965q	118.0	163.0	90	75-125	163.0	160.0	84	1.9	10	97	90-110	< 0.5
	50.00	97	85-115	50.0	17A11966q	112.0	160.0	96	75-125	160.0	149.0	74	7.1	10	96	90-110	< 0.5
Chloride mg/L	-	-	-	60.0	17-A12092	4.5	61.8	96	85-121	61.8	60.2	93	2.6	5	95	90-110	< 3

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Quality Control Report

Lab IDs: 17-A11961 to 17-A11967

Project: HOOT LAKE PLANT CCR

Work Order: 201731-0135

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 mg/L	1.000	101	85-115	1.00	17A11965q	<0.01	0.964	96	75-125	0.964	0.963	96	0.1	10	94	90-110	<0.01
	1.000	96	85-115	1.00	17A11374q	<0.01	0.966	97	75-125	0.966	1.010	101	4.5	10			<0.01
	1.000	98	85-115	1.00	17A11966q	<0.01	0.976	98	75-125	0.976	1.010	101	3.4	10			<0.01
Cobalt ug/L	25.0	107	85-115	25.0	17A11961q	<2.5	24.3	97	75-125	24.3	24.4	98	0.4	10	102	90-110	<0.5
	25.0	106	85-115	25.0	17A11967q	<2.5	24.2	97	75-125	24.2	24.2	97	0.0	10			<0.5
Fluoride mg/L	-	-	-	0.20	17-A11967	0.170	0.400	115	75-125	0.400	0.400	115	0.0	10	99	90-110	<0.02
Lead ug/L	25.0	105	85-115	25.0	17A11961q	<2.5	25.9	104	75-125	25.9	26.6	106	2.7	10	99	90-110	<0.5
	25.0	104	85-115	25.0	17A11967q	<2.5	26.6	106	75-125	26.6	26.9	108	1.1	10	102	90-110	<0.5
Lithium mg/L	1.000	110	85-115	1.00	17-A11965	0.022	1.090	107	75-125	1.090	1.050	103	3.7	10	102	90-110	<0.005
	1.000	102	85-115	1.00	17-A11966	0.026	1.130	110	75-125	1.130	1.060	103	6.4	10	102	90-110	<0.005
Mercury ug/L	-	-	-	0.10	17-A11954	<0.005	0.083	83	63-111	0.083	0.084	84	1.2	18	93	76-113	<0.005
	-	-	-														<0.005
Molybdenum ug/L	25.0	99	85-115	25.0	17A11961q	<2.5	25.1	100	75-125	25.1	26.0	104	3.5	10	94	90-110	<0.5
	25.0	98	85-115	25.0	17A11967q	<2.5	26.7	107	75-125	26.7	27.6	110	3.3	10	92	90-110	<0.5

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Quality Control Report

Lab IDs: 17-A11961 to 17-A11967

Project: HOOT LAKE PLANT CCR

Work Order: 201731-0135

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	-	-	-	-	-	-	-	-	-	7.1	7.0	-	1.4	2.5	101	90-110	-
	-	-	-	-	-	-	-	-	-	7.8	7.8	-	0.0	2.5	101	90-110	-
Selenium ug/L	25.0	104	85-115	25.0	17A11961q	<2.5	27.5	110	75-125	27.5	27.2	109	1.1	10	102	90-110	<0.5
	25.0	108	85-115	25.0	17A11967q	<2.5	28.5	114	75-125	28.5	30.1	120	5.5	10	100	90-110	<0.5
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	574	602	-	4.8	8	103	85-115	<10
	-	-	-	-	-	-	-	-	-	582	575	-	1.2	8			
Sulfate mg/L	-	-	-	500	17-A11965	93.9	584	98	74-128	584	585	98	0.2	5	97	80-120	<5
	-	-	-	500	17-A11967	113	621	102	74-128	621	625	102	0.6	5	101	80-120	<5
	-	-	-	50.0	17-A11955	9.7	59.4	99	74-128	59.4	58.8	98	1.0	5			
	-	-	-	50.0	17-A11005	53.3	107	107	74-128	107	108	109	0.9	5			
Thallium ug/L	5.00	100	85-115	5.00	17A12436q	<0.1	5.19	104	75-125	5.19	5.39	108	3.8	10	101	90-110	<0.1
	5.00	106	85-115	5.00	17A11961q	<0.5	5.54	111	75-125	5.54	5.37	107	3.1	10			<0.1
	5.00	104	85-115	5.00	17A11967q	<0.5	5.15	103	75-125	5.15	5.22	104	1.4	10			<0.1

*** Due to result < 15 mg/L, data reported based on acceptance criteria of Relative % Difference of +/- 4 mg/L.

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: 5/1/2017

CLIENT: MVTL Inc
Project: Ottertail Power Hoot Lake
Lab Order: S1704106

CASE NARRATIVE
Report ID: S1704106001

Samples S10R-A11965, S13-A11966, S14R-A11967, S2A-A11961, S3AR-A11962, S51-A11963, and S52-A11964 were received on April 7, 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

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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 5/1/2017
Report ID S1704106001

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1704106-001
ClientSample ID: S2A-A11961
COC: WEB 31-0135

WorkOrder: S1704106
CollectionDate: 4/3/2017 4:16:00 PM
DateReceived: 4/7/2017 11:53:00 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	04/26/2017 1106	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	04/26/2017 1106	MB
Radium 228	ND	pCi/L		2	Ga-Tech	04/27/2017 008	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	04/27/2017 008	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

Sample Analysis Report

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

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1704106-002
ClientSample ID: S3AR-A11962
COC: WEB 31-0135

Date Reported 5/1/2017
Report ID S1704106001

WorkOrder: S1704106
CollectionDate: 4/3/2017 12:06:00 PM
DateReceived: 4/7/2017 11:53:00 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	04/26/2017 1534 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	04/26/2017 1534 MB
Radium 228	ND	pCi/L		2	Ga-Tech	04/27/2017 312 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	04/27/2017 312 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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Your Environmental Monitoring Partner

Sample Analysis Report

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

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1704106-003
ClientSample ID: S51-A11963
COC: WEB 31-0135

Date Reported 5/1/2017
Report ID S1704106001

WorkOrder: S1704106
CollectionDate: 4/3/2017 5:20:00 PM
DateReceived: 4/7/2017 11:53:00 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	04/26/2017 1534	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	04/26/2017 1534	MB
Radium 228	ND	pCi/L		2	Ga-Tech	04/27/2017 616	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	04/27/2017 616	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

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 5/1/2017
Report ID S1704106001

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1704106-004
ClientSample ID: S52-A11964
COC: WEB 31-0135

WorkOrder: S1704106
CollectionDate: 4/3/2017 6:02:00 PM
DateReceived: 4/7/2017 11:53:00 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	04/26/2017 1534 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	04/26/2017 1534 MB
Radium 228	ND	pCi/L		2	Ga-Tech	04/27/2017 920 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	04/27/2017 920 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 Hoot Lake
Lab ID: S1704106-005
ClientSample ID: S10R-A11965
COC: WEB 31-0135

Date Reported 5/1/2017
Report ID S1704106001

WorkOrder: S1704106
CollectionDate: 4/3/2017 2:04:00 PM
DateReceived: 4/7/2017 11:53:00 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	04/26/2017 1534	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	04/26/2017 1534	MB
Radium 228	ND	pCi/L		2	Ga-Tech	04/27/2017 1224	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	04/27/2017 1224	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

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 5/1/2017
Report ID S1704106001

ProjectName: Ottetail Power Hoot Lake
Lab ID: S1704106-006
ClientSample ID: S13-A11966
COC: WEB 31-0135

WorkOrder: S1704106
CollectionDate: 4/3/2017 12:34:00 PM
DateReceived: 4/7/2017 11:53:00 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	04/26/2017 1534	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	04/26/2017 1534	MB
Radium 228	2.1	pCi/L		2	Ga-Tech	04/27/2017 1527	MB
Radium 228 Precision (±)	2.8	pCi/L			Ga-Tech	04/27/2017 1527	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
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 5/1/2017
Report ID S1704106001

ProjectName: Ottetail Power Hoot Lake
Lab ID: S1704106-007
ClientSample ID: S14R-A11967
COC: WEB 31-0135

WorkOrder: S1704106
CollectionDate: 4/3/2017 1:18:00 PM
DateReceived: 4/7/2017 11:53:00 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	04/26/2017 1534	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	04/26/2017 1534	MB
Radium 228	ND	pCi/L		2	Ga-Tech	04/27/2017 1832	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	04/27/2017 1832	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

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTI Inc
Work Order: S1704106
Project: Ottertail Power Hoot Lake

Date: 5/1/2017
Report ID: S1704106001

Radium 228 by Ga/Tech		Sample Type	MBLK	Units: pCi/L				
MB-430 (04/26/17 11:52)	RunNo: 145297	PrepDate: 04/17/17 14:00	BatchID 13102					
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-430 (04/26/17 14:57)	RunNo: 145297	PrepDate: 04/17/17 14:00	BatchID 13102					
Analyte	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)	RunNo: 145297	PrepDate: 04/17/17 14:00	BatchID 13102					
Analyte	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				
S1704140-003AMS (04/28/17 15:59)	RunNo: 145297	PrepDate: 04/17/17 14:00	BatchID 13102					
Analyte	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				
S1704140-003AMSD (04/28/17 19:04)	RunNo: 145297	PrepDate: 04/17/17 14:00	BatchID 13102					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228	35	1	25	31.3	86.1	20	R	
Radium 226 In Water -		Sample Type	MBLK	Units: pCi/L				
MB-1741 (04/26/17 11:06)	RunNo: 145249	PrepDate: 04/19/17 0:00	BatchID 13099					
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-1741 (04/26/17 11:06)	RunNo: 145249	PrepDate: 04/19/17 0:00	BatchID 13099					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226	6.1	0.2	5.89		104	67.1 - 122		
Radium 226 In Water -		Sample Type	MS	Units: pCi/L				
MS-1741 (04/26/17 11:06)	RunNo: 145249	PrepDate: 04/19/17 0:00	BatchID 13099					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226	5.9	0.2	5.89	ND	101	65 - 131		
Radium 226 In Water -		Sample Type	MSD	Units: pCi/L				
MSD-1741 (04/26/17 11:06)	RunNo: 145249	PrepDate: 04/19/17 0:00	BatchID 13099					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Radium 226	6.4	0.2	ND		109	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		

Minnesota Valley Testing Laboratories

1126 North Front Street

Phone: 800 782 3557

New Ulm, MN 56003

Fax: 507 359 2890

Field Service Chain of Custody Record

Project Name: Otter Tail Power Co. Hoot Lake Plant		Project Type: Hoot Lake Plant	Name of Samplers: Jeff Hoffman Ben Wolf
Report To: Otter Tail Power Company Attn: Paul Vukonich Address: P.O. Box 496 Fergus Falls, MN 56038-0496 Phone: 218-739-8349		Carbon Copy: Attn: Address:	Quote Number: Work Order Number: Lab Numbers:

Sample Information							Bottle Type										Analysis		
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	VOC Set	1000 none	1000 HNO3	500 HNO3	Filter? Y or N	500 HNO3	Filter? Y or N	500H2SO4	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
A11961	S2A		3 Apr 17	1616	GW			1	2	1	n								see attachment
A11962	S3AR			1206	GW			1	2	1	n								
A11963	S51			1720	GW			1	2	1	n								
A11964	S52			1802	GW			1	2	1	n								
A11965	S10R			1404	GW			1	2	1	n								
A11966	S13			1234	GW			1	2	1	n								
67	S14R			1318	GW			1	2	1	n								

Comments: CCR walls

Comments: CCR wells

Work Order #2

-500 HNO3 is with the Reg. sampling

Samples Relinquished By: [Signature]				Samples Received By: [Signature]			
Date: 4 Apr 17		Time: 1339		Date: 4 Apr 17		Time: 1339	
Temp: 1.2		Temp: 1.2		Temp: 1.2		Temp: 1.2	
Samples Relinquished into: (Fridge) Log in Cart Other:				Samples Relinquished into: (Fridge) Log in Cart Other:			
Samples Relinquished By:				Samples Received By:			
Date:		Time:		Date:		Time:	
Temp:		Temp:		Temp:		Temp:	
Deliver:				Seal Number(s) - If Used			
Transp.:				Seals Intact? Yes No			

HLP "H" Monitoring Parameters (CCR)

CCR - Appendix III Detection Monitoring

Field Parameters

pH*

* Field and Laboratory Measurements

Total Concentration Parameters

Boron

Calcium

Chloride

Fluoride

pH

Sulfate

Dissolved Solids, Total

HLP "I" Monitoring Parameters CCR

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

Sampling Information

Sample Event Key #

Landfill Name: Otter Tail Power Co / Hoot Lake Plant "Spring"

Facility ID: SW-211

Well Number	Unique Number	TOC Elev.	Casing Diameter (in.)	Analytical Parameters	Pump Type	Dedicated?	Purge Rate	Well Depth
A-1		1282.03	4	List B	Submersible	N/A	0.25	115.00
A-3		1275.83	4	List B	Submersible	N/A	0.25	110.00
B-1		1273.50	2	List C	Bladder	No	0.25	74.00
B-2A		1273.78	2"	List C	Bladder	No	0.25	79.63
B-3		1276.67	2	List B	Bladder	N/A	0.25	22.67
B-3A-R		1271.56	2	List C	Grundfos	No	0.25	78.42
B-4		1277.92	2	List B	Bladder	N/A	0.25	40.72
B-5		1295.34	2	List C	Bladder	No	0.25	95.57
B-6		1263.63	2	List C	Grundfos	No	0.25	58.90
B-10R			2	List C	Grundfos	No	0.25	81.00
B-11		1279.08	2	List C	Grundfos	No	0.25	75.97
B-13		1296.42	2	List C	Grundfos	No	0.25	90.19
B-14R			2	List C	Grundfos	No	N/A	87.00
B51			2	List C	Bladder	Yes	0.25	55.60
B52			2	List C	Bladder	Yes	0.25	88.30
Leachate		N/A	N/A	List A	Pump	No	unknown	N/A
Leachate LDS		N/A	N/A	List A	Pump	No	unknown	N/A
SW-1 Upstream		N/A	N/A	List D	Grab	N/A	N/A	N/A
SW-2 Downstream		1200.67	N/A	List D	Grab	N/A	N/A	N/A
B-2014				List C	Grundfos		0.25	114.00
Duplicate 1	NA	NA	N/A	List B	NA	NA	NA	NA
Equipment Blank	NA	NA	N/A	List B	NA	NA	NA	NA

Equipment Blank and Duplicate sample from List B Wells

List A= Field: Appearance, pH, Specific Conductance, Temp, Turb., D.O.
 Lab: Appearance, pH, Specific Conductance, Alkalinity, Chloride, TDS, TSS, Sulfate, Ammonia, Nitrate + Nitrite Nitrogen, Total Phosphorous, Potassium, Aluminum, Arsenic, Barium, Beryllium, B, Cd, Ca, Total Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Mercury, Molybdenum, Mn, Ni, Se, Silver, Strontium, Sodium, Thallium, Tin, Vanadium, Zinc, Fluoride, Antimony
 CBOD, TKN

List B= Field: Appearance, pH, Specific Conductance, Temp, Turb., D.O., Static water Elevation
 Lab: Appearance, pH, Specific Conductance, Alkalinity, Chloride, TDS, TSS, Sulfate, Ammonia, Nitrate + Nitrite Nitrogen, Total Phosphorous, Dissolved: Aluminum, Arsenic, Barium, Potassium, Beryllium, B, Cd, Ca, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Mercury, Molybdenum, Mn, Ni, Se, Silver, Strontium, Sodium, Thallium, Tin, Vanadium, Zinc, Antimony
 Note: Parameters only needed if they are detected in the Leachate. Be, Co, Ag, Sn

Sampling Information

Sample Event Key #

Landfill Name: Otter Tail Power Co.

Facility ID: Hoot Lake Plant "Spring"

List A= Field: Appearance, pH, Specific Conductance, Temp, Turb., D.O., Static water Elevation
Lab: Appearance, pH, Specific Conductance, Alkalinity, Chloride, TDS, TSS, Sulfate, Ammonia,
Nitrate + Nitrite Nitrogen, Dissolved: K, Al, As, B, Cd, Ca, Cu, Fe, Pb, Mg, Mn, Hg, Mo, Ni, Se, Na,
Chromium

List D= Field: Appearance, pH, Specific Conductance, Temp, Turb., D.O., Static water Elevation
Lab: Appearance, pH, Specific Conductance, Alkalinity, Chloride, TDS, TSS, Sulfate, Ammonia,
Nitrate + Nitrite Nitrogen, K, Al, As, B, Cd, Ca, Cu, Fe, Pb, Mg, Mn, Hg, Mo, Ni, Se, Na,
Total Chromium

List E= Field: Appearance, pH, Specific Conductance, Temp, Turb., D.O., Static water Elevation
Lab: Appearance, pH, Specific Conductance, Alkalinity, Chloride, TDS, TSS, Sulfate,
Dissolved: As, B, Se,

List F= Field: Appearance, pH, Specific Conductance, Temp, Turb., D.O., Static water Elevation
Lab: Appearance, pH, Specific Conductance, Alkalinity, Chloride, TDS, TSS, Sulfate,
Dissolved: As, B, Se, Mo

List G= Field: Appearance, pH, Specific Conductance, Temp, Turb., D.O., Static water Elevation
Lab: Appearance, pH, Specific Conductance, Alkalinity, Chloride, TDS, TSS, Sulfate,
Dissolved: As, B, Se, Ni

List H= Field: pH
Lab: pH, Chloride, TDS, Sulfate,
B, Calcium, Fluoride

List I= Total Fluoride, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium
Cobalt Lead, Lithium, Mercury, Molybdenum, Selenium, Thallium, Radium 226 and 228 combined

Bottle List A= 500 none, 1000 None, 500 HNO3, 500 H2SO4

Bottle List B= 1000 None, 500 HNO3 filtered, 500 H2SO4 500 HNO3

Bottle List C= 1000 None, 500 HNO3 filtered, 500 H2SO4 500 HNO3

Bottle List D= 1000 None, 500 HNO3, 500 H2SO4

Bottle List E= 1000 None, 500 HNO3 filtered

Bottle List F= 1000 None, 500 HNO3 filtered

Bottle List G= 1000 None, 500 HNO3 filtered

Bottle List H,I 1000 None, 500 HNO3, 2-1000 HNO3,

Stabilization Parameters: Temperature 0.5, Specific Conductivity 5%, Turbidity, pH 0.1

Filters .45 micron

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben wolf

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 3 April 17

Unique Station ID:

Sample ID: S-2A

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: 79.61

Constructed Depth: 79.63

Casing Diameter: 2"

Water Level Before Purge: 76.51

Well Volume: .51 Gallons

Well Casing Elevation: 1273.776

Static Water Elevation: 1197.27

Previous Static: 1197.13

Water Level After Sample:

Measurement Method: ☒ Elec. WL ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 59 Wind: NE @ 12 Sky: Fair

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

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

Well Purged Dry? ☒ Yes ☐ No Time Pump Began: 1607 am / pm

Time Purged Dry? — Time of Sampling: 1616 am / pm

Duplicate Sample? Yes ☒ No ID: — Sample EH: 62.0

Sample Appearance: General: Clear Color: NO7 Phase: NO7 Odor: NO7

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
3 1610	6.81	889	9.25	4.89	6.6	.75	1	
1613	6.79	887	9.14	4.51	5.1	1.50	2	
1616	6.73	886	9.06	4.41	2.2	2.25	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 2.25 Gallons

Comments:

C, COR

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 3 Apr 17

Unique Station ID: 674671

Sample ID: S-3A-R

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: 78.40

Constructed Depth: 78.42

Casing Diameter: 2"

Water Level Before Purge: 67.88

Well Volume: 1.72 Gallons

Well Casing Elevation: 1271.562

Static Water Elevation: 1203.68

Previous Static: 1203.96

Water Level After Sample: 67.97

Measurement Method: Elec. WLI Steel Tape

Sampling Information

Weather Conditions: Temp: 52° Wind: N-S 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: —

Pumping Rate: 0.25 gpm

Time Pump Began: 1145 am pm

Time of Sampling: 1206 am / pm

Sample EH: - 98.1

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:
7 1152	6.91	944	9.04	1.10	9.9	1.75	1	
1159	6.90	947	9.02	1.08	8.3	3.50	2	
1206	6.88	950	8.98	1.22	0.0	5.25	3	
							4	
							5	

Stabilized? ☒ Yes No

Amount Water Removed: 5.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 3 April 17

Unique Station ID: 814830

Sample ID: S-51

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: 55.60

Constructed Depth: 55.60

Casing Diameter: 2"

Water Level Before Purge: 49.96

Well Volume: 92 Gallons

Well Casing Elevation: 1286.9

Static Water Elevation: 1236.94

Previous Static: 1237.17

Water Level After Sample: 50.02

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

Sampling Information

Weather Conditions: Temp: 59 Wind: NE @ 8 Sky: Fair

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

Dedicated Equipment: ☒ Yes ☐ No

Well Purged Dry? ☐ Yes ☒ No

Time Purged Dry? -

Duplicate Sample? ☐ Yes ☒ No ID: -

Pumping Rate: 25 gpm

Time Pump Began: 1700 am / ☒ pm

Time of Sampling: 1720 am / ☒ pm

Sample EH: -67.9

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>1704</u>	<u>7.28</u>	<u>702</u>	<u>9.00</u>	<u>2.20</u>	<u>65.3</u>	<u>1</u>	<u>1</u>	
<u>1708</u>	<u>6.91</u>	<u>733</u>	<u>8.63</u>	<u>1.10</u>	<u>46.1</u>	<u>2</u>	<u>2</u>	
<u>1712</u>	<u>6.80</u>	<u>743</u>	<u>8.50</u>	<u>.78</u>	<u>22.6</u>	<u>3</u>	<u>3</u>	
<u>1716</u>	<u>6.80</u>	<u>745</u>	<u>8.45</u>	<u>.69</u>	<u>12.0</u>	<u>4</u>	<u>4</u>	
<u>1720</u>	<u>6.81</u>	<u>745</u>	<u>8.44</u>	<u>.67</u>	<u>9.3</u>	<u>5</u>	<u>5</u>	

Stabilized? ☐ Yes ☒ No

Amount Water Removed: 5 Gallons

Comments:

Exceptions to Protocol:

Clear
*Not in notes program

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517



Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 3 April 17

Unique Station ID: 822155

Sample ID: S-52

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: 88.30

Constructed Depth: 88.30

Casing Diameter: 2"

Water Level Before Purge: 70.37

Well Volume: 2.92 Gallons

Well Casing Elevation: 1286.62

Static Water Elevation: 1216.25

Previous Static: 1216.03

Water Level After Sample: 70.40

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 57 Wind: NE @ 10 Sky: Part

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

Dedicated Equipment: ☒ Yes ☐ No

Well Purged Dry? ☒ Yes ☐ No

Time Purged Dry? -

Duplicate Sample? ☒ Yes ☐ No ID: -

Pumping Rate: .25 gpm

Time Pump Began: 1726 am / ☒ pm

Time of Sampling: 1802 am / ☒ pm

Sample EH: -122.0

Sample Appearance: General: Clear Color: none Phase: Light Sed. Odor: Sulfurous

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1738</u>	<u>6.97</u>	<u>733</u>	<u>8.49</u>	<u>.89</u>	<u>9.9</u>	<u>3</u>	<u>1</u>	
<u>1750</u>	<u>6.93</u>	<u>732</u>	<u>8.46</u>	<u>.64</u>	<u>3.2</u>	<u>6</u>	<u>2</u>	
<u>1802</u>	<u>6.93</u>	<u>731</u>	<u>8.38</u>	<u>.52</u>	<u>1.9</u>	<u>9</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 9 Gallons

Comments:

L, W, H

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jess Hoffman

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 3 Apr 17

Unique Station ID: 806341

Sample ID: S-10R

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: 80.62

Constructed Depth: —

Casing Diameter: 2"

Water Level Before Purge: 72.02

Well Volume: Gallons

Well Casing Elevation: 1581.47

Static Water Elevation: 1208.45

Previous Static: —

Water Level After Sample: 72.02

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 54° Wind: N-S Sky: P. 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: 13:34 am ☐ pm ☒

Time Purged Dry?

Time of Sampling: 1404 am ☐ pm ☒

Duplicate Sample? Yes ☒ No ☐ ID: —

Sample EH: -80.9

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:
1340	6.89	901	9.14	8.06	194.3	1.5	1	
1346	6.89	901	9.08	4.24	80.2	3.0	2	
1352	6.85	906	9.08	4.96	44.8	4.5	3	
1358	6.85	907	9.02	0.68	5.2	6.0	4	
1404	6.84	907	9.01	0.47	1.0	25	5	

Stabilized? Yes ☒ No ☐

Amount Water Removed: 75 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517



Groundwater Assessment

Sampling Personnel:

Jeff Hoffmann

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 3 Apr 17

Unique Station ID:

Sample ID: S-13

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: 90.27

Constructed Depth: 90.19

Casing Diameter: 2"

Water Level Before Purge: 85.67

Well Volume: 0.75 Gallons

Well Casing Elevation: 1296.423

Static Water Elevation: 1210.75

Previous Static: 1211.61

Water Level After Sample: 85.74

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 52 Wind: N-S 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:

Pumping Rate: 0.25 gpm

Time Pump Began: 12:25 am ☒ pm ☐

Time of Sampling: 12:34 am ☐ pm ☒

Sample EH: -117.5

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

3 Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1228	6.99	859	9.49	2.73	0.0	.75	1	
1231	6.96	862	9.45	2.52	0.0	1.50	2	
1234	6.93	864	9.42	2.29	0.0	2.25	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 2.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

J. S. Hallman

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 3 Apr 17

Unique Station ID: 806342

Sample ID: S-14R

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: 87.11

Constructed Depth: —

Casing Diameter: 2"

Water Level Before Purge: 79.25

Well Volume: 1.28 Gallons

Well Casing Elevation: 1280.61

Static Water Elevation: 1201.36

Previous Static: —

Water Level After Sample: 79.25

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

Sampling Information

Weather Conditions: Temp: 52 Wind: N-5 Sky: Sunny

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: 12:54 am ☒ pm

Time Purged Dry? —

Time of Sampling: 1318 am ☒ pm

Duplicate Sample? Yes ☒ No ☐ ID: —

Sample EH: -177.5

Sample Appearance: General: Clear Color: none Phase: none Odor: Sulfurous

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1300	6.91	985	9.17	1.01	9.0	1.5	1	
1306	6.89	973	9.16	0.71	5.2	3.0	2	
1312	6.88	968	9.11	0.41	3.8	4.5	3	
1318	6.85	957	9.12	0.29	1.0	6.0	4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 6.0 Gallons

Comments:

Exceptions to Protocol:



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FINAL REPORT COMPLETION DATE: 23 Jun 17 AX

Date Reported: 20 Jun 2017

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

Work Order #: 31-0189
Account #: 006106
PO #: 48679

Project Name: HOOT LAKE PLANT

J. J. J. 22 Jun 17
Field Service Manager/Date Reviewed

Q. O. C. 20 June 2017
Chemistry Lab Manager/Date Reviewed

V. K. 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-A18609
 Work Order #: 31-0189
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 May 2017 12:26
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 3 May 2017 16:45
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S2A

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 7:18	ABL
Radium 228	SEE ATTACHED		EPA M9320	20 Jun 17 7:19	ABL
pH, Field	6.81 units	1.00	I-1586-85	3 May 17 12:26	BMW
pH	* 7.0 units	1.0	SM 4500 H+ B-2000	4 May 17 15:30	DK
Sulfate	140 @ mg/L	5.0	ASTM D516-07	11 May 17 8:01	KCJ
Chloride	< 3 mg/L	3	SM 4500 Cl E	5 May 17 11:53	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	18 May 17 14:34	RMB
Solids, Total Dissolved	626 mg/L	10	SM 2540 C-97	5 May 17 13:54	RC
Calcium	135.0 mg/L	0.500	SW6010C	9 May 17 10:11	RC
	See Narrative				
Lithium	0.032 mg/L	0.005	SW6010C	9 May 17 10:11	RC
Barium	0.041 mg/L	0.005	SW6010C	9 May 17 10:11	RC
Chromium	< 0.01 mg/L	0.01	SW6010C	9 May 17 10:11	RC
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	9 May 17 10:11	RC
Boron	0.177 mg/L	0.100	SW6010C	9 May 17 10:11	RC
Antimony	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	17 May 17 12:06	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 May 17 19:04	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 12:06	RMV
Selenium	< 5 @ ^ ug/L	0.5	SW6020A	17 May 17 12:06	RMV
Thallium	< 0.5 ug/L	0.1	SW6020A	17 May 17 12:06	RMV
	@See Narrative				
Fluoride	0.250 mg/L	0.020	EPA 300.0	5 May 17 10:06	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/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-A18610
 Work Order #: 31-0189
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 May 2017 11:56
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 3 May 2017 16:45
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-3A-R

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 7:19	ABL
Radium 228	SEE ATTACHED		EPA M9320	20 Jun 17 7:19	ABL
pH, Field	6.85 units	1.00	I-1586-85	3 May 17 11:56	BMW
pH	* 7.2 units	1.0	SM 4500 H+ B-2000	4 May 17 15:30	DK
Sulfate	120 @ mg/L	5.0	ASTM D516-07	11 May 17 8:01	KCJ
Chloride	12.4 mg/L	3.0	SM 4500 Cl E	5 May 17 11:53	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	18 May 17 14:34	RMB
Solids, Total Dissolved	552 mg/L	10	SM 2540 C-97	5 May 17 13:54	RC
Calcium	114.0 mg/L	0.500	SW6010C	9 May 17 10:11	RC
	See Narrative				
Lithium	0.022 mg/L	0.005	SW6010C	9 May 17 10:11	RC
Barium	0.041 mg/L	0.005	SW6010C	9 May 17 10:11	RC
Chromium	< 0.01 mg/L	0.01	SW6010C	9 May 17 10:11	RC
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	9 May 17 10:11	RC
Boron	0.196 mg/L	0.100	SW6010C	9 May 17 10:11	RC
Antimony	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	17 May 17 12:06	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 May 17 19:04	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 12:06	RMV
Selenium	< 5 @ ^ ug/L	0.5	SW6020A	17 May 17 12:06	RMV
Thallium	< 0.5 ug/L	0.1	SW6020A	17 May 17 12:06	RMV
	@See Narrative				
Fluoride	0.200 mg/L	0.020	EPA 300.0	5 May 17 10:06	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

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

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 ! = 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: 20 Jun 2017
 Lab Number: 17-A18611
 Work Order #: 31-0189
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 May 2017 11:47
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 3 May 2017 16:45
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-51

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 7:19	ABL
Radium 228	SEE ATTACHED		EPA M9320	20 Jun 17 7:19	ABL
pH, Field	6.96 units	1.00	I-1586-85	3 May 17 11:47	JLH
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	4 May 17 15:30	DK
Sulfate	61.4 @ mg/L	5.0	ASTM D516-07	11 May 17 8:01	KCJ
Chloride	16.5 mg/L	3.0	SM 4500 Cl E	5 May 17 11:53	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	18 May 17 14:34	RMB
Solids, Total Dissolved	466 mg/L	10	SM 2540 C-97	5 May 17 13:54	RC
Calcium	114.0 mg/L	0.500	SW6010C	9 May 17 10:11	RC
	See Narrative				
Lithium	0.023 mg/L	0.005	SW6010C	9 May 17 10:11	RC
Barium	0.065 mg/L	0.005	SW6010C	9 May 17 10:11	RC
Chromium	< 0.01 mg/L	0.01	SW6010C	9 May 17 10:11	RC
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	9 May 17 10:11	RC
Boron	< 0.1 mg/L	0.1	SW6010C	9 May 17 10:11	RC
Antimony	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	17 May 17 12:06	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 May 17 19:04	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 12:06	RMV
Selenium	< 5 @ ^ ug/L	0.5	SW6020A	17 May 17 12:06	RMV
Thallium	< 0.5 ug/L	0.1	SW6020A	17 May 17 12:06	RMV
	@See Narrative				
Fluoride	0.260 mg/L	0.020	EPA 300.0	5 May 17 10:06	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/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-A18612
 Work Order #: 31-0189
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 May 2017 12:34
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 3 May 2017 16:45
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-52

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 7:19	ABL
Radium 228	SEE ATTACHED		EPA M9320	20 Jun 17 7:20	ABL
pH, Field	6.97 units	1.00	I-1586-85	3 May 17 12:34	JLH
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	4 May 17 15:30	DK
Sulfate	59.3 @ mg/L	5.0	ASTM D516-07	11 May 17 8:01	KCJ
Chloride	15.3 mg/L	3.0	SM 4500 Cl E	5 May 17 11:53	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	18 May 17 14:34	RMB
Solids, Total Dissolved	463 mg/L	10	SM 2540 C-97	5 May 17 13:54	RC
Calcium	108.0 mg/L	0.500	SW6010C	9 May 17 10:11	RC
	See Narrative				
Lithium	0.021 mg/L	0.005	SW6010C	9 May 17 10:11	RC
Barium	0.112 mg/L	0.005	SW6010C	9 May 17 10:11	RC
Chromium	< 0.01 mg/L	0.01	SW6010C	9 May 17 10:11	RC
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	9 May 17 10:11	RC
Boron	< 0.1 mg/L	0.1	SW6010C	9 May 17 10:11	RC
Antimony	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Arsenic	2.67 @ ug/L	0.50	SW6020A	9 May 17 19:04	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	17 May 17 12:06	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 May 17 19:04	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Molybdenum	2.55 @ ug/L	0.50	SW6020A	17 May 17 12:06	RMV
Selenium	< 5 @ ^ ug/L	0.5	SW6020A	17 May 17 12:06	RMV
Thallium	< 0.5 ug/L	0.1	SW6020A	17 May 17 12:06	RMV
	@See Narrative				
Fluoride	0.210 mg/L	0.020	EPA 300.0	5 May 17 10:06	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/DW # R-040



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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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-A18613
 Work Order #: 31-0189
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 May 2017 11:12
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 3 May 2017 16:45
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-10R

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 7:21	ABL
Radium 228	SEE ATTACHED		EPA M9320	20 Jun 17 7:21	ABL
pH, Field	6.87 units	1.00	I-1586-85	3 May 17 11:12	JLH
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	4 May 17 15:30	DK
Sulfate	98.7 @ mg/L	5.0	ASTM D516-07	11 May 17 8:01	KCJ
Chloride	11.6 mg/L	3.0	SM 4500 Cl E	5 May 17 11:53	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	18 May 17 14:34	RMB
Solids, Total Dissolved	517 mg/L	10	SM 2540 C-97	5 May 17 13:54	RC
Calcium	125.0 mg/L	0.500	SW6010C	9 May 17 10:11	RC
	See Narrative				
Lithium	0.022 mg/L	0.005	SW6010C	9 May 17 10:11	RC
Barium	0.133 mg/L	0.005	SW6010C	9 May 17 10:11	RC
Chromium	< 0.01 mg/L	0.01	SW6010C	9 May 17 10:11	RC
Cobalt	0.011 ^ mg/L	0.005	SW6010C	9 May 17 10:11	RC
Boron	< 0.1 mg/L	0.1	SW6010C	9 May 17 10:11	RC
Antimony	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Arsenic	25.0 @ ug/L	0.50	SW6020A	9 May 17 19:04	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	17 May 17 12:06	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 May 17 19:04	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Molybdenum	2.73 @ ug/L	0.50	SW6020A	17 May 17 12:06	RMV
Selenium	< 5 @ ^ ug/L	0.5	SW6020A	17 May 17 12:06	RMV
Thallium	< 0.5 ug/L	0.1	SW6020A	17 May 17 12:06	RMV
	@See Narrative				
Fluoride	0.200 mg/L	0.020	EPA 300.0	5 May 17 10:06	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/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-A18614
 Work Order #: 31-0189
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 May 2017 11:19
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 3 May 2017 16:45
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-13

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 7:21	ABL
Radium 228	SEE ATTACHED		EPA M9320	20 Jun 17 7:21	ABL
pH, Field	6.38 units	1.00	I-1586-85	3 May 17 11:19	BMW
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	4 May 17 15:30	DK
Sulfate	81.7 @ mg/L	5.0	ASTM D516-07	11 May 17 8:01	KCJ
Chloride	7.6 mg/L	3.0	SM 4500 Cl E	5 May 17 11:53	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	18 May 17 14:34	RMB
Solids, Total Dissolved	494 mg/L	10	SM 2540 C-97	5 May 17 13:54	RC
Calcium	112.0 mg/L	0.500	SW6010C	9 May 17 10:11	RC
	See Narrative				
Lithium	0.024 mg/L	0.005	SW6010C	9 May 17 10:11	RC
Barium	0.060 mg/L	0.005	SW6010C	9 May 17 10:11	RC
Chromium	< 0.01 mg/L	0.01	SW6010C	9 May 17 10:11	RC
Cobalt	0.010 ^ mg/L	0.005	SW6010C	9 May 17 10:11	RC
Boron	< 0.1 mg/L	0.1	SW6010C	9 May 17 10:11	RC
Antimony	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	17 May 17 12:06	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 May 17 19:04	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 12:06	RMV
Selenium	< 5 @ ^ ug/L	0.5	SW6020A	17 May 17 12:06	RMV
Thallium	< 0.5 ug/L	0.1	SW6020A	17 May 17 12:06	RMV
	@See Narrative				
Fluoride	0.250 mg/L	0.020	EPA 300.0	5 May 17 10:06	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:

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CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447690 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-A18615
 Work Order #: 31-0189
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 3 May 2017 13:01
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 3 May 2017 16:45
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-14R

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 7:21	ABL
Radium 228	SEE ATTACHED		EPA M9320	20 Jun 17 7:21	ABL
pH, Field	7.00 units	1.00	I-1586-85	3 May 17 13:01	BMW
pH	* 7.2 units	1.0	SM 4500 H+ B-2000	4 May 17 15:30	DK
Sulfate	105 @ mg/L	5.0	ASTM D516-07	11 May 17 8:01	KCJ
Chloride	5.5 mg/L	3.0	SM 4500 Cl E	5 May 17 11:53	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	18 May 17 14:34	RMB
Solids, Total Dissolved	568 mg/L	10	SM 2540 C-97	5 May 17 13:54	RC
Calcium	129.0 mg/L	0.500	SW6010C	9 May 17 10:11	RC
	See Narrative				
Lithium	0.028 mg/L	0.005	SW6010C	9 May 17 10:11	RC
Barium	0.072 mg/L	0.005	SW6010C	9 May 17 10:11	RC
Chromium	< 0.01 mg/L	0.01	SW6010C	9 May 17 10:11	RC
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	9 May 17 10:11	RC
Boron	< 0.1 mg/L	0.1	SW6010C	9 May 17 10:11	RC
Antimony	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Arsenic	2.88 @ ug/L	0.50	SW6020A	9 May 17 19:04	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	17 May 17 12:06	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 May 17 19:04	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 12:06	RMV
Selenium	< 5 @ ^ ug/L	0.5	SW6020A	17 May 17 12:06	RMV
Thallium	< 0.5 ug/L	0.1	SW6020A	17 May 17 12:06	RMV
	@See Narrative				
Fluoride	0.220 mg/L	0.020	EPA 300.0	5 May 17 10:06	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

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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:

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 ! = 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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Page: 9 of 9

Date Reported: 20 Jun 2017

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

Work Order #: 201731-0189
Account Number: 006106
PO #: 48679

Project Name: HOOT LAKE 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-A18609 through 17-A18615. The laboratory control spike, matrix spike, and matrix spike duplicate recoveries were all acceptable. 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-A18609 through 17-A18615. 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 during these analyses.



Date: 6/19/2017

CLIENT: MVTL Inc
Project: Ottertail Power Hoot Lake
Lab Order: S1705189

CASE NARRATIVE
Report ID: S1705189001

Samples A18609 S2A, A18610 S3AR, A18611 S51, A18612 S52, A18613 S10R, A18614 S13, and A18615 S14R 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

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: Ottetail Power Hoot Lake
Lab ID: S1705189-001
ClientSample ID: A18609 S2A
COC: WEB

Date Reported 6/19/2017
Report ID S1705189001

WorkOrder: S1705189
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	05/25/2017 1456	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	05/25/2017 1456	MB
Radium 228	ND	pCi/L		2	Ga-Tech	06/17/2017 650	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	06/17/2017 650	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 1 of 7



Sample Analysis Report

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

ProjectName: Ottetail Power Hoot Lake
Lab ID: S1705189-002
ClientSample ID: A18610 S3AR
COC: WEB

Date Reported 6/19/2017
Report ID S1705189001

WorkOrder: S1705189
CollectionDate: 5/3/2017 11:56:00 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	05/25/2017 1456	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	05/25/2017 1456	MB
Radium 228	ND	pCi/L		2	Ga-Tech	06/17/2017 954	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	06/17/2017 954	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



Sample Analysis Report

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

Date Reported 6/19/2017
Report ID S1705189001

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1705189-003
ClientSample ID: A18611 S51
COC: WEB

WorkOrder: S1705189
CollectionDate: 5/3/2017 11:47:00 AM
DateReceived: 5/9/2017 11:24:00 AM
FieldSampler:
Matrix: Water

Comments

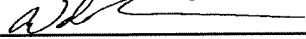
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	05/30/2017 952	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	05/30/2017 952	MB
Radium 228	ND	pCi/L		2	Ga-Tech	06/17/2017 1257	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	06/17/2017 1257	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

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1705189-004
ClientSample ID: A18612 S52
COC: WEB

Date Reported 6/19/2017
Report ID S1705189001

WorkOrder: S1705189
CollectionDate: 5/3/2017 12:34:00 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 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	06/17/2017 1600	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	06/17/2017 1600	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 4 of 7



Sample Analysis Report

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

Date Reported 6/19/2017
Report ID S1705189001

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1705189-005
ClientSample ID: A18613 S10R
COC: WEB

WorkOrder: S1705189
CollectionDate: 5/3/2017 11:12:00 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	2.2	pCi/L		2	Ga-Tech	06/17/2017 1903	MB
Radium 228 Precision (±)	2.8	pCi/L			Ga-Tech	06/17/2017 1903	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



Sample Analysis Report

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

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1705189-006
ClientSample ID: A18614 S13
COC: WEB

Date Reported 6/19/2017
Report ID S1705189001

WorkOrder: S1705189
CollectionDate: 5/3/2017 11:19:00 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	06/17/2017 2206	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	06/17/2017 2206	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: MVTL Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1705189-007
ClientSample ID: A18615 S14R
COC: WEB

Date Reported 6/19/2017
Report ID S1705189001

WorkOrder: S1705189
CollectionDate: 5/3/2017 1:01:00 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 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	06/18/2017 109	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	06/18/2017 109	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 7 of 7



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: S1705189
Project: Ottertail Power Hoot Lake

Date: 6/19/2017
Report ID: S1705189001

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

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Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Inc
Work Order: S1705189
Project: Ottetail Power Hoot Lake

Date: 6/19/2017
Report ID: S1705189001

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

Units: pCi/L

MB-1753 (05/26/17 06:46)	RunNo: 146130	PrepDate: 05/18/17 0:00	BatchID 13210					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Radium 226

ND

0.2

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-1753 (05/25/17 11:37)	RunNo: 146130	PrepDate: 05/18/17 0:00	BatchID 13210					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Radium 226

6.4

0.2

6.41

99.8

67.1 - 122

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-1753 (05/25/17 11:37)	RunNo: 146130	PrepDate: 05/18/17 0:00	BatchID 13210					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	

Radium 226

6.5

0.2

6.4

1.65

101

20

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

S1705188-004AMS (05/25/17 11:37)	RunNo: 146130	PrepDate: 05/18/17 0:00	BatchID 13210					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Radium 226

12.5

0.2

12.8

0.4

93.8

65 - 131

S1705188-007AMS (05/25/17 14:56)	RunNo: 146130	PrepDate: 05/18/17 0:00	BatchID 13210					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Radium 226

12.4

0.2

12.8

ND

97.0

65 - 131

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

Radium 226 in Water -Sample Type **MSD**

Units: pCi/L

S1705188-004AMSD (05/25/17 14:56)	RunNo: 146130	PrepDate: 05/18/17 0:00	BatchID 13210					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	

Radium 226

13.1

0.2

12.5

5.21

99.0

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

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Your Environmental Monitoring Partner

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Inc
Work Order: S1705189
Project: Ottertail Power Hoot Lake

Date: 6/19/2017
Report ID: S1705189001

Radium 226 in Water -

Sample Type MSD

Units: pCi/L

S1705188-007AMSD (05/25/17 14:56)	RunNo: 146130	PrepDate: 05/18/17 0:00	BatchID 13210				
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 226	12.8	0.2	12.4	3.13	100	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		

Page: 1 of 1

Quality Control Report

Lab IDs: 17-A18609 to 17-A18615

Project: HOOT LAKE PLANT

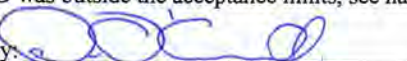
Work Order: 201731-0189

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
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
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
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
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
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
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
Chloride mg/L	-	-	-	60.0	17-A18619	47.9	108	100	85-121	108	110	104	1.8	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
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
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
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
Lithium mg/L	1.000	101		1.00	17-A18619	0.105	1.100	100		1.100	1.170	106	6.2		102		< 0.005
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
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
pH units	-	-	-	-	-	-	-	-	-	7.0	7.0	-	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
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	2160 1790	2260 1770	-	4.5 1.1	8 8	102	85-115	< 10
Sulfate mg/L	-	-	-	500	17-A18609	140	651	102	74-128	651	674	107	3.5	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

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

The thallium duplicate RPD was outside the acceptance limits, see narrative.

Approved by:



Minnesota Valley Testing Laboratories

1126 North Front Street
Phone: 800 782 3557

New Ulm, MN 56003
Fax: 507 359 2890

Field Service Chain of Custody Record

This is an exact copy of
the original document

By AK Date 3 May 17
Pages 1-11

Project Name: Otter Tail Power Co. Hoot Lake Plant		Project Type: Hoot Lake Plant	Name of Samplers: Ben Wolf Jeff Hoffman
Report To: Otter Tail Power Company Attn: Paul Vukonich Address: P.O. Box 496 Fergus Falls, MN 56038-0496 Phone: 218-739-8349		Carbon Copy: Attn: Address:	Quote Number: Work Order Number: 31-0189 Lab Numbers:

Sample Information							Bottle Type												Analysis
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	VOC Set	1000 none	1000 HNO3	500 HNO3	Filter? Y or N	500 HNO3	Filter? Y or N	500H2SO4	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
A18609	S2A		3 May 17	1226	GW			1	2	1	n								see attachment
10	S3AR			1156	GW			1	2	1	n								
11	S51			1147	GW			1	2	1	n								
12	S52			1234	GW			1	2	1	n								
13	S10R			1112	GW			1	2	1	n								
14	S13			1119	GW			1	2	1	n								
15	S14R			1301	GW			1	2	1	n								

Comments: CCR wells

Comments: CCR wells
Work Order #2

Samples Relinquished By: <u>Ben Wolf</u>				Samples Received By: <u>AK</u>			
Date: <u>3 May 17</u>		Time: <u>1645</u>		Date: <u>3 May 17</u>		Time: <u>1645</u>	
Temp: <u>1.0</u>		Temp: <u>1.0</u>		Temp: <u>1.0</u>		Temp: <u>1.0</u>	
Samples Relinquished into: <u>Fridge</u> Log in Cart Other:				Samples Relinquished into: <u>Fridge</u> Log in Cart Other:			
Samples Relinquished By:				Samples Received By:			
Date:		Time:		Date:		Time:	
Temp:		Temp:		Temp:		Temp:	
Delivery: <u>Samplers</u> Other:				Seal Number(s) - If Used			
Transport: <u>Ambient</u> Ice Other:				Seals Intact? Yes No			

HLP "H" Monitoring 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

1-LITER

HLP "I" Monitoring 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 ~ 2-1000 HNO₃

500 HNO₃

Alice Lieder

From: Tim Portner
Sent: Thursday, May 04, 2017 2:11 PM
To: Alice Lieder
Subject: Big Stone

CCR - Appendix III Detection Monitoring

Field Parameters

pH*

* Field and Laboratory Measurements

Total Concentration Parameters

Boron
Calcium
Chloride
Fluoride
pH
Sulfate
Dissolved Solids, Total

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./ Hoot Lake

Facility ID: SW-211

Date: 3 May 17

Unique Station ID:

Sample ID: S-2A

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: cap does not fit over dedicated pump

Well Information

Well Depth: 79.61

Well Casing Elevation: 1273.776

Constructed Depth: 79.63

Static Water Elevation: 1197.66

Casing Diameter: 2"

Previous Static: 1197.27

Water Level Before Purge: 76.12

Water Level After Sample: Below Pump

Well Volume: .57 Gallons

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

Sampling Information

Weather Conditions: Temp: 61 Wind: W@8 Sky: Partly 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 Pump Began: 1217 am / ☒ pm

Time Purged Dry? -

Time of Sampling: 1226 am / ☒ pm

Duplicate Sample? Yes ☒ No ☐ ID: -

Sample EH: 6.8

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:
<u>1220</u>	<u>6.99</u>	<u>1014</u>	<u>9.07</u>	<u>1.70</u>	<u>0.2</u>	<u>.75</u>	<u>1</u>	
<u>1223</u>	<u>6.89</u>	<u>1018</u>	<u>8.93</u>	<u>1.55</u>	<u>0.0</u>	<u>1.50</u>	<u>2</u>	
<u>1226</u>	<u>6.81</u>	<u>1019</u>	<u>8.95</u>	<u>1.41</u>	<u>0.0</u>	<u>2.25</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 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./ Hoot Lake

Facility ID: SW-211

Date: 3 May 17

Unique Station ID: 674671

Sample ID: S-3A-R

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: 78.40

Well Casing Elevation: 1271.562

Constructed Depth: 78.42

Static Water Elevation: 1203.76

Casing Diameter: 2"

Previous Static: 1203.68

Water Level Before Purge: 607.80

Water Level After Sample: 608.00

Well Volume: 1.73 Gallons

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 57 Wind: L&V 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: 1135 am pm

Time Purged Dry? -

Time of Sampling: 1156 am pm

Duplicate Sample? ☐ Yes ☒ No ID: -

Sample EH: -79.8

Sample Appearance: General: clear Color: none Phase: Light sed. Odor: sulfurous

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>7</u> <u>1142</u>	<u>7.04</u>	<u>927</u>	<u>9.05</u>	<u>1.31</u>	<u>7.4</u>	<u>1.75</u>	<u>1</u>	
<u>1149</u>	<u>6.87</u>	<u>935</u>	<u>8.96</u>	<u>1.44</u>	<u>5.8</u>	<u>3.5</u>	<u>2</u>	
<u>1156</u>	<u>6.85</u>	<u>935</u>	<u>9.03</u>	<u>1.48</u>	<u>7.8</u>	<u>5.25</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 5.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 3 May 17

Unique Station ID: 814830

Sample ID: S-51

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: 55.60

Well Casing Elevation: 1286.9

Constructed Depth: —

Static Water Elevation: 1236.89

Casing Diameter: 2"

Previous Static: —

Water Level Before Purge: 50.01

Water Level After Sample: 50.06

Well Volume: Gallons

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 58° Wind: WS 10 Sky: Sunny

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: 11:27 ☒ am ☐ pm

Time Purged Dry? —

Time of Sampling: 11:47 ☒ am ☐ pm

Duplicate Sample? Yes ☒ No ☐ ID: —

Sample EH: -167.5

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>1131</u>	<u>6.95</u>	<u>824</u>	<u>9.03</u>	<u>1.93</u>	<u>223.0</u>	<u>1.0</u>	<u>1</u>	
<u>1135</u>	<u>6.97</u>	<u>836</u>	<u>8.82</u>	<u>1.06</u>	<u>88.7</u>	<u>2.0</u>	<u>2</u>	
<u>1139</u>	<u>6.96</u>	<u>842</u>	<u>8.72</u>	<u>0.77</u>	<u>36.6</u>	<u>3.0</u>	<u>3</u>	
<u>1143</u>	<u>6.96</u>	<u>843</u>	<u>8.69</u>	<u>0.62</u>	<u>22.2</u>	<u>4.0</u>	<u>4</u>	
<u>1147</u>	<u>6.96</u>	<u>843</u>	<u>8.73</u>	<u>0.63</u>	<u>16.4</u>	<u>5.0</u>	<u>5</u>	

Stabilized? Yes ☒ No ☐

Amount Water Removed: 5.0 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 3 May 17

Unique Station ID: 822155

Sample ID: S-52

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: 88.30

Well Casing Elevation: 1286.62

Constructed Depth:

Static Water Elevation: 1216.11

Casing Diameter: 2"

Previous Static:

Water Level Before Purge: 70.51

Water Level After Sample: 70.51

Well Volume: 2.90 Gallons

Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 58 Wind: WS 10 Sky: Sunny

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

Dedicated Equipment: Yes No

Pumping Rate: 0.25 gpm

Well Purged Dry? Yes No

Time Pump Began: 11:58 am/pm

Time Purged Dry:

Time of Sampling: 12:34 am/pm

Duplicate Sample? Yes No ID: —

Sample EH: -197.7

Sample Appearance: General: Clear Color: none Phase: none Odor: sulfurous

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1210	6.96	829	8.63	0.48	0.0	3	1	
1222	6.97	829	8.56	0.21	0.0	6	2	
1234	6.97	828	8.64	0.19	0.0	9	3	
							4	
							5	

Stabilized? Yes No

Amount Water Removed: 9.0 Gallons

Comments:

Exceptions to Protocol:

- not in notes program

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffmann

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 3 May 17

Unique Station ID: 806341

Sample ID: S-10R

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: 80.62

Well Casing Elevation: 1281.47

Constructed Depth:

Static Water Elevation: 1209.45

Casing Diameter: 2"

Previous Static: 1209.45

Water Level Before Purge: 72.02

Water Level After Sample: 72.02

Well Volume: 1.40 Gallons

Measurement Method: Elec. WLI Steel Tape

Sampling Information

Weather Conditions: Temp: 58° Wind: WS 10 Sky: Sunny

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: 10:54 am pm

Time Purged Dry?

Time of Sampling: 11:12 am pm

Duplicate Sample? Yes No ID: —

Sample EH: -24.4

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>11:00</u>	<u>6.79</u>	<u>893</u>	<u>9.35</u>	<u>0.78</u>	<u>10.1</u>	<u>1.5</u>	<u>1</u>	
<u>11:06</u>	<u>6.84</u>	<u>895</u>	<u>9.31</u>	<u>0.66</u>	<u>7.5</u>	<u>3.0</u>	<u>2</u>	
<u>11:12</u>	<u>6.87</u>	<u>896</u>	<u>9.31</u>	<u>0.56</u>	<u>4.0</u>	<u>4.5</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? Yes No

Amount Water Removed: 4.5 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./ Hoot Lake

Facility ID: SW-211

Date: 3 May 17

Unique Station ID:

Sample ID: S-13

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: 90.27

Well Casing Elevation: 1296.423

Constructed Depth: 90.19

Static Water Elevation: 1210.82

Casing Diameter: 2"

Previous Static: 1210.75

Water Level Before Purge: 85.60

Water Level After Sample: 86.21

Well Volume: .76 Gallons

Measurement Method: ☒ Elec. WLL ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 57 Wind: LLV Sky: Fair

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: 1103 ☒ am ☐ pm

Time Purged Dry? -

Time of Sampling: 1119 ☒ am ☐ pm

Duplicate Sample? ☒ Yes ☐ No ID: -

Sample EH: -61.8

Sample Appearance: General: clear Color: none Phase: none Odor: Sulfurous

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1107</u>	<u>6.67</u>	<u>853</u>	<u>9.60</u>	<u>2.24</u>	<u>5.0</u>	<u>1</u>	<u>1</u>	
<u>1111</u>	<u>6.24</u>	<u>858</u>	<u>9.26</u>	<u>1.20</u>	<u>1.8</u>	<u>2</u>	<u>2</u>	
<u>1115</u>	<u>6.31</u>	<u>858</u>	<u>9.20</u>	<u>.46</u>	<u>1.0</u>	<u>3</u>	<u>3</u>	
<u>1119</u>	<u>6.38</u>	<u>857</u>	<u>9.17</u>	<u>.90</u>	<u>0.7</u>	<u>4</u>	<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 4 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Offer Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 3 May

Unique Station ID:

Sample ID: S-14R

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: 87.11

Constructed Depth: -

Casing Diameter: 2"

Water Level Before Purge: 79.09

Well Volume: 1.31 Gallons

Well Casing Elevation: NA

Static Water Elevation: I

Previous Static:

Water Level After Sample: 79.09

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 61 Wind: W@8 Sky: Partly 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 Pump Began: 1243 am / ☒ pm

Time Purged Dry? -

Time of Sampling: 1301 am / ☒ pm

Duplicate Sample? Yes ☒ No ID: -

Sample EH: -182.2

Sample Appearance: General: clear Color: none Phase: none Odor: Sulfurous

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1249</u>	<u>7.18</u>	<u>984</u>	<u>9.20</u>	<u>.65</u>	<u>0.0</u>	<u>1.50</u>	<u>1</u>	
<u>1255</u>	<u>7.04</u>	<u>966</u>	<u>9.13</u>	<u>.52</u>	<u>0.0</u>	<u>3.00</u>	<u>2</u>	
<u>1301</u>	<u>7.00</u>	<u>949</u>	<u>8.95</u>	<u>.50</u>	<u>0.0</u>	<u>4.50</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 9.5 Gallons

Comments:

Exceptions to Protocol:



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FINAL REPORT COMPLETION DATE: 20 Jul 17 *ax*

Date Reported: 17 Jul 2017

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

Work Order #: 31-0262
Account #: 006106
PO #: 48679

Project Name: HOOT LAKE PLANT CCR

T. T. D. 19 July 17
Field Service Manager/Date Reviewed
[Signature] 18 July 2017
Chemistry Lab Manager/Date Reviewed
[Signature] 18 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 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: 17 Jul 2017
 Lab Number: 17-A25518
 Work Order #: 31-0262
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 7 Jun 2017 12:56
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 7 Jun 2017 16:47
 PO #: 48679

Project Name: HOOT LAKE PLANT CCR

Sample Description: S2A

Temp at Receipt: 0.0C

	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			17 Jul 17 7:40	ABL
Radium 228	SEE ATTACHED		EPA M9320	17 Jul 17 7:40	ABL
pH, Field	6.86 units	1.00	I-1586-85	7 Jun 17 12:56	DGF
pH	* 6.9 units	1.0	SM 4500 H+ B-2000	8 Jun 17 11:50	JFG
Sulfate	147 @ mg/L	5.0	ASTM D516-07	21 Jun 17 7:35	AKF
Chloride	< 3 mg/L	3	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	619 mg/L	10	SM 2540 C-97	9 Jun 17 13:12	RC
Calcium	142.0 mg/L	0.500	SW6010C	13 Jun 17 17:26	KAM
Lithium	0.033 mg/L	0.005	SW6010C	12 Jun 17 12:02	KAM
Barium	0.041 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	0.232 mg/L	0.100	SW6010C	12 Jun 17 12:02	KAM
Antimony	< 2.5 @ ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
Arsenic	< 5 @ ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
Beryllium	< 0.5 ug/L	0.05	SW6020A	14 Jun 17 16:10	RMV
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	14 Jun 17 16:10	RMV
Lead	< 2.5 ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
	@See Narrative				
Molybdenum	< 5 @ ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
Selenium	< 10 @ ^ ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
Thallium	< 0.5 ug/L	0.1	SW6020A	14 Jun 17 16:10	RMV
	@ See Narrative				
Fluoride	0.230 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 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

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

Report Date: 17 Jul 2017
 Lab Number: 17-A25519
 Work Order #: 31-0262
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 7 Jun 2017 12:05
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 7 Jun 2017 16:47
 PO #: 48679

Project Name: HOOT LAKE PLANT CCR

Sample Description: S3AR

Temp at Receipt: 0.0C

	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			17 Jul 17 7:41	ABL
Radium 228	SEE ATTACHED		EPA M9320	17 Jul 17 7:41	ABL
pH, Field	7.10 units	1.00	I-1586-B5	7 Jun 17 12:05	DGF
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	8 Jun 17 11:50	JFG
Sulfate	106 @ mg/L	5.0	ASTM D516-07	21 Jun 17 7:35	AKF
Chloride	12.4 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	533 mg/L	10	SM 2540 C-97	9 Jun 17 13:12	RC
Calcium	118.0 mg/L	0.500	SW6010C	13 Jun 17 17:26	KAM
Lithium	0.022 mg/L	0.005	SW6010C	12 Jun 17 12:02	KAM
Barium	0.042 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	0.199 mg/L	0.100	SW6010C	12 Jun 17 12:02	KAM
Antimony	< 2.5 @ ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
Arsenic	< 5 @ ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
Beryllium	< 0.5 ug/L	0.05	SW6020A	14 Jun 17 16:10	RMV
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	14 Jun 17 16:10	RMV
Lead	< 2.5 ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
	@See Narrative				
Molybdenum	< 5 @ ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
Selenium	< 10 @ ^ ug/L	0.5	SW6020A	14 Jun 17 16:10	RMV
Thallium	< 0.5 ug/L	0.1	SW6020A	14 Jun 17 16:10	RMV
	@ See Narrative				
Fluoride	0.200 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

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

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447690 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: 17 Jul 2017
 Lab Number: 17-A25520
 Work Order #: 31-0262
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 7 Jun 2017 12:13
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 7 Jun 2017 16:47
 PO #: 48679

Project Name: HOOT LAKE PLANT CCR

Sample Description: S51

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					9 Jun 17	JMS
Water Digestions					8 Jun 17	JMS
Radium 226	SEE ATTACHED				17 Jul 17 7:41	ABL
Radium 228	SEE ATTACHED			EPA M9320	17 Jul 17 7:41	ABL
pH, Field	6.89	units	1.00	I-1586-85	7 Jun 17 12:13	JLH
pH	* 7.0	units	1.0	SM 4500 H+ B-2000	8 Jun 17 11:50	JFG
Sulfate	66.8	mg/L	5.0	ASTM D516-07	21 Jun 17 7:35	AKF
Chloride	16.0	mg/L	3.0	SM 4500 Cl E	8 Jun 17 9:57	MRW
Mercury	< 0.005	ug/L	0.005	EPA 245.7	15 Jun 17 15:47	RMB
Solids, Total Dissolved	452	mg/L	10	SM 2540 C-97	9 Jun 17 13:12	RC
Calcium	115.0	mg/L	0.500	SW6010C	13 Jun 17 17:26	KAM
Lithium	0.022	mg/L	0.005	SW6010C	12 Jun 17 12:02	KAM
Barium	0.071	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	< 0.1	mg/L	0.1	SW6010C	12 Jun 17 12:02	KAM
Antimony	< 2.5 @	ug/L	0.5	SW6020A	14 Jun 17 17:05	RMV
Arsenic	< 5 @	ug/L	0.5	SW6020A	15 Jun 17 17:59	RMV
Beryllium	< 0.5 @	ug/L	0.05	SW6020A	20 Jun 17 9:33	RMV
Cadmium	< 0.5 @	ug/L	0.1	SW6020A	14 Jun 17 17:05	RMV
Lead	< 2.5 @	ug/L	0.5	SW6020A	14 Jun 17 17:05	RMV
Molybdenum	< 5 @	ug/L	0.5	SW6020A	15 Jun 17 17:59	RMV
Selenium	< 5 @	ug/L	0.5	SW6020A	20 Jun 17 9:33	RMV
Thallium	< 0.5 @	ug/L	0.1	SW6020A	14 Jun 17 17:05	RMV
Fluoride	0.210 @	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/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: 17 Jul 2017
 Lab Number: 17-A25521
 Work Order #: 31-0262
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 7 Jun 2017 13:00
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 7 Jun 2017 16:47
 PO #: 48679

Project Name: HOOT LAKE PLANT CCR

Sample Description: S52

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					9 Jun 17	JMS
Water Digestions					9 Jun 17	JMS
Radium 226	SEE ATTACHED				17 Jul 17 7:41	ABL
Radium 228	SEE ATTACHED			EPA M9320	17 Jul 17 7:41	ABL
pH, Field	6.90 units		1.00	I-1586-85	7 Jun 17 13:00	JLH
pH	* 7.0 units		1.0	SM 4500 H+ B-2000	8 Jun 17 11:50	JFG
Sulfate	64.5 mg/L		5.0	ASTM D516-07	21 Jun 17 7:35	AKF
Chloride	15.2 mg/L		3.0	SM 4500 Cl E	8 Jun 17 9:57	MRW
Mercury	< 0.005 ug/L		0.005	EPA 245.7	15 Jun 17 15:47	RMB
Solids, Total Dissolved	449 mg/L		10	SM 2540 C-97	9 Jun 17 13:12	RC
Calcium	102.0 mg/L		0.500	SW6010C	14 Jun 17 11:23	KAM
Lithium	0.019 mg/L		0.005	SW6010C	14 Jun 17 11:23	KAM
Barium	0.104 mg/L		0.005	SW6010C	14 Jun 17 11:23	KAM
Chromium	< 0.01 mg/L		0.01	SW6010C	14 Jun 17 11:23	KAM
Cobalt	< 0.005 mg/L		0.005	SW6010C	14 Jun 17 11:23	KAM
Boron	< 0.1 mg/L		0.1	SW6010C	14 Jun 17 11:23	KAM
Antimony	< 2.5 @ ug/L		0.5	SW6020A	14 Jun 17 17:05	RMV
Arsenic	< 5 @ ug/L		0.5	SW6020A	15 Jun 17 17:59	RMV
Beryllium	< 0.5 @ ug/L		0.05	SW6020A	20 Jun 17 9:33	RMV
Cadmium	< 0.5 @ ug/L		0.1	SW6020A	14 Jun 17 17:05	RMV
Lead	< 2.5 @ ug/L		0.5	SW6020A	14 Jun 17 17:05	RMV
Molybdenum	< 5 @ ug/L		0.5	SW6020A	15 Jun 17 17:59	RMV
Selenium	< 5 @ ug/L		0.5	SW6020A	20 Jun 17 9:33	RMV
Thallium	< 0.5 @ ug/L		0.1	SW6020A	14 Jun 17 17:05	RMV
Fluoride	0.230 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

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 WW/DW # R-040



MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
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CERTIFICATE of ANALYSIS - CCR

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

Report Date: 17 Jul 2017
 Lab Number: 17-A25522
 Work Order #: 31-0262
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 7 Jun 2017 11:38
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 7 Jun 2017 16:47
 PO #: 48679

Project Name: HOOT LAKE PLANT CCR

Sample Description: S10R

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					9 Jun 17	JMS
Water Digestions					9 Jun 17	JMS
Radium 226	SEE ATTACHED				17 Jul 17 7:41	ABL
Radium 228	SEE ATTACHED			EPA M9320	17 Jul 17 7:41	ABL
pH, Field	6.83 units		1.00	I-1586-85	7 Jun 17 11:38	JLH
pH	* 7.0 units		1.0	SM 4500 H+ B-2000	8 Jun 17 11:50	JFG
Sulfate	82.1 @ mg/L		5.0	ASTM D516-07	21 Jun 17 7:35	AKF
Chloride	11.7 mg/L		3.0	SM 4500 Cl E	8 Jun 17 9:57	MRW
Mercury	< 0.005 ug/L		0.005	EPA 245.7	15 Jun 17 15:47	RMB
Solids, Total Dissolved	528 mg/L		10	SM 2540 C-97	9 Jun 17 13:12	RC
Calcium	110.0 mg/L		0.500	SW6010C	14 Jun 17 11:23	KAM
Lithium	0.021 mg/L		0.005	SW6010C	14 Jun 17 11:23	KAM
Barium	0.097 mg/L		0.005	SW6010C	14 Jun 17 11:23	KAM
Chromium	< 0.01 mg/L		0.01	SW6010C	14 Jun 17 11:23	KAM
Cobalt	< 0.005 mg/L		0.005	SW6010C	14 Jun 17 11:23	KAM
Boron	< 0.1 mg/L		0.1	SW6010C	14 Jun 17 11:23	KAM
Antimony	< 2.5 @ ug/L		0.5	SW6020A	14 Jun 17 17:05	RMV
Arsenic	< 5 @ ug/L		0.5	SW6020A	15 Jun 17 17:59	RMV
Beryllium	< 0.5 @ ug/L		0.05	SW6020A	20 Jun 17 9:33	RMV
Cadmium	< 0.5 @ ug/L		0.1	SW6020A	14 Jun 17 17:05	RMV
Lead	< 2.5 @ ug/L		0.5	SW6020A	14 Jun 17 17:05	RMV
Molybdenum	< 5 @ ug/L		0.5	SW6020A	15 Jun 17 17:59	RMV
Selenium	< 5 @ ug/L		0.5	SW6020A	20 Jun 17 9:33	RMV
Thallium	< 0.5 @ ug/L		0.1	SW6020A	14 Jun 17 17:05	RMV
Fluoride	0.200 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

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: 17 Jul 2017
Lab Number: 17-A25523
Work Order #: 31-0262
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 7 Jun 2017 11:32
Sampled By: MVTI FIELD PERSONNEL
Date Received: 7 Jun 2017 16:47
PO #: 48679

Project Name: HOOT LAKE PLANT CCR

Sample Description: S13

Temp at Receipt: 0.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				9 Jun 17	JMS
Water Digestions				9 Jun 17	JMS
Radium 226	SEE ATTACHED			17 Jul 17 7:41	ABL
Radium 228	SEE ATTACHED		EPA M9320	17 Jul 17 7:41	ABL
pH, Field	7.04 units	1.00	I-1586-85	7 Jun 17 11:32	JLH
pH	* 7.0 units	1.0	SM 4500 H+ B-2000	8 Jun 17 11:50	JFG
Sulfate	64.1 @ mg/L	5.0	ASTM D516-07	21 Jun 17 7:35	AKF
Chloride	8.0 mg/L	3.0	SM 4500 Cl E	8 Jun 17 9:57	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	15 Jun 17 15:47	RMB
Solids, Total Dissolved	479 mg/L	10	SM 2540 C-97	9 Jun 17 13:12	RC
Calcium	113.0 mg/L	0.500	SW6010C	14 Jun 17 11:23	KAM
Lithium	0.023 mg/L	0.005	SW6010C	14 Jun 17 11:23	KAM
Barium	0.088 mg/L	0.005	SW6010C	14 Jun 17 11:23	KAM
Chromium	< 0.01 mg/L	0.01	SW6010C	14 Jun 17 11:23	KAM
Cobalt	< 0.005 mg/L	0.005	SW6010C	14 Jun 17 11:23	KAM
Boron	< 0.1 mg/L	0.1	SW6010C	14 Jun 17 11:23	KAM
Antimony	< 2.5 @ ug/L	0.5	SW6020A	14 Jun 17 17:05	RMV
Arsenic	< 5 @ ug/L	0.5	SW6020A	15 Jun 17 17:59	RMV
Beryllium	< 0.5 @ ug/L	0.05	SW6020A	20 Jun 17 9:33	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	14 Jun 17 17:05	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	14 Jun 17 17:05	RMV
Molybdenum	< 5 @ ug/L	0.5	SW6020A	15 Jun 17 17:59	RMV
Selenium	< 5 @ ug/L	0.5	SW6020A	20 Jun 17 9:33	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	14 Jun 17 17:05	RMV
Fluoride	0.240 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

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:

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

CONFIDENTIAL: MN LAR # 027-015-125 MI LAR # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

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

CERTIFICATE of ANALYSIS - CCR

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

Report Date: 17 Jul 2017
Lab Number: 17-A25524
Work Order #: 31-0262
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 7 Jun 2017 12:38
Sampled By: MVTL FIELD PERSONNEL
Date Received: 7 Jun 2017 16:47
PO #: 48679

Temp at Receipt: 0.0C

Project Name: HOOT LAKE PLANT CCR

Sample Description: S14R

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					9 Jun 17	JMS
Water Digestions					9 Jun 17	JMS
Radium 226	SEE ATTACHED				17 Jul 17 7:42	ABL
Radium 228	SEE ATTACHED			EPA M9320	17 Jul 17 7:42	ABL
pH, Field	7.04	units	1.00	I-1586-85	7 Jun 17 12:38	DGF
pH	* 7.0	units	1.0	SM 4500 H+ B-2000	8 Jun 17 11:50	JFG
Sulfate	97.4 @	mg/L	5.0	ASTM D516-07	21 Jun 17 7:35	AKF
Chloride	5.7	mg/L	3.0	SM 4500 Cl E	8 Jun 17 9:57	MRW
Mercury	< 0.005	ug/L	0.005	EPA 245.7	15 Jun 17 15:47	RMB
Solids, Total Dissolved	561	mg/L	10	SM 2540 C-97	9 Jun 17 13:12	RC
Calcium	131.0	mg/L	0.500	SW6010C	14 Jun 17 11:23	KAM
Lithium	0.028	mg/L	0.005	SW6010C	14 Jun 17 11:23	KAM
Barium	0.078	mg/L	0.005	SW6010C	14 Jun 17 11:23	KAM
Chromium	< 0.01	mg/L	0.01	SW6010C	14 Jun 17 11:23	KAM
Cobalt	< 0.005	mg/L	0.005	SW6010C	14 Jun 17 11:23	KAM
Boron	< 0.1	mg/L	0.1	SW6010C	14 Jun 17 11:23	KAM
Antimony	< 2.5 @	ug/L	0.5	SW6020A	14 Jun 17 17:05	RMV
Arsenic	< 5 @	ug/L	0.5	SW6020A	15 Jun 17 17:59	RMV
Beryllium	< 0.5 @	ug/L	0.05	SW6020A	20 Jun 17 9:33	RMV
Cadmium	< 0.5 @	ug/L	0.1	SW6020A	14 Jun 17 17:05	RMV
Lead	< 2.5 @	ug/L	0.5	SW6020A	14 Jun 17 17:05	RMV
Molybdenum	< 5 @	ug/L	0.5	SW6020A	15 Jun 17 17:59	RMV
Selenium	< 5 @	ug/L	0.5	SW6020A	20 Jun 17 9:33	RMV
Thallium	< 0.5 @	ug/L	0.1	SW6020A	14 Jun 17 17:05	RMV
Fluoride	0.220	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

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TWI 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



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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Date Reported: 17 Jul 2017

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

Work Order #: 201731-0262
Account Number: 006106
PO #: 48679

Project Name: HOOT LAKE PLANT CCR

LABORATORY NARRATIVE

INORGANIC AND METALS ANALYSES:

Beryllium recovery was elevated in the laboratory control spike associated with samples 17-A25518 and 17-A25519. 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-A25518 and 17-A25519. 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.



Date: 7/10/2017

CLIENT: MVTL Inc
Project: Ottertail Power Hoot Lake
Lab Order: S1706215

CASE NARRATIVE
Report ID: S1706215001

Samples S10R A25522, S13 A25523, S14R A25524, S2A A25518, S3AR A25519, S51 A25520, and S52 A25521 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



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: Ottetail Power Hoot Lake
Lab ID: S1706215-001
ClientSample ID: S2A A25518
COC: WEB

Date Reported 7/10/2017
Report ID S1706215001

WorkOrder: S1706215
CollectionDate: 6/7/2017 12:56:00 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 710	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	07/06/2017 710	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 1 of 7



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 Hoot Lake
Lab ID: S1706215-002
ClientSample ID: S3AR A25519
COC: WEB

Date Reported 7/10/2017
Report ID S1706215001

WorkOrder: S1706215
CollectionDate: 6/7/2017 12:05:00 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 1013	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	07/06/2017 1013	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 2 of 7



Sample Analysis Report

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

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1706215-003
ClientSample ID: S51 A25520
COC: WEB

Date Reported 7/10/2017
Report ID S1706215001

WorkOrder: S1706215
CollectionDate: 6/7/2017 12:13:00 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 1316	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	07/06/2017 1316	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: Ottetail Power Hoot Lake
Lab ID: S1706215-004
ClientSample ID: S52 A25521
COC: WEB

Date Reported 7/10/2017
Report ID S1706215001

WorkOrder: S1706215
CollectionDate: 6/7/2017 1:00:00 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 1619	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	07/06/2017 1619	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
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

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

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1706215-005
ClientSample ID: S10R A25522
COC: WEB

Date Reported 7/10/2017
Report ID S1706215001

WorkOrder: S1706215
CollectionDate: 6/7/2017 11:38:00 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 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 1921	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	07/06/2017 1921	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: Ottetail Power Hoot Lake
Lab ID: S1706215-006
ClientSample ID: S13 A25523
COC: WEB

Date Reported 7/10/2017
Report ID S1706215001

WorkOrder: S1706215
CollectionDate: 6/7/2017 11:32:00 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 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 2224	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	07/06/2017 2224	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: MVTL Inc
1126 N Front St
New Ulm, MN 56073

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1706215-007
ClientSample ID: S14R A25524
COC: WEB

Date Reported 7/10/2017
Report ID S1706215001

WorkOrder: S1706215
CollectionDate: 6/7/2017 12:38:00 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	07/07/2017 128	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	07/07/2017 128	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 7 of 7



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: S1706215
Project: Ottertail Power Hoot Lake

Date: 7/10/2017
Report ID: S1706215001

Radium 228 by Ga/Tech		Sample Type MBLK		Units: pCi/L			
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-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-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-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	
Radium 226 in Water -		Sample Type MBLK		Units: pCi/L			
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-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-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			
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	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		

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 2

Quality Control Report

Lab IDs: 17-A25518 to 17-A25524

Project: HOOT LAKE PLANT CCR**Work Order: 201731-0262**

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	a25082qc	< 0.5	25.5	102	75-125	25.5	25.5	102	0.0	10	98	90-110	< 0.5
	25.0	98	85-115	25.0	17A25524q	< 2.5	26.1	104	75-125	26.1	25.5	102	2.3	10	98	90-110	< 0.5
Arsenic ug/L	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
	25.0	101	85-115	25.0	17A25524q	< 5	29.1	116	75-125	29.1	29.9	120	2.7	10	100	90-110	< 0.5
Barium mg/L	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
	1.000	100	85-115	1.00	17A25523q	0.088	1.100	101	75-125	1.100	1.020	93	7.5	10	99	90-110	< 0.005
Beryllium ug/L	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
	2.50	102	85-115	2.50	17A25524q	< 0.5	2.50	100	75-125	2.50	2.41	96	3.7	10	95	90-110	< 0.05
Boron mg/L	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
	1.000	101	85-115	1.00	17A25523q	< 0.1	1.100	110	75-125	1.100	1.020	102	7.5	10	97	90-110	< 0.1
Cadmium ug/L	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
	5.00	102	85-115	5.00	17A25524q	< 0.5	5.28	106	75-125	5.28	5.11	102	3.3	10	102	90-110	< 0.1
Calcium mg/L	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
	50.00	104	85-115	50.0	17A25523q	113.0	162.0	98	75-125	162.0	151.0	76	7.0	10	102	90-110	< 0.5
Chloride mg/L	-	-	-	60.0	17-A25519	12.4	72.5	100	85-121	72.5	72.5	100	0.0	5	96	90-110	< 3
	-	-	-	60.0	17-A25542	12.1	71.8	100	85-121	71.8	69.4	96	3.4	5	96	90-110	< 3
	-	-	-	60.0	17-A25097	78.1	143	108	85-121	143	137	98	4.3	5			
Chromium mg/L	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
	1.000	102	85-115	1.00	17A25523q	< 0.01	1.040	104	75-125	1.040	0.964	96	7.6	10	103	90-110	< 0.01
Cobalt mg/L	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
	1.000	102	85-115	1.00	17A25523q	< 0.005	0.984	98	75-125	0.984	0.915	92	7.3	10	101	90-110	< 0.005
Fluoride mg/L	-	-	-	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	a25082qc	1.78	28.1	105	75-125	28.1	27.7	104	1.4	10	101	90-110	< 0.5
	25.0	100	85-115	25.0	17A25524q	< 2.5	26.2	105	75-125	26.2	25.4	102	3.1	10	101	90-110	< 0.5
Lithium mg/L	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
	1.000	102	85-115	1.00	17-A25523	0.023	1.050	103	75-125	1.050	0.971	95	7.8	10	100	90-110	< 0.005
Mercury ug/L	-	-	-	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

Page: 2 of 2

Quality Control Report

Lab IDs: 17-A25518 to 17-A25524

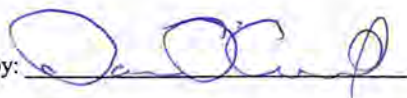
Project: HOOT LAKE PLANT CCR

Work Order: 201731-0262

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
Molybdenum ug/L	25.0 25.0	102 102	85-115 85-115	25.0 25.0	a25082qc 17A25524q	1.20 < 5	26.6 29.5	102 118	75-125 75-125	26.6 29.5	26.2 28.8	100 115	1.5 2.4	10 10	98 103	90-110 90-110	< 0.5 < 0.5
pH units	-	-	-	-	-	-	-	-	-	7.0	7.1	-	1.4	2.5	100	90-110	-
Selenium ug/L	25.0 25.0	104 103	85-115 85-115	25.0 25.0	a25082qc 17A25524q	< 1 < 5	27.0 25.7	108 103	75-125 75-125	27.0 25.7	27.5 26.8	110 107	1.8 4.2	10 10	107 100	90-110 90-110	< 0.5 < 0.5
Solids, Total Dissolved mg/L	- -	- -	- -	- -	- -	- -	- -	- -	- -	1170 561	1170 550	- -	0.0 2.0	8 8	93	85-115	< 10
Sulfate mg/L	-	-	-	500	17-A25524	97.4	647	110	74-128	647	647	110	0.0	5	99	80-120	< 5
Thallium ug/L	5.00 5.00	98 100	85-115 85-115	5.00 5.00	a25082qc 17A25524q	< 0.1 < 0.5	5.24 5.26	105 105	75-125 75-125	5.24 5.26	5.18 5.12	104 102	1.2 2.7	10 10	102 102	90-110 90-110	< 0.1 < 0.1

The beryllium LCS recovery 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 7 Jun 17
pages 1-11

Project Name: Otter Tail Power Co. Hoot Lake Plant	Project Type: Hoot Lake Plant	Name of Samplers: Dusty Fergusson Jeff Holman
Report To: Otter Tail Power Company Attn: Paul Vukonich Address: P.O. Box 496 Fergus Falls, MN 56038-0496 Phone: 218-739-8349	Carbon Copy: Attn: Address:	Quote Number: Work Order Number: 31-0262 Lab Numbers:

Sample Information							Bottle Type												Analysis
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	VOC Set	1000 none	1000 HNO3	500 HNO3	Filter? Y or N	500 HNO3	Filter? Y or N	500H2SO4	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
A25518	S2A		7 June 17	1256	GW			1	2	1	n								see attachment
19	S3AR			1205	GW			1	2	1	n								
20	S51			1213	GW			1	2	1	n								
21	S52			1300	GW			1	2	1	n								
22	S10R			1138	GW			1	2	1	n								
23	S13			1132	GW			1	2	1	n								
24	S14R			1238	GW			1	2	1	n								

Comments: CCR wells
Work Order #2

Samples Relinquished By: <u>AS</u>	Samples Received By: <u>D. Fergusson</u>
Date: <u>7 June 17</u> Time: <u>1647</u> Temp: <u>0.0</u>	Date: <u>7 Jun 17</u> Time: <u>1647</u> Temp: <u>0-0C</u>
Samples Relinquished into: Fridge <u>Log in Cart</u> Other:	
Samples Relinquished By:	Samples Received By:
Date: Time: Temp:	Date: Time: Temp:
Deliver <u>Samplers</u> Other:	Seal Number(s) - If Used
Transp. <u>Ambient</u> <u>Ice</u> Other:	Seals Intact? Yes No

CCR 2017 ~~Dec~~
(make copy)

Hoot Lake Site CCR Background Sampling

Site	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (gal/minute)	Goes Dry?
S2A	HLP H, HLP I	79.63	2	1273.776	Bladder	Yes	< 0.25	No
S3AR	HLP H, HLP I	78.42	2	1271.562	Bladder	Yes	< 0.25	No
S51	HLP H, HLP I	55.6	2	1286.904	Bladder	Yes	< 0.25	No
S52	HLP H, HLP I	88.3	2	1286.623	Bladder	Yes	< 0.25	No
S10R	HLP H, HLP I	57.00	2	1281.47	Bladder	Yes	< 0.25	No
S13	HLP H, HLP I	90.19	2	1296.423	Bladder	Yes	< 0.25	No
S14R	HLP H, HLP I	70.86	2	1280.61	Bladder	Yes	< 0.25	Yes

All CCR wells should be low flow purges with turbidity <10 NTU

HLP "H" Monitoring 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

1-LITER

HLP "I" Monitoring 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 ~ 2-1000 HNO₃

500 HNO₃

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Faresyn

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 7 June 17

Unique Station ID:

Sample ID: S-2A

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: casing does not fit over dedicated pump

Well Information

Well Depth: 79.61

Well Casing Elevation: 1273.776

Constructed Depth: 79.63

Static Water Elevation: 1197.176

Casing Diameter: 2"

Previous Static: 1297.66

Water Level Before Purge: 76.60

Water Level After Sample: Below Pump

Well Volume: 0.49 Gallons

Measurement Method: ☒ Elec. WD ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 70 Wind: L+V Sky: Partly 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: 1250 am / pm

Time Purged Dry?

Time of Sampling: 1256 am / pm

Duplicate Sample? Yes ☒ No ID: —

Sample EH: 13.5

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>1252</u>	<u>6.90</u>	<u>1051</u>	<u>10.20</u>	<u>2.95</u>	<u>4.8</u>	<u>0.5</u>	<u>1</u>	
<u>1254</u>	<u>6.88</u>	<u>1052</u>	<u>9.93</u>	<u>2.82</u>	<u>2.8</u>	<u>1</u>	<u>2</u>	
<u>1256</u>	<u>6.86</u>	<u>1052</u>	<u>9.87</u>	<u>2.52</u>	<u>1.7</u>	<u>1.5</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes No

Amount Water Removed: 1.5 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Farsyn

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 7 June 17

Unique Station ID: 674671

Sample ID: S-3A-R

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: 78.40

Well Casing Elevation: 1271.562

Constructed Depth: 78.42

Static Water Elevation: 1203.402

Casing Diameter: 2"

Previous Static: 1203.76

Water Level Before Purge: 68.16

Water Level After Sample: 68.16

Well Volume: 1.67 Gallons

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 70 Wind: L+V Sky: Partly 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: 1144 ☒ am ☐ pm

Time Purged Dry? ☒

Time of Sampling: 1205 ☒ am ☒ pm

Duplicate Sample? ☐ Yes ☒ No ID: —

Sample EH: -12.0

Sample Appearance: General: Clear Color: None Phase: 4. Sed. Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1151</u>	<u>7.12</u>	<u>934</u>	<u>10.00</u>	<u>1.22</u>	<u>29.5</u>	<u>1.75</u>	<u>1</u>	
<u>1158</u>	<u>7.14</u>	<u>932</u>	<u>9.81</u>	<u>1.29</u>	<u>26.0</u>	<u>3.5</u>	<u>2</u>	
<u>1205</u>	<u>7.10</u>	<u>930</u>	<u>9.65</u>	<u>1.39</u>	<u>18.7</u>	<u>5.25</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 5.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 7 Jun 17

Unique Station ID: 814830

Sample ID: S-51

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: 55.60

Constructed Depth: ~

Casing Diameter: 2"

Water Level Before Purge: 49.81

Well Volume: 0.94 Gallons

Well Casing Elevation: 1286.9

Static Water Elevation: 1237.09

Previous Static: 1236.89

Water Level After Sample: 49.84

Measurement Method: Elec. WLI Steel Tape

Sampling Information

Weather Conditions: Temp: 72° Wind: L+V Sky: Partly 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: 11:53 am / pm

Time of Sampling: 12:13 am / pm

Sample EH: -97.4

Sample Appearance: General: slightly cloudy Color: none Phase: Lt Sediment Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1157</u>	<u>6.83</u>	<u>781</u>	<u>8.99</u>	<u>0.92</u>	<u>195.8</u>	<u>1</u>	<u>1</u>	
<u>1201</u>	<u>6.87</u>	<u>780</u>	<u>8.86</u>	<u>0.72</u>	<u>122.3</u>	<u>2</u>	<u>2</u>	
<u>1205</u>	<u>6.89</u>	<u>782</u>	<u>8.77</u>	<u>0.72</u>	<u>69.8</u>	<u>3</u>	<u>3</u>	
<u>1209</u>	<u>6.89</u>	<u>785</u>	<u>8.75</u>	<u>0.69</u>	<u>43.9</u>	<u>4</u>	<u>4</u>	
<u>1213</u>	<u>6.89</u>	<u>784</u>	<u>8.77</u>	<u>0.69</u>	<u>25.4</u>	<u>5</u>	<u>5</u>	

Stabilized? Yes No

Amount Water Removed: 5 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 7 Jun 17

Unique Station ID: 822155

Sample ID: S-52

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: 88.30

Constructed Depth:

Casing Diameter: 2"

Water Level Before Purge: 70.46

Well Volume: 2.91 Gallons

Well Casing Elevation: 1286.62

Static Water Elevation: 1216.16

Previous Static: 1216.11

Water Level After Sample: 70.46

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 72° Wind: 4+V Sky: Partly 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: 12:24 am ☒ pm

Time Purged Dry?

Time of Sampling: 13:00 am ☒ pm

Duplicate Sample? Yes ☒ No ID:

Sample EH: -162.6

Sample Appearance: General: Clear Color: none Phase: none Odor: Sulfurous

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1236</u>	<u>6.91</u>	<u>777</u>	<u>8.65</u>	<u>0.27</u>	<u>0</u>	<u>3</u>	<u>1</u>	
<u>1248</u>	<u>6.91</u>	<u>777</u>	<u>8.67</u>	<u>0.28</u>	<u>0</u>	<u>6</u>	<u>2</u>	
<u>1300</u>	<u>6.90</u>	<u>777</u>	<u>8.67</u>	<u>0.23</u>	<u>0</u>	<u>9</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes No

Amount Water Removed: 9.0 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jess Hoffman

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 7 Jun 17

Unique Station ID: 806341

Sample ID: S-10R

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: 80.62

Constructed Depth:

Casing Diameter: 2"

Water Level Before Purge: 71.94

Well Volume: 1.41 Gallons

Well Casing Elevation: 1281.47

Static Water Elevation: 1209.53

Previous Static: 1209.45

Water Level After Sample: 71.94

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 72° Wind: L+U Sky: Partly 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 Pump Began: 11:20 ☒ am ☐ pm

Time Purged Dry?

Time of Sampling: 11:38 ☒ am ☐ pm

Duplicate Sample? Yes ☒ No ID: —

Sample EH: -46.9

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:
1126	6.27	834	9.37	0.90	10.8	1.5	1	
1132	6.29	835	9.36	0.84	9.1	3.0	2	
1138	6.85	838	9.32	0.74	7.4	4.5	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 4.5 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Farzyn

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: June 17

Unique Station ID: + 632810

Sample ID: S-13

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: 90.27

Well Casing Elevation: 1296.423

Constructed Depth: 90.19

Static Water Elevation: 1210.673

Casing Diameter: 2"

Previous Static: 1210.82

Water Level Before Purge: 85.75

Water Level After Sample: 85.75

Well Volume: 0.73 Gallons

Measurement Method: (Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 70 Wind: L+V Sky: Partly Cloudy

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

Dedicated Equipment: ☒ Yes ☐ No

Pumping Rate: 0.25 gpm

Well Purged Dry? Yes ☒ No

Time Pump Began: 1123 am / pm

Time Purged Dry? —

Time of Sampling: 1132 am / pm

Duplicate Sample? Yes ☒ No ID: —

Sample EH: -22.0

Sample Appearance: General: Clear Color: None Phase: None Odor: sl. Sulfurous

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1124</u>	<u>7.09</u>	<u>856</u>	<u>10.55</u>	<u>2.19</u>	<u>5.9</u>	<u>0.75</u>	<u>1</u>	
<u>1129</u>	<u>7.06</u>	<u>856</u>	<u>10.50</u>	<u>1.88</u>	<u>5.5</u>	<u>1.50</u>	<u>2</u>	
<u>1132</u>	<u>7.04</u>	<u>860</u>	<u>10.31</u>	<u>1.70</u>	<u>4.9</u>	<u>2.25</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 2.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Farsyn

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 7 June 17

Unique Station ID: 800342

Sample ID: S-14R

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: 87.11

Well Casing Elevation: NA

Constructed Depth: —

Static Water Elevation: 1

Casing Diameter: 2"

Previous Static: 1

Water Level Before Purge: 79.23

Water Level After Sample: 79.23

Well Volume: 1.29 Gallons

Measurement Method: ☒ Elec. WLL ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 70 Wind: L+V Sky: Partly 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: 1220 am / ☒ pm

Time Purged Dry? —

Time of Sampling: 1238 am / ☒ pm

Duplicate Sample? Yes ☒ No ID: —

Sample EH: -123.5

Sample Appearance: General: Clear Color: None Phase: L. Sed. Odor: Sulfurous

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1220</u>	<u>7.05</u>	<u>1012</u>	<u>10.28</u>	<u>1.88</u>	<u>27.5</u>	<u>1.50</u>	<u>1</u>	
<u>1232</u>	<u>7.05</u>	<u>1005</u>	<u>10.21</u>	<u>1.52</u>	<u>22.0</u>	<u>3</u>	<u>2</u>	
<u>1238</u>	<u>7.04</u>	<u>1001</u>	<u>10.06</u>	<u>1.40</u>	<u>20.0</u>	<u>4.5</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes No

Amount Water Removed: 4.5 Gallons

Comments:

Exceptions to Protocol:



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www.mvtl.com



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FINAL REPORT COMPLETION DATE: 17 Aug 17

Date Reported: 16 Aug 2017

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

Work Order #: 31-0335
Account #: 006106
PO #: 48679

Project Name: HOOT LAKE PLANT

T. J. D. 16 Aug 17
Field Service Manager/Date Reviewed
J. O. C. 16 Aug 2017
Chemistry Lab Manager/Date Reviewed
D. M. S. 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 MVT L Laboratory Management

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: 16 Aug 2017
 Lab Number: 17-A32939
 Work Order #: 31-0335
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 10 Jul 2017 14:57
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 11 Jul 2017 13:00
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-2A

Temp at Receipt: 0.5C

	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 15:02	ABL
Radium 228	See Attached		EPA M9320	15 Aug 17 15:03	ABL
pH, Field	6.86 units	1.00	I-1586-85	10 Jul 17 14:57	DGF
pH	* 7.0 units	1.0	SM 4500 H+ B-2000	12 Jul 17 12:30	AJM
Sulfate	154 @ mg/L	5.0	ASTM D516-07	18 Jul 17 9:17	MRW
Chloride	< 3 mg/L	3	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	645 mg/L	10	SM 2540 C-97	13 Jul 17 9:14	AJM
Calcium	140.0 mg/L	0.500	SW6010C	19 Jul 17 14:40	KAM
Lithium	0.034 mg/L	0.005	SW6010C	20 Jul 17 14:32	KAM
Barium	0.043 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	0.236 mg/L	0.100	SW6010C	19 Jul 17 14:40	KAM
Antimony	< 2 @^ ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
Arsenic	< 1 ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Beryllium	< 0.1 ug/L	0.05	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Cadmium	< 0.2 @ ug/L	0.1	SW6020A	2 Aug 17 14:10	RMV
Lead	< 1 @ ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
Molybdenum	1.38 ug/L	0.50	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Selenium	< 1 ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Thallium	< 0.2 @ ug/L	0.1	SW6020A	2 Aug 17 14:10	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

^ 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

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-A32940
 Work Order #: 31-0335
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 10 Jul 2017 15:46
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 11 Jul 2017 13:00
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-3A-R

Temp at Receipt: 0.5C

	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 15:03	ABL
Radium 228	See Attached			EPA M9320	15 Aug 17 15:03	ABL
pH, Field	7.02 units		1.00	I-1586-85	10 Jul 17 15:46	DGF
pH	* 7.1 units		1.0	SM 4500 H+ B-2000	12 Jul 17 12:30	AJM
Sulfate	108 @ mg/L		5.0	ASTM D516-07	18 Jul 17 9:17	MRW
Chloride	12.5 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	544 mg/L		10	SM 2540 C-97	13 Jul 17 9:35	AJM
Calcium	105.0 mg/L		0.500	SW6010C	19 Jul 17 14:40	KAM
Lithium	0.023 mg/L		0.005	SW6010C	20 Jul 17 14:32	KAM
Barium	0.039 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	0.177 mg/L		0.100	SW6010C	19 Jul 17 14:40	KAM
Antimony	< 2 @^ ug/L		0.5	SW6020A	2 Aug 17 14:10	RMV
Arsenic	< 1 ug/L		0.5	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative					
Beryllium	< 0.1 ug/L		0.05	SW6020A	2 Aug 17 14:10	RMV
	@ See Narrative					
Cadmium	< 0.2 @ ug/L		0.1	SW6020A	2 Aug 17 14:10	RMV
Lead	< 1 @ ug/L		0.5	SW6020A	2 Aug 17 14:10	RMV
Molybdenum	1.77 ug/L		0.50	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative					
Selenium	2.84 ug/L		0.50	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative					
Thallium	< 0.2 @ ug/L		0.1	SW6020A	2 Aug 17 14:10	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

* 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.

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

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

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DM # 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-A32941
 Work Order #: 31-0335
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 10 Jul 2017 17:46
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 11 Jul 2017 13:00
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-51

Temp at Receipt: 0.5C

	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 15:03	ABL
Radium 228	See Attached		EPA M9320	15 Aug 17 15:03	ABL
pH, Field	6.93 units	1.00	I-1586-85	10 Jul 17 17:46	DGF
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	12 Jul 17 12:30	AJM
Sulfate	53.2 @ mg/L	5.0	ASTM D516-07	18 Jul 17 9:17	MRW
Chloride	16.2 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	479 mg/L	10	SM 2540 C-97	13 Jul 17 9:35	AJM
Calcium	108.0 mg/L	0.500	SW6010C	19 Jul 17 14:40	KAM
Lithium	0.022 mg/L	0.005	SW6010C	20 Jul 17 14:32	KAM
Barium	0.061 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	< 0.1 mg/L	0.1	SW6010C	19 Jul 17 14:40	KAM
Antimony	< 2 @^ ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
Arsenic	< 1 ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Beryllium	< 0.1 ug/L	0.05	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Cadmium	< 0.2 @ ug/L	0.1	SW6020A	2 Aug 17 14:10	RMV
Lead	< 1 @ ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
Molybdenum	1.72 ug/L	0.50	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Selenium	< 1 ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Thallium	< 0.2 @ ug/L	0.1	SW6020A	2 Aug 17 14:10	RMV
Fluoride	0.450 # 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

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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

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

Report Date: 16 Aug 2017
 Lab Number: 17-A32942
 Work Order #: 31-0335
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 10 Jul 2017 18:08
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 11 Jul 2017 13:00
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-52

Temp at Receipt: 0.5C

	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 15:03	ABL
Radium 228	See Attached		EPA M9320	15 Aug 17 15:03	ABL
pH, Field	6.74 units	1.00	I-1586-85	10 Jul 17 18:08	JLH
pH	* 7.0 units	1.0	SM 4500 H+ B-2000	12 Jul 17 12:30	AJM
Sulfate	54.0 @ mg/L	5.0	ASTM D516-07	18 Jul 17 9:17	MRW
Chloride	15.6 mg/L	3.0	SM 4500 Cl E	14 Jul 17 9:06	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	24 Jul 17 16:02	RMB
Solids, Total Dissolved	459 mg/L	10	SM 2540 C-97	13 Jul 17 9:35	AJM
Calcium	97.40 mg/L	0.500	SW6010C	19 Jul 17 14:40	KAM
Lithium	0.021 mg/L	0.005	SW6010C	20 Jul 17 14:32	KAM
Barium	0.109 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	< 0.1 mg/L	0.1	SW6010C	19 Jul 17 14:40	KAM
Antimony	< 2 @^ ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
Arsenic	1.91 ug/L	0.50	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Beryllium	< 0.1 ug/L	0.05	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Cadmium	< 0.2 @ ug/L	0.1	SW6020A	2 Aug 17 14:10	RMV
Lead	< 1 @ ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
Molybdenum	2.07 ug/L	0.50	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Selenium	< 1 ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Thallium	< 0.2 @ ug/L	0.1	SW6020A	2 Aug 17 14:10	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

^ 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

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

Report Date: 16 Aug 2017
 Lab Number: 17-A32943
 Work Order #: 31-0335
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 10 Jul 2017 17:18
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 11 Jul 2017 13:00
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-10R

Temp at Receipt: 0.5C

	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 15:04	ABL
Radium 228	See Attached		EPA M9320	15 Aug 17 15:05	ABL
pH, Field	6.69 units	1.00	I-1586-85	10 Jul 17 17:18	JLH
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	12 Jul 17 12:30	AJM
Sulfate	98.1 @ mg/L	5.0	ASTM D516-07	18 Jul 17 9:17	MRW
Chloride	11.7 mg/L	3.0	SM 4500 Cl E	14 Jul 17 9:06	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	26 Jul 17 12:01	RMB
	See Narrative				
Solids, Total Dissolved	529 mg/L	10	SM 2540 C-97	13 Jul 17 9:35	AJM
Calcium	109.0 mg/L	0.500	SW6010C	19 Jul 17 14:40	KAM
Lithium	0.022 mg/L	0.005	SW6010C	20 Jul 17 14:32	KAM
Barium	0.099 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	< 0.1 mg/L	0.1	SW6010C	19 Jul 17 14:40	KAM
Antimony	< 2 @^ ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
Arsenic	7.95 ug/L	0.50	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Beryllium	< 0.1 ug/L	0.05	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Cadmium	< 0.2 @ ug/L	0.1	SW6020A	2 Aug 17 14:10	RMV
Lead	< 1 @ ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
Molybdenum	2.31 ug/L	0.50	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Selenium	< 1 ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Thallium	< 0.2 @ ug/L	0.1	SW6020A	2 Aug 17 14:10	RMV
Fluoride	0.220 # mg/L	0.020	EPA 300.0	13 Jul 17 10:50	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 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

Project Name: HOOT LAKE PLANT

Sample Description: S-10R

Report Date: 16 Aug 2017
Lab Number: 17-A32943
Work Order #: 31-0335
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 10 Jul 2017 17:18
Sampled By: MVTL FIELD PERSONNEL
Date Received: 11 Jul 2017 13:00
PO #: 48679

Temp at Receipt: 0.5C

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

^ 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 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: 16 Aug 2017
 Lab Number: 17-A32944
 Work Order #: 31-0335
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 10 Jul 2017 16:13
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 11 Jul 2017 13:00
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-13

Temp at Receipt: 0.5C

	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 15:05	ABL
Radium 228	See Attached		EPA M9320	15 Aug 17 15:05	ABL
pH, Field	6.99 units	1.00	I-1586-85	10 Jul 17 16:13	DGF
pH	* 7.2 units	1.0	SM 4500 H+ B-2000	12 Jul 17 12:40	AJM
Sulfate	73.4 @ mg/L	5.0	ASTM D516-07	18 Jul 17 9:17	MRW
Chloride	8.9 mg/L	3.0	SM 4500 Cl E	14 Jul 17 9:06	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	26 Jul 17 12:01	RMB
	See Narrative				
Solids, Total Dissolved	477 mg/L	10	SM 2540 C-97	13 Jul 17 9:35	AJM
Calcium	111.0 mg/L	0.500	SW6010C	19 Jul 17 14:40	KAM
Lithium	0.025 mg/L	0.005	SW6010C	20 Jul 17 14:32	KAM
Barium	0.061 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	< 0.1 mg/L	0.1	SW6010C	19 Jul 17 14:40	KAM
Antimony	< 2 @^ ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
Arsenic	< 1 ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Beryllium	< 0.1 ug/L	0.05	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Cadmium	< 0.2 @ ug/L	0.1	SW6020A	2 Aug 17 14:10	RMV
Lead	< 1 @ ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
Molybdenum	1.20 ug/L	0.50	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Selenium	< 1 ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Thallium	< 0.2 @ ug/L	0.1	SW6020A	2 Aug 17 14:10	RMV
Fluoride	0.330 # mg/L	0.020	EPA 300.0	13 Jul 17 10:50	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 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: 16 Aug 2017
Lab Number: 17-A32944
Work Order #: 31-0335
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 10 Jul 2017 16:13
Sampled By: MVTL FIELD PERSONNEL
Date Received: 11 Jul 2017 13:00
PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-13

Temp at Receipt: 0.5C

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

^ 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

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

Report Date: 16 Aug 2017
 Lab Number: 17-A32945
 Work Order #: 31-0335
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 10 Jul 2017 17:01
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 11 Jul 2017 13:00
 PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-14R

Temp at Receipt: 0.5C

	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 15:05	ABL
Radium 228	See Attached		EPA M9320	15 Aug 17 15:06	ABL
pH, Field	6.70 units	1.00	I-1586-85	10 Jul 17 17:01	DGF
pH	* 7.1 units	1.0	SM 4500 H+ B-2000	12 Jul 17 12:40	AJM
Sulfate	96.8 @ mg/L	5.0	ASTM D516-07	18 Jul 17 9:17	MRW
Chloride	5.5 mg/L	3.0	SM 4500 Cl E	14 Jul 17 9:06	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	26 Jul 17 12:01	RMB
	See Narrative				
Solids, Total Dissolved	568 mg/L	10	SM 2540 C-97	13 Jul 17 9:35	AJM
Calcium	117.0 mg/L	0.500	SW6010C	19 Jul 17 14:40	KAM
Lithium	0.031 mg/L	0.005	SW6010C	20 Jul 17 14:32	KAM
Barium	0.070 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	< 0.1 mg/L	0.1	SW6010C	19 Jul 17 14:40	KAM
Antimony	< 2 @^ ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
Arsenic	3.37 ug/L	0.50	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Beryllium	< 0.1 ug/L	0.05	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Cadmium	< 0.2 @ ug/L	0.1	SW6020A	2 Aug 17 14:10	RMV
Lead	< 1 @ ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
Molybdenum	2.34 ug/L	0.50	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Selenium	< 1 ug/L	0.5	SW6020A	2 Aug 17 14:10	RMV
	@See Narrative				
Thallium	< 0.2 @ ug/L	0.1	SW6020A	2 Aug 17 14:10	RMV
Fluoride	0.320 # mg/L	0.020	EPA 300.0	13 Jul 17 10:50	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 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: 16 Aug 2017
Lab Number: 17-A32945
Work Order #: 31-0335
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 10 Jul 2017 17:01
Sampled By: MVTL FIELD PERSONNEL
Date Received: 11 Jul 2017 13:00
PO #: 48679

Project Name: HOOT LAKE PLANT

Sample Description: S-14R

Temp at Receipt: 0.5C

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

* 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

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



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Date Reported: 16 Aug 2017

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

Work Order #: 201731-0335
Account Number: 006106
PO #: 48679

Project Name: HOOT LAKE PLANT

LABORATORY NARRATIVE

INORGANIC AND METALS ANALYSES:

The mercury recovery was elevated in the matrix spike duplicate associated with samples 17-A32943 through 17-A32945. Data that was below the reporting limit was reported.

For samples 17-A32939 through 17-A32945, the beryllium recovery was elevated outside of acceptance range in the knowns. Data that was below the reporting limit was reported.

The internal standards associated with beryllium, arsenic, selenium, and molybdenum were outside of acceptance range in the blank spike. Beryllium was outside of acceptance range in the matrix spike and matrix spike duplicate in samples 17-A32939 through 17-A32945. Data was reported based on the acceptable recovery of beryllium, arsenic, selenium, and molybdenum in the blank spike, matrix spike, and matrix spike duplicate.

No other problems were encountered with these analyses.

Page: 1 of 2

Quality Control Report
Lab IDs: 17-A32939 to 17-A32945

Project: HOOT LAKE PLANT

Work Order: 201731-0335

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	a32948qc	< 2	25.3	101	75-125	25.3	25.3	101	0.0	10	102	90-110	< 0.5
Arsenic ug/L	25.0	100	85-115	25.0	a32948qc	12.3	38.3	104	75-125	38.3	38.6	105	0.8	10	102	90-110	< 0.5
Barium mg/L	1.000	100	85-115	1.00	17A32945q	0.070	1.080	101	75-125	1.080	1.090	102	0.9	10	98	90-110	< 0.005
Beryllium ug/L	2.50	109	85-115	2.50	a32948qc	< 0.1	2.31	92	75-125	2.31	2.37	95	2.6	10	117	90-110	< 0.05
Boron mg/L	1.000	96	85-115	1.00	17A32945q	< 0.1	1.040	104	75-125	1.040	1.050	105	1.0	10	95	90-110	< 0.1
Cadmium ug/L	5.00	103	85-115	5.00	a32948qc	< 0.2	5.18	104	75-125	5.18	5.22	104	0.8	10	103	90-110	< 0.1
Calcium mg/L	50.00	98	85-115	50.0	17A32945q	117.0	170.0	106	75-125	170.0	169.0	104	0.6	10	96	90-110	< 0.5
Chloride mg/L	-	-	-	60.0	17-A32939	< 3	61.3	102	85-121	61.3	61.6	103	0.5	5	95	90-110	< 3
	-	-	-	60.0	17-A33020	169	226	95	85-121	226	222	88	1.8	5	94	90-110	< 3
Chromium mg/L	1.000	101	85-115	1.00	17A32945q	< 0.01	1.020	102	75-125	1.020	1.010	101	1.0	10	100	90-110	< 0.01
Cobalt mg/L	1.000	102	85-115	1.00	17A32945q	< 0.005	0.959	96	75-125	0.959	0.962	96	0.3	10	100	90-110	< 0.005
Fluoride mg/L	-	-	-	2.00	17-A32945	0.320	2.13	91	75-125	2.13	2.21	94	3.7	10	97	90-110	< 0.02
Lead ug/L	25.0	103	85-115	25.0	a32948qc	< 1	26.0	104	75-125	26.0	26.0	104	0.0	10	103	90-110	< 0.5
Lithium mg/L	1.000	105	85-115	1.00	17-A32944	0.025	1.140	112	75-125	1.140	1.140	112	0.0	10	106 107	90-110	< 0.005
Mercury ug/L	-	-	-	0.10	17-A32942	< 0.005	0.099	99	63-111	0.099	0.099	99	0.0	18	99	76-113	< 0.005
	-	-	-	0.10	17-A34058	0.007	0.115	108	63-111	0.115	0.119	112	3.4	18	102	76-113	< 0.005
	-	-	-														< 0.005
	-	-	-														< 0.005
Molybdenum ug/L	25.0	99	85-115	25.0	a32948qc	2.37	27.4	100	75-125	27.4	27.6	101	0.7	10	106	90-110	< 0.5

Quality Control Report
Lab IDs: 17-A32939 to 17-A32945

Project: HOOT LAKE PLANT

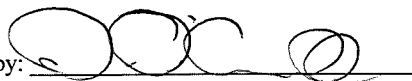
Work Order: 201731-0335

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	- -	- -	- -	- -	- -	- -	- -	- -	- -	7.1 7.0	7.1 7.0	- -	0.0 0.0	2.5 2.5	101 101	90-110 90-110	- -
Selenium ug/L	25.0	99	85-115	25.0	a32948qc	< 1	25.9	104	75-125	25.9	25.8	103	0.4	10	102	90-110	< 0.5
Solids, Total Dissolved mg/L	- -	- -	- -	- -	- -	- -	- -	- -	- -	645 544	649 550	- -	0.6 1.1	8 8	88 94	85-115 85-115	< 10
Sulfate mg/L	-	-	-	500	17-A32946	305	917	122	74-128	917	909	121	0.9	5	102	80-120	< 5
Thallium ug/L	5.00	103	85-115	5.00	a32948qc	< 0.2	5.38	108	75-125	5.38	5.34	107	0.7	10	103	90-110	< 0.1 < 0.1

The Beryllium know recovery was outside the acceptance limits, see narrative.

The mercury 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: 8/15/2017

CLIENT: MVTL Inc
Project: Ottertail Power Hoot Lake
Lab Order: S1707201

CASE NARRATIVE

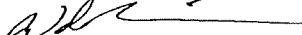
Report ID: S1707201001

Samples S10R-A32943, S13-A32944, S14R-A32945, S2A-A32939, S51-A32941, S52-A32942, and SA3R-A32940 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



Sample Analysis Report

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

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1707201-001
ClientSample ID: S2A-A32939
COC: WO#31-0335

Date Reported 8/15/2017
Report ID S1707201001

WorkOrder: S1707201
CollectionDate: 7/10/2017 2:57:00 PM
DateReceived: 7/14/2017 11:21:00 AM
FieldSampler:
Matrix: Water

Comments

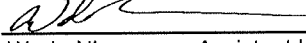
Comments						
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	08/10/2017 2237 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	08/10/2017 2237 MB
Radium 228	ND	pCi/L		2	Ga-Tech	08/08/2017 807 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/08/2017 807 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

**Sample Analysis Report**

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

Date Reported 8/15/2017
Report ID S1707201001

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1707201-002
ClientSample ID: SA3R-A32940
COC: WO#31-0335

WorkOrder: S1707201
CollectionDate: 7/10/2017 3:46:00 PM
DateReceived: 7/14/2017 11:21:00 AM
FieldSampler:
Matrix: Water

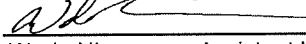
Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	08/11/2017 1129	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	08/11/2017 1129	MB
Radium 228	ND	pCi/L		2	Ga-Tech	08/08/2017 1110	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/08/2017 1110	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



Sample Analysis Report

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

ProjectName: Ottetail Power Hoot Lake
Lab ID: S1707201-003
ClientSample ID: S51-A32941
COC: WO#31-0335

Date Reported 8/15/2017
Report ID S1707201001

WorkOrder: S1707201
CollectionDate: 7/10/2017 5:46:00 PM
DateReceived: 7/14/2017 11:21:00 AM
FieldSampler:
Matrix: Water

Comments

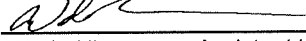
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	08/11/2017 1129	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	08/11/2017 1129	MB
Radium 228	ND	pCi/L		2	Ga-Tech	08/08/2017 1413	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/08/2017 1413	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

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1707201-004
ClientSample ID: S52-A32942
COC: WO#31-0335

Date Reported 8/15/2017
Report ID S1707201001

WorkOrder: S1707201
CollectionDate: 7/10/2017 6:08:00 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 1129	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	08/11/2017 1129	MB
Radium 228	ND	pCi/L		2	Ga-Tech	08/08/2017 1716	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/08/2017 1716	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 4 of 7



Sample Analysis Report

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

ProjectName: Ottetail Power Hoot Lake
Lab ID: S1707201-005
ClientSample ID: S10R-A32943
COC: WO#31-0335

Date Reported 8/15/2017
Report ID S1707201001

WorkOrder: S1707201
CollectionDate: 7/10/2017 5:18:00 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 1129	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	08/11/2017 1129	MB
Radium 228	ND	pCi/L		2	Ga-Tech	08/08/2017 2019	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/08/2017 2019	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



Sample Analysis Report

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

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1707201-006
ClientSample ID: S13-A32944
COC: WO#31-0335

Date Reported: 8/15/2017
Report ID: S1707201001

WorkOrder: S1707201
CollectionDate: 7/10/2017 4:13:00 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 1129	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	08/11/2017 1129	MB
Radium 228	ND	pCi/L		2	Ga-Tech	08/11/2017 1359	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/11/2017 1359	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



Sample Analysis Report

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

ProjectName: Ottertail Power Hoot Lake
Lab ID: S1707201-007
ClientSample ID: S14R-A32945
COC: WO#31-0335

Date Reported 8/15/2017
Report ID S1707201001

WorkOrder: S1707201
CollectionDate: 7/10/2017 5:01:00 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 1129	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	08/11/2017 1129	MB
Radium 228	ND	pCi/L		2	Ga-Tech	08/11/2017 1702	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/11/2017 1702	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

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

ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Inc
Work Order: S1707201
Project: Ottertail Power Hoot Lake

Date: 8/15/2017
Report ID: S1707201001

Radium 228 by Ga/TechSample Type **MBLK**

Units: pCi/L

MB-451 (08/05/17 22:08)	RunNo: 148896	PrepDate: 07/17/17 14:00	BatchID 13519					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Total Radium 228

ND

1

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/TechSample Type **LCS**

Units: pCi/L

LCS-451 (08/06/17 01:11)	RunNo: 148896	PrepDate: 07/17/17 14:00	BatchID 13519					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Total Radium 228

43

1

39.5

108

65.9 - 132

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/TechSample Type **MS**

Units: pCi/L

MS-451 (08/06/17 07:18)	RunNo: 148896	PrepDate: 07/17/17 14:00	BatchID 13519					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	

Total Radium 228

49

1

39.5

ND

123

50 - 139

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/TechSample 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

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: MVTI Inc
Work Order: S1707201
Project: Ottetail Power Hoot Lake

Date: 8/15/2017
Report ID: S1707201001

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						
MB-1777 (08/10/17 15:49)	RunNo: 148982	PrepDate: 07/31/17 0:00	BatchID 13530					
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		
LCS-1777 (08/10/17 15:49)	RunNo: 148982	PrepDate: 07/31/17 0:00	BatchID 13530					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226	5.9	0.2	6.41		92.5	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		
MS-1777 (08/10/17 15:49)	RunNo: 148982	PrepDate: 07/31/17 0:00	BatchID 13530					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226	5.6	0.2	6.41	ND	86.4	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		
MSD-1777 (08/10/17 15:49)	RunNo: 148982	PrepDate: 07/31/17 0:00	BatchID 13530					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Radium 226	5.8	0.2	5.6	5.14	91.0	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 -

Page of

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#WEB

Client Name MVTL		Project Identification Ottetail Power Hoot Lake		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	

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME	SAMPLE IDENTIFICATION	Matrix	# of Containers	Radium 226 + 228											
1	570721-001	10 July 17	1457	S2A - A32939	WT	2	x											
2	-002		1546	S3AR - A32940	WT	2	x											
3	-003		1746	S51 - A32941	WT	2	x											
4	-004		1808	S52 - A32942	WT	2	x											
5	-005		1718	S10R - A32943	WT	2	x											
6	-006		1613	S13 - A32944	WT	2	x											
7	-007		1701	S14R - A32945	WT	2	x											
8				MVTL WO# 31-0335														
9																		
10																		
11																		
12																		
13																		
14																		

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
23.5°C	DT En/Dorby Ferguson	10 July 17		Jane Belknap	7/14/17	11:21

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 ? Y / N Program (SDWA, NPDES,...) PWSID / Permit # Chlorinated? 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 DF Date 11 Jul 17

pages 1-8

Project Name: Otter Tail Power Co. Hoot Lake Plant	Project Type: Hoot Lake Plant	Name of Samplers: DF, JH
Report To: Otter Tail Power Company Attn: Paul Vukonich Address: P.O. Box 496 Fergus Falls, MN 56038-0496 Phone: 218-739-8349	Carbon Copy: Attn: Address:	Quote Number: Work Order Number: 31-0335 Lab Numbers:

Sample Information							Bottle Type												Analysis
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	VOC Set	1000 none	1000 HNO3	500 HNO3	Filter? Y or N	500 HNO3	Filter? Y or N	500H2SO4	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other 150 None	Analysis Required
A32939	S2A		10 July 17	1457	GW			1	2	1	n								see attachment
40	S3AR			1546	GW			1	2	1	n								
41	S51			1746	GW			1	2	1	n								
42	S52			1808	GW			1	2	1	n								
43	S10R			1718	GW			1	2	1	n								
44	S13			1613	GW			1	2	1	n								
45	S14R			1701	GW			1	2	1	n								

Comments: CCR wells
Work Order #2

Samples Relinquished By: <u>DF</u>	Samples Received By: <u>A. Riedel</u>
Date: <u>11 July 17</u> Time: <u>1300</u> Temp: <u>0.5</u>	Date: <u>11 Jul 17</u> Time: <u>1300</u> Temp: <u>0.5C</u>
Samples Relinquished into: <u>Fridge</u> Log in Cart Other:	
Samples Relinquished By:	Samples Received By:
Date: Time: Temp:	Date: Time: Temp:
Deliver: <u>Samplers</u> Other:	Seal Number(s) - If Used
Transp: <u>Ambient</u> <u>Ice</u> Other:	Seals Intact? <u>Yes</u> <u>No</u>

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Farasyn

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 10 July 17

Unique Station ID: ✓

Sample ID: S-2A

Well Condition

Well Locked? Yes ☒ No

Well Labeled? ☒ Yes No

Casing Straight? ☒ Yes No

Repairs Necessary: CSP does not fit over dedicated pump

Protective Posts? ☒ Yes No

State ID Tag? ☒ Yes ☒ No

Grout Seal Intact? ☒ Yes No

Well Information

Well Depth: 79.61

Well Casing Elevation: 1273.776

Constructed Depth: 79.63

Static Water Elevation: 1197.236

Casing Diameter: 2"

Previous Static: 1197.176

Water Level Before Purge: 76.54

Water Level After Sample: Below Pump

Well Volume: 0.50 Gallons

Measurement Method: ☒ Elec. WLL ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 80 Wind: NE 7 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: 1451 am / ☒ pm

Time Purged Dry? ✓

Time of Sampling: 1457 am / ☒ pm

Duplicate Sample? Yes ☒ No ID: —

Sample EH: -18.0

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>1453</u>	<u>6.86</u>	<u>1044</u>	<u>11.31</u>	<u>12.10</u>	<u>6.2</u>	<u>0.5</u>	<u>1</u>	
<u>1455</u>	<u>6.85</u>	<u>1045</u>	<u>11.22</u>	<u>12.07</u>	<u>5.5</u>	<u>1</u>	<u>2</u>	
<u>1457</u>	<u>6.86</u>	<u>1043</u>	<u>11.16</u>	<u>12.03</u>	<u>5.1</u>	<u>1.5</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes No

Amount Water Removed: 1.5 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./ Hoot Lake

Facility ID: SW-211

Date: 10 July 17

Unique Station ID: 674671

Sample ID: S-3A-R

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: 78.40

Constructed Depth: 78.42

Casing Diameter: 2"

Water Level Before Purge: 67.92

Well Volume: 1.71 Gallons

Well Casing Elevation: 1271.562

Static Water Elevation: 1203.642

Previous Static: 1203.402

Water Level After Sample: 67.92

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

Sampling Information

Weather Conditions: Temp: 80 Wind: NE 7 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: —

Pumping Rate: 0.25 gpm

Time Pump Began: 1525 am / ☒ pm

Time of Sampling: 1546 am / ☒ pm

Sample EH: -37.0

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:
<u>1532</u>	<u>7.07</u>	<u>909</u>	<u>10.05</u>	<u>8.05</u>	<u>13.0</u>	<u>1.75</u>	<u>1</u>	
<u>1539</u>	<u>7.06</u>	<u>911</u>	<u>10.00</u>	<u>7.97</u>	<u>11.2</u>	<u>3.5</u>	<u>2</u>	
<u>1546</u>	<u>7.02</u>	<u>912</u>	<u>9.95</u>	<u>8.00</u>	<u>9.8</u>	<u>5.25</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 5.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Farasyn

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 10 July 17

Unique Station ID: 814830

Sample ID: S-51

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: 55.60

Constructed Depth: —

Casing Diameter: 2"

Water Level Before Purge: 49.78

Well Volume: 0.95 Gallons

Well Casing Elevation: 1286.9

Static Water Elevation: 1237.12

Previous Static: 1237.09

Water Level After Sample: 49.78

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 80

Wind: NE 7

Sky: Sunny

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: 1726 am / ☒ pm

Time Purged Dry? —

Time of Sampling: 1746 am / ☒ pm

Duplicate Sample? ☐ Yes ☒ No

ID: —

Sample EH: -87.5

Sample Appearance: General: Clear Color: None Phase: H. Sed. Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1730</u>	<u>7.01</u>	<u>812</u>	<u>9.64</u>	<u>5.30</u>	<u>103.5</u>	<u>1</u>	<u>1</u>	
<u>1734</u>	<u>6.94</u>	<u>822</u>	<u>9.45</u>	<u>4.45</u>	<u>64.0</u>	<u>2</u>	<u>2</u>	
<u>1738</u>	<u>6.92</u>	<u>828</u>	<u>9.28</u>	<u>3.98</u>	<u>29.5</u>	<u>3</u>	<u>3</u>	
<u>1742</u>	<u>6.92</u>	<u>833</u>	<u>9.21</u>	<u>3.52</u>	<u>19.1</u>	<u>4</u>	<u>4</u>	
<u>1746</u>	<u>6.93</u>	<u>835</u>	<u>9.24</u>	<u>2.91</u>	<u>12.5</u>	<u>5</u>	<u>5</u>	

Stabilized? Yes ☒ No

Amount Water Removed: 5 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 10 July 17

Unique Station ID:

Sample ID: S-52

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: 88.30

Constructed Depth:

Casing Diameter: 2"

Water Level Before Purge: 70.41

Well Volume: 2.91 Gallons

Well Casing Elevation: 1286.62

Static Water Elevation: 1216.21

Previous Static: 1216.16

Water Level After Sample: 70.41

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 82° Wind: N-5 Sky: Part

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

Dedicated Equipment: ☒ Yes ☐ No

Pumping Rate: 1.25 gpm

Well Purged Dry? Yes ☒ No ☐

Time Pump Began: 17:32 am / ☒ pm

Time Purged Dry?

Time of Sampling: 1808 am / ☒ pm

Duplicate Sample? Yes ☒ No ☐ ID: —

Sample EH: -185.8

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:
<u>1744</u>	<u>6.67</u>	<u>845</u>	<u>8.93</u>	<u>.37</u>	<u>0</u>	<u>3</u>	<u>1</u>	
<u>1756</u>	<u>6.68</u>	<u>845</u>	<u>8.81</u>	<u>.25</u>	<u>0</u>	<u>6</u>	<u>2</u>	
<u>1808</u>	<u>6.74</u>	<u>845</u>	<u>8.81</u>	<u>.26</u>	<u>0</u>	<u>9</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 9 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Jeff Hoffman

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 10 July 17

Unique Station ID: 806341

Sample ID: S-10R

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: 80.62

Constructed Depth:

Casing Diameter: 2"

Water Level Before Purge: 71.86

Well Volume: 1.42 Gallons

Well Casing Elevation: 1281.47

Static Water Elevation: 1209.61

Previous Static: 1209.53

Water Level After Sample: 71.86

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 81 Wind: N-5 Sky: FAIR

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

Dedicated Equipment: ☒ Yes ☐ No

Pumping Rate: 1.25 gpm

Well Purged Dry? Yes ☒ No ☐

Time Pump Began: 1700 am / ☒ pm

Time Purged Dry? —

Time of Sampling: 1718 am / ☒ pm

Duplicate Sample? Yes ☒ No ☐ ID: —

Sample EH: -43.5

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:
1704	6.69	907	10.30	.94	10.4	1.5	1	
1712	6.69	911	10.22	.88	8.9	3.0	2	
1718	6.69	909	10.24	.79	6.7	4.5	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 4.5 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Dusty Farasyn

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 10 July 17

Unique Station ID: 632810

Sample ID: S-13

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: 90.27

Well Casing Elevation: 1296.423

Constructed Depth: 90.19

Static Water Elevation: 1211.003

Casing Diameter: 2"

Previous Static: 1210.673

Water Level Before Purge: 85.42

Water Level After Sample: 85.42

Well Volume: 0.79 Gallons

Measurement Method: ☒ Elec. WL ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 80 Wind: NE 7 Sky: Sunny

Sampling Method: Grundfos ☒ Bladder SST ☐ Disp. Bailor ☐ Whale ☐ Grab ☐ Other:

Dedicated Equipment: ☒ Yes ☐ No

Pumping Rate: 0.25 gpm

Well Purged Dry? Yes ☒ No ☐

Time Pump Began: 1601 am / ☒ pm

Time Purged Dry? —

Time of Sampling: 1613 am / ☒ pm

Duplicate Sample? Yes ☒ No ☐ ID: —

Sample EH: -83.0

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>1605</u>	<u>7.03</u>	<u>836</u>	<u>11.15</u>	<u>8.39</u>	<u>0.2</u>	<u>1</u>	<u>1</u>	
<u>1609</u>	<u>7.01</u>	<u>838</u>	<u>11.07</u>	<u>8.30</u>	<u>0.1</u>	<u>2</u>	<u>2</u>	
<u>1613</u>	<u>6.99</u>	<u>838</u>	<u>11.06</u>	<u>8.29</u>	<u>0.2</u>	<u>3</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ 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:

Dusty Farasyn

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 10 July 17

Unique Station ID: 806342

Sample ID: S-14R

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: 87.11

Well Casing Elevation: NA

Constructed Depth: —

Static Water Elevation: 1

Casing Diameter: 2"

Previous Static: 1

Water Level Before Purge: 79.23

Water Level After Sample: 79.23

Well Volume: 1.29 Gallons

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

Sampling Information

Weather Conditions: Temp: 80 Wind: NE 7 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: 1643 am / ☒ pm

Time Purged Dry? —

Time of Sampling: 1701 am / ☒ pm

Duplicate Sample? Yes ☒ No ID: —

Sample EH: +121.5

Sample Appearance: General: Clear Color: None Phase: Lt. Green Odor: Sulfurous

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1649</u>	<u>6.83</u>	<u>957</u>	<u>10.26</u>	<u>8.50</u>	<u>11.4</u>	<u>1.5</u>	<u>1</u>	
<u>1655</u>	<u>6.79</u>	<u>952</u>	<u>10.15</u>	<u>8.25</u>	<u>9.8</u>	<u>3</u>	<u>2</u>	
<u>1701</u>	<u>6.70</u>	<u>942</u>	<u>10.06</u>	<u>8.00</u>	<u>7.8</u>	<u>4.5</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? ☒ Yes No

Amount Water Removed: 4.5 Gallons

Comments:

Exceptions to Protocol: