2019 Groundwater Monitoring and Corrective Action Report

CCR Annual Monitoring Report
Hoot Lake Plant Ash Landfill

Hoot Lake Plant
Otter Tail Power Company

Carlson McCain
Project No. 6345-01

Prepared for:

Otter Tail Power Company
1012 Water Plant Road
Fergus Falls, MN 56537

January 15, 2020

Carlson McCain
15650 36th Ave N, Suite 110
Plymouth, MN 55446
Tel 952-346-3900
Fax 952-346-3901
www.carlsonmccain.com

ENVIRONMENTAL • ENGINEERING • LAND SURVEYING

TABLE OF CONTENTS

FIGURES

APPENDICES

1.0 INTRODUCTION

Otter Tail Power Company (OTP) operates the Hoot Lake Generating Plant (Plant), a coal-fired electrical generating facility located in Fergus Falls, Minnesota. The burning of coal produces coal combustion residuals (CCR) which are placed in an on-site ash landfill (Landfill) for disposal. The Landfill is subject to regulation as a CCR unit under U.S. Code of Federal Regulations, Title 40, Parts 257 and 261 (CFR, 2015), regarding the disposal of CCR in landfills and surface impoundments.

Ongoing monitoring of groundwater is required to evaluate the Landfill's performance and compliance with 40 CFR §257.94 to §257.95. Carlson McCain, Inc. (Carlson McCain) has prepared this 2019 Groundwater Monitoring and Corrective Action Report (Report) on behalf of OTP to describe the monitoring activities and present results for the 2019 Landfill monitoring.

The Landfill is currently operating in detection monitoring as described in §257.94 of the CCR Rule.

1.1 Purpose and Scope

This Report (Report) is intended to meet the annual reporting requirements of §257.90(e). In particular, this report includes a discussion on:

- Current status of the groundwater monitoring and corrective action program for the Landfill;
- Key actions completed;
- Problems encountered and actions completed to resolve the problems, and;
- Key activities for the upcoming year.

The specific paragraph requirements as listed in §257.90(e), and their locations in the Report are summarized in the table below:

Paragraph	Requirement	Report Location
§257.90(e)(1)	A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the Landfill.	Figure 1
§257.90(e)(2)	Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken.	Section 2.1
§257.90(e)(3)	In addition to all the monitoring data obtained under §§257.90 through 257.98, A summary including the number of groundwater samples collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection or assessment monitoring programs.	Section 2.2 and 2.3
§257.90(e)(4)	A discussion of any transition between monitoring programs.	Section 2.2
§257.90(e)(5)	Other information to be included in the annual report as specified in §§257.90 through 257.98.	No other information is required in this report for 2019.

2.0 GROUNDWATER MONITORING AND CORRECTIVE ACTION PROGRAM

This section documents and describes the status of the CCR groundwater monitoring and corrective action program for the Landfill for 2019. Baseline sampling for the Landfill has been previously documented in the *2017 Annual Groundwater Monitoring and Corrective Action Report* (Barr, 2018). The initial detection monitoring activities and statistical analysis were conducted in 2018, and have subsequently continued through 2019. Statistical analysis includes determining whether parameter concentrations exhibit a statistically significant increase over background values, as required by §257.93 (h).

2.1 Groundwater Monitoring System

An aerial map showing the Landfill and the monitoring wells that comprise the groundwater monitoring system is included in the attached Figure 1. No modifications were made to the monitoring system in 2019. Further details and background information on the monitoring wells and groundwater monitoring system can be found in the *Groundwater Monitoring System Report* (Barr, 2016), which is posted on the Plant's CCR website.

2.2 2019 Monitoring and Analytical Results

Groundwater sampling for the CCR groundwater monitoring system wells consisted of the following events:

- Two routine detection monitoring events, one in April and one in October, in accordance with the semi-annual detection monitoring frequency listed in §257.94 (b). Per the *CCR Groundwater Sampling and Analysis Plan* (Carlson McCain, 2017), all upgradient (i.e. background) and downgradient wells were sampled during each sampling event, and were analyzed for the detection monitoring parameters listed in Appendix III of §257.
- One supplemental sampling event in December for the purpose of resampling select wells, as described in Section 2.3 of this Report.

Field sampling data sheets, which include dates of sampling, and laboratory analytical reports for each sampling event are included in the attached Appendix A.

There were no transitions between monitoring programs in 2019. The Landfill remained in detection monitoring during each sampling event.

2.3 2019 Key Actions and Problems Summary

No problems were encountered during the 2019 detection monitoring activities. Key actions completed for the groundwater monitoring program in 2019 include the following:

- The first semi-annual detection monitoring event (i.e. the spring event) was conducted on April 22,2019. Statistical analysis on the spring event groundwater monitoring dataset was completed in accordance with the site-specific sampling and analysis plan, and no well/parameter pairs exhibited a statistically significant increase in parameter concentrations over background.
- The second semi-annual detection monitoring event (i.e. the fall event) took place on October 16, 2019. Statistical analysis was performed on the fall event dataset in accordance with the site-specific sampling and analysis plan. Results of the statistical analyses indicated potential statistically significant increases for chloride in monitoring well S-3AR, fluoride in monitoring well S-13, and fluoride in monitoring well S-2A. Verification resampling was completed on December 16, 2019, and results exhibited no statistically significant increases.

2.4 Projected Actions for 2020

No modifications to the groundwater monitoring program are scheduled for 2020. The following activities are planned for the upcoming year:

- Continue the groundwater monitoring program in accordance with CCR Rule requirements, and collect spring and fall detection monitoring event samples.
- Perform statistical analysis on the 2020 semi-annual detection monitoring results to determine statistically significant increases, in accordance with the statistical monitoring plan (Carlson McCain, 2017).

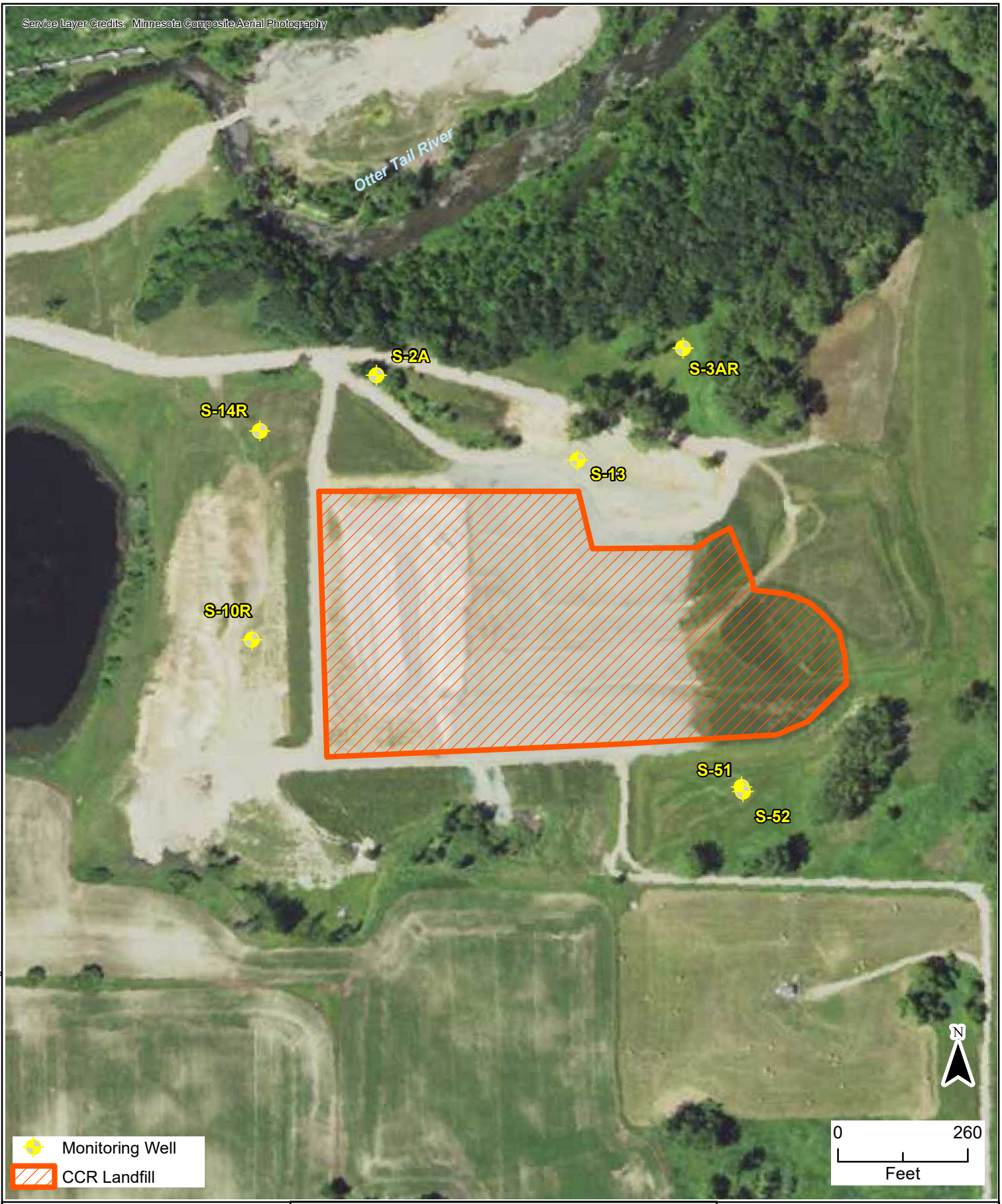
3.0 REFERENCES

Barr Engineering Co., 2018. 2017 Annual Groundwater Monitoring and Corrective Action Report; Prepared for Otter Tail Power Company, January 2018.

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

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

Figures



Carlson McCain
ENVIRONMENTAL ◦ ENGINEERING ◦ SURVEYING

2019 CCR Annual Monitoring Report
Hoot Lake Plant Ash Landfill
Otter Tail Power Company
Fergus Falls, Minnesota

FIGURE 1

SITE MAP AND CCR GROUNDWATER MONITORING SYSTEM

Document Path: P:\Projects\Otter Tail Power\6345 - Hoot Lake Plant\GIS\Figure 1 CCR Area and wells.mxd

Appendix A

Laboratory Data

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

FINAL REPORT COMPLETION DATE: 10May19

Date Reported: 7 May 2019

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

Work Order #: 31-0148
Account #: 006106
PO #: 48679

Project Name: HOOT LAKE PLANT

8 May 19
Field Service Manager/Date Reviewed

07 May 19
Chemistry Lab Manager/Date Reviewed

for 08 May 2019
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.

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

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: S2A

Report Date: 7 May 2019
Lab Number: 19-A17492
Work Order #: 31-0148
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 22 Apr 2019 13:34
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Apr 2019 12:16
PO #: 48679

Temp at Receipt: 0.6C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					25 Apr 19	JMS
pH, Field	7.02	units	1.00	SM4500-H+-2011	22 Apr 19 13:34	BMW
pH	* 6.9	units	1.0	SM 4500 H+ B-2000	24 Apr 19 12:08	DK
Sulfate	108 @	mg/L	5.0	ASTM D516-07	25 Apr 19 8:40	KCD
Chloride	< 3	mg/L	3	SM 4500 Cl E	25 Apr 19 10:07	SS
Solids, Total Dissolved	513	mg/L	10	SM 2540 C-97	24 Apr 19 16:00	AL
Calcium	120.0	mg/L	0.500	SW6010C	29 Apr 19 11:53	KAM
Boron	0.131	mg/L	0.100	SW6010C	29 Apr 19 11:53	KAM
Fluoride	0.130 @	mg/L	0.020	EPA 300.0	26 Apr 19 17:45	RMV

* Holding Time Exceeded

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

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: S3AR

Report Date: 7 May 2019
Lab Number: 19-A17493
Work Order #: 31-0148
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 22 Apr 2019 16:11
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Apr 2019 12:16
PO #: 48679

Temp at Receipt: 0.6C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					25 Apr 19	JMS
pH, Field	7.12	units	1.00	SM4500-H+-2011	22 Apr 19 16:11	MS
pH	* 7.0	units	1.0	SM 4500 H+ B-2000	24 Apr 19 12:08	DK
Sulfate	89.4 @	mg/L	5.0	ASTM D516-07	25 Apr 19 8:40	KCD
Chloride	11.8	mg/L	3.0	SM 4500 Cl E	25 Apr 19 10:07	SS
Solids, Total Dissolved	543	mg/L	10	SM 2540 C-97	24 Apr 19 16:00	AL
Calcium	112.0	mg/L	0.500	SW6010C	29 Apr 19 11:53	KAM
Boron	0.135	mg/L	0.100	SW6010C	29 Apr 19 11:53	KAM
Fluoride	0.180 @	mg/L	0.020	EPA 300.0	26 Apr 19 17:45	RMV

* Holding Time Exceeded

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

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: S51

Report Date: 7 May 2019
Lab Number: 19-A17494
Work Order #: 31-0148
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 22 Apr 2019 14:01
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Apr 2019 12:16
PO #: 48679

Temp at Receipt: 0.6C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					25 Apr 19	JMS
pH, Field	7.09	units	1.00	SM4500-H+-2011	22 Apr 19 14:01	BMW
pH	* 7.0	units	1.0	SM 4500 H+ B-2000	24 Apr 19 12:08	DK
Sulfate	50.7	mg/L	5.0	ASTM D516-07	25 Apr 19 8:40	KCD
Chloride	12.3	mg/L	3.0	SM 4500 Cl E	25 Apr 19 10:07	SS
Solids, Total Dissolved	438	mg/L	10	SM 2540 C-97	24 Apr 19 16:00	AL
Calcium	104.0	mg/L	0.500	SW6010C	29 Apr 19 11:53	KAM
Boron	< 0.1	mg/L	0.1	SW6010C	29 Apr 19 11:53	KAM
Fluoride	0.180 @	mg/L	0.020	EPA 300.0	26 Apr 19 17:45	RMV

* Holding Time Exceeded

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

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: S52

Report Date: 7 May 2019
Lab Number: 19-A17495
Work Order #: 31-0148
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 22 Apr 2019 14:49
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Apr 2019 12:16
PO #: 48679

Temp at Receipt: 0.6C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					25 Apr 19	JMS
pH, Field	7.01	units	1.00	SM4500-H+-2011	22 Apr 19 14:49	BMW
pH	* 6.9	units	1.0	SM 4500 H+ B-2000	24 Apr 19 12:08	DK
Sulfate	84.2 @	mg/L	5.0	ASTM D516-07	25 Apr 19 8:40	KCD
Chloride	15.5	mg/L	3.0	SM 4500 Cl E	25 Apr 19 10:07	SS
Solids, Total Dissolved	451	mg/L	10	SM 2540 C-97	24 Apr 19 16:00	AL
Calcium	105.0	mg/L	0.500	SW6010C	29 Apr 19 11:53	KAM
Boron	< 0.1	mg/L	0.1	SW6010C	29 Apr 19 11:53	KAM
Fluoride	0.140 @	mg/L	0.020	EPA 300.0	26 Apr 19 17:45	RMV

* Holding Time Exceeded

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

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: S10R

Report Date: 7 May 2019
Lab Number: 19-A17496
Work Order #: 31-0148
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 22 Apr 2019 12:17
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Apr 2019 12:16
PO #: 48679

Temp at Receipt: 0.6C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					25 Apr 19	JMS
pH, Field	7.33	units	1.00	SM4500-H+-2011	22 Apr 19 12:17	MS
pH	* 7.2	units	1.0	SM 4500 H+ B-2000	24 Apr 19 12:08	DK
Sulfate	105	mg/L	5.0	ASTM D516-07	25 Apr 19 8:40	KCD
Chloride	10.3	mg/L	3.0	SM 4500 Cl E	25 Apr 19 10:07	SS
Solids, Total Dissolved	540	mg/L	10	SM 2540 C-97	24 Apr 19 16:00	AL
Calcium	120.0	mg/L	0.500	SW6010C	29 Apr 19 11:53	KAM
Boron	< 0.1	mg/L	0.1	SW6010C	29 Apr 19 11:53	KAM
Fluoride	0.140 @	mg/L	0.020	EPA 300.0	26 Apr 19 17:45	RMV

* Holding Time Exceeded

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

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: S13

Report Date: 7 May 2019
Lab Number: 19-A17497
Work Order #: 31-0148
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 22 Apr 2019 13:05
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Apr 2019 12:16
PO #: 48679

Temp at Receipt: 0.6C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					25 Apr 19	JMS
pH, Field	7.09	units	1.00	SM4500-H+-2011	22 Apr 19 13:05	MS
pH	* 6.9	units	1.0	SM 4500 H+ B-2000	24 Apr 19 12:08	DK
Sulfate	68.7 @	mg/L	5.0	ASTM D516-07	25 Apr 19 8:59	KCD
Chloride	6.3	mg/L	3.0	SM 4500 Cl E	25 Apr 19 10:26	SS
Solids, Total Dissolved	503	mg/L	10	SM 2540 C-97	24 Apr 19 16:00	AL
Calcium	114.0	mg/L	0.500	SW6010C	29 Apr 19 11:53	KAM
Boron	< 0.1	mg/L	0.1	SW6010C	29 Apr 19 11:53	KAM
Fluoride	0.200 @	mg/L	0.020	EPA 300.0	26 Apr 19 17:45	RMV

* Holding Time Exceeded

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

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: S14R

Report Date: 7 May 2019
Lab Number: 19-A17498
Work Order #: 31-0148
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 22 Apr 2019 11:36
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Apr 2019 12:16
PO #: 48679

Temp at Receipt: 0.6C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					25 Apr 19	JMS
pH, Field	7.01	units	1.00	SM4500-H+-2011	22 Apr 19 11:36	MS
pH	* 7.0	units	1.0	SM 4500 H+ B-2000	24 Apr 19 12:08	DK
Sulfate	88.9 @	mg/L	5.0	ASTM D516-07	25 Apr 19 8:59	KCD
Chloride	5.0	mg/L	3.0	SM 4500 Cl E	25 Apr 19 10:26	SS
Solids, Total Dissolved	606	mg/L	10	SM 2540 C-97	24 Apr 19 16:00	AL
Calcium	123.0	mg/L	0.500	SW6010C	29 Apr 19 11:53	KAM
Boron	< 0.1	mg/L	0.1	SW6010C	29 Apr 19 11:53	KAM
Fluoride	0.220 @	mg/L	0.020	EPA 300.0	26 Apr 19 17:45	RMV

* Holding Time Exceeded

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

INORGANIC & METALS ANALYSES:
No problems were encountered with these analyses.

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
www.mvtl.com

MEMBER
ACIL

Quality Control Report

Lab IDs: 19-A17492 to 19-A17498 **Project:** HOOT LAKE PLANT **Work Order:** 201931-0148

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Boron mg/L	1.000	101	85-115	1.00	19A17492q	0.131	1.150	102	75-125	1.150	1.170	104	1.7	10	99	90-110	< 0.1
Calcium mg/L	50.00	107	85-115	50.0	19A17492q	120.0	174.0	108	75-125	174.0	171.0	102	1.7	10	105	90-110	< 0.5
Chloride mg/L	-	-	-	60.0	19-A17496	10.3	71.7	102	86-117	71.7	74.7	107	4.1	5	101	90-110	< 3
	-	-	-	60.0	19-A17510	10.1	72.1	103	86-117	72.1	72.5	104	0.6	5	102	90-110	< 3
Fluoride mg/L				1.00	19-A17492	0.130	1.10	97	75-125	1.10	1.14	101	3.6	10	94	90-110	< 0.02
pH units	-	-	-	-	-	-	-	-	-	7.2	7.2	-	0.0	2.5	101	90-110	-
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	498	486	-	2.4	10	102	85-115	< 10
	-	-	-	-	-	-	-	-	-	587	580	-	1.2	7			
Sulfate mg/L	-	-	-	50.0	19-A17496	105	148	86	68-132	148	146	82	1.4	5	95	80-120	< 5
	-	-	-	500	19-A17510	72.6	534	92	68-132	534	531	92	0.6	5	94	80-120	< 5

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

Project Name:	Otter Tail Power Co. Hoot Lake Plant	**Project Type:**	CCR	**Name of Samplers:**	Matt Stein & Ben Wolf
Report To:	Otter Tail Power Company	**Carbon Copy:**	Carlson McCain		
Attn:	Paul Vukonich	Attn:	Megan Lindstrom	Quote Number:	
Address:	P.O. Box 496	Address:		Work Order Number:	31-0148
	Fergus Falls, MN 56038-0496			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
A17492	S2A		22Apr19	1334	GW			1		1	N								See Attatched
93	S3AR			1611	GW			1		1	N								
94	S51			1401	GW			1		1	N								
95	S52			1449	GW			1		1	N								
96	S10R			1217	GW			1		1	N								
97	S13			1305	GW			1		1	N								
98	S14R			1136	GW			1		1	N								

Comments: **CCR wells**

Samples Relinquished By:				Samples Received By:	
Date: 23 Apr 19	Time: 1216	Temp: 0.6 TM784		Date: 23 Apr 19	Time: 1216	Temp: 0.6 C
Samples Relinquished into:	Fridge	Log in Cart	Other:			
Samples Relinquished By:				Samples Received By:		
Date:	Time:	Temp:		Date:	Time:	Temp:
Delive Samplers	Other:			Seal Number(s) - If Used		
Transport: Ambient	Ice	Other:		Seals Intact? Yes No		

spring CCR 2019

Hoot Lake Site CCR Sampling - 2(

Site	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?
S2A	CCR 3	79.63	2	1273.776	Bladder	Yes
S3AR	CCR 3	78.42	2	1271.562	Bladder	Yes
S51	CCR 3	55.6	2	1286.904	Bladder	Yes
S52	CCR 3	88.3	2	1286.623	Bladder	Yes
S10R	CCR 3	57.00	2	1281.47	Bladder	Yes
S13	CCR 3	90.19	2	1296.423	Bladder	Yes
S14R	CCR 3	70.86	2	1280.61	Bladder	Yes

Note: CCR samples must be on their own COC.

Total Recoverable Metals! Groundwater samples shall not be field filtered prior to analysis

Spring sampling March 27 - April 28

Fall sampling October 14 - November 14

Ber Met+

1000 None
500 HNO_3 Total

)19

Pump Rate (gal/minute)	Goes Dry?
< 0.25	No
< 0.25	No
< 0.25	No
< 0.25	No
< 0.25	No
< 0.25	No
< 0.25	Yes

CCR - Appendix III Detection Monitoring

Field Parameters

pH*

* Field and Laboratory Measurements

Total Concentration Parameters	**Method**
Boron	6010
Calcium	6010
Chloride	SM4500 CL E
Fluoride	EPA 300
pH	SM 4500 H+B-96
Sulfate	ASTM D516
Dissolved Solids, Total	SM 2540 C-97

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: 22 Aug 19

Unique Station ID:

Sample ID: S-2A

Well Condition

Well Locked?	(Yes)	No	Protective Posts?	(Yes)	No
Well Labeled?	(Yes)	No	State ID Tag?	Yes	(No)
Casing Straight?	(Yes)	No	Grout Seal Intact?	(Yes)	No

Repairs Necessary:

Well Information

Well Depth:	79.62	Well Casing Elevation:	1273.776
Constructed Depth:	79.63	Static Water Elevation:	1197.96
Casing Diameter:	2"	Previous Static:	1197.66
Water Level Before Purge:	75.82	Water Level After Sample:	75.82
Well Volume:	.62 Gallons	Measurement Method:	(Elec. WL) Steel Tape

Sampling Information

Weather Conditions: Temp: 61 Wind: NE@16 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:	1325 am / (pm)
Time Purged Dry?	—	Time of Sampling:	1334 am / (pm)
Duplicate Sample?	Yes (No) ID: —	Sample EH:	-60.4

Sample Appearance: General: Color: Phase: Odor:

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1328	7.03	918	9.31	1.51	0.0	.75	1	
1331	7.02	918	9.30	1.34	0.0	1.50	2	
1334	7.02	919	9.27	1.16	0.0	2.25	3	
							4	
							5	

Stabilized? Yes No Amount Water Removed: 2.25 Gallons

Comments:

Start
E
CC

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Site: Ottertail Power Co./Hoot Lake

Sampling Personnel: MS, BWO

Facility ID: SW-211

Date: 22Apr19

Unique Station ID: 674671

Sample ID: S-3A-R

Well Condition

Well Locked?	(Yes)	No	Protective Posts?	(Yes)	No
Well Labeled?	(Yes)	No	State ID Tag?	~~Yes~~	No
Casing Straight?	(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:	1203.30
Casing Diameter:	2"	Previous Static:	1202.62
Water Level Before Purge:	68.26	Water Level After Sample:	68.31
Well Volume:	1.65 Gallons	Measurement Method:	(Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 63 Wind: NE-15 Sky: Fair

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

Dedicated Equipment:	(Yes) No	Pumping Rate:	0.25 gpm
Well Purged Dry?	Yes (No)	Time Pump Began:	15:50 am (pm)
Time Purged Dry?	—	Time of Sampling:	1611 am (pm)
Duplicate Sample?	Yes (No) ID: —	Sample EH:	

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

(7) Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1557	7.20	996	9.83	.26	0.0	1.75	1	
1604	7.14	999	9.69	.40	0.0	3.5	2	
1611	7.12	997	9.71	.53	0.0	5.25	3	
							4	
							5	

Stabilized? (Yes) No Amount Water Removed: 5.25 Gallons

Comments:

State ID CCR

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Site: Ottertail Power Co./Hoot Lake

Sampling Personnel: Ben Wolf

Facility ID: SW-211

Date: 22 April 19

Unique Station ID: 814830

Sample ID: S-51

Well Condition

Well Locked?	(Yes)	No	Protective Posts?	Yes	(No)
Well Labeled?	(Yes)	No	State ID Tag?	(Yes)	No
Casing Straight?	(Yes)	No	Grout Seal Intact?	(Yes)	No

Repairs Necessary:

Well Information

Well Depth:	55.60	Well Casing Elevation:	1286.904
Constructed Depth:	55.60	Static Water Elevation:	1235.87
Casing Diameter:	2"	Previous Static:	1236.89
Water Level Before Purge:	51.03	Water Level After Sample:	51.03
Well Volume:	.75 Gallons	Measurement Method:	(Elec. WL) Steel Tape

Sampling Information

Weather Conditions: Temp: 61 Wind: NE@16 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:	1352 am / (pm)
Time Purged Dry?	—	Time of Sampling:	1401 am / (pm)
Duplicate Sample?	Yes (No) ID: —	Sample EH:	-114.8

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

Time (3)	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1355	7.09	887	9.05	1.42	9.4	.75	1	
1358	7.09	888	9.04	1.40	2.5	1.5	2	
1401	7.09	888	9.00	1.40	1.0	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

Site: Ottertail Power Co./Hoot Lake

Sampling Personnel: Ben Wolf

Facility ID: SW-211

Date: 22 Apr. 14

Unique Station ID:

Sample ID: S-52

Well Condition

Well Locked?	(Yes)	No	Protective Posts?	(Yes)	No
Well Labeled?	(Yes)	No	State ID Tag?	(Yes)	No
Casing Straight?	(Yes)	No	Grout Seal Intact?	(Yes)	No

Repairs Necessary:

Well Information

Well Depth:	88.30	Well Casing Elevation:	1286.623
Constructed Depth:	88.30	Static Water Elevation:	1215.74
Casing Diameter:	2"	Previous Static:	1215.92
Water Level Before Purge:	70.88	Water Level After Sample:	70.88
Well Volume:	2.84 Gallons	Measurement Method:	(Elec. WL) Steel Tape

Sampling Information

Weather Conditions: Temp: 61 Wind: NE @ 16 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:	1413 am / (pm)
Time Purged Dry?	-	Time of Sampling:	1449 am / (pm)
Duplicate Sample?	Yes (No) ID: -	Sample EH:	-121.9

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

Time (12)	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1425	7.01	926	9.00	.24	0.0	3	1	
1437	7.01	926	9.01	.26	0.0	6	2	
1449	7.01	926	9.01	.29	0.0	9	3	
							4	
							5	

Stabilized? (Yes) No Amount Water Removed: 9 Gallons

Comments:

State & CCR

* not in notes

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: MS

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 22Apr19

Unique Station ID: 806341

Sample ID: S-10R

Well Condition

Well Locked?	Yes	No	Protective Posts?	Yes	No
Well Labeled?	Yes	No	State ID Tag?	Yes	No
Casing Straight?	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:	1211.37
Casing Diameter:	2"	Previous Static:	1209.15
Water Level Before Purge:	70.10	Water Level After Sample:	Below Pump
Well Volume:	1.72 Gallons	Measurement Method:	Elec WLI Steel Tape

Sampling Information

Weather Conditions: Temp: 54 Wind: N-10 Sky: Fair

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

A MS 22Apr19

Dedicated Equipment:	Yes No	Pumping Rate:	0.25 gpm
Well Purged Dry?	Yes No	Time Pump Began:	1155 am / pm
Time Purged Dry?	1212	Time of Sampling:	1217 am / pm
Duplicate Sample?	Yes No ID: Duplicate	Sample EH:	592

Sample Appearance: General: Cloudy Color: tan Phase: none Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1205	7.41	537	9.37	9.65	114.8	1.75	1	
1212	7.64	483	9.41	10.18	102.8	3.5	2	
~~1219~~						~~5.25~~	3	
1217	7.33	542	9.63	6.34	51.3		4	recharge
							5	

Stabilized? Yes No Amount Water Removed: 3.5 Gallons

Comments:

Start @ 1155

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: MS

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 22Apr19

Unique Station ID: 632810

Sample ID: S-13

Well Condition

Well Locked?	(Yes)	No	Protective Posts?	(Yes)	No
Well Labeled?	(Yes)	No	State ID Tag?	(Yes)	No
Casing Straight?	(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:	1210.81
Casing Diameter:	2"	Previous Static:	1210.41
Water Level Before Purge:	85.61	Water Level After Sample:	86.410
Well Volume:	0.76 Gallons	Measurement Method:	(Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 56 Wind: N-10 to 15 Sky: Fair

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: ~~Duplicate~~ Duplicate

AMS 22Apr19

Pumping Rate: 0.25 gpm

Time Pump Began: 1049 ~~1038~~ ~~am~~ (pm)

Time of Sampling: 1305 am (pm)

Sample EH: -47.8

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

Time (4)	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1253 ~~1242~~	7.29	779	10.37	5.11	27.1	1	1	
1257 ~~1246~~	7.17	812	9.50	1.06	5.4	2	2	
1301 ~~1250~~	7.10	815	9.37	1.02	2.5	3	3	
1305	7.09	814	9.38	1.05	1.9	4	4	
							5	

Stabilized? Yes No

Amount Water Removed: Gallons

Comments: Duplicate

Exceptions to Protocol:

Stale

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: MS

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 22Apr19

Unique Station ID: 806342

Sample ID: S-14R

Well Condition

Well Locked?	Yes	No	Protective Posts?	Yes	No
Well Labeled?	Yes	No	State ID Tag?	Yes	No
Casing Straight?	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:	1201.48
Casing Diameter:	2"	Previous Static:	1200.61
Water Level Before Purge:	79.13	Water Level After Sample:	79.18
Well Volume:	1.3 gal	Measurement Method:	~~Elec. WL~~ Steel Tape

Sampling Information

Weather Conditions: Temp: 54 Wind: N-10 Sky: Fair

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: 1112 am / pm

Time of Sampling: 1136 am / pm

Sample EH: -123.0

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

Time (6)	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1118	7.06	925	9.31	5.43	11.2	1.5	1	
1124	7.03	921	9.28	5.67	8.5	3.0	2	
1130	7.03	916	9.16	4.86	5.5	4.5	3	
1136	7.01	915	9.17	5.17	4.9	6.0	4	
							5	

Stabilized? Yes No

Amount Water Removed: 6.0 Gallons

Comments:

Start @ 1112

Exceptions to Protocol:

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

FINAL REPORT COMPLETION DATE: 8 Nov 19 ah

Date Reported: 4 Nov 2019

JOSH HOLLEN
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 31-0500
Account #: 006106
PO #: 48679

Project Name: HOOT LAKE CCR

7 Nov 19
Field Service Manager/Date Reviewed

05 Nov 19
Chemistry Lab Manager/Date Reviewed

for 05 Nov 19
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.

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

CERTIFICATE of ANALYSIS - CCR

JOSH HOLLEN
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Project Name: HOOT LAKE CCR

Sample Description: S2A

Report Date: 4 Nov 2019
Lab Number: 19-A53390
Work Order #: 31-0500
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 16 Oct 2019 12:46
Sampled By: MVTL FIELD PERSONNEL
Date Received: 17 Oct 2019 13:30
PO #: 48679

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					22 Oct 19	JMS
pH, Field	6.79	units	1.00	SM4500-H+-2011	16 Oct 19 12:49	BMW
pH	* 6.9	units	1.0	SM 4500 H+ B-2000	18 Oct 19 12:50	AL
Sulfate	148 @	mg/L	5.0	ASTM D516-07	24 Oct 19 9:27	AKF
Chloride	< 3	mg/L	3	SM 4500 Cl E	23 Oct 19 10:32	SS
Solids, Total Dissolved	656	mg/L	10	SM 2540 C-97	22 Oct 19 16:10	NB
Calcium	135.0	mg/L	0.500	SW6010C	23 Oct 19 15:01	KAM
Boron	0.139	mg/L	0.100	SW6010C	23 Oct 19 15:01	KAM
Fluoride	0.480 @	mg/L	0.020	EPA 300.0	31 Oct 19 11:30	RMV

* Holding Time Exceeded

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

CERTIFICATE of ANALYSIS - CCR

JOSH HOLLEN
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Project Name: HOOT LAKE CCR

Sample Description: S3AR

Report Date: 4 Nov 2019
Lab Number: 19-A53391
Work Order #: 31-0500
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 16 Oct 2019 13:35
Sampled By: MVTL FIELD PERSONNEL
Date Received: 17 Oct 2019 13:30
PO #: 48679

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					22 Oct 19	JMS
pH, Field	6.80	units	1.00	SM4500-H+-2011	16 Oct 19 13:35	MS
pH	* 7.1	units	1.0	SM 4500 H+ B-2000	18 Oct 19 12:50	AL
Sulfate	83.6 @	mg/L	5.0	ASTM D516-07	24 Oct 19 9:27	AKF
Chloride	13.0	mg/L	3.0	SM 4500 Cl E	23 Oct 19 10:32	SS
Solids, Total Dissolved	516	mg/L	10	SM 2540 C-97	22 Oct 19 16:10	NB
Calcium	105.0	mg/L	0.500	SW6010C	23 Oct 19 15:01	KAM
Boron	0.119	mg/L	0.100	SW6010C	23 Oct 19 15:01	KAM
Fluoride	0.320 @	mg/L	0.020	EPA 300.0	31 Oct 19 11:30	RMV

* Holding Time Exceeded

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

CERTIFICATE of ANALYSIS - CCR

JOSH HOLLEN
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Project Name: HOOT LAKE CCR

Sample Description: S51

Report Date: 4 Nov 2019
Lab Number: 19-A53392
Work Order #: 31-0500
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 16 Oct 2019 14:07
Sampled By: MVTL FIELD PERSONNEL
Date Received: 17 Oct 2019 13:30
PO #: 48679

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					22 Oct 19	JMS
pH, Field	7.01	units	1.00	SM4500-H+-2011	16 Oct 19 14:07	BMW
pH	* 7.1	units	1.0	SM 4500 H+ B-2000	18 Oct 19 12:50	AL
Sulfate	50.3	mg/L	5.0	ASTM D516-07	31 Oct 19 9:34	SS
Chloride	11.4	mg/L	3.0	SM 4500 Cl E	23 Oct 19 10:32	SS
Solids, Total Dissolved	435	mg/L	10	SM 2540 C-97	22 Oct 19 17:34	NB
Calcium	99.50	mg/L	0.500	SW6010C	23 Oct 19 15:28	KAM
Boron	< 0.1	mg/L	0.1	SW6010C	23 Oct 19 15:28	KAM
Fluoride	0.480 @	mg/L	0.020	EPA 300.0	31 Oct 19 11:30	RMV

* Holding Time Exceeded

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

CERTIFICATE of ANALYSIS - CCR

JOSH HOLLEN
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 4 Nov 2019
Lab Number: 19-A53393
Work Order #: 31-0500
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 16 Oct 2019 14:51
Sampled By: MVTL FIELD PERSONNEL
Date Received: 17 Oct 2019 13:30
PO #: 48679

Project Name: HOOT LAKE CCR

Sample Description: S52

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					22 Oct 19	JMS
pH, Field	6.94	units	1.00	SM4500-H+-2011	16 Oct 19 14:51	BMW
pH	* 7.0	units	1.0	SM 4500 H+ B-2000	18 Oct 19 12:50	AL
Sulfate	58.3 @	mg/L	5.0	ASTM D516-07	24 Oct 19 9:45	AKF
Chloride	16.8	mg/L	3.0	SM 4500 Cl E	23 Oct 19 10:32	SS
Solids, Total Dissolved	481	mg/L	10	SM 2540 C-97	22 Oct 19 17:34	NB
Calcium	108.0	mg/L	0.500	SW6010C	23 Oct 19 15:28	KAM
Boron	< 0.1	mg/L	0.1	SW6010C	23 Oct 19 15:28	KAM
Fluoride	0.410 @	mg/L	0.020	EPA 300.0	31 Oct 19 11:30	RMV

* Holding Time Exceeded

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

CERTIFICATE of ANALYSIS - CCR

JOSH HOLLEN
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 4 Nov 2019
Lab Number: 19-A53394
Work Order #: 31-0500
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 16 Oct 2019 12:24
Sampled By: MVTL FIELD PERSONNEL
Date Received: 17 Oct 2019 13:30
PO #: 48679

Project Name: HOOT LAKE CCR

Sample Description: S10R

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					22 Oct 19	JMS
pH, Field	6.91	units	1.00	SM4500-H+-2011	16 Oct 19 12:24	MS
pH	* 7.2	units	1.0	SM 4500 H+ B-2000	18 Oct 19 12:50	AL
Sulfate	100 @	mg/L	5.0	ASTM D516-07	24 Oct 19 9:45	AKF
Chloride	11.5	mg/L	3.0	SM 4500 Cl E	23 Oct 19 10:32	SS
Solids, Total Dissolved	536	mg/L	10	SM 2540 C-97	22 Oct 19 17:34	NB
Calcium	114.0	mg/L	0.500	SW6010C	23 Oct 19 15:28	KAM
Boron	< 0.1	mg/L	0.1	SW6010C	23 Oct 19 15:28	KAM
Fluoride	0.320 @	mg/L	0.020	EPA 300.0	31 Oct 19 11:30	RMV

* Holding Time Exceeded

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

CERTIFICATE of ANALYSIS - CCR

JOSH HOLLEN
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 4 Nov 2019
Lab Number: 19-A53395
Work Order #: 31-0500
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 16 Oct 2019 12:48
Sampled By: MVTL FIELD PERSONNEL
Date Received: 17 Oct 2019 13:30
PO #: 48679

Project Name: HOOT LAKE CCR

Sample Description: S13

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					22 Oct 19	JMS
pH, Field	7.12	units	1.00	SM4500-H+-2011	16 Oct 19 12:48	MS
pH	* 7.2	units	1.0	SM 4500 H+ B-2000	18 Oct 19 12:50	AL
Sulfate	76.0 @	mg/L	5.0	ASTM D516-07	24 Oct 19 9:45	AKF
Chloride	7.7	mg/L	3.0	SM 4500 Cl E	23 Oct 19 10:32	SS
Solids, Total Dissolved	492	mg/L	10	SM 2540 C-97	22 Oct 19 17:34	NB
Calcium	108.0	mg/L	0.500	SW6010C	23 Oct 19 15:28	KAM
Boron	< 0.1	mg/L	0.1	SW6010C	23 Oct 19 15:28	KAM
Fluoride	0.570 @	mg/L	0.020	EPA 300.0	31 Oct 19 18:21	RMV

* Holding Time Exceeded

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

CERTIFICATE of ANALYSIS - CCR

JOSH HOLLEN
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Project Name: HOOT LAKE CCR

Sample Description: S14R

Report Date: 4 Nov 2019
Lab Number: 19-A53396
Work Order #: 31-0500
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 16 Oct 2019 12:04
Sampled By: MVTL FIELD PERSONNEL
Date Received: 17 Oct 2019 13:30
PO #: 48679

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					22 Oct 19	JMS
pH, Field	6.73	units	1.00	SM4500-H+-2011	16 Oct 19 12:04	MS
pH	* 7.1	units	1.0	SM 4500 H+ B-2000	18 Oct 19 12:50	AL
Sulfate	78.7 @	mg/L	5.0	ASTM D516-07	24 Oct 19 9:45	AKF
Chloride	4.1	mg/L	3.0	SM 4500 Cl E	23 Oct 19 10:32	SS
Solids, Total Dissolved	567	mg/L	10	SM 2540 C-97	22 Oct 19 17:34	NB
Calcium	122.0	mg/L	0.500	SW6010C	23 Oct 19 15:28	KAM
Boron	< 0.1	mg/L	0.1	SW6010C	23 Oct 19 15:28	KAM
Fluoride	0.430 @	mg/L	0.020	EPA 300.0	31 Oct 19 18:21	RMV

* Holding Time Exceeded

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

INORGANIC AND METALS ANALYSES:
No problems were encountered with these analyses.

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
www.mvtl.com

MEMBER
ACIL

Quality Control Report

Lab IDs: 19-A53390 to 19-A53396 **Project:** HOOT LAKE CCR **Work Order:** 201931-0500

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Boron mg/L	1.000	97	85-115	1.00	19A53391q	0.119	1.080	96	75-125	1.080	1.120	100	3.6	10	96	90-110	< 0.1
	1.000	98	85-115	1.00	19A53468q	< 0.1	1.040	104	75-125	1.040	1.080	108	3.8	10	97	90-110	< 0.1
Calcium mg/L	50.00	106	85-115	50.0	19A53391q	105.0	155.0	100	75-125	155.0	158.0	106	1.9	10	101	90-110	< 0.5
	50.00	106	85-115	50.0	19A53468q	82.30	136.0	107	75-125	136.0	138.0	111	1.5	10	102	90-110	< 0.5
Chloride mg/L	-	-	-	60.0	19-A53396	4.1	66.6	104	86-117	66.6	67.7	106	1.6	5	101	90-110	< 3
Fluoride mg/L	-	-	-	1.00	19-A53379	0.430	1.38	95	80-120	1.38	1.35	92	2.2	10	102	90-110	< 0.02
	-	-	-	1.00	19-A53395	0.570	1.40	83	80-120	1.40	1.46	89	4.2	10	93	90-110	
pH units	-	-	-	-	-	-	-	-	-	6.8	6.8	-	0.0	2.5	101	90-110	-
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	500	499	-	0.2	10	102	85-115	< 10
	-	-	-	-	-	-	-	-	-	516	516	-	0.0	7	101	85-115	< 10
	-	-	-	-	-	-	-	-	-	1940	1950	-	0.5	7			
	-	-	-	-	-	-	-	-	-	2550	2540	-	0.4	7			
Sulfate mg/L	-	-	-	500	19-A53392*	< 50	555	111	68-132	555	548	110	1.3	5	104	80-120	< 5
	-	-	-	500	19-A53396	78.7	593	103	68-132	593	596	103	0.5	5	108	80-120	< 5
	-	-	-	50.0	19-A53988	< 5	55.5	111	68-132	55.5	57.0	114	2.7	5	102	80-120	< 5
	-	-	-	50.0	19-A53256	28.9	91.8	126	68-132	91.8	92.0	126	0.2	5			
	-	-	-	50.0	19-A54704	40.2	97.5	115	68-132	97.5	92.3	104	5.5	5			

Approved by: _____

Fall 2019

This is an exact copy of the original document
By AS Date 17Oct19
pages 1-10

Minnesota Valley Testing Laboratories

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

Field Service Chain of Custody Record

Project Name:	Otter Tail Power Co. Hoot Lake Plant	**Project Type:**	CCR	**Name of Samplers:**	Matt Stern & Ben Wolf
Report To:	Otter Tail Power Company	**Carbon Copy:**	Carlson McCain		
Attn:	Paul Vukonich	Attn:	Megan Lindstrom	Quote Number:	
Address:	P.O. Box 496	Address:		Work Order Number:	31-500
	Fergus Falls, MN 56038-0496			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
A53390	S2A		16Oct19	1246	GW			1		1	N								See Attatched
91	S3AR			1335	GW			1		1	N								
92	S51			1407	GW			1		1	N								
93	S52			1451	GW			1		1	N								
94	S10R			1224	GW			1		1	N								
95	S13			1248	GW			1		1	N								
96	S14R		"	1204	GW			1		1	N								

Comments: **CCR wells**

Samples Relinquished By:				Samples Received By:	A. Reuder
Date: 17Oct19	Time: 1330	Temp: 3.0 TM784		Date: 17Oct19	Time: 1330	Temp: 3.0C
Samples Relinquished into:	Fridge	Log in Cart	Other:			
Samples Relinquished By:				Samples Received By:		
Date:	Time:	Temp:		Date:	Time:	Temp:
Delivery:	Samplers	Other:		Seal Number(s) - If Used		
Transp	Ambient	Ice	Other:	Seals Intact?	Yes	No

Hoot Lake Site CCR Sampling - 2019

Site	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (gal/minute)	Goes Dry?
S2A	CCR 3	79.63	2	1273.776	Bladder	Yes	< 0.25	No
S3AR	CCR 3	78.42	2	1271.562	Bladder	Yes	< 0.25	No
S51	CCR 3	55.6	2	1286.904	Bladder	Yes	< 0.25	No
S52	CCR 3	88.3	2	1286.623	Bladder	Yes	< 0.25	No
S10R	CCR 3	57.00	2	1281.47	Bladder	Yes	< 0.25	No
S13	CCR 3	90.19	2	1296.423	Bladder	Yes	< 0.25	No
S14R	CCR 3	70.86	2	1280.61	Bladder	Yes	< 0.25	Yes

Note: CCR samples must be on their own COC.

Total Recoverable Metals! Groundwater samples shall not be field filtered prior to analysis.

Spring sampling March 27 - April 28

Fall sampling October 14 - November 14

CCR - Appendix III Detection Monitoring

Field Parameters

pH*

* Field and Laboratory Measurements

Total Concentration Parameters	**Method**
Boron	6010
Calcium	6010
Chloride	SM4500 CL E
Fluoride	EPA 300
pH	SM 4500 H+B-96
Sulfate	ASTM D516
Dissolved Solids, Total	SM 2540 C-97

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Site: Otter Tail Power Co./ Hoot Lake

Sampling Personnel: Ben Wolf

Facility ID: SW-211

Date: 16 oct 19

Unique Station ID: 444350

Sample ID: S-2A

Well Condition

Well Locked?	(Yes)	No	Protective Posts?	(Yes)	No
Well Labeled?	(Yes)	No	State ID Tag?	Yes	(No)
Casing Straight?	(Yes)	No	Grout Seal Intact?	(Yes)	No

Repairs Necessary:

Well Information

Well Depth:	79.62	Well Casing Elevation:	1273.776
Constructed Depth:	79.63	Static Water Elevation:	1197.77
Casing Diameter:	2"	Previous Static:	1197.96
Water Level Before Purge:	76.01	Water Level After Sample:	76.01
Well Volume:	.59 Gallons	Measurement Method:	(Elec. WL) Steel Tape

Sampling Information

Weather Conditions: Temp: 41 Wind: LLV 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:	1237 am / (pm)
Time Purged Dry?	—	Time of Sampling:	1246 am / (pm)
Duplicate Sample?	Yes (No) ID: —	Sample EH:	-21.9

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

Time 3	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1240	6.80	1048	8.82	1.20	0.0	.75	1	
1243	6.79	1063	8.80	.94	0.5	1.50	2	
1246	6.79	1068	8.79	.83	0.0	2.25	3	
							4	
							5	

Stabilized? (Yes) No Amount Water Removed: 2.25 Gallons

Comments:

Exceptions to Protocol: State & CCR

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: MS

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 16OCT19

Unique Station ID: 674671

Sample ID: S-3A-R

Well Condition

Well Locked?	(Yes)	No	Protective Posts?	(Yes)	No
Well Labeled?	(Yes)	No	State ID Tag?	(Yes)	No
Casing Straight?	(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:	
Casing Diameter:	2"	Previous Static:	1203.30
Water Level Before Purge:	68.34	Water Level After Sample:	
Well Volume:	1.64 Gallons	Measurement Method:	(Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 40 Wind: Low Sky: cloudy

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

Dedicated Equipment: (Yes) No

Well Purged Dry? Yes (No)

Time Purged Dry? —

Duplicate Sample? Yes (No) ID: —

Pumping Rate: 0.25 gpm

Time Pump Began: 1314 am / (pm)

Time of Sampling: 1335 am / (pm)

Sample EH: 34.7

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

(7) Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1321	6.80	726	8.85	1.22	2.9	1.75	1	
1328	6.84	726	8.90	1.66	3.9	3.5	2	
1335	6.80	726	8.91	1.52	3.0	5.25	3	
							4	
							5	

Stabilized? (Yes) No

Amount Water Removed: 5.25 Gallons

Comments:

Exceptions to Protocol:

Staff
E
CR

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: 10 Oct 19

Unique Station ID: 814830

Sample ID: S-51

Well Condition

Well Locked?	(Yes)	No	Protective Posts?	Yes	(No)
Well Labeled?	(Yes)	No	State ID Tag?	(Yes)	No
Casing Straight?	(Yes)	No	Grout Seal Intact?	(Yes)	No

Repairs Necessary:

Well Information

Well Depth:	55.60	Well Casing Elevation:	1286.9
Constructed Depth:	55.60	Static Water Elevation:	1236.31
Casing Diameter:	2"	Previous Static:	1235.87
Water Level Before Purge:	50.59	Water Level After Sample:	50.59
Well Volume:	.82 Gallons	Measurement Method:	(Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 41 Wind: LW 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:	1347 am / (pm)
Time Purged Dry?	—	Time of Sampling:	1407 am / (pm)
Duplicate Sample?	Yes (No) ID: —	Sample EH:	-97.2

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:
1351	7.41	802	8.50	2.05	72.5	1	1	
1355	7.13	827	8.44	.98	69.2	2	2	
1359	7.03	843	8.43	.80	56.4	3	3	
1403	7.01	845	8.43	.64	20.7	4	4	
1407	7.01	844	8.43	.59	13.4	5	5	

Stabilized? Yes (No) Amount Water Removed: 5 Gallons

Comments:

Exceptions to Protocol: State ID WR

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: 16 Oct 19

Unique Station ID:

Sample ID: S-52

Well Condition

Well Locked?	(Yes)	No	Protective Posts?	(Yes)	No
Well Labeled?	(Yes)	No	State ID Tag?	(Yes)	No
Casing Straight?	(Yes)	No	Grout Seal Intact?	(Yes)	No

Repairs Necessary:

Well Information

Well Depth:	88.30	Well Casing Elevation:	1286.62
Constructed Depth:	88.30	Static Water Elevation:	1215.67
Casing Diameter:	2"	Previous Static:	1215.74
Water Level Before Purge:	70.95	Water Level After Sample:	70.95
Well Volume:	2.83 Gallons	Measurement Method:	(Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 42 Wind: Lgt Sky: Cloudy

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

Dedicated Equipment: (Yes) No — Pumping Rate: 125 gpm

Well Purged Dry? Yes (No) — Time Pump Began: 1415 am / (pm)

Time Purged Dry? — — Time of Sampling: 1451 am / (pm)

Duplicate Sample? Yes (No) ID: — Sample EH: -117.3

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:
1427	6.91	903	8.48	.26	2.9	3	1	
1439	6.91	906	8.48	.25	1.9	6	2	
1451	6.94	906	8.48	.25	0.4	9	3	
							4	
							5	

Stabilized? (Yes) No — Amount Water Removed: 9 Gallons

Comments:

Exceptions to Protocol: State & CCR

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: MS

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 16OCT19

Unique Station ID: 806341

Sample ID: S-10R

Well Condition

Well Locked?	(Yes)	No	Protective Posts?	(Yes)	No
Well Labeled?	(Yes)	No	State ID Tag?	(Yes)	No
Casing Straight?	(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:	1208.77
Casing Diameter:	2"	Previous Static:	1211.37
Water Level Before Purge:	72.70	Water Level After Sample:	Below Pump
Well Volume:	1.29 Gallons	Measurement Method:	(Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 40 Wind: LOW 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: 1214 am / (pm)

Time Purged Dry? 1219

Time of Sampling: 1224 am / pm

Duplicate Sample? Yes (No) ID: —

Sample EH: 13.8

Sample Appearance: General: cloudy Color: tan Phase: Lt. sed. Odor: none

(5) Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1219	6.95	730	9.13	4.29	142.1	1.25	1	
1224	6.91	744	9.01	5.39	35.5	—	2	recharge
							3	
							4	
							5	

Stabilized? Yes (No)

Amount Water Removed: 1.25 Gallons

Comments:

Exceptions to Protocol:

Stop
@
CCR

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: MS

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 16OCT19

Unique Station ID: 632810

Sample ID: S-13

Well Condition

Well Locked?	(Yes)	No	Protective Posts?	(Yes)	No
Well Labeled?	(Yes)	No	State ID Tag?	(Yes)	No
Casing Straight?	(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:	1210.81
Water Level Before Purge:	85.60	Water Level After Sample:	85.71
Well Volume:	0.76 Gallons	Measurement Method:	(Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 40 Wind: LGU Sky: Cloudy

Sampling Method: Grundfos (Bladder SSA) Disp. Bailer Whale Grab Other:

Dedicated Equipment: (Yes) No — Pumping Rate: 0.25 gpm

Well Purged Dry? Yes (No) — Time Pump Began: 1236 am / (pm)

Time Purged Dry? — Time of Sampling: 1248 am / (pm)

Duplicate Sample? (Yes) No ID: Duplicate — Sample EH: -2.4

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

(H) Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1240	7.16	681	9.06	5.09	9.6	1	1	
1244	7.14	683	9.05	4.77	8.1	2	2	
1248	7.12	685	9.04	4.69	7.9	3	3	
							4	
							5	

Stabilized? (Yes) No — Amount Water Removed: 3 Gallons

Comments:

Exceptions to Protocol:

State
C
CCR

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: MS

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 160CT19

Unique Station ID: 806342

Sample ID: S-14R

Well Condition

Well Locked?	Yes	No	Protective Posts?	Yes	No
Well Labeled?	Yes	No	State ID Tag?	Yes	No
Casing Straight?	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: 1201.71

Casing Diameter: 2"

Previous Static: 1201.48

Water Level Before Purge: 78.90

Water Level After Sample: 79.03

Well Volume: 1.33 Gallons

Measurement Method: Elec. WL / Steel Tape

Sampling Information

Weather Conditions: Temp: 40 Wind: Calm 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: 1140 am / pm

Time Purged Dry? —

Time of Sampling: 1204 am / pm

Duplicate Sample? Yes / No ID: —

Sample EH: -34.6

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

Time (6)	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1146	6.91	809	9.13	4.15	60.2	1.5	1	
1152	6.79	786	8.82	2.25	16.1	3.0	2	
1158	6.75	775	8.78	2.32	13.2	4.5	3	
1204	6.73	773	8.78	2.15	15.7	6.0	4	
							5	

Stabilized? Yes / No

Amount Water Removed: 6.0 Gallons

Comments:

Had to use vaccum on control Box.

Exceptions to Protocol:

Steep

CCR

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

MEMBER ACIL

FINAL REPORT COMPLETION DATE: 31 Dec 19

Date Reported: 24 Dec 2019

JOSH HOLLEN
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 31-0622
Account #: 006106
PO #: 48679

Project Name: HOOT LAKE PLANT

30 Dec 19
Field Service Manager/Date Reviewed

27 Dec 19
Chemistry Lab Manager/Date Reviewed

27 Dec 2019
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.

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

CERTIFICATE of ANALYSIS - CCR

JOSH HOLLEN
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Project Name: HOOT LAKE PLANT

Sample Description: S-2A

Report Date: 24 Dec 2019
Lab Number: 19-A63827
Work Order #: 31-0622
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 16 Dec 2019 10:47
Sampled By: MVTL FIELD PERSONNEL
Date Received: 16 Dec 2019 15:34
PO #: 48679

Temp at Receipt: 4.1C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH, Field	6.62	units	1.00	SM4500-H+-2011	16 Dec 19 10:47	BMW
Fluoride	0.340 @ See Narrative	mg/L	0.020	EPA 300.0	20 Dec 19 10:10	RMV

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

CERTIFICATE of ANALYSIS - CCR

JOSH HOLLEN
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Project Name: HOOT LAKE PLANT

Sample Description: S-3A-R

Report Date: 24 Dec 2019
Lab Number: 19-A63828
Work Order #: 31-0622
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 16 Dec 2019 12:06
Sampled By: MVTL FIELD PERSONNEL
Date Received: 16 Dec 2019 15:34
PO #: 48679

Temp at Receipt: 4.1C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH, Field	7.16	units	1.00	SM4500-H+-2011	16 Dec 19 12:06	BMW
Chloride	11.3	mg/L	3.0	SM 4500 Cl E	18 Dec 19 8:19	SS

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

CERTIFICATE of ANALYSIS - CCR

JOSH HOLLEN
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Project Name: HOOT LAKE PLANT

Sample Description: S-13

Report Date: 24 Dec 2019
Lab Number: 19-A63829
Work Order #: 31-0622
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 16 Dec 2019 11:19
Sampled By: MVTL FIELD PERSONNEL
Date Received: 16 Dec 2019 15:34
PO #: 48679

Temp at Receipt: 4.1C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH, Field	7.30	units	1.00	SM4500-H+-2011	16 Dec 19 11:19	BMW
Fluoride	0.410 @ See Narrative	mg/L	0.020	EPA 300.0	20 Dec 19 10:10	RMV

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

INORGANIC & METALS ANALYSES:
Due to the high concentration of fluoride in the spiked sample, the recovery for the matrix spike duplicate was outside of acceptance range for samples 19-A63827 and 19-A63829. Data was reported based on the acceptable recovery of fluoride in the knowns and the relative percent difference between the matrix spikes.

No other problems were encountered with these analyses.

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
www.mvtl.com

MEMBER
ACIL

Quality Control Report

Lab IDs: 19-A63827 to 19-A63829 **Project:** HOOT LAKE PLANT **Work Order:** 201931-0622

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
Chloride mg/L	-	-	-	60.0	19-A63908	131	192	102	86-117	192	189	97	1.6	5	100	90-110	< 3
	-	-	-	60.0	19-A63382	3.2	61.3	97	85-115	61.3	62.8	99	2.4	5			
Fluoride mg/L	-	-	-	2.00	19-D4259	5.70	7.36	83	80-120	7.36	7.20	75	2.2	10	102	90-110	< 0.02
	-	-	-	0.40	19-A63049	1.19	1.58	97	80-120	1.58	1.59	100	0.6	10			

Approved by: _____

This is an exact copy of the original document
By AS Date 16 Dec 19
pages 1-5

Minnesota Valley Testing Laboratories

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

Field Service Chain of Custody Record

Project Name:	Otter Tail Power Co. Hoot Lake Plant	**Project Type:**	CCR	**Name of Samplers:**	Ben Wolf, Matt Stein
Report To:	Otter Tail Power Company	**Carbon Copy:**	Carlson McCain	Quote Number:	
Attn:	Paul Vukonich	Attn:	Megan Lindstrom	Work Order Number:	31-0622
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 500 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
A63827	S2A		16Dec19	1047	GW		X											See Attatched F
28	S3AR		"	1206	GW		X											CL
29	S-13		"	1114	GW		X											F.

Comments: **CCR wells**

Samples Relinquished By:				Samples Received By:	
Date: 16 DEC 19	Time: 1534	Temp: 4.1 TM784		Date: 16 Dec 19 Time: 1534	Temp: 4.1C
Samples Relinquished into:	Fridge	Log in Cart	Other:		
Samples Relinquished By:				Samples Received By:	
Date:	Time:	Temp:		Date: Time:	Temp:
Delivery:	Samplers	Other:		Seal Number(s) - If Used	
Transport:	Ambient	Ice	Other:	Seals Intact? Yes	No

Hoot Lake 3 wells 12/16/19

Jeff Hoffman

From: Hollen, Josh <jhollen@otpco.com>
Sent: Tuesday, November 26, 2019 2:51 PM
To: Jeff Hoffman
Subject: Hoot Lake - Additional Groundwater sampling needed

Jeff,

We just discussed this on the phone. We need to have 3 wells resampled at our Hoot Lake plant. This is CCR groundwater sampling. Let's get it scheduled.

CoC

Two wells need to be resampled for Fluoride, those wells are S-13 and S-2A.

One well needs to be resampled for Chloride, that well is S-3AR.

Let me know when it is scheduled, I will be there to meet the samplers. Also, let me know if you need anything else.

Thanks.

OTTER TAIL POWER COMPANY

Josh Hollen
Environmental Compliance Specialist
Environmental Services Dept.

Phone: (218) 739-8314

otpco.com

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Site: Ottertail Power Co./Hoot Lake

Sampling Personnel: Ben Groit, Matt Stein

Facility ID: SW-211

Date: 16 Dec 19

Unique Station ID: 444350

Sample ID: S-2A

Well Condition

Well Locked?	(Yes)	No	Protective Posts?	(Yes)	No
Well Labeled?	(Yes)	No	State ID Tag?	Yes	(No)
Casing Straight?	(Yes)	No	Grout Seal Intact?	(Yes)	No

Repairs Necessary:

Well Information

Well Depth:	79.62	Well Casing Elevation:	1273.776
Constructed Depth:	79.63	Static Water Elevation:	1198.43
Casing Diameter:	2"	Previous Static:	1197.77
Water Level Before Purge:	75.35	Water Level After Sample:	75.35
Well Volume:	.70 Gallons	Measurement Method:	(Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 12 Wind: LLV 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:	1038 (am) pm
Time Purged Dry?	—	Time of Sampling:	1047 (am) pm
Duplicate Sample?	Yes (No) ID: —	Sample EH:	-10.7

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:
1041	6.47	1078	7.99	11.61	0.0	.75	1	
1044	6.56	1080	7.83	11.56	0.0	1.50	2	
1047	6.62	1080	7.76	11.26	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

Site: Otertail Power Co. / Hoot Lake

Sampling Personnel: Ben Wolf, Matt Stelz

Facility ID:

Date: 16 Dec 14

Unique Station ID:

Sample ID: S-3A-R

Well Condition

Well Locked?	(Yes)	No	Protective Posts?	(Yes)	No
Well Labeled?	(Yes)	No	State ID Tag?	(Yes)	No
Casing Straight?	(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:	1203.37
Casing Diameter:	2"	Previous Static:	1203.22
Water Level Before Purge:	68.19	Water Level After Sample:	68.19
Well Volume:	1.67 Gallons	Measurement Method:	(Elec. W/L) Steel Tape

Sampling Information

Weather Conditions: Temp: 12 Wind: LGV 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: 1131 (am) / pm

Time Purged Dry? — Time of Sampling: 1206 am / (pm)

Duplicate Sample? Yes (No) ID: — Sample EH: -30.9

Sample Appearance: General: cloudy Color: Tan Phase: Light sed. Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1138	7.10	749	6.56	9.19	57.4	1.75	1	
1145	7.13	744	6.66	8.40	46.5	3.50	2	
1152	7.15	736	6.72	8.17	39.8	5.25	3	
1159	7.14	730	6.77	7.61	34.9	7.00	4	
1206	7.16	727	6.88	6.91	33.4	8.75	5	

Stabilized? Yes No Amount Water Removed: 8.75 Gallons

Comments:

* sample became cloudy during sampling

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Site: Ottertail Power Co./Hoot Lake

Sampling Personnel: Ben Wolf, Matt Stein

Facility ID: SW-211

Date: 11a Dec 19

Unique Station ID: 632810

Sample ID: S-13

Well Condition

Well Locked?	(Yes)	No	Protective Posts?	(Yes)	No
Well Labeled?	(Yes)	No	State ID Tag?	(Yes)	No
Casing Straight?	(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:	1211.23
Casing Diameter:	2"	Previous Static:	1210.82
Water Level Before Purge:	85.19	Water Level After Sample:	85.25
Well Volume:	.83 Gallons	Measurement Method:	(Elec. WL) Steel Tape

Sampling Information

Weather Conditions: Temp: 12 Wind: LGV 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: 1107 (am) / pm

Time Purged Dry? — — Time of Sampling: 1119 am / pm

Duplicate Sample? Yes (No) ID: — — Sample EH: 19.6

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:
1111	7.29	760	8.16	8.35	10.4	1	1	
1115	7.30	759	8.20	8.37	6.7	2	2	
1119	7.30	760	8.24	8.39	4.5	3	3	
							4	
							5	

Stabilized? (Yes) No — Amount Water Removed: 3 Gallons

Comments:

Exceptions to Protocol: