

2021 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 Rd
Fergus Falls, MN 56537

January 26, 2022



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1.0 EXECUTIVE SUMMARY

Groundwater monitoring at the Hoot Lake Plant Ash Landfill occurred in accordance with the detection monitoring requirements as described in §257.94 of the CCR Rule for the year 2021. Detection monitoring activities and statistical analysis were initially conducted in 2018 and have subsequently continued through 2021. Statistical analysis was performed on the 2021 groundwater data and a statistically significant increase in total dissolved solids concentration was observed at well S-3A-R during the spring event and confirmed during the summer and fall events. An alternate source demonstration was completed to demonstrate that statistically significant increase is the result of natural variability, so the landfill remains in detection monitoring. Two wells were unable to be sampled during the fall event due to low water levels. Detection monitoring will continue at the landfill during 2022.

2.0 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 2021 Groundwater Monitoring and Corrective Action Report (Report) on behalf of OTP to describe the monitoring activities and present results for the 2021 Landfill monitoring.

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

2.1 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 3.1
§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 3.2 and 3.3
§257.90(e)(4)	A discussion of any transition between monitoring programs.	Section 3.2
§257.90(e)(5)	Other information to be included in the annual report as specified in §§257.90 through 257.98.	Alternate Source Demonstration – Appendix B.
§257.90(e)(6)	A brief overview of the current status of groundwater monitoring and corrective action programs for the CCR Unit.	Section 1.0

3.0 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 2021. 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 2021. Statistical analysis includes determining whether parameter concentrations exhibit a statistically significant increase (SSI) over background values, as required by §257.93 (h).

3.1 Groundwater Monitoring System

An aerial map showing the Landfill and the monitoring wells that comprise the CCR groundwater monitoring system is included in the attached Figure 1. The CCR monitoring system consists of upgradient wells S-51 and S-52, and downgradient wells S-2A, S-3A-R, S-10R, S-13, and S-14-R. 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.

3.2 2021 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 May 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, 2017a), 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.
- A supplemental sampling event in June for the purpose of resampling select wells, as described in Section 3.3 of this Report.
- Groundwater sampling and laboratory analysis was conducted by Minnesota Valley Testing Laboratories, Inc. (MVTL) of New Ulm, Minnesota.

3.2.1 Groundwater Elevations and Flow

Groundwater elevations were measured at each well during the spring and fall 2021 sampling events. Reported groundwater elevations are included on the field sampling data sheets, which are included in the attached Appendix A, and are shown on groundwater elevation contour maps for the spring and fall 2021 events, which are presented in the attached Figures 2 and 3, respectively. Based on the contour maps, groundwater flow is generally to the north-northwest across the Landfill. The average horizontal gradient (vertical feet per horizontal foot) was approximately 0.016 during the spring event and approximately 0.018 during the fall event. Using these gradients with the groundwater

velocity equation presented in the Landfill's Groundwater Monitoring System Report (Barr, 2016) results in calculated average groundwater velocities of 152 feet per year for the spring event and 171 feet per year for the fall event.

3.2.2 Analytical Results

Analytical results for wells sampled during the spring and fall 2021 sampling events are summarized in the attached Table 1. Field sampling data sheets, which include dates of sampling, and laboratory analytical reports for each sampling event are included in the attached Appendix A.

3.2.3 Monitoring Programs

There were no transitions between monitoring programs in 2021. The Landfill remained in detection monitoring during each sampling event.

3.3 2021 Key Actions and Problems Summary

Key actions completed for the groundwater monitoring program in 2021 include the following:

- The first semi-annual detection monitoring event (i.e. the spring event) was conducted on May 4, 2021. Statistical analysis on the spring event groundwater monitoring dataset was completed in accordance with the site-specific Statistical Analysis Plan (Carlson McCain, 2017b) on the Landfill's publicly available CCR website. Results of the statistical analysis indicated potential statistically significant increases for calcium and chloride in monitoring well S-2A, and for TDS in monitoring well S-3A-R. Verification resampling was conducted on June 24, 2021, and results confirmed the SSI for TDS at well S-3A-R. The potential SSIs for calcium and chloride at well S-2A were not confirmed during resampling.
- In response to the verified SSI for TDS at well S-3A-R, an alternate source demonstration (ASD) was prepared within 90 days of detecting the SSI, pursuant to 40 CFR §257.94 (e)(2). The ASD, prepared by Carlson McCain and dated August 27, 2021, concludes that the SSI is due to natural variation in groundwater quality. Based on the completion of the ASD, the Landfill remained in detection monitoring following the detection of the SSI. A copy of the ASD is attached to this report as Appendix B.
- The second semi-annual detection monitoring event (i.e. the fall event) took place on October 5, 2021. Statistical analysis was performed on the fall event dataset in accordance with the site-specific Statistical Analysis Plan (Carlson McCain, 2017b). Results of the statistical analyses indicated a continued SSI for TDS at well S-3A-R. This SSI was already addressed by the 8/27/21 ASD and no new initial or confirmed exceedances of statistical limits were observed.

The following problems were encountered during the 2021 groundwater monitoring activities:

- During the spring event the bladder pump in S-2A did not work, so the sampling technician had to sample the well using a disposable bailer. The sample exhibited high turbidity, which likely resulted from sample agitation due to use of the bailer.
- During the June sampling event, the bladder pump in well S-2A had been repaired, but the well had insufficient volume to sample with a pump. The technician again used a bailer to sample the well. The sampling field sheet reports indicate that the sampling technician was very careful and did not hit the bottom of the well with the bailer, and that the sample was as “clean” (i.e. low turbidity) as he could get it.
- During the fall event no samples were collected from wells S-2A and S-13 due to insufficient water volume in the wells. Water levels in these wells were approximately two feet lower than those observed during October 2020 (Carlson McCain, 2021). The low water levels are attributed to drought conditions experienced throughout western Minnesota during 2021.

3.4 Projected Actions for 2022

No modifications to the groundwater monitoring program are scheduled for 2022. 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. If a bailer must be used to collect samples, the sampler should take care to minimize sample agitation.
- Perform statistical analysis on the 2022 semi-annual detection monitoring results to determine statistically significant increases, in accordance with the CCR Statistical Analysis Plan (Carlson McCain, 2017b).

4.0 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, 2017a. CCR Groundwater Sampling and Analysis Plan, Ash Landfill – Hoot Lake Plant; Prepared for Otter Tail Power Company, October 2017.

Carlson McCain, 2017b. Statistical Analysis Plan, Ash Landfill – Hoot Lake Plant; Prepared for Otter Tail Power Company, October 2017.

Carlson McCain, 2021. 2020 Groundwater Monitoring and Corrective Action Report. CCR Annual Monitoring Report, Hoot Lake Plant Ash Landfill; Prepared for Otter Tail Power Company, January 18, 2021.

Tables

Table 1
2021 Groundwater Analytical Data Summary
Hoot Lake - Ash Disposal Facility
Otter Tail Power Company

Spring Sampling Event										
Parameter	Units	S-2A	S-2A*	S-3AR	S-3AR*	S-51	S-52	S-10R	S-13	S-14R
		5/4/2021	6/24/2021	5/4/2021	6/24/2021	5/4/2021	5/4/2021	5/4/2021	5/4/2021	5/4/2021
Boron, total	mg/L	0.20	0.157	0.237	NS	0.264	<0.1	<0.1	<0.1	<0.1
Calcium, total	mg/L	257	171	121	NS	101	104	110	115	114
Chloride	mg/L	3.3	1.91	9.2	NS	17.5	11.2	11.2	8.6	3.5
Field pH	SU	6.9	6.9	6.92	NS	6.33	6.41	6.91	6.37	6.7
Fluoride	mg/L	0.2	0.22	0.19	NS	0.23	0.21	<0.1	0.22	0.22
pH, Lab	SU	7	7	6.9	NS	6.9	6.9	6.9	6.9	6.9
Total Dissolved Solids	mg/L	445	610	670	727	525	473	495	498	499
Sulfate	mg/L	94.6	143	169	NS	74.5	72	106	78.7	65.3

Fall Sampling Event								
Parameter	Units	S-2A	S-3AR	S-51	S-52	S-10R	S-13	S-14R
		10/5/2021	10/5/2021	10/5/2021	10/5/2021	10/5/2021	10/5/2021	10/5/2021
Boron, total	mg/L	Dry	0.233	0.176	< 0.1	< 0.1	Dry	< 0.1
Calcium, total	mg/L	Dry	120	97.1	98.6	109	Dry	102
Chloride	mg/L	Dry	9.5	15.5	14.9	11.3	Dry	3.4
Field pH	SU	Dry	7.12	6.48	6.65	7.03	Dry	7.12
Fluoride	mg/L	Dry	0.19	0.24	0.22	0.19	Dry	0.24
pH, Lab	SU	Dry	7.3	7.2	7.2	7.5	Dry	7.2
Total Dissolved Solids	mg/L	Dry	751	520	489	497	Dry	499
Sulfate	mg/L	Dry	237	85	82.9	121	Dry	88.1

* = Denotes a resample event

SU = Standard Units

NS Not sampled

Figures

Otter Tail River

S-2A

S-3AR

S-14R

S-13

S-10R

S-51

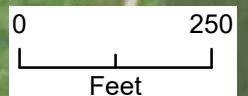
S-52



Monitoring Well



CCR Unit Cell Area



**CARLSON
McCAIN**

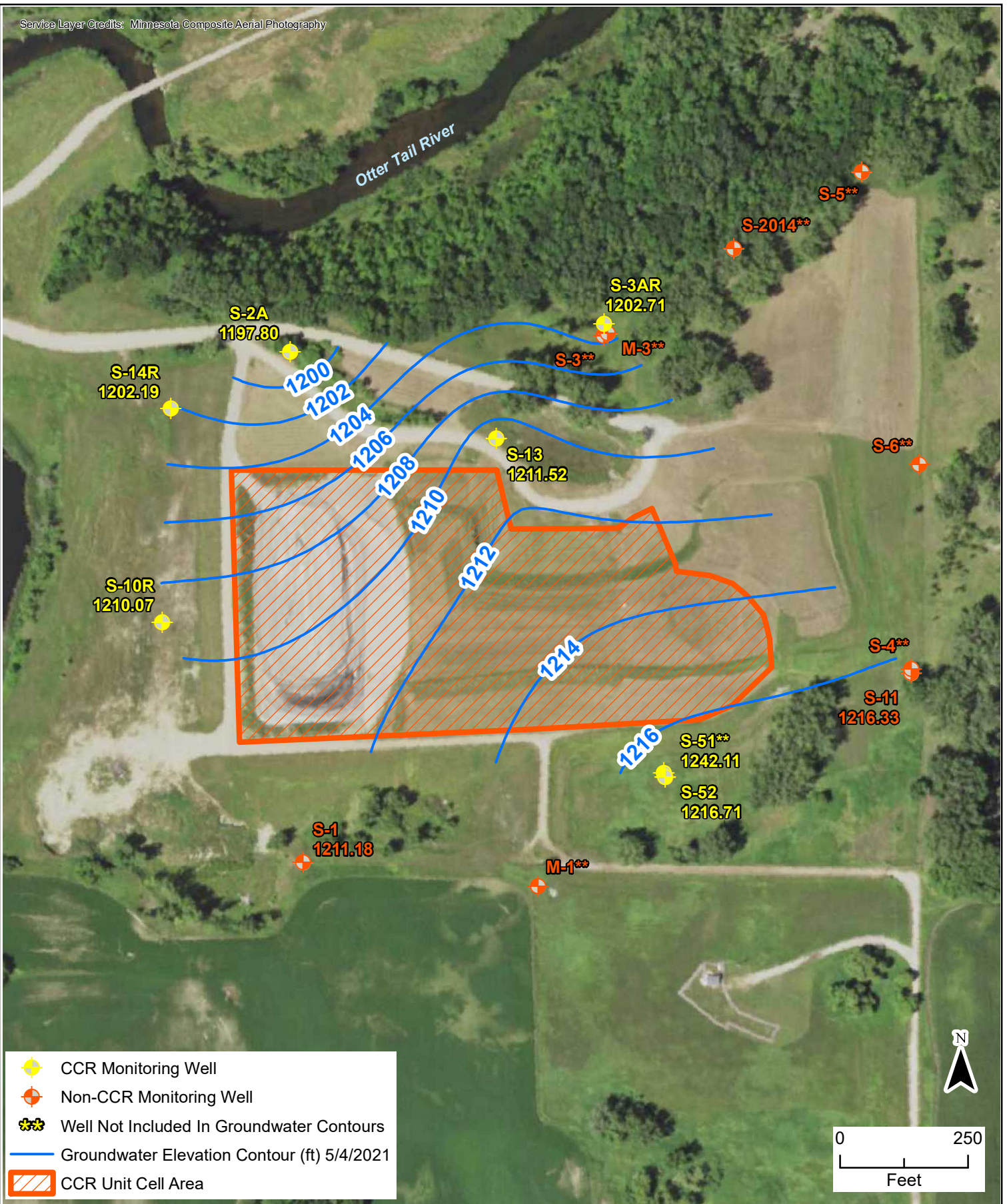
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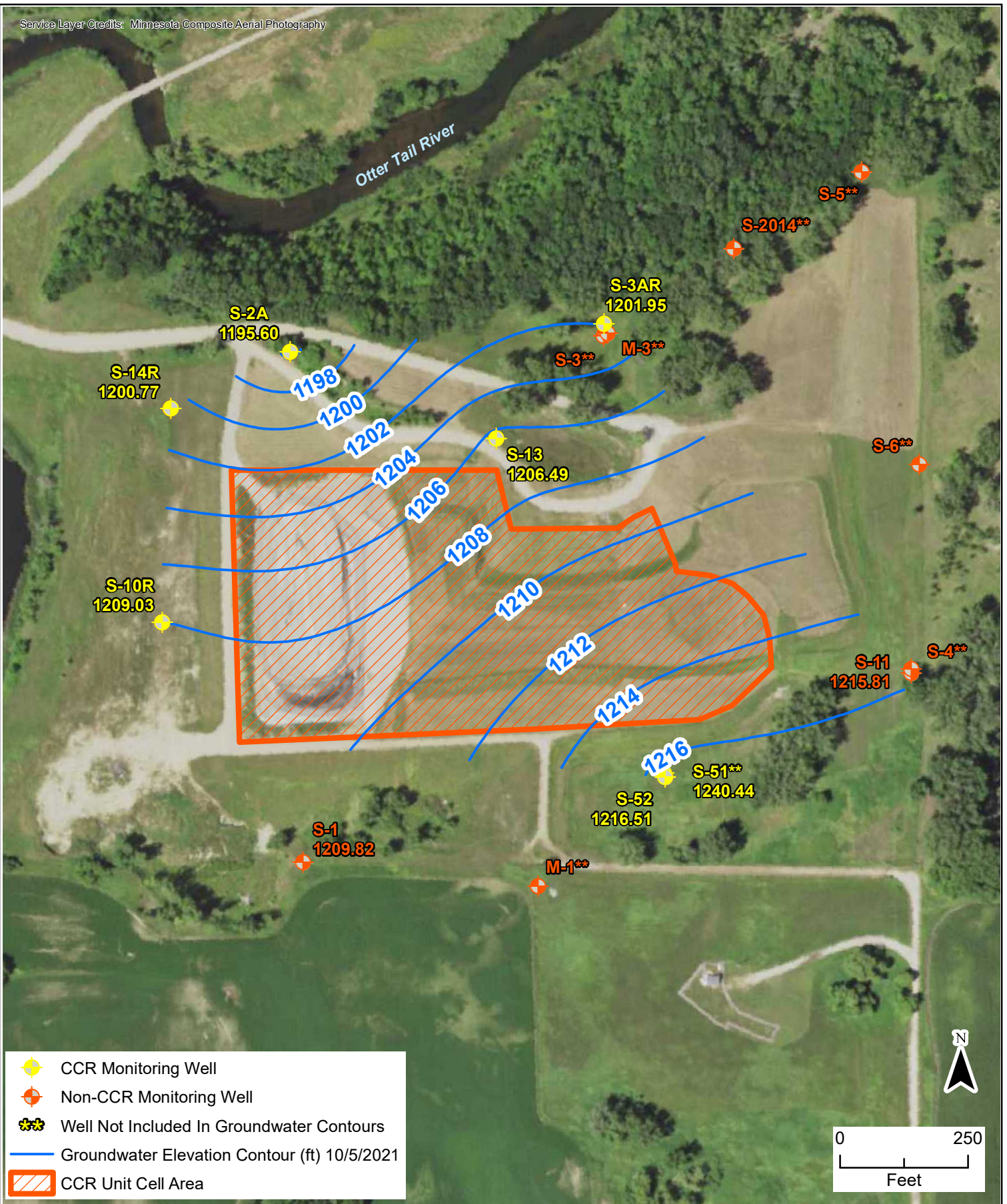
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Hoot Lake Ash Disposal Facility
Otter Tail Power Company
Fergus Falls, Minnesota

FIGURE 1

**CCR Unit Cell Area
and Monitoring Wells**





Appendix A

Laboratory Data



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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FINAL REPORT COMPLETION DATE: 21 May 21 AH

Date Reported: 19 May 2021

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

Work Order #: 31-0183
Account #: 006106
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Jeff Hoffman 20 May 21
Field Service Manager/Date Reviewed

[Signature] 19 May 21
Chemistry Lab Manager/Date Reviewed

[Signature] 19 May 21
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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JOSH HOLLEN
 OTTER TAIL POWER CO
 PO BOX 496
 FERGUS FALLS MN 56538-0496

Report Date: 19 May 2021
 Lab Number: 21-A20897
 Work Order #: 31-0183
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 4 May 2021 13:20
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 4 May 2021 18:35
 PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S2A

Temp at Receipt: 3.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions						
pH, Field	6.90	units	1.00	SM4500-H+-2011	7 May 21	JMS
pH	* 7.0	units	1.0	SM 4500 H+ B-2000	4 May 21 13:20	BMW
Sulfate	94.6	mg/L	5.0	ASTM D516-11	6 May 21 14:44	HO
Chloride	3.3	mg/L	3.0	SM 4500 Cl E	12 May 21 13:29	SS
Solids, Total Dissolved	445	mg/L	10	SM 2540 C-97	6 May 21 14:51	MDH
Calcium	257.0	mg/L	0.500	SW6010D	7 May 21 12:56	PJH
Boron	0.199	mg/L	0.100	SW6010D	10 May 21 13:16	KAM
Fluoride	0.200 @	mg/L	0.020	EPA 300.0	10 May 21 13:16	KAM
					14 May 21 21:21	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 ND WW/DW # R-040



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OTTER TAIL POWER CO
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FERGUS FALLS MN 56538-0496

Report Date: 19 May 2021
Lab Number: 21-A20898
Work Order #: 31-0183
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 4 May 2021 12:37
Sampled By: MVTL FIELD PERSONNEL
Date Received: 4 May 2021 18:35
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-3A-R

Temp at Receipt: 3.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					7 May 21	JMS
pH, Field	6.92	units	1.00	SM4500-H+-2011	4 May 21 12:37	MS
pH	* 6.9	units	1.0	SM 4500 H+ B-2000	6 May 21 14:44	HO
Sulfate	169 @	mg/L	5.0	ASTM D516-11	12 May 21 14:05	SS
Chloride	9.2	mg/L	3.0	SM 4500 Cl E	6 May 21 15:19	MDH
Solids, Total Dissolved	670	mg/L	10	SM 2540 C-97	7 May 21 12:56	PJH
Calcium	121.0	mg/L	0.500	SW6010D	10 May 21 13:16	KAM
Boron	0.237	mg/L	0.100	SW6010D	10 May 21 13:16	KAM
Fluoride	0.190 @	mg/L	0.020	EPA 300.0	14 May 21 21:21	RMV

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

Report Date: 19 May 2021
Lab Number: 21-A20899
Work Order #: 31-0183
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 4 May 2021 11:14
Sampled By: MVTL FIELD PERSONNEL
Date Received: 4 May 2021 18:35
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-51

Temp at Receipt: 3.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions						
pH, Field	6.33	units	1.00	SM4500-H+-2011	7 May 21	JMS
pH	* 6.9	units	1.0	SM 4500 H+ B-2000	4 May 21 11:14	BMW
Sulfate	74.5	mg/L	5.0	ASTM D516-11	6 May 21 14:44	HO
Chloride	17.5	mg/L	3.0	SM 4500 Cl E	12 May 21 14:05	SS
Solids, Total Dissolved	525	mg/L	10	SM 2540 C-97	6 May 21 15:19	MDH
Calcium	101.0	mg/L	0.500	SW6010D	7 May 21 12:56	PJH
Boron	0.264	mg/L	0.100	SW6010D	10 May 21 13:16	KAM
Fluoride	0.230 @	mg/L	0.020	EPA 300.0	10 May 21 13:16	KAM
					14 May 21 21:21	RMV

* Holding Time Exceeded

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

Report Date: 19 May 2021
Lab Number: 21-A20900
Work Order #: 31-0183
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 4 May 2021 11:53
Sampled By: MVTL FIELD PERSONNEL
Date Received: 4 May 2021 18:35
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-52

Temp at Receipt: 3.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					7 May 21	JMS
pH, Field	6.41	units	1.00	SM4500-H+-2011	4 May 21 11:53	BMW
pH	* 6.9	units	1.0	SM 4500 H+ B-2000	6 May 21 14:44	HO
Sulfate	72.0	mg/L	5.0	ASTM D516-11	12 May 21 14:05	SS
Chloride	11.2	mg/L	3.0	SM 4500 Cl E	6 May 21 15:19	MDH
Solids, Total Dissolved	473	mg/L	10	SM 2540 C-97	7 May 21 12:56	PJH
Calcium	104.0	mg/L	0.500	SW6010D	10 May 21 13:16	KAM
Boron	< 0.1	mg/L	0.1	SW6010D	10 May 21 13:16	KAM
Fluoride	0.210 @	mg/L	0.020	EPA 300.0	14 May 21 2:50	RMV

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

Report Date: 19 May 2021
Lab Number: 21-A20901
Work Order #: 31-0183
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 4 May 2021 11:56
Sampled By: MVTL FIELD PERSONNEL
Date Received: 4 May 2021 18:35
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-10R

Temp at Receipt: 3.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions						
pH, Field	6.91	units	1.00	SM4500-H+-2011	7 May 21	JMS
pH	* 6.9	units	1.0	SM 4500 H+ B-2000	4 May 21 11:56	MS
Sulfate	106	mg/L	5.0	ASTM D516-11	6 May 21 14:44	HO
Chloride	11.0	mg/L	3.0	SM 4500 Cl E	12 May 21 14:05	SS
Solids, Total Dissolved	495	mg/L	10	SM 2540 C-97	6 May 21 15:19	MDH
Calcium	110.0	mg/L	0.500	SW6010D	7 May 21 12:56	PJH
Boron	< 0.1	mg/L	0.1	SW6010D	10 May 21 13:16	KAM
Fluoride	< 0.1 @	mg/L	0.02	EPA 300.0	10 May 21 13:16	KAM
					14 May 21 2:50	RMV

* Holding Time Exceeded

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! = Due to sample quantity

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 ND WW/DW # R-040



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

Report Date: 19 May 2021
Lab Number: 21-A20902
Work Order #: 31-0183
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 4 May 2021 10:42
Sampled By: MVTL FIELD PERSONNEL
Date Received: 4 May 2021 18:35
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-13

Temp at Receipt: 3.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					7 May 21	JMS
pH, Field	6.37	units	1.00	SM4500-H+-2011	4 May 21 10:42	MS
pH	* 6.9	units	1.0	SM 4500 H+ B-2000	6 May 21 14:44	HO
Sulfate	78.7	mg/L	5.0	ASTM D516-11	12 May 21 14:05	SS
Chloride	8.6	mg/L	3.0	SM 4500 Cl E	6 May 21 15:19	MDH
Solids, Total Dissolved	498	mg/L	10	SM 2540 C-97	7 May 21 12:56	PJH
Calcium	115.0	mg/L	0.500	SW6010D	10 May 21 13:16	KAM
Boron	< 0.1	mg/L	0.1	SW6010D	10 May 21 13:16	KAM
Fluoride	0.220 @	mg/L	0.020	EPA 300.0	14 May 21 2:50	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 sample quantity

= Due to concentration of other analytes

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 ND WW/DW # R-040



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

Report Date: 19 May 2021
 Lab Number: 21-A20903
 Work Order #: 31-0183
 Account #: 006106
 Sample Matrix: GROUNDWATER
 Date Sampled: 4 May 2021 11:18
 Sampled By: MVTL FIELD PERSONNEL
 Date Received: 4 May 2021 18:35
 PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-14R

Temp at Receipt: 3.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions						
pH, Field	6.70	units	1.00	SM4500-H+-2011	7 May 21	JMS
pH	* 6.9	units	1.0	SM 4500 H+ B-2000	4 May 21 11:18	MS
Sulfate	65.3	mg/L	5.0	ASTM D516-11	6 May 21 14:44	HO
Chloride	3.5	mg/L	3.0	SM 4500 Cl E	12 May 21 14:05	SS
Solids, Total Dissolved	499	mg/L	10	SM 2540 C-97	6 May 21 15:19	MDH
Calcium	114.0	mg/L	0.500	SW6010D	7 May 21 12:56	PJH
Boron	< 0.1	mg/L	0.1	SW6010D	10 May 21 13:16	KAM
Fluoride	0.220 @	mg/L	0.020	EPA 300.0	10 May 21 13:16	KAM
					14 May 21 2:50	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 ND WW/DW # R-040



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Date Reported: 19 May 2021

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

Work Order #: 202131-0183
Account Number: 006106
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

LABORATORY NARRATIVE

INORGANIC & METALS ANALYSES:
No problems were encountered.

MVTL**MINNESOTA VALLEY TESTING LABORATORIES, INC.**

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MEMBER
ACIL

Page: 1 of 1


Quality Control Report

Lab IDs: 21-A20897 to 21-A20903

Project: HOOT LAKE PLANT CCR

Work Order: 202131-0183

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	96	85-115	1.00	21A20292q	0.224	1.280	106	75-125	1.280	1.280	106	0.0	10	100	90-110	< 0.1
Calcium mg/L	50.00	97	85-115	50.0	21A20292q	60.40	108.0	95	75-125	108.0	107.0	93	0.9	10	104	90-110	< 0.5
Chloride mg/L	-	-	-	60.0	21-A20892	< 3	62.9	105	86-117	62.9	62.7	104	0.3	5	92	90-110	< 3
	-	-	-	60.0	21-A20894	8.8	71.3	104	86-117	71.3	71.6	105	0.4	5	92	90-110	< 3
Fluoride mg/L	-	-	-	1.00	21-A20898	0.190	1.17	98	75-125	1.17	1.18	99	0.9	10	100	90-110	< 0.02
	-	-	-	1.00	21-A20902	0.220	1.20	98	75-125	1.20	1.22	100	1.7	10	100	90-110	-
pH units	-	-	-	-	-	-	-	-	-	6.9	7.0	-	1.4	2.5	101	90-110	-
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	1670	1670	-	0.0	7	102	85-115	< 10
	-	-	-	-	-	-	-	-	-	1520	1520	-	0.0	7	-	-	-
Sulfate mg/L	-	-	-	50.0	21-A20892	< 5	53.7	107	68-132	53.7	53.0	106	1.3	5	98	80-120	< 5
	-	-	-	50.0	21-A21145	74.5	134	119	68-132	134	136	123	1.5	5	98	80-120	< 5

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 MS Date 4 May 21
pages 1-8

Project Name: Otter Tail Power Co. Hoot Lake Plant	Project Type: CCR	Name of Samplers: MS BW
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: Carlson McCain Attn: Megan Lindstrom Address:	Quote Number: Work Order Number: 31-0183 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
A20897	S2A		4 May 21	1320	GW			1		1	N								See Attached
98	S3AR		}	1237	GW			1		1	N								
99	S51			1114	GW			1		1	N								
A20900	S52			1153	GW			1		1	N								
01	S10R			1056	GW			1		1	N								
02	S13			1042	GW			1		1	N								
03	S14R			1118	GW			1		1	N								

Comments: CCR wells

Samples Relinquished By: <u>[Signature]</u>				Samples Received By: <u>A. Aedin</u>			
Date: <u>4 May 21</u>		Time: <u>1835</u>		Date: <u>4 May 21</u>		Time: <u>1835</u>	
Temp: <u>3.3M785</u>		Temp: <u>3.3C</u>					
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> <u>Ice</u> Other:				Seals Intact? Yes No			

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: 4 May 21

Unique Station ID: 444350

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: 79.62

Constructed Depth: 79.63

Casing Diameter: 2"

Water Level Before Purge: 75.98

Well Volume: .59 Gallons

Well Casing Elevation: 1273.776

Static Water Elevation: 1197.80

Previous Static: 1197.66

Water Level After Sample: 75.98

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

Sampling Information

Weather Conditions: Temp: 54 Wind: NO/10 Sky: Fair

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

Dedicated Equipment: ☒ Yes ☐ No

Pumping Rate: .25 gpm

Well Purged Dry? Yes ☒ No ☐

Time Pump Began: 1311 am / pm

Time Purged Dry? —

Time of Sampling: 1320 am / pm

Duplicate Sample? Yes ☒ No ☐ ID: —

Sample EH: -87.8

Sample Appearance: General: cloudy Color: Brown Phase: Heavy Sed Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1314	6.98	977	9.82	5.10	137.6	.75	1	
1317	6.91	972	9.99	4.87	134.7	1.5	2	
1320	6.90	970	10.05	4.79	132.9	2.25	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 2.25 Gallons

Comments:

*Bladder was not working so I had to bail it.

Exceptions to Protocol:

↳ very dirty sample

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: 4 May 21

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: 68.85

Well Volume: 1.55 Gallons

Well Casing Elevation: 1271.562

Static Water Elevation: 1202.71

Previous Static: 1203.49

Water Level After Sample: 69.19

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 49 Wind: 11-15 Sky: Fair

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: 1216 am / pm

Time Purged Dry?

Time of Sampling: 1237 am / pm

Duplicate Sample? Yes ☒ No ID: —

Sample EH: ~101.6

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1223	6.92	927	9.00	8.97	2.8	1.75	1	
1230	6.92	927	8.96	8.97	3.0	3.5	2	
1237	6.92	928	8.95	8.97	3.0	5.25	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 5.25 Gallons

Comments:

Exceptions to Protocol:

+CCR

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

BW

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date:

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: 44.79
Well Volume: 1.76 Gallons

Well Casing Elevation: 1286.904
Static Water Elevation: 1242.11
Previous Static: 1236.19
Water Level After Sample: 44.79
Measurement Method: ☒ Elec. W/L ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 50 Wind: N010 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: —
Sample Appearance: General: Clear Color: None Phase: None Odor: Sulfur

Pumping Rate: 125 gpm
Time Pump Began: 1050 am
Time of Sampling: 1114 am
Sample EH: -132.7

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1058	6.27	1039	8.56	.19	7.6	2	1	
1106	6.31	1039	8.57	.18	5.8	4	2	
1114	6.33	1039	8.59	.19	6.5	6	3	
							4	
							5	

Stabilized? ☒ Yes No

Amount Water Removed: 6 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 4 May 21

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: 88.30

Casing Diameter: 2"

Water Level Before Purge: 69.91

Well Volume: 3.00 Gallons

Well Casing Elevation: 1286.623

Static Water Elevation: 1216.71

Previous Static: 1215.40

Water Level After Sample: 69.91

Measurement Method: Elec. W/L Steel Tape

Sampling Information

Weather Conditions: Temp: 51 Wind: N@10 Sky: Fair

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

Dedicated Equipment: Yes No

Pumping Rate: 26 gpm

Well Purged Dry? Yes No

Time Pump Began: 1117 am / pm

Time Purged Dry?

Time of Sampling: 1153 am / pm

Duplicate Sample? Yes No

ID: Duplicate

Sample EH: -140.2

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1129</u>	<u>6.38</u>	<u>930</u>	<u>8.60</u>	<u>.23</u>	<u>2.5</u>	<u>3</u>	<u>1</u>	
<u>1141</u>	<u>6.40</u>	<u>930</u>	<u>8.59</u>	<u>.24</u>	<u>0.0</u>	<u>6</u>	<u>2</u>	
<u>1153</u>	<u>6.41</u>	<u>929</u>	<u>8.61</u>	<u>.26</u>	<u>0.0</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:

ms

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 4 May 21

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: 57.00
Casing Diameter: 2"
Water Level Before Purge: 71.40
Well Volume: 1.50 Gallons

Well Casing Elevation: 1281.47
Static Water Elevation: 1210.07
Previous Static: 1209.75
Water Level After Sample: Below Pump
Measurement Method: ☒ Elec. WLL ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 46 Wind: N-W Sky: Part
Sampling Method: Grundfos ☒ Bladder SS/T ☐ Disp. Bailer ☐ Whale ☐ Grab ☐ Other:
Dedicated Equipment: ☒ Yes ☐ No
Well Purged Dry? Yes ☒ No
Time Purged Dry:
Duplicate Sample? Yes ☒ No ID:
Sample Appearance: General: Sl. cloudy Color: tan Phase: Lt. so d Odor: none
Pumping Rate: 0.25 gpm
Time Pump Began: 11:38 am / pm
Time of Sampling: 11:56 am / pm
Sample EH: 47.1

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1144	6.86	777	9.41	9.21	31.5	1.50	1	
1150	6.86	770	9.30	9.19	29.5	3.00	2	
1156	6.91	771	9.20	9.15	28.1	4.50	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 4.50 Gallons

Comments:

Exceptions to Protocol:

Heck

EB @ 1200
pH: 7.63
Cond: 38
Temp: 15.92
DO: 9.69
Temp:
Turb: 3.1
EH: 55.1

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: 4 May 21

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: 84.90
Well Volume: 0.83 Gallons

Well Casing Elevation: 1296.423
Static Water Elevation: 1211.52
Previous Static: 1208.34
Water Level After Sample: Below Pump
Measurement Method: ☒ Elec. WL ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 45 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: —
Sample Appearance: General: sl. cloudy Color: tan Phase: Lt & Rd Odor: none
Pumping Rate: .25 gpm
Time Pump Began: 1030 am / pm
Time of Sampling: 1042 am / pm
Sample EH: 149.0

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1034	6.29	736	11.37	5.51	26.1	1	1	
1038	6.31	740	11.13	6.00	25.0	2	2	
1042	6.37	751	10.95	5.48	21.8	3	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 3 Gallons

Comments:

HEER

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: 4 May 21

Unique Station ID: 806342

Sample ID: S-14R

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: 87.11

Constructed Depth: 70.86

Casing Diameter: 2"

Water Level Before Purge: 78.42

Well Volume: 1.41 Gallons

Well Casing Elevation: 1280.61

Static Water Elevation: 1202.19

Previous Static: 1201.97

Water Level After Sample: 79.90

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 45 Wind: N-11 Sky: Part

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: 25 gpm

Time Pump Began: 1100 (am) / pm

Time of Sampling: 1118 am / pm

Sample EH: 26.5

Sample Appearance: General: clear Color: none Phase: 1750d Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1106	6.79	824	9.07	10.22	44.3	1.50	1	
1112	6.66	820	9.01	10.11	37.1	3	2	
1118	6.70	816	8.95	10.09	25.8	4.5	3	✓
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 4.5 Gallons

Comments:

Exceptions to Protocol:

HECK



MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890.
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FINAL REPORT COMPLETION DATE: 8 July 21

Date Reported: 8 Jul 2021

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

Work Order #: 31-0281
Account #: 006106
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Jeff Koff 8 July 21
Field Service Manager/Date Reviewed
Al Hall 08 July 21
Chemistry Lab Manager/Date Reviewed
Michelle Fu 08 July 21
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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JOSH HOLLEN
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 8 Jul 2021
Lab Number: 21-A30823
Work Order #: 31-0281
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 24 Jun 2021 12:00
Sampled By: MVTL FIELD PERSONNEL
Date Received: 24 Jun 2021 15:00
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S2A

Temp at Receipt: 1.7C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions					25 Jun 21	JMS
pH, Field	6.90	units	1.00	SM4500-H+-2011	24 Jun 21 12:00	BMW
pH	* 7.0	units	1.0	SM 4500 H+ B-2000	24 Jun 21 16:39	HB
Solids, Total Dissolved	610	mg/L	10	SM 2540 C-97	25 Jun 21 14:35	HB
Calcium	171.0	mg/L	0.500	SW6010D	29 Jun 21 10:55	KAM
Boron	0.157	mg/L	0.100	SW6010D	29 Jun 21 10:55	KAM
Fluoride	0.220 @	mg/L	0.020	EPA 300.0	28 Jun 21 9:14	RMV
Sulfate	143 ~	mg/L	0.150	EPA 300.0	28 Jun 21 9:14	RMV
Chloride	1.91 ~	mg/L	0.030	EPA 300.0	28 Jun 21 9:14	RMV

* Holding Time Exceeded

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

RL = Reporting Limit

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

@ = Due to sample matrix

! = Due to sample quantity

= Due to concentration of other analytes

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 ND WW/DW # R-040



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

Report Date: 8 Jul 2021
Lab Number: 21-A30824
Work Order #: 31-0281
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 24 Jun 2021 11:42
Sampled By: MVTL FIELD PERSONNEL
Date Received: 24 Jun 2021 15:00
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S3AR

Temp at Receipt: 1.7C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Solids, Total Dissolved	727	mg/L	10	SM 2540 C-97	25 Jun 21 14:35	HB

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 ND WW/DW # R-040

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Date Reported: 8 Jul 2021

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

Work Order #: 202131-0281
Account Number: 006106
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

LABORATORY NARRATIVE

INORGANIC & METALS ANALYSES:
No problems were encountered.

MVTL**MINNESOTA VALLEY TESTING LABORATORIES, INC.**

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MEMBER
ACIL

Page: 1 of 1

Quality Control Report

Lab IDs: 21-A30823 to 21-A30824

Project: HOOT LAKE PLANT CCR

Work Order: 202131-0281

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	96	85-115	1.00	21A30570q	< 0.1	0.979	98	75-125	0.979	1.020	102	4.1	10	99	90-110	< 0.1
Calcium mg/L	50.00	108	85-115	50.0	21A30570q	< 0.5	52.90	106	75-125	52.90	54.40	109	2.8	10	104	90-110	< 0.5
Chloride mg/L				30.0	a30844qc	32.2	61.5	98		61.5	61.7	98	0.3		101		< 0.03
Fluoride mg/L				1.00	a30844qc	0.250	1.27	102	75-125	1.27	1.26	101	0.8	10	101	90-110	< 0.02
pH units	-	-	-	-	-	-	-	-	-			-			101	90-110	-
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	< 10 727	< 10 741	-	0.0 1.9	* 7	101	85-115	< 10
Sulfate mg/L				150	a30844qc	102	256	103	50-145	256	256	103	0.0	5	103	80-120	< 0.15

* Due to result < 15 mg/L, data reported based on acceptance criteria of an Absolute Difference of +/- 5 mg/L.

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: 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: Carlson McCain Attn: Megan Lindstrom Address:	Quote Number: Work Order Number: 31-0281 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 None	Other: 150 H2SO4	Other 150 None	Analysis Required
A30823	S2A		24 Jun 21	1200	GW		1		1	N					X				CCR 3(See Attached)
24	S3AR		I	1142	GW		1												TDS
				</															

Comments: CCR wells

A Rush Analysis, from Josh at OTP

Samples Relinquished By: Ben Wolf				Samples Received By: A. Huidu			
Date: 24 Jun 21		Time: 1500		Date: 24 Jun 21		Time: 1500	
Temp: 1.7 °C		Temp: 1.7 °C		Temp: 1.7 °C		Temp: 1.7 °C	
Samples Relinquished into: Fridge Log in Cart Other:				Samples Received By:			
Date:				Date:			
Time:				Time:			
Temp:				Temp:			
Delivery: Samplers Other:				Seal Number(s) - If Used			
Transport: Ambient Ice Other:				Seals Intact? Yes No			

3

CCR - Appendix III Detection Monitoring

Field Parameters

pH*

* Field and Laboratory Measurements

Total Concentration Parameters

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: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 24 Jun 21

Unique Station ID: 444350

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: 79.62

Well Casing Elevation: 1273.776

Constructed Depth: 79.63

Static Water Elevation: 1196.47

Casing Diameter: 2"

Previous Static: 1197.66

Water Level Before Purge: 77.31

Water Level After Sample: 77.31

Well Volume: 38 Gallons

Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 76 Wind: LEV Sky: Fair

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

Dedicated Equipment: Yes ☐ No ☒

Pumping Rate: — gpm

Well Purged Dry? Yes ☐ No ☒

Time Pump Began: 1153 am / pm

Time Purged Dry? 1155

Time of Sampling: 1200 am / pm

Duplicate Sample? Yes ☐ No ☒ ID: —

Sample EH: 22.4

Sample Appearance: General: cloudy Color: gray Phase: Light sed Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1155</u>	<u>6.95</u>	<u>975</u>	<u>10.95</u>	<u>3.79</u>	<u>138.3</u>	<u>.66</u>	<u>1</u>	
							<u>2</u>	
							<u>3</u>	
<u>1200</u>	<u>6.90</u>	<u>987</u>	<u>9.49</u>	<u>3.39</u>	<u>111.3</u>	<u>—</u>	<u>4</u>	<u>Recharge</u>
							<u>5</u>	

Stabilized? Yes ☐ No ☒

Amount Water Removed: .66 Gallons

Comments:

Exceptions to Protocol:

* Not enough volume to purge with a whale pump.
Used bailer. Did not hit bottom with bailer so sample was as clean as it can get

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: 24 June 21

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: 1202.25

Casing Diameter: 2"

Previous Static: 1203.49

Water Level Before Purge: 64.31

Water Level After Sample:

Well Volume: 1.48 Gallons

Measurement Method: Elec. WLI Steel Tape

Sampling Information

Weather Conditions: Temp: 76 Wind: WN Sky: Fair

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

Dedicated Equipment: Yes No

Pumping Rate: 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: -91.6

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>1130</u>	<u>7.24</u>	<u>854</u>	<u>12.85</u>	<u>2.34</u>	<u>0.0</u>	<u>1.5</u>	<u>1</u>	
<u>1136</u>	<u>7.12</u>	<u>1091</u>	<u>12.71</u>	<u>2.22</u>	<u>0.0</u>	<u>3.0</u>	<u>2</u>	
<u>1142</u>	<u>7.18</u>	<u>1092</u>	<u>12.95</u>	<u>1.96</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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FINAL REPORT COMPLETION DATE: 29 Oct 21 AK

Date Reported: 27 Oct 2021

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

Work Order #: 31-0431
Account #: 006106
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

JH Hollen 29 Oct 21
Field Service Manager/Date Reviewed

[Signature] 27 Oct 21
Chemistry Lab Manager/Date Reviewed

[Signature] 28 Oct 21
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.

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

Report Date: 27 Oct 2021
Lab Number: 21-A50931
Work Order #: 31-0431
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 5 Oct 2021 13:23
Sampled By: MVTL FIELD PERSONNEL
Date Received: 6 Oct 2021 12:20
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-3A-R

Temp at Receipt: 3.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions						
pH, Field	7.12	units	1.00	SM4500-H+-2011	8 Oct 21	KAM
pH	* 7.3	units	1.0	SM 4500 H+ B-2000	5 Oct 21 13:23	DS
Sulfate	237	mg/L	5.0	ASTM D516-11	7 Oct 21 12:27	XC
Chloride	9.5	mg/L	3.0	SM 4500 Cl E	7 Oct 21 13:34	SS
Solids, Total Dissolved	751	mg/L	10	SM 2540 C-97	14 Oct 21 8:16	SS
Calcium	120.0	mg/L	0.500	SW6010D	8 Oct 21 11:38	PJH
Boron	0.233	mg/L	0.100	SW6010D	12 Oct 21 18:18	KAM
Fluoride	0.190 @	mg/L	0.020	EPA 300.0	12 Oct 21 18:18	KAM
					8 Oct 21 15:24	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 ND WW/DW # R-040



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

Report Date: 27 Oct 2021
Lab Number: 21-A50932
Work Order #: 31-0431
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 5 Oct 2021 12:34
Sampled By: MVTL FIELD PERSONNEL
Date Received: 6 Oct 2021 12:20
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-51

Temp at Receipt: 3.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions						
pH, Field	6.48	units	1.00	SM4500-H+-2011	8 Oct 21	KAM
pH	* 7.2	units	1.0	SM 4500 H+ B-2000	5 Oct 21 12:34	BMW
Sulfate	85.0	mg/L	5.0	ASTM D516-11	7 Oct 21 12:27	XC
Chloride	15.5	mg/L	3.0	SM 4500 Cl E	7 Oct 21 13:34	SS
Solids, Total Dissolved	520	mg/L	10	SM 2540 C-97	14 Oct 21 8:16	SS
Calcium	97.10	mg/L	0.500	SW6010D	8 Oct 21 11:38	PJH
Boron	0.176	mg/L	0.100	SW6010D	12 Oct 21 18:18	KAM
Fluoride	0.240 @	mg/L	0.020	EPA 300.0	12 Oct 21 18:18	KAM
					8 Oct 21 15:24	RMV

* Holding Time Exceeded

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@ = 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 ND WW/DW # R-040



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

Report Date: 27 Oct 2021
Lab Number: 21-A50933
Work Order #: 31-0431
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 5 Oct 2021 13:14
Sampled By: MVTL FIELD PERSONNEL
Date Received: 6 Oct 2021 12:20
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-52

Temp at Receipt: 3.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions						
pH, Field	6.65	units	1.00	SM4500-H+-2011	8 Oct 21	KAM
pH	* 7.2	units	1.0	SM 4500 H+ B-2000	5 Oct 21 13:14	BMW
Sulfate	82.9	mg/L	5.0	ASTM D516-11	7 Oct 21 12:27	XC
Chloride	14.9	mg/L	3.0	SM 4500 Cl E	7 Oct 21 13:34	SS
Solids, Total Dissolved	489	mg/L	10	SM 2540 C-97	14 Oct 21 8:16	SS
Calcium	98.60	mg/L	0.500	SW6010D	8 Oct 21 11:38	PJH
Boron	< 0.1	mg/L	0.1	SW6010D	12 Oct 21 18:18	KAM
Fluoride	0.220 @	mg/L	0.020	EPA 300.0	12 Oct 21 18:18	KAM
					8 Oct 21 15:24	RMV

* Holding Time Exceeded

RL = Reporting Limit

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= Due to concentration of other analytes

! = Due to sample quantity

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CERTIFICATION: MN LAB # 027-015-125 ND WW/DW # R-040



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

Report Date: 27 Oct 2021
Lab Number: 21-A50934
Work Order #: 31-0431
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 5 Oct 2021 11:42
Sampled By: MVTL FIELD PERSONNEL
Date Received: 6 Oct 2021 12:20
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-10R

Temp at Receipt: 3.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions						
pH, Field	7.03	units	1.00	SM4500-H+-2011	8 Oct 21	KAM
pH	* 7.5	units	1.0	SM 4500 H+ B-2000	5 Oct 21 11:42	DS
Sulfate	121	mg/L	5.0	ASTM D516-11	7 Oct 21 12:47	XC
Chloride	11.3	mg/L	3.0	SM 4500 Cl E	7 Oct 21 13:34	SS
Solids, Total Dissolved	497	mg/L	10	SM 2540 C-97	14 Oct 21 8:16	SS
Calcium	109.0	mg/L	0.500	SW6010D	8 Oct 21 11:38	PJH
Boron	< 0.1	mg/L	0.1	SW6010D	12 Oct 21 18:18	KAM
Fluoride	0.190 @	mg/L	0.020	EPA 300.0	12 Oct 21 18:18	KAM
					8 Oct 21 15:24	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

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CERTIFICATION: MN LAB # 027-015-125 ND WW/DW # R-040



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

Report Date: 27 Oct 2021
Lab Number: 21-A50935
Work Order #: 31-0431
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 5 Oct 2021 12:17
Sampled By: MVTL FIELD PERSONNEL
Date Received: 6 Oct 2021 12:20
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-14R

Temp at Receipt: 3.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Water Digestions						
pH, Field	7.12	units	1.00	SM4500-H+-2011	8 Oct 21	KAM
pH	* 7.2	units	1.0	SM 4500 H+ B-2000	5 Oct 21 12:17	DS
Sulfate	88.1	mg/L	5.0	ASTM D516-11	7 Oct 21 12:47	XC
Chloride	3.4	mg/L	3.0	SM 4500 Cl E	7 Oct 21 13:34	SS
Solids, Total Dissolved	499	mg/L	10	SM 2540 C-97	14 Oct 21 8:16	SS
Calcium	102.0	mg/L	0.500	SW6010D	8 Oct 21 11:38	PJH
Boron	< 0.1	mg/L	0.1	SW6010D	12 Oct 21 18:18	KAM
Fluoride	0.240 @	mg/L	0.020	EPA 300.0	12 Oct 21 18:18	KAM
					8 Oct 21 15:24	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 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
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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Date Reported: 27 Oct 2021

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

Work Order #: 202131-0431
Account Number: 006106
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

LABORATORY NARRATIVE

INORGANIC & METALS ANALYSES:
No problems were encountered.



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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

Report Date: 27 Oct 2021
Lab Number: 21-A50936
Work Order #: 31-0431
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 5 Oct 2021 13:19
Sampled By: MVTL FIELD PERSONNEL
Date Received: 6 Oct 2021 12:20
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-2A

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Misc Comment	INSUFFICIENT VOLUME-NO SAMPLE				

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 ND WW/DW # R-040



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Page: 9 of 9

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

Report Date: 27 Oct 2021
Lab Number: 21-A50937
Work Order #: 31-0431
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 5 Oct 2021 12:40
Sampled By: MVTL FIELD PERSONNEL
Date Received: 6 Oct 2021 12:20
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-13

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Misc Comment	INSUFFICIENT VOLUME-NO SAMPLE				

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 ND WW/DW # R-040

MVTL**MINNESOTA VALLEY TESTING LABORATORIES, INC.**

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MEMBER
ACIL

Page: 1 of 1

Quality Control Report

Lab IDs: 21-A50931 to 21-A50935

Project: HOOT LAKE PLANT CCR

Work Order: 202131-0431

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	99	85-115	1.00	21A50818q	< 0.1	1.040	104	75-125	1.040	1.040	104	0.0	10	99	90-110	< 0.1
Calcium mg/L	50.00	98	85-115	50.0	21A50818q	< 0.5	48.90	98	75-125	48.90	48.60	97	0.6	10	96	90-110	< 0.5
Chloride mg/L	-	-	-	60.0	21-A50933	14.9	76.2	102	86-117	76.2	77.6	104	1.8	5	99	90-110	< 3
Fluoride mg/L	-	-	-	1.00	21-A50931	0.190	1.22	103	75-125	1.22	1.23	104	0.8	10	102	90-110	< 0.02
pH units	-	-	-	-	-	-	-	-	-	7.2 7.2	7.2 7.2	- -	0.0 0.0	2.5 2.5	101 101	90-110 90-110	- -
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	1040 1170	1020 1160	- -	1.9 0.9	7 7	100 -	85-115 -	< 10 -
Sulfate mg/L	-	-	-	500	21-A50975	46.4	516	94	68-132	516	509	93	1.4	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

This is an exact copy of
the original document

By AB Date 6 Oct 21

pages 1-10

Project Name: Otter Tail Power Co. Hoot Lake Plant	Project Type: CCR	Name of Samplers: DS BW
Report To: Otter Tail Power Company	Carbon Copy: Carlson McCain	Quote Number:
Attn: Paul Vukonich	Attn: Megan Lindstrom	Work Order Number: 31-431
Address: P.O. Box 496 Fergus Falls, MN 56038-0496	Address:	Lab Numbers:
Phone: 218-739-8349		

Phone: 218-755-6545

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	
	S2A		5 Oct 21	NS	GW			1		1	N								See Attached	
AS0931	S3AR			1323	GW			1		1	N									
32	S51			1234	GW			1		1	N									
33	S52			1314	GW			1		1	N									
34	S10R			1142	GW			1		1	N									
	S13			NS	GW			1		1	N									
35	S14R			1217	GW			1		1	N									

Comments: CCR wells

Samples Relinquished By: <u>Dyl</u>				Samples Received By: <u>A. Fredin</u>			
Date: <u>6 Oct 21</u>		Time: <u>1220</u>		Date: <u>6 Oct 21</u>		Time: <u>1220</u>	
Temp: <u>3.3C</u>				Temp: <u>3.3C</u>			
Samples Relinquished into: Fridge Log in Cart Other:				Samples Received By:			
Samples Relinquished By:				Samples Received By:			
Date:		Time:		Date:		Time:	
Temp:				Temp:			
Deliver: <u>Samplers</u> Other:				Seal Number(s) - If Used			
Transp: <u>Ambient</u> <u>Ice</u> Other:				Seals Intact? Yes No			

Hoot Lake Site CCR Sampling - 2021

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.

CCR - Appendix III Detection Monitoring

Field Parameters

pH*

* Field and Laboratory Measurements

Total Concentration Parameters

Boron

Calcium

Chloride

Fluoride

pH

Sulfate

Dissolved Solids, Total

Method

6010

6010

SM4500 CL E

EPA 300

SM 4500 H+B-96

ASTM D516

SM 2540 C-97

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel: ES

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 5 Oct 11

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: 69.61

Well Volume: 1.43 Gallons

Well Casing Elevation: 1271.562

Static Water Elevation: 1201.95

Previous Static: 1203.83

Water Level After Sample: 69.63

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

Sampling Information

Weather Conditions: Temp: 73 Wind: SE @ 9 Sky: CL

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: 1305 am / ☒ pm

Time of Sampling: 1323 am / pm

Sample EH: 750.7

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:
1311	7.20	1067	11.79	1.18	1.3	1.5	1	
1317	7.16	1073	11.66	0.91	1.1	3	2	
1323	7.12	1086	11.45	0.75	1.5	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: 5 OCT 21

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: 46.46

Well Volume: 1.49 Gallons

Well Casing Elevation: 1286.904

Static Water Elevation: 1240.44

Previous Static: 1235.91

Water Level After Sample: 61.20

Measurement Method: ☒ Elec. WL ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 72 Wind: Lvw Sky: Fair

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

Dedicated Equipment: ☒ Yes ☐ No

Well Purged Dry? ☒ Yes ☐ No

Time Purged Dry?

Duplicate Sample? ☒ Yes ☐ No ID: —

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1222</u>	<u>6.43</u>	<u>969</u>	<u>8.98</u>	<u>.09</u>	<u>2.7</u>	<u>1.5</u>	<u>1</u>	
<u>1228</u>	<u>6.44</u>	<u>969</u>	<u>8.99</u>	<u>.09</u>	<u>1.4</u>	<u>3.0</u>	<u>2</u>	
<u>1234</u>	<u>6.48</u>	<u>969</u>	<u>8.98</u>	<u>.10</u>	<u>2.0</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: 5 Oct 21

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: 88.30

Casing Diameter: 2"

Water Level Before Purge: 70.11

Well Volume: 2.97 Gallons

Well Casing Elevation: 1286.623

Static Water Elevation: 1216.51

Previous Static: 1215.14

Water Level After Sample: 70.11

Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 74 Wind: LVV 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 ☒ ID: —

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>1250</u>	<u>6.64</u>	<u>903</u>	<u>9.10</u>	<u>.20</u>	<u>2.8</u>	<u>3</u>	<u>1</u>	
<u>1302</u>	<u>6.62</u>	<u>903</u>	<u>9.09</u>	<u>.20</u>	<u>1.5</u>	<u>6</u>	<u>2</u>	
<u>1314</u>	<u>6.65</u>	<u>903</u>	<u>9.08</u>	<u>.21</u>	<u>0.0</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:

DS

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date:

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: 80.52

Constructed Depth: 57.00

Casing Diameter: 2"

Water Level Before Purge: 71.84

Well Volume: 142 Gallons

Well Casing Elevation: 1281.47

Static Water Elevation: 1209.63

Previous Static: 1210.53

Water Level After Sample: Below Pump

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 73° Wind: SE 9 Sky: Clear

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

Dedicated Equipment: ☒ Yes ☐ No

Well Purged Dry? ☒ Yes ☐ No

Time Purged Dry: 1137

Duplicate Sample? Yes ☒ No ☐ ID: -

Pumping Rate: 0.5 gpm

Time Pump Began: 1134 (am) / pm

Time of Sampling: 1142 (am) / pm

Sample EH: 21.8

Sample Appearance: General: Cloudy Color: Lt Orange Phase: Lt Sed Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1137	6.98	838	12.61	2.88	220.7	1.5	1	
							2	
							3	
							4	
1142	7.03	843	12.56	2.94	154.3	-	5	recheck

Stabilized? Yes ☒ No ☐

Amount Water Removed: 1.5 Gallons

Comments:

* sample closed up while sampling

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

DS

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date:

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: 70.86

Casing Diameter: 2"

Water Level Before Purge: 79.84

Well Volume: 1.19 Gallons

Well Casing Elevation: 1280.61

Static Water Elevation: 1266.77

Previous Static: 1202.22

Water Level After Sample: 79.84

Measurement Method: Elec. WLI Steel Tape

Sampling Information

Weather Conditions: Temp: 73° Wind: SE @ 9 Sky: Clear

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: 1202 am / ☒ pm

Time Purged Dry? -

Time of Sampling: 1217 am / ☒ pm

Duplicate Sample? Yes ☒ No ID: -

Sample EH: -138.8

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:
1207	7.12	870	11.15	0.83	1.7	1.25	1	
1212	7.12	865	11.09	0.93	1.1	2.5	2	
1217	7.12	860	11.03	0.81	0.8	3.75	3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: 5.75 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co. / Hoot Lake

Facility ID: SW-211

Date: 5 Oct 21

Unique Station ID: 444350

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: 79.62

Well Casing Elevation: 1273.776

Constructed Depth: 79.63

Static Water Elevation: 1195.60

Casing Diameter: 2"

Previous Static: 1197.59

Water Level Before Purge: 78.18

Water Level After Sample: —

Well Volume: .23 Gallons

Measurement Method: ☒ Elec. WLI ☐ Steel Tape

Sampling Information

Weather Conditions: Temp: 75 Wind: LLW 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: — am / pm

Time Purged Dry? —

Time of Sampling: 1319 am / ☒ pm

Duplicate Sample? ☒ Yes ☐ No ID: —

Sample EH: ☒

Sample Appearance: General: — Color: — Phase: — Odor: —

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
							1	
							2	
							3	
							4	
							5	

Stabilized? Yes ☐ No ☐

Amount Water Removed: — Gallons

Comments:

Exceptions to Protocol:

*Insufficient volume for sampling!
↳ No sample!*

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

Groundwater Assessment

Sampling Personnel:

DS

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 5 Oct 21

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: 89.93

Well Volume: 0.06 Gallons

Well Casing Elevation: 1296.423

Static Water Elevation: 1206.49

Previous Static: 1208.59

Water Level After Sample: -

Measurement Method: Elec. W/L Steel Tape

Sampling Information

Weather Conditions: Temp: 73° Wind: SE@9 Sky: Over

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: -

Sample Appearance: General: - Color: - Phase: - Odor: -

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
							1	
							2	
							3	
							4	
							5	

Stabilized? ☒ Yes ☐ No

Amount Water Removed: - Gallons

Comments:

*insufficient volume to purge
* No sample

Exceptions to Protocol:

Appendix B

Alternate Source Demonstration

TECHNICAL MEMORANDUM

Date: August 27, 2021

From: Nick Bonow, P.E., P.G.
Carlson McCain, Inc.

To: Paul Vukonich, P.E., Josh Hollen
Otter Tail Power Company

Re: Alternate Source Demonstration
Hoot Lake Ash Landfill

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, 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, including determination of any statistically significant increase (SSI) over background for constituents listed in Appendix III to §257. During the spring 2021 groundwater monitoring event it was determined that monitoring well S-3A-R exhibited an SSI in total dissolved solids (TDS) concentration.

Upon determination of an SSI, 40 CFR 257.94(e)(2) states that the owner or operator may demonstrate that a source other than the CCR unit caused the statistically significant increase over background, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete a written demonstration within 90 days of detecting a statistically significant increase over background levels to include obtaining certification from a qualified professional engineer verifying the accuracy of the information in the report. The purpose of this memorandum is to present an alternate source demonstration for the SSI determined for TDS at monitoring well S-3A-R, showing that the increase in the TDS concentration is due to a source other than the CCR unit.

Background

Statistical analysis of detection monitoring samples collected in May 2021 resulted in the determination of an SSI for the TDS concentration at monitoring well S-3A-R. The TDS concentration reported during the routine spring sampling event conducted on May 4, 2021 was 670 mg/L, which exceeds the statistical control limit of 642.6 mg/L. In response to this initial

exceedance, OTP conducted verification resampling at least 30 days following the original sample, in accordance with the CCR Statistical Analysis Plan. Resampling was conducted on June 24, 2021, and the reported TDS concentration was 727 mg/L. Because both the original and resample results exceeded the control limits, an SSI was confirmed. Carlson McCain completed the statistical analysis of the resampling data and notified OTP of the SSI on July 15, 2021.

Alternate Source Demonstration

Carlson McCain reviewed sampling, analytical, and statistical analysis procedures and found no apparent errors or omissions that would cause the SSI.

Closer inspection of the analytical data from well S-3A-R and other upgradient and downgradient monitoring wells indicates that the SSI is attributable to natural variation in groundwater quality, rather than a release from the CCR unit.

Indicator Parameter Concentrations in S-3A-R

Monitoring well S-3A-R does not exhibit SSIs for other Appendix III constituents, including primary coal ash indicator parameters such as boron, sulfate and chloride.

Upgradient Well Results

The statistical testing program for detection monitoring includes intrawell testing as the primary analytical technique. This includes comparing compliance monitoring observations in individual wells to historical (i.e. background) observations within the same well. This eliminates spatial variability that can affect interwell (i.e. upgradient versus downgradient) comparisons. With intrawell testing, upgradient observations are not directly comparable to downgradient (i.e. compliance) well observations; however, as stated in the Landfill's Statistical Analysis Plan, "...it is appropriate to discuss results of intrawell testing at compliance wells in the context of the overall site, including upgradient wells. For example, if SSIs in downgradient wells are associated with corresponding elevated concentrations or increasing trends in upgradient wells it may be an indication of natural changes in groundwater quality that are unrelated to the CCR unit." (Carlson McCain, 2017¹).

One or more upgradient wells at the site have exhibited TDS concentrations higher than those observed at S-3A-R during the spring 2021 sampling event. Upgradient well S-51 exhibited a concentration of 1,190 mg/L during the October 5, 2020 sampling event. This is higher than both the original and resample at S-3A-R, and it is the highest concentration observed in any upgradient or downgradient well since the inception of the CCR groundwater monitoring program. Upgradient wells are unaffected by the Landfill, therefore constituent concentrations observed in upgradient wells represent the potential range of values for the background population of concentrations. According to the Landfill's Groundwater Monitoring System

¹ Statistical Analysis Plan. Ash Landfill – Hoot Lake Plant. Prepared for Otter Tail Power Company. Carlson McCain, Inc., October 2017
Carlson McCain, Inc.

Certification (Barr, 2016²), well S-51 “is adequately constructed and well placed for upgradient monitoring of the existing CCR landfill because, based on the conceptual model, groundwater from this area flows past the upgradient waste boundary and then to downgradient wells”. It therefore reflects background concentrations for groundwater beneath the Landfill, although these observations are not used in direct statistical comparisons with downgradient wells.

As noted previously, the value of 1,190 mg/L observed at upgradient well S-51 represents a historic high value for upgradient and downgradient wells. Results of Dixon’s outlier testing for this value indicate that it is a statistical outlier. Unified Guidance (EPA, 2009³) states that if either Dixon’s or Rosner’s test identifies an observation as a statistical outlier, the measurement should not be treated as such *until* a specific physical reason for the abnormal value can be determined. Based on Carlson McCain’s review of sampling and analytical procedures for well S-51, there is no evidence that the value is erroneous or otherwise not representative of actual groundwater quality. The result is therefore considered to be an as-yet unsampled portion of the background population.

Downgradient Well Results

TDS concentrations in excess of those observed in well S-3A-R have also been observed in compliance well S-2A, which exhibited concentrations of 645 mg/L during baseline sampling in July 2017 and 741 mg/L in October 2020. This well has had no SSIs for Appendix III constituents and is considered unimpacted by the Landfill. This information supports the assertion that background groundwater quality around the Landfill includes TDS concentrations in excess of the control limit at S-3A-R.

Conclusion

Because concentrations of other, unimpacted upgradient and downgradient monitoring wells include TDS concentrations in excess of those observed in well S-3A-R, and S-3A-R exhibits no exceedances of other Appendix III constituents, the SSI for TDS observed in well S-3A-R is attributed to natural variation in groundwater quality.

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² Groundwater Monitoring System Report. Ash Landfill, Hoot Lake Plant. Prepared for Otter Tail Power Company. Barr Engineering. November 2016.

³ Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance. Environmental Protection Agency, Office of Resource Conservation and Recovery. March 2009. Carlson McCain, Inc.

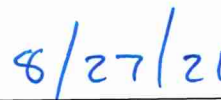
Certification

I certify that this report was prepared by me or under my direction or supervision under a system designed to assure that qualified personnel gather and evaluate the information submitted. Based on my inquiry of the persons or person who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. Furthermore, I certify that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.



Nicholas Bonow, P.E., P.G.

License No. 47510



Date

