2023 Annual Groundwater Monitoring and Corrective Action Report

Ash Landfill

Hoot Lake Plant
Fergus Falls, Minnesota

Prepared for
Otter Tail Power Company

January 2024

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2023 Annual Groundwater Monitoring and Corrective Action Report

Ash Landfill

Hoot Lake Plant
Fergus Falls, Minnesota

January 2024

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Abbreviations

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

Executive Summary

This summary provides an overview of the Groundwater Monitoring & Corrective Action Program status as required by 40 CFR 257.90(e)(6). On November 3, 2022, the CCR unit transitioned to an assessment monitoring program, as required by §257.94(e). At the end of the 2023 annual reporting period, an assessment monitoring program as described in §257.95 was ongoing at the CCR unit.

Statistical analysis of Appendix III parameters for the July 2023 monitoring data identified SSIs for the following: total dissolved solids (TDS) and pH at S-13. Analysis of the Appendix IV parameters resulted in no exceedances of groundwater protection standards.

Statistical analysis of Appendix III parameters for the October 2023 monitoring data identified SSIs for the following: Total dissolved solids (TDS) and sulfate at S-13. Analysis of the Appendix IV parameters resulted in no exceedances of groundwater protection standards.

As a result, corrective and remedial measures were not required as described in §257.96, 257.97, and 257.98.

1 Introduction

Otter Tail Power Company (OTP) operated the Hoot Lake Generating Plant (Hoot Lake), located in Fergus Falls, Minnesota. Hoot Lake was a coal-fired electrical generating plant, the operation of which resulted in coal combustion residuals (CCR) as a by-product. Hoot Lake stopped burning coal on May 27, 2021. Management of CCR from plant operations included placing CCR in an on-site landfill, referred to as the Ash Landfill. The Ash Landfill is required to comply with the provisions of the US Environmental Protection Agency (EPA) CCR Rule (40 CFR Parts 257 and 261, Disposal of Coal Combustion Residuals from Electric Utilities) for existing CCR landfills. The location of the Ash Landfill is shown on Figure 1. The last phase of final cover construction was completed in 2023. A Construction Certification Report (Carlson-McCain) documenting the construction was submitted to the Minnesota Pollution Control Agency (MPCA) on November 20, 2023.

This 2023 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) describes the monitoring program and results for the Ash Landfill at Hoot Lake. The Ash Landfill is currently in assessment monitoring, as described in §257.95 of the CCR Rule.

1.1 Purpose

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

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

1.2 Status of the Groundwater Monitoring and Corrective Action Program

Baseline monitoring was completed in 2017, as documented in the 2017 Annual Groundwater Monitoring and Corrective Action Report, Ash Disposal Area (Barr, 2018). Evaluation of groundwater monitoring data for SSIs over background levels for the constituents listed in Appendix III to the CCR Rule, began on October 17, 2017, and continued until November 2, 2022. Statistically significant increases (SSIs) over background were determined for the spring 2022 monitoring event for calcium, sulfate, and total dissolved solids at monitoring well S-3A-R. As a result, the CCR unit transitioned to assessment monitoring on November 2, 2022 (Section 2.3). At the end of 2023, the assessment monitoring program was ongoing.

The initial groundwater sampling event (§257.95(b)) under the assessment monitoring program was conducted on November 17, 2022. All constituents listed in Appendix III and Appendix IV to the CCR Rule were sampled in 2023 on January 23, July 11, and October 3. Groundwater protection standards (GWPS) were established for all Appendix IV constituents as described in the Statistical Analysis Plan, Appendix B

of the CCR Groundwater Sampling and Analysis Plan (Carlson McCain, 2017). Corrective and remedial measures were not required as described in §257.96, 257.97, and 257.98.

1.3 CCR Rule Requirements

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

Table 1 CCR Rule Requirements

CCR Rule Reference	Content Required in Report	Location
§257.90(e)(1)	Map showing the CCR unit and all monitoring wells that are part of the groundwater monitoring system	Section 2.1.1 Documentation; see Figure 1
§257.90(e)(2)	Discuss any new or decommissioned monitoring wells	Not applicable – no wells were installed or decommissioned
§257.90(e)(3)	All monitoring data obtained under §257.90 through §257.98; provide the number and date groundwater samples were collected, and the monitoring (i.e., detection or assessment)	Section 2.2 Monitoring and Analytical Results; Table 3, Figure 2, Figure 3, Figure 4, Appendices
§257.90(e)(4)	Discuss any transition between monitoring programs	Section 2.3 Monitoring
§257.90(e)(5)	Other information specified in §257.90 through §257.98	Throughout report
§257.90(e)(6)	Overview at beginning of annual report	Executive Summary

2 Groundwater Monitoring and Corrective Action Program

This section documents the status of the groundwater monitoring and corrective action program for the Ash Landfill for 2023. The groundwater monitoring system is described in Section 2.1, the monitoring and analytical results are described in Section 2.2, key actions completed and problems encountered are described in Section 2.4, and key activities planned for 2024 are described in Section 2.5.

2.1 Groundwater Monitoring System

2.1.1 Documentation

Figure 1 shows an aerial image of the Ash Landfill and all upgradient (background) and downgradient monitoring wells, including the well identification numbers, that are part of the groundwater monitoring system, as required by §257.90(e)(1). Further details on the monitoring system and the Ash Landfill monitoring wells can be found in the Groundwater Monitoring System Report (Barr, 2016).

2.1.2 Changes to Monitoring System

The groundwater monitoring system was unchanged in 2023.

2.2 Monitoring and Analytical Results

Groundwater samples (Table 2) were collected from monitoring wells S-51, S-52, S-10R, S-13, S-14R, and S-3A-R when the landfill transitioned to assessment monitoring in November 2022[1], a resample monitoring event in January 2023, and two semiannual sampling events. Monitoring well S-2A had sufficient volume to sample during one semiannual sampling event in July 2023. A total of nineteen groundwater samples were collected and analyzed for the constituents listed in Appendix III and Appendix IV (Part 257) in 2023 under the assessment monitoring program, consistent with the requirements of §257.95(b). Dates of sampling are reported on the field data sheets, and analytical laboratory reports are presented in Appendix A. Results are summarized in Table 3. Groundwater flow data, as required by §257.93(c), are presented in Figure 2, Figure 3, Figure 4, and Appendix B.

2.3 Monitoring Program Status

The Ash Landfill transitioned to assessment monitoring from detection monitoring on November 2, 2022. Within 90 days from the transition to assessment monitoring, a resample event occurred on January 23, 2023. Two semiannual assessment monitoring events occurred during the remainder of 2023. The landfill remains under assessment monitoring at the end of 2023.

[1] As noted in the 2022 AMR, data from the November 2022 sampling event was not available in time for inclusion in the 2022 AMR and is included in this 2023 AMR.

Table 2 2023 Groundwater Sampling Summary

Monitoring Location	Fall 2022 Sampling (Initial Assessment Monitoring Samples)	January 2023 Assessment Monitoring Resample	July 2023 Semiannual Sampling	October 2023 Semiannual Sampling
Date	November 17, 2022	January 23, 2023	July 11, 2023	October 3, 2023
S-51 (background)	Appendix IV	Appendix III & IV	Appendix III & IV	Appendix III & IV
S-52 (background)	Appendix IV	Appendix III & IV	Appendix III & IV	Appendix III & IV
S-10R	Appendix IV	Appendix III & IV	Appendix III & IV	Appendix III & IV
S-13	Appendix IV	Appendix III & IV	Appendix III & IV	Appendix III & IV
S-14R	Appendix IV	Appendix III & IV	Appendix III & IV	Appendix III & IV
S-2A	Water level only (insufficient volume)	Water level only (insufficient volume)	Appendix III & IV	Water level only (insufficient volume)
S-3A-R	Appendix IV	Appendix III & IV	Appendix III & IV	Appendix III & IV
Number of Samples	**6**	**6**	**7**	**6**

2.4 Key Actions Completed/Problems Encountered

The following key actions were completed for the groundwater monitoring program during 2023:

- Final analytical results from the initial assessment monitoring groundwater sampling event were pending at the end of 2022. The results are included in this 2023 Annual Report. The initial groundwater sampling under the assessment monitoring program (§257.95(b)) was completed in November 2022, which left insufficient time to obtain the final analytical results in 2022.
- In January 2023, resampled all wells for the constituents listed in Appendix III and for those constituents in Appendix IV that were detected during the fall 2022 initial assessment monitoring program sampling event, as per §257.95(d)(1).
- Established groundwater protection standards for Appendix IV constituents.
- Completed semiannual groundwater sampling under the assessment monitoring program during July and October 2023 in accordance with the CCR Rule.
- Closed the active portion of the landfill in 2023.

The following problems were encountered, and the following actions were taken to resolve them:

- Monitoring well S-2A yielded insufficient water volume for sampling during the January 2023 and fall 2023 assessment monitoring events. Water level and volume at S-2A will be reassessed during the next sampling event required under §257.95(d), and changes to the monitoring system will be undertaken if needed.

2.5 Key Activities for the Upcoming Year

The following key groundwater monitoring program activities are planned for 2024:

- Continue the assessment monitoring program in accordance with the CCR Rule.
- Evaluate hydrogeologic conditions at monitoring well S-2A to determine whether monitoring system changes are needed for continued compliance with §257.91.

3 References

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

Barr, 2018. 2017 Annual Groundwater Monitoring and Corrective Action Report, Hoot Lake Plant. Prepared for Otter Tail Power Company. January 2018.

Carlson McCain, 2017. CCR Groundwater Sampling and Analysis Plan (Including Statistical Method Selection and Certification), Ash Landfill-Hoot Lake Plant. Prepared for Otter Tail Power Company. October 2017.

Tables

Table 3
Groundwater Analytical Data Summary
Hoot Lake Station
Otter Tail Power Company

Location		S-2A	S-3A-R	S-3A-R	S-3A-R	S-10R	S-10R	S-10R	S-13	S-13	S-13	S-14R
Date		7/11/2023	1/23/2023	7/11/2023	10/03/2023	1/23/2023	7/11/2023	10/03/2023	1/23/2023	7/11/2023	10/03/2023	1/23/2023
Sample Type		N	N	N	N	N	N	N	N	N	N	N
Parameter	Units											
Appendix III												
Boron, Total	mg/l	0.127	0.203	0.170	0.165	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	0.102	< 0.1 U
Calcium, Total	mg/l	143.0	116.0	119.0	123.0	108.0	115.0	117.0	120.0	118.0	128.0	112.0
Chloride	mg/l	< 3 U	12.2	12.8	12.1	11.4	12.3	11.5	8.6	8.4	8.4	3.7
Fluoride	mg/l	0.240	0.200	0.230	0.180	0.180	0.200	0.170	0.210	0.210	0.200	0.230
pH, Field	pH units	7.20	7.17	7.31	7.70	7.20	7.44	7.22	7.24	7.62	6.68	7.15
Solids, total dissolved	mg/l	650	601	601	624	500	500	504	557	563	680	464
Sulfate, as SO4	mg/l	172	147	144	137	110	99.2	104	133	115	127	79.9
Appendix IV												
Antimony, Total	mg/l	< 0.0005 U	< 0.0005 U	< 0.0005 U	0.00051	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U
Arsenic, Total	mg/l	0.00071	0.00072	< 0.0005 U	< 0.0005 U	0.00635	0.141	0.00706	< 0.0005 U	< 0.0005 U	< 0.0005 U	0.00274
Barium, Total	mg/l	0.060	0.045	0.046	0.045	0.091	0.233	0.099	0.057	0.060	0.064	0.046
Beryllium, Total	mg/l	< 0.00005 U	< 0.005 U	< 0.00005 U	< 0.005 U	< 0.005 U	< 0.00005 U	< 0.005 U	< 0.005 U	< 0.00005 U	< 0.005 U	< 0.005 U
Cadmium, Total	mg/l	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U
Chromium, Total	mg/l	< 0.0005 U	< 0.01 U	< 0.0005 U	< 0.01 U	< 0.01 U	0.00313	< 0.01 U	< 0.01 U	< 0.0005 U	< 0.01 U	< 0.01 U
Cobalt, Total	mg/l	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U
Lead, Total	mg/l	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.001 U	< 0.0005 U	< 0.0005 U	< 0.0005 U
Lithium, Total	mg/l	0.034	0.020	0.021	0.021	< 0.02 U	0.021	0.021	0.022	0.025	0.027	0.027
Mercury, Total	mg/l	< 0.000005 U	< 0.000005 U	< 0.000005 U	< 0.000005 U	< 0.000005 U	< 0.000005 U	< 0.000005 U	< 0.000005 U	< 0.000005 U	< 0.000005 U	< 0.000005 U
Molybdenum, Total	mg/l	0.00106	< 0.015 U	0.00627	< 0.015 U	< 0.015 U	0.00312	< 0.015 U	< 0.015 U	0.00140	< 0.015 U	< 0.015 U
Selenium, Total	mg/l	< 0.0005 U	0.00323	0.00657	0.00354	< 0.001 U	< 0.001 U	< 0.0005 U	< 0.001 U	< 0.001 U	0.00053	< 0.001 U
Thallium, Total	mg/l	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0002 U	< 0.0001 U	< 0.0001 U	< 0.0001 U
Radium 226	pCi/l	-0.0184 +/- 0.0569 ND	0.107 +/- 0.184 ND	0.696 +/- 0.398 UB	0.565 +/- 0.386	0.332 +/- 0.246	0.908 +/- 0.411 UB	0.137 +/- 0.237 ND	0.107 +/- 0.157 ND	0.160 +/- 0.309 ND	0.380 +/- 0.275	0.0982 +/- 0.132 ND
Radium 228	pCi/l	0.0783 +/- 0.383 ND	-1.79 +/- 0.641 ND	-0.135 +/- 0.328 ND	0.875 +/- 0.232 UB	0.609 +/- 0.346 ND	3.87 +/- 0.533	0.287 +/- 0.253 ND	-1.49 +/- 0.552 ND	0.400 +/- 0.271 ND	0.467 +/- 0.265 ND	0.677 +/- 0.516 ND
Radium, combined (226+228) [Barr Calculation]	pCi/l	0.0783 +/- 0.383 ND	0.11 +/- 0.180 ND	-0.135 +/- 0.328 ND	0.565 +/- 0.386	0.941 +/- 0.420 q	3.87 +/- 0.533 q	0.424 +/- 0.347 ND	0.107 +/- 0.160 ND	0.560 +/- 0.410 ND	0.847 +/- 0.382 q	0.775 +/- 0.530 ND
Other												
Groundwater elevation, Field	ft amsl	1198.1	1203.34	1203.06	1203.06	1209.24	1209.45	1205.88	1210.7	1210.58	1210.66	1201.44

N	Sample Type: Normal Detection Monitoring
FB	Sample Type: Field Blank
ND	The analyte was analyzed for, but was not detected.
q	The combined radium result includes both detected and not detected values.
U	The analyte was analyzed for, but was not detected.
UB	The analyte was detected in one of the associated laboratory, equipment, field or trip blank samples and is considered non-detect at the concentration reported by the laboratory.

Table 3
Groundwater Analytical Data Summary
Hoot Lake Station
Otter Tail Power Company

Location		S-14R	S-14R	S-51	S-51	S-51	S-52	S-52	S-52	QC	QC
Date		7/11/2023	10/03/2023	1/23/2023	7/11/2023	10/03/2023	1/23/2023	7/11/2023	10/03/2023	1/23/2023	7/11/2023
Sample Type		N	N	N	N	N	N	N	N	FB	FB
Parameter	Units										
Appendix III											
Boron, Total	mg/l	< 0.1 U	< 0.1 U	0.177	0.193	0.193	< 0.1 U	< 0.100 U	< 0.1 U	< 0.1 U	< 0.1 U
Calcium, Total	mg/l	114.0	119.0	99.10	92.00	93.10	106.0	104.0	107.0	< 0.5 U	< 0.5 U
Chloride	mg/l	4.1	4.0	11.0	10.4	9.1	15.5	15.0	14.7	< 3 U	< 3 U
Fluoride	mg/l	0.240	0.220	0.240	0.230	0.220	0.230	0.210	0.190	< 0.02 U	< 0.02 U
pH, Field	pH units	7.26	7.42	7.12	7.29	7.19	7.10	7.21	6.91	--	--
Solids, total dissolved	mg/l	497	501	474	451	457	454	474	441	< 10 U	< 10 U
Sulfate, as SO4	mg/l	73.3	83.2	68.5	51.6	47.4	71.8	61.4	65.6	< 5 U	< 5 U
Appendix IV											
Antimony, Total	mg/l	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U
Arsenic, Total	mg/l	0.00285	0.00244	0.00064	< 0.0005 U	< 0.0005 U	0.00179	0.00170	0.00160	< 0.0005 U	< 0.0005 U
Barium, Total	mg/l	0.050	0.050	0.065	0.064	0.062	0.109	0.113	0.112	< 0.005 U	< 0.005 U
Beryllium, Total	mg/l	< 0.00005 U	< 0.005 U	< 0.005 U	< 0.00005 U	< 0.005 U	< 0.005 U	< 0.00005 U	< 0.005 U	< 0.005 U	< 0.00005 U
Cadmium, Total	mg/l	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U
Chromium, Total	mg/l	< 0.0005 U	< 0.01 U	< 0.01 U	0.00058	< 0.01 U	< 0.01 U	< 0.00050 U	< 0.01 U	< 0.01 U	< 0.0005 U
Cobalt, Total	mg/l	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U
Lead, Total	mg/l	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U
Lithium, Total	mg/l	0.030	0.032	0.020	0.021	< 0.02 U	< 0.02 U	0.022	0.021	< 0.02 U	< 0.02 U
Mercury, Total	mg/l	< 0.000005 U	< 0.000005 U	< 0.000005 U	< 0.000005 U	< 0.000005 U	< 0.000005 U	< 0.000005 U	< 0.000005 U	< 0.000005 U	< 0.000005 U
Molybdenum, Total	mg/l	0.00244	< 0.015 U	< 0.015 U	0.00240	< 0.015 U	< 0.015 U	0.00169	< 0.015 U	< 0.015 U	< 0.0005 U
Selenium, Total	mg/l	< 0.001 U	< 0.0005 U	< 0.001 U	< 0.001 U	0.00057	< 0.001 U	< 0.001 U	< 0.0005 U	< 0.0005 U	< 0.0005 U
Thallium, Total	mg/l	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U
Radium 226	pCi/l	0.163 +/- 0.350 ND	0.440 +/- 0.316	0.528 +/- 0.321	0.616 +/- 0.572 ND	0.588 +/- 0.409	0.462 +/- 0.300	3.22 +/- 0.935 UB	0.180 +/- 0.202 ND	0.0733 +/- 0.144 ND	1.23 +/- 0.605
Radium 228	pCi/l	0.488 +/- 0.297 ND	0.373 +/- 0.332 ND	1.88 +/- 0.549	-0.0758 +/- 0.339 ND	0.137 +/- 0.377 ND	-0.664 +/- 0.463 ND	0.421 +/- 0.333 ND	0.890 +/- 0.218	1.03 +/- 0.588 ND	0.288 +/- 0.293 ND
Radium, combined (226+228) [Barr Calculation]	pCi/l	0.651 +/- 0.460 ND	0.813 +/- 0.458 q	2.41 +/- 0.640	0.616 +/- 0.572 ND	0.725 +/- 0.556 q	0.462 +/- 0.300 ND	0.421 +/- 0.333 ND	1.070 +/- 0.297 q	1.10 +/- 0.610 ND	1.52 +/- 0.670 q
Other											
Groundwater elevation, Field	ft amsl	1201.22	1200.7	1237.34	1236.52	1236.45	1215.89	1215.87	1215.42	--	--

N Sample Type: Normal Detection Monitoring
FB Sample Type: Field Blank

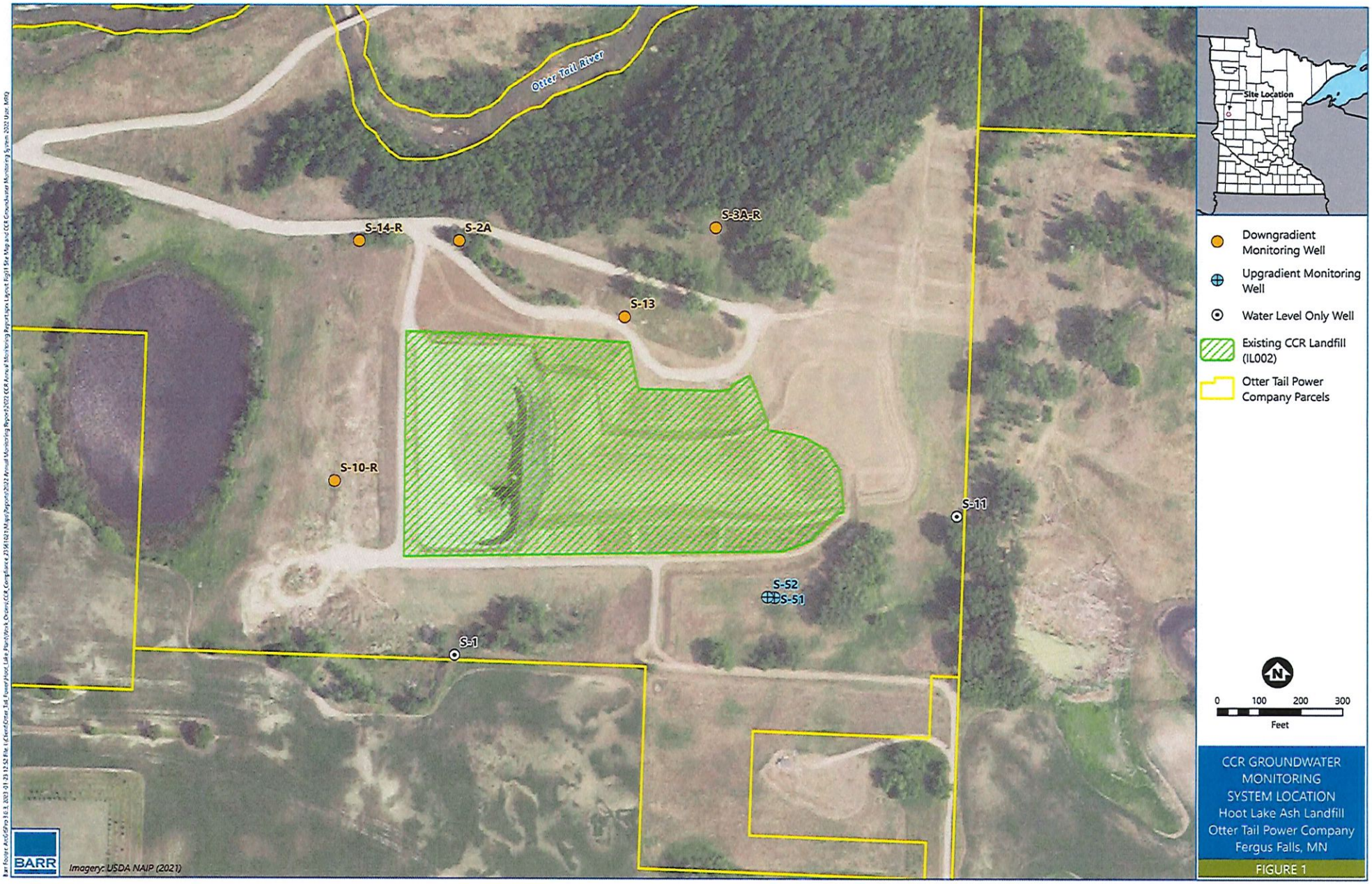
q The combined radium result includes both detected and not detected values.
U The analyte was analyzed for, but was not detected.
UB The analyte was detected in one of the associated laboratory, equipment, field or trip blank samples and is considered non-detect at the concentration reported by the laboratory.

Table 4
Appendix III Background Concentrations and Appendix IV Groundwater Protection Standards (GWPS)
Hoot Lake Station
Otter Tail Power Company

Parameter	Units	Background
Boron	mg/L	0.26
Calcium	mg/L	127
Chloride	mg/L	19.2
Fluoride	mg/L	0.48
pH	units	6.4 - 7.4
Sulfate	mg/L	84.3
Total Dissolved Solids	mg/L	520

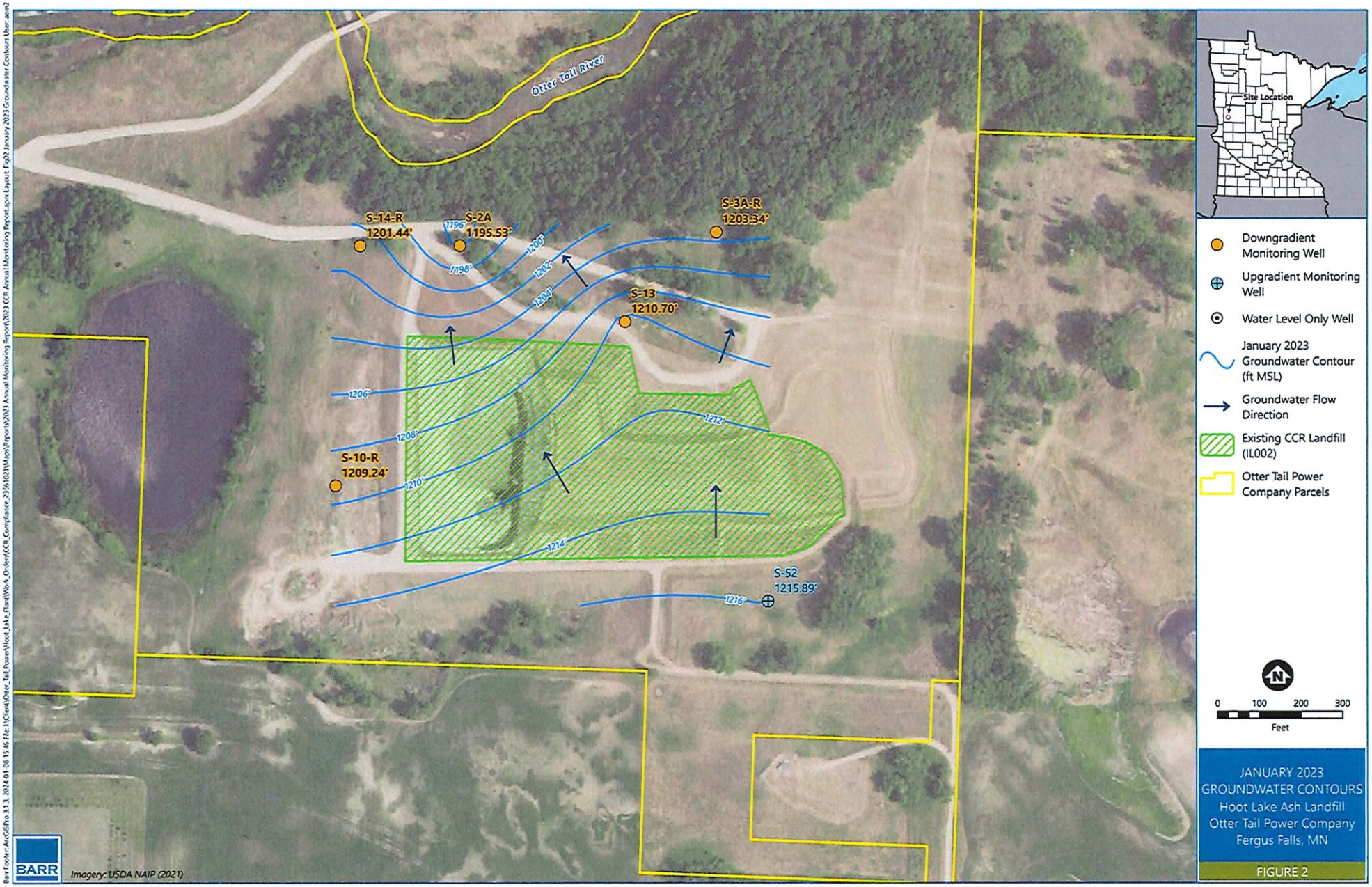
Parameter	Units	GWPS
Antimony	µg/L	6
Arsenic	µg/L	10
Barium	µg/L	2000
Beryllium	µg/L	4
Cadmium	µg/L	5
Chromium	µg/L	100
Cobalt	µg/L	6
Fluoride	mg/L	4
Lead	µg/L	15
Lithium	µg/L	40
Mercury	µg/L	2
Molybdenum	µg/L	100
Radium	pCi/L	5.8
Selenium	µg/L	50
Thallium	µg/L	2

Figures



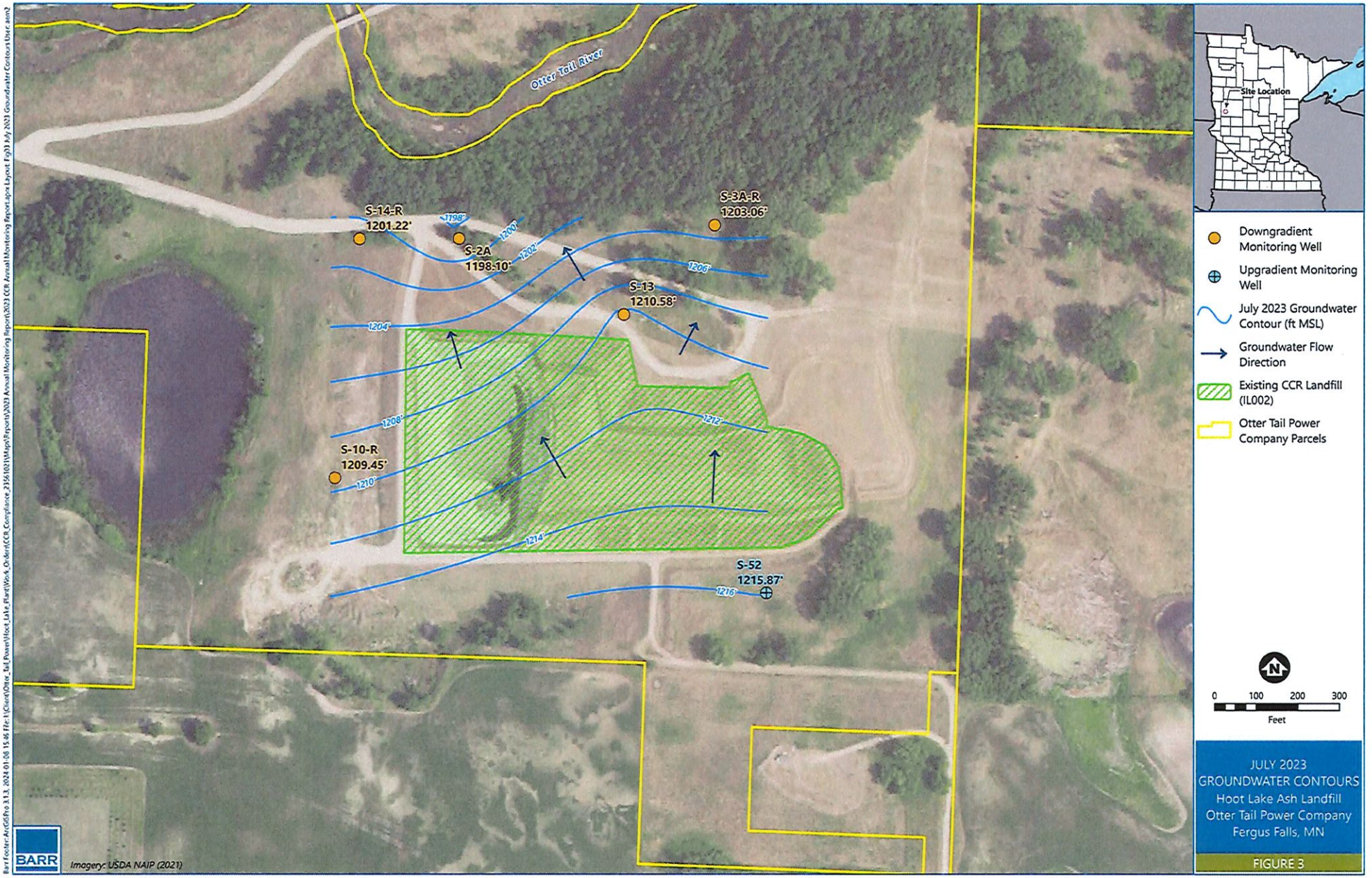
CCR GROUNDWATER MONITORING SYSTEM LOCATION
Hoot Lake Ash Landfill
Otter Tail Power Company
Fergus Falls, MN

FIGURE 1



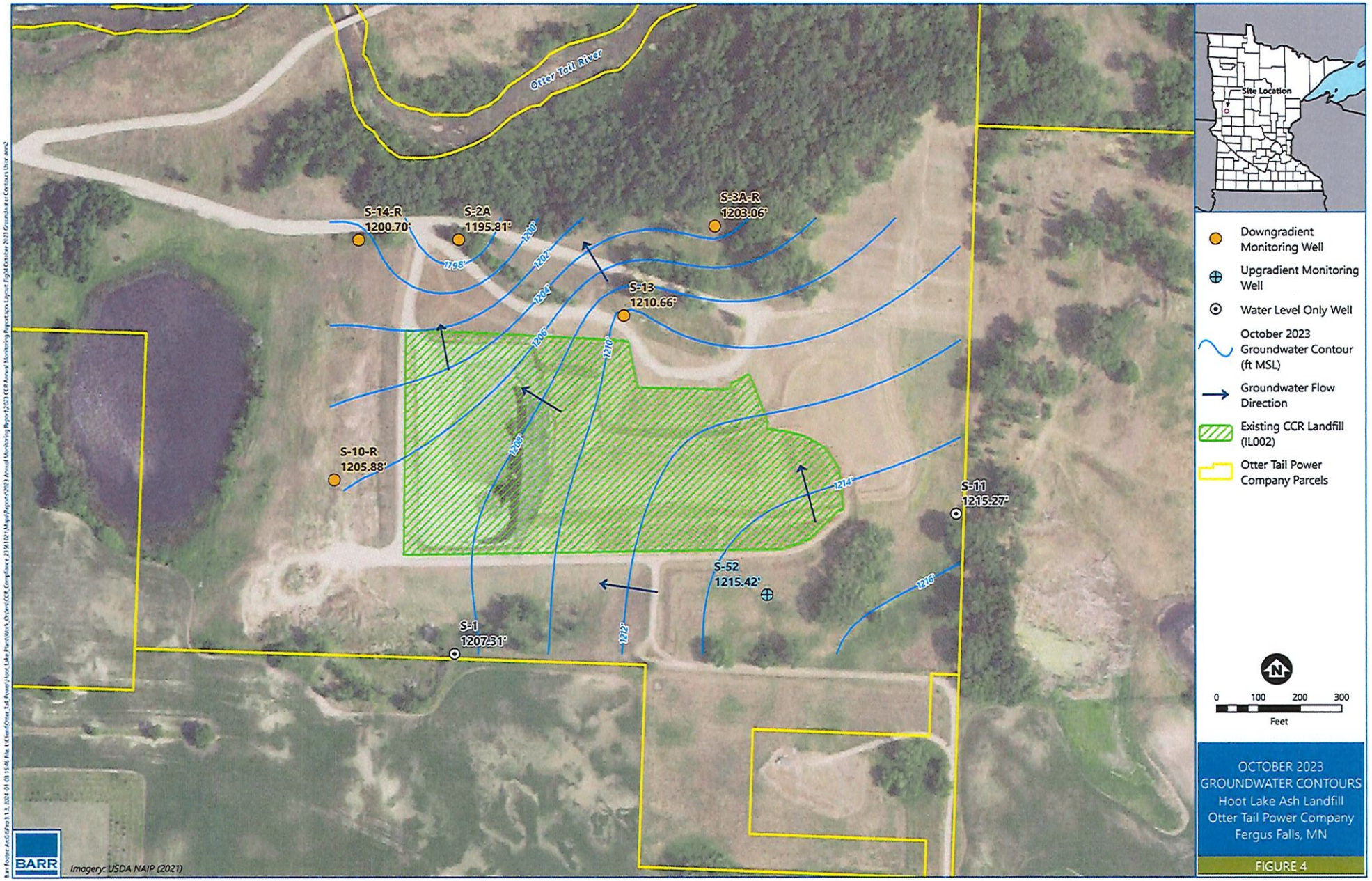
JANUARY 2023
GROUNDWATER CONTOURS
Hoot Lake Ash Landfill
Otter Tail Power Company
Fergus Falls, MN

FIGURE 2



JULY 2023
GROUNDWATER CONTOURS
Hoot Lake Ash Landfill
Otter Tail Power Company
Fergus Falls, MN

FIGURE 3



OCTOBER 2023
GROUNDWATER CONTOURS
Hoot Lake Ash Landfill
Otter Tail Power Company
Fergus Falls, MN

FIGURE 4

Appendices

Appendix A

Laboratory Reports and Field Sheets

MINNESOTA VALLEY TESTING LABORATORIES, INC.
1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
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: 8Mar23 AM

Date Reported: 8 Mar 2023

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

Work Order #: 31-0034
Account #: 006106
PO #: 59640

Project Name: HOOT LAKE CCR

JH Hollen 08 MAR 23
Field Service Manager/Date Reviewed

08March23
Chemistry Lab Manager/Date Reviewed

08 Mar 2023
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.
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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com
MEMBER ACIL

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

Project Name: HOOT LAKE CCR

Sample Description: S3AR

Report Date: 8 Mar 2023
Lab Number: 23-A1990
Work Order #: 31-0034
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Jan 2023 13:04
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Jan 2023 16:40
PO #: 59640

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					25 Jan 23	RRA
Water Digestions					24 Jan 23	RRA
pH, Field	7.17	units	1.00	SM4500-H+-2011	23 Jan 23 13:04	MS
pH	* 7.0	units	1.0	SM 4500 H+ B-2000	24 Jan 23 8:10	HO
Radium 226	0.11	pCi/L	0.60		1 Feb 23 22:59	OL
Radium 228	-1.79	pCi/L	3.00	EPA M9320	1 Mar 23 10:30	OL
Sulfate	147	mg/L	5.0	ASTM D516-11	26 Jan 23 8:24	SS
Chloride	12.2	mg/L	3.0	SM 4500 Cl E	26 Jan 23 8:47	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	31 Jan 23 11:25	RMB
Solids, Total Dissolved	601	mg/L	10	SM 2540 C-97	25 Jan 23 9:30	CC
Calcium	116.0	mg/L	0.500	SW6010D	25 Jan 23 12:32	KAM
Lithium	0.020	mg/L	0.020	SW6010D	25 Jan 23 12:32	KAM
Barium	0.045	mg/L	0.005	SW6010D	25 Jan 23 12:32	KAM
Beryllium	< 0.005	mg/L	0.005	SW6010D	25 Jan 23 12:32	KAM
Chromium	< 0.01	mg/L	0.01	SW6010D	25 Jan 23 12:32	KAM
Cobalt	< 0.005	mg/L	0.005	SW6010D	25 Jan 23 12:32	KAM
Molybdenum	< 0.015	mg/L	0.015	SW6010D	25 Jan 23 12:32	KAM
Boron	0.203	mg/L	0.100	SW6010D	25 Jan 23 12:32	KAM
Antimony	< 0.5	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Arsenic	0.72	ug/L	0.50	SW6020B	26 Jan 23 18:28	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	26 Jan 23 18:28	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Selenium	3.23 ^	ug/L	0.50	SW6020B	26 Jan 23 18:28	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	26 Jan 23 18:28	KAM
Fluoride	0.200	mg/L	0.020	EPA 300.0	26 Jan 23 23:44	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

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| = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 ND NW/DW # R-040

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

Report Date: 8 Mar 2023
Lab Number: 23-A1991
Work Order #: 31-0034
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Jan 2023 11:42
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Jan 2023 16:40
PO #: 59640

Project Name: HOOT LAKE CCR

Sample Description: S-51

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					25 Jan 23	RRA
Water Digestions					24 Jan 23	RRA
pH, Field	7.12	units	1.00	SM4500-H+-2011	23 Jan 23 11:42	MS
pH	* 7.0	units	1.0	SM 4500 H+ B-2000	24 Jan 23 8:10	HO
Radium 226	0.53	pCi/L	0.60		1 Feb 23 22:59	OL
Radium 228	1.88	pCi/L	3.00	EPA M9320	1 Mar 23 10:30	OL
Sulfate	68.5	mg/L	5.0	ASTM D516-11	26 Jan 23 8:24	SS
Chloride	11.0	mg/L	3.0	SM 4500 Cl E	26 Jan 23 8:47	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	31 Jan 23 11:25	RMB
Solids, Total Dissolved	474	mg/L	10	SM 2540 C-97	25 Jan 23 9:30	CC
Calcium	99.10	mg/L	0.500	SW6010D	25 Jan 23 15:18	KAM
Lithium	0.020	mg/L	0.020	SW6010D	25 Jan 23 15:18	KAM
Barium	0.065	mg/L	0.005	SW6010D	25 Jan 23 15:18	KAM
Beryllium	< 0.005	mg/L	0.005	SW6010D	25 Jan 23 15:18	KAM
Chromium	< 0.01	mg/L	0.01	SW6010D	25 Jan 23 15:18	KAM
Cobalt	< 0.005	mg/L	0.005	SW6010D	25 Jan 23 15:18	KAM
Molybdenum	< 0.015	mg/L	0.015	SW6010D	25 Jan 23 15:18	KAM
Boron	0.177	mg/L	0.100	SW6010D	25 Jan 23 15:18	KAM
Antimony	< 0.5	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Arsenic	0.64	ug/L	0.50	SW6020B	26 Jan 23 18:28	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	26 Jan 23 18:28	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Selenium	< 1 ^	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	26 Jan 23 18:28	KAM
Fluoride	0.240	mg/L	0.020	EPA 300.0	26 Jan 23 23:44	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

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www.mvtl.com
MEMBER ACIL

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

Report Date: 8 Mar 2023
Lab Number: 23-A1992
Work Order #: 31-0034
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Jan 2023 11:59
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Jan 2023 16:40
PO #: 59640

Project Name: HOOT LAKE CCR

Sample Description: S-52

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					25 Jan 23	RRA
Water Digestions					24 Jan 23	RRA
pH, Field	7.10	units	1.00	SM4500-H+-2011	23 Jan 23 11:59	MS
pH	* 6.9	units	1.0	SM 4500 H+ B-2000	24 Jan 23 8:10	HO
Radium 226	0.46	pCi/L	0.60		1 Feb 23 22:59	OL
Radium 228	-0.66	pCi/L	3.00	EPA M9320	1 Mar 23 10:30	OL
Sulfate	71.8	mg/L	5.0	ASTM D516-11	26 Jan 23 8:24	SS
Chloride	15.5	mg/L	3.0	SM 4500 Cl E	26 Jan 23 8:47	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	31 Jan 23 11:25	RMB
Solids, Total Dissolved	454	mg/L	10	SM 2540 C-97	25 Jan 23 9:30	CC
Calcium	106.0	mg/L	0.500	SW6010D	25 Jan 23 12:32	KAM
Lithium	< 0.02	mg/L	0.02	SW6010D	25 Jan 23 12:32	KAM
Barium	0.109	mg/L	0.005	SW6010D	25 Jan 23 12:32	KAM
Beryllium	< 0.005	mg/L	0.005	SW6010D	25 Jan 23 12:32	KAM
Chromium	< 0.01	mg/L	0.01	SW6010D	25 Jan 23 12:32	KAM
Cobalt	< 0.005	mg/L	0.005	SW6010D	25 Jan 23 12:32	KAM
Molybdenum	< 0.015	mg/L	0.015	SW6010D	25 Jan 23 12:32	KAM
Boron	< 0.1	mg/L	0.1	SW6010D	25 Jan 23 12:32	KAM
Antimony	< 0.5	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Arsenic	1.79	ug/L	0.50	SW6020B	26 Jan 23 18:28	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	26 Jan 23 18:28	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Selenium	< 1 ^	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	26 Jan 23 18:28	KAM
Fluoride	0.230	mg/L	0.020	EPA 300.0	26 Jan 23 23:44	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

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Report Date: 8 Mar 2023
Lab Number: 23-A1993
Work Order #: 31-0034
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Jan 2023 11:06
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Jan 2023 16:40
PO #: 59640

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

Project Name: HOOT LAKE CCR

Sample Description: S-10R

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					25 Jan 23	RRA
Water Digestions					24 Jan 23	RRA
pH, Field	7.20	units	1.00	SM4500-H+-2011	23 Jan 23 11:06	MS
pH	* 7.1	units	1.0	SM 4500 H+ B-2000	24 Jan 23 8:10	HO
Radium 226	0.33	pCi/L	0.60		1 Feb 23 22:59	OL
Radium 228	0.61	pCi/L	3.00	EPA M9320	1 Mar 23 10:30	OL
Sulfate	110	mg/L	5.0	ASTM D516-11	26 Jan 23 8:24	SS
Chloride	11.4	mg/L	3.0	SM 4500 Cl E	26 Jan 23 8:47	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	31 Jan 23 11:25	RMB
Solids, Total Dissolved	500	mg/L	10	SM 2540 C-97	25 Jan 23 9:30	CC
Calcium	108.0	mg/L	0.500	SW6010D	25 Jan 23 12:32	KAM
Lithium	< 0.02	mg/L	0.02	SW6010D	25 Jan 23 12:32	KAM
Barium	0.091	mg/L	0.005	SW6010D	25 Jan 23 12:32	KAM
Beryllium	< 0.005	mg/L	0.005	SW6010D	25 Jan 23 12:32	KAM
Chromium	< 0.01	mg/L	0.01	SW6010D	25 Jan 23 12:32	KAM
Cobalt	< 0.005	mg/L	0.005	SW6010D	25 Jan 23 12:32	KAM
Molybdenum	< 0.015	mg/L	0.015	SW6010D	25 Jan 23 12:32	KAM
Boron	< 0.1	mg/L	0.1	SW6010D	25 Jan 23 12:32	KAM
Antimony	< 0.5	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Arsenic	6.35	ug/L	0.50	SW6020B	26 Jan 23 18:28	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	26 Jan 23 10:28	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Selenium	< 1 ^	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	26 Jan 23 18:28	KAM
Fluoride	0.180	mg/L	0.020	EPA 300.0	26 Jan 23 23:44	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

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

Project Name: HOOT LAKE CCR

Sample Description: S-13

Report Date: 8 Mar 2023
Lab Number: 23-A1994
Work Order #: 31-0034
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Jan 2023 12:25
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Jan 2023 16:40
PO #: 59640

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					25 Jan 23	RRA
Water Digestions					24 Jan 23	RRA
pH, Field	7.24	units	1.00	SM4500-H+-2011	23 Jan 23 12:25	MS
pH	* 7.2	units	1.0	SM 4500 H+ B-2000	24 Jan 23 8:10	HO
Radium 226	0.11	pCi/L	0.60		1 Feb 23 22:59	OL
Radium 228	-1.49	pCi/L	3.00	EPA M9320	1 Mar 23 10:30	OL
Sulfate	133	mg/L	5.0	ASTM D516-11	26 Jan 23 8:24	SS
Chloride	8.6	mg/L	3.0	SM 4500 Cl E	26 Jan 23 8:47	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	31 Jan 23 11:25	RMB
Solids, Total Dissolved	557	mg/L	10	SM 2540 C-97	25 Jan 23 9:30	CC
Calcium	120.0	mg/L	0.500	SW6010D	25 Jan 23 12:32	KAM
Lithium	0.022	mg/L	0.020	SW6010D	25 Jan 23 12:32	KAM
Barium	0.057	mg/L	0.005	SW6010D	25 Jan 23 12:32	KAM
Beryllium	< 0.005	mg/L	0.005	SW6010D	25 Jan 23 12:32	KAM
Chromium	< 0.01	mg/L	0.01	SW6010D	25 Jan 23 12:32	KAM
Cobalt	< 0.005	mg/L	0.005	SW6010D	25 Jan 23 12:32	KAM
Molybdenum	< 0.015	mg/L	0.015	SW6010D	25 Jan 23 12:32	KAM
Boron	< 0.1	mg/L	0.1	SW6010D	25 Jan 23 12:32	KAM
Antimony	< 0.5	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Arsenic	< 0.5	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	26 Jan 23 18:28	KAM
Lead	< 1 @	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Selenium	< 1 ^	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Thallium	< 0.2 @	ug/L	0.1	SW6020B	26 Jan 23 18:28	KAM
Fluoride	0.210	mg/L	0.020	EPA 300.0	26 Jan 23 23:44	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
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1-612-607-1700

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

Project Name: HOOT LAKE CCR

Sample Description: S-14R

Report Date: 8 Mar 2023
Lab Number: 23-A1995
Work Order #: 31-0034
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Jan 2023 10:40
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Jan 2023 16:40
PO #: 59640

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					25 Jan 23	RRA
Water Digestions					24 Jan 23	RRA
pH, Field	7.15	units	1.00	SM4500-H+-2011	23 Jan 23 10:40	MS
pH	* 7.1	units	1.0	SM 4500 H+ B-2000	24 Jan 23 8:10	HO
Radium 226	0.10	pCi/L	0.60		1 Feb 23 22:59	OL
Radium 228	0.68	pCi/L	3.00	EPA M9320	1 Mar 23 10:30	OL
Sulfate	79.9	mg/L	5.0	ASTM D516-11	26 Jan 23 8:24	SS
Chloride	3.7	mg/L	3.0	SM 4500 Cl E	26 Jan 23 8:47	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	31 Jan 23 11:25	RMB
Solids, Total Dissolved	464	mg/L	10	SM 2540 C-97	25 Jan 23 9:30	CC
Calcium	112.0	mg/L	0.500	SW6010D	25 Jan 23 12:32	KAM
Lithium	0.027	mg/L	0.020	SW6010D	25 Jan 23 12:32	KAM
Barium	0.046	mg/L	0.005	SW6010D	25 Jan 23 12:32	KAM
Beryllium	< 0.005	mg/L	0.005	SW6010D	25 Jan 23 12:32	KAM
Chromium	< 0.01	mg/L	0.01	SW6010D	25 Jan 23 12:32	KAM
Cobalt	< 0.005	mg/L	0.005	SW6010D	25 Jan 23 12:32	KAM
Molybdenum	< 0.015	mg/L	0.015	SW6010D	25 Jan 23 12:32	KAM
Boron	< 0.1	mg/L	0.1	SW6010D	25 Jan 23 12:32	KAM
Antimony	< 0.5	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Arsenic	2.74	ug/L	0.50	SW6020B	26 Jan 23 18:28	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	26 Jan 23 18:28	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Selenium	< 1 ^	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	26 Jan 23 18:28	KAM
Fluoride	0.230	mg/L	0.020	EPA 300.0	26 Jan 23 23:44	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

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

Report Date: 8 Mar 2023
Lab Number: 23-A1996
Work Order #: 31-0034
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Jan 2023 10:18
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Jan 2023 16:40
PO #: 59640

Project Name: HOOT LAKE CCR

Sample Description: FIELD BLANK

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					25 Jan 23	RRA
Water Digestions					26 Jan 23	RRA
pH, Field	5.53	units	1.00	SM4500-H+-2011	23 Jan 23 10:18	MS
pH	* 7.1	units	1.0	SM 4500 H+ B-2000	24 Jan 23 8:10	HO
Radium 226	0.07	pCi/L	0.60		1 Feb 23 22:59	OL
Radium 228	1.03	pCi/L	3.00	EPA M9320	1 Mar 23 10:30	OL
Sulfate	< 5	mg/L	5	ASTM D516-11	26 Jan 23 8:24	SS
Chloride	< 3	mg/L	3	SM 4500 Cl E	26 Jan 23 8:47	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	31 Jan 23 11:25	RMB
Solids, Total Dissolved	< 10	mg/L	10	SM 2540 C-97	25 Jan 23 9:30	CC
Calcium	< 0.5	mg/L	0.5	SW6010D	30 Jan 23 12:46	RMV
Lithium	< 0.02	mg/L	0.02	SW6010D	30 Jan 23 12:46	RMV
Barium	< 0.005	mg/L	0.005	SW6010D	30 Jan 23 12:46	RMV
Beryllium	< 0.005	mg/L	0.005	SW6010D	30 Jan 23 12:46	RMV
Chromium	< 0.01	mg/L	0.01	SW6010D	30 Jan 23 12:46	RMV
Cobalt	< 0.005	mg/L	0.005	SW6010D	30 Jan 23 12:46	RMV
Molybdenum	< 0.015	mg/L	0.015	SW6010D	30 Jan 23 12:46	RMV
Boron	< 0.1	mg/L	0.1	SW6010D	30 Jan 23 12:46	RMV
Antimony	< 0.5	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Arsenic	< 0.5	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	26 Jan 23 18:28	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	26 Jan 23 18:28	KAM
Selenium	< 0.5	ug/L	0.5	SW6020B	27 Jan 23 11:13	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	26 Jan 23 18:28	KAM
Fluoride	< 0.02	mg/L	0.02	EPA 300.0	26 Jan 23 23:44	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

OL = Analysis performed by an Outside Laboratory.

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

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

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

Report Date: 8 Mar 2023
Lab Number: 23-A1997
Work Order #: 31-0034
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 23 Jan 2023
Sampled By: MVTL FIELD PERSONNEL
Date Received: 23 Jan 2023 16:40
PO #: 59640

Project Name: HOOT LAKE CCR

Sample Description: S2A

	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 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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MEMBER ACIL

Date Reported: 8 Mar 2023

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

Work Order #: 202331-0034
Account Number: 006106
PO #: 59640

Project Name: HOOT LAKE CCR

LABORATORY NARRATIVE

INORGANIC & METALS ANALYSES:
No problems were encountered.

MVTL

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

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ACIL

Quality Control Report

Lab IDs: 23-A1990 to 23-A1997 **Project:** HOOT LAKE CCR **Work Order:** 202331-0034

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony ug/L	25.0	106	85-115	25.0	23A1994	< 0.5	26.4	106	75-125	26.4	26.6	106	0.8	10	101	90-110	< 0.5
Arsenic ug/L	25.0	101	85-115	25.0	23A1994	< 0.5	26.7	107	75-125	26.7	26.6	106	0.4	10	98	90-110	< 0.5
Barium mg/L	1.000	99	85-115	1.00	23A1992	0.109	1.110	100	75-125	1.110	1.110	100	0.0	10	98	90-110	< 0.005
	1.000	99	85-115	1.00	23A1991	0.065	1.080	102	75-125	1.080	1.080	102	0.0	10	97	90-110	< 0.005
	1.000	101	85-115	1.00	23A1996	< 0.005	1.030	103	75-125	1.030	1.030	103	0.0	10	99	90-110	< 0.005
Beryllium mg/L	1.000	100	85-115	1.00	23A1992	< 0.005	1.030	103	75-125	1.030	1.030	103	0.0	10	98	90-110	< 0.005
	1.000	100	85-115	1.00	23A1991	< 0.005	1.030	103	75-125	1.030	1.030	103	0.0	10	97	90-110	< 0.005
	1.000	101	85-115	1.00	23A1996	< 0.005	1.020	102	75-125	1.020	1.030	103	1.0	10	100	90-110	< 0.005
Boron mg/L	1.000	101	85-115	1.00	23A1992	< 0.1	1.110	111	75-125	1.110	1.100	110	0.9	10	98	90-110	< 0.1
	1.000	101	85-115	1.00	23A1991	0.177	1.240	106	75-125	1.240	1.250	107	0.8	10	97	90-110	< 0.1
	1.000	101	85-115	1.00	23A1996	< 0.1	1.030	103	75-125	1.030	1.040	104	1.0	10	98	90-110	< 0.1
Cadmium ug/L	5.00	104	85-115	5.00	23A1994	< 0.1	5.30	106	75-125	5.30	5.25	105	0.9	10	99	90-110	< 0.1
Calcium mg/L	50.00	99	85-115	50.0	23A1992	106.0	156.0	100	75-125	156.0	154.0	96	1.3	10	99	90-110	< 0.5
	50.00	99	85-115	50.0	23A1991	99.10	148.0	98	75-125	148.0	149.0	100	0.7	10	98	90-110	< 0.5
	50.00	102	85-115	50.0	23A1996	< 0.5	51.70	103	75-125	51.70	51.60	103	0.2	10	101	90-110	< 0.5
Chloride mg/L	-	-	-	60.0	23-A1996	< 3	58.4	97	86-117	58.4	58.2	97	0.3	5	95	90-110	< 3
Chromium mg/L	1.000	97	85-115	1.00	23A1992	< 0.01	0.982	98	75-125	0.982	0.972	97	1.0	10	96	90-110	< 0.01
	1.000	97	85-115	1.00	23A1991	< 0.01	0.977	98	75-125	0.977	0.975	98	0.2	10	95	90-110	< 0.01
	1.000	96	85-115	1.00	23A1996	< 0.01	0.971	97	75-125	0.971	0.977	98	0.6	10	97	90-110	< 0.01
Cobalt mg/L	1.000	101	85-115	1.00	23A1992	< 0.005	0.992	99	75-125	0.992	0.986	99	0.6	10	100	90-110	< 0.005
	1.000	101	85-115	1.00	23A1991	< 0.005	0.991	99	75-125	0.991	0.996	100	0.5	10	99	90-110	< 0.005
	1.000	101	85-115	1.00	23A1996	< 0.005	1.020	102	75-125	1.020	1.030	103	1.0	10	99	90-110	< 0.005
Fluoride mg/L	-	-	-	0.20	23-A1996	< 0.02	0.200	100	75-125	0.200	0.210	105	4.9	10	102	90-110	< 0.02
Lead ug/L	25.0	102	85-115	25.0	23A1994	< 1	26.3	105	75-125	26.3	26.0	104	1.1	10	100	90-110	< 0.5
Lithium mg/L	1.000	100	85-115	1.00	23-A1992	< 0.02	1.030	103	75-125	1.030	1.020	102	1.0	10	96	90-110	< 0.02
	1.000	100	85-115	1.00	23-A1991	0.020	1.030	101	75-125	1.030	1.020	100	1.0	10	96	90-110	< 0.02
	1.000	102	85-115	1.00	23-A1996	< 0.02	1.040	104	75-125	1.040	1.030	103	1.0	10	99	90-110	< 0.02

MVTL

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Quality Control Report

Lab IDs: 23-A1990 to 23-A1997 **Project:** HOOT LAKE CCR **Work Order:** 202331-0034

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (≤)	Known Rec (%)	Known % Rec Limits	Method Blank
Mercury ug/L	-	-	-	0.10	23-A1995	< 0.005	0.075	75	63-111	0.075	0.074	74	1.3	18	104	76-113	< 0.005
Molybdenum mg/L	1.000	97	85-115	1.00	23A1992	< 0.015	1.000	100	75-125	1.000	0.990	99	1.0	10	99	90-110	< 0.015
	1.000	97	85-115	1.00	23A1991	< 0.015	1.000	100	75-125	1.000	1.000	100	0.0	10	97	90-110	< 0.015
	1.000	97	85-115	1.00	23A1996	< 0.015	0.979	98	75-125	0.979	0.987	99	0.8	10	99	90-110	< 0.015
pH units	-	-	-	-	-	-	-	-	-	7.4	7.4	-	0.0	2.5	101	90-110	-
Selenium ug/L	25.0	107	85-115	25.0	23A1994	< 1	28.1	112	75-125	28.1	28.2	113	0.4	10	98	90-110	< 0.5
	25.0	107	85-115	25.0	23A1994	< 2.5	23.7	95	75-125	23.7	25.7	103	8.1	10	104	90-110	< 0.5
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	1550	1460	-	6.0	7	94	85-115	< 10
	-	-	-	-	-	-	-	-	-	1250	1270	-	1.6	7	-	-	-
Sulfate mg/L	-	-	-	50.0	23-A1996	< 5	47.7	95	68-132	47.7	49.4	99	3.5	5	95	80-120	< 5
Thallium ug/L	5.00	104	85-115	5.00	23A1994	< 0.2	5.31	106	75-125	5.31	5.13	103	3.4	10	98	90-110	< 0.1

Approved by:

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

March 02, 2023

Todd Rieger
MVTL Laboratories
1126 North Front Street
New Ulm, MN 56073

RE: Project: Work Order: 31-0547 Ottertail
Pace Project No.: 10640858

Dear Todd Rieger:

Enclosed are the analytical results for sample(s) received by the laboratory on January 25, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Piper J Gibbs

Piper Gibbs
piper.gibbs@pacelabs.com
(612)607-1700
Project Manager

Enclosures

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: Work Order: 31-0547 Ottertail
Pace Project No.: 10640858

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10640858001	23A1990 - S3AR	Water	01/23/23 13:04	01/25/23 09:24
10640858002	23A1991 - S51	Water	01/23/23 11:42	01/25/23 09:24
10640858003	23A1992 - S52	Water	01/23/23 11:59	01/25/23 09:24
10640858004	23A1993 - S10R	Water	01/23/23 11:06	01/25/23 09:24
10640858005	23A1994 - S13	Water	01/23/23 12:25	01/25/23 09:24
10640858006	23A1995 - S14R	Water	01/23/23 10:40	01/25/23 09:24
10640858007	23A1996 - FIELD BLANK	Water	01/23/23 10:18	01/25/23 09:24

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A — Required Client Information:

Company:	MVTL
Address:	1126 NORTH FRONT BLDG #2
	NEW ULM, MN 56073
Email To:	alieder@mvtl.com; trieger@mvtl.com
Phone: 507-233-7135	Fax:
Requested Due Date/TAT:	standard

Section B — Required Project Information:

Report To:	TODD RIEGER
Copy To:	0
Purchase Order No.:	CL13299
Project Name:	Ottertail Power Co
Project Number:	Work Order: 31-0547

Section C — Invoice Information:

Attention:	AP
Company Name:	MVTL
Address:	1126 NORTH FRONT BLDG 2
Pace Quote Reference:	109838
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MN

Requested Analysis Filtered (Y/N)

Section D — Required Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test: Radium 226 / 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	23A1990 - S3AR	WT				01/23/23	13:04		1									X		001
2	23A1991 - S51	WT				01/23/23	11:42		1									X		002
3	23A1992 - S52	WT				01/23/23	11:59		1									X		003
4	23A1993 - S10R	WT				01/23/23	11:06		1									X		004
5	23A1994 - S13	WT				01/23/23	12:25		1									X		005
6	23A1995 -S14R	WT				01/23/23	10:40		1									X		006
7	23A1996 - FIELD BLANK	WT				01/23/23	10:18		1									X		007
8																				
9																				
10	Results needed by	2/14/23	OK	per	Piper	Gibb														
11																				
12																				

ADDITIONAL COMMENTS

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
			Pace	1/25/23	9:24

SAMPLE CONDITIONS

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
3.3	Y	N	X

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

WO# : 10640858

10640858

Page 10 of 25

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

DC#_Title: Excel Form Template
Effective Date:

Sample Condition Upon Receipt

Client Name: MVTL

Project #: **WO#: 10640858**

PM: PG Due Date: 02/23/23
CLIENT: MVTL

Courier: ☐ FedEx ☐ UPS ☐ USPS ☒ Client ☐ Pace ☐ SpeeDee ☐ Commercial

☐ See Exceptions ENV-FRM-MIN4-0142

Tracking Number: _____

Custody Seal on Cooler/Box Present? ☐ Yes ☒ No Seals Intact? ☐ Yes ☒ No Biological Tissue Frozen? ☐ Yes ☐ No ☒ N/A

Packing Material: ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other Temp Blank? ☒ Yes ☐ No

Thermometer: ☐ T1 (0461) ☐ T2 (1336) ☐ T3 (0459) ☐ T4 (0254) ☐ T5 (0178) ☐ T6 (0235) ☒ T7 (0042) ☐ T8 (0775) ☐ T9(0727) ☐ 01339252/1710

Type of Ice: ☒ Wet ☐ Blue ☐ Dry ☐ None ☐ Melted

Did Samples Originate in West Virginia? ☐ Yes ☒ No Were All Container Temps Taken? ☐ Yes ☐ No ☒ N/A

Temp should be above freezing to 6 °C

Cooler temp Read w/Temp Blank: 3.1 °C

Correction Factor: +0.2

Cooler Temp Corrected w/temp blank: 3.3 °C

Average Corrected Temp (no temp blank only): _____ °C

☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

USDA Regulated Soil: (☒ N/A, water sample/other: _____)

Date/Initials of Person Examining Contents: 1/25/23 NF

Did samples originate in a quarantine zone within the United States: AL, AR, AZ CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (ENV-FRM-MIN4-0154) and include with SCUR/COC paperwork.

Location (Check one): ☐ Duluth ☒ Minneapolis ☐ Virginia				COMMENTS
Chain of Custody Present and Filled Out?	☒ Yes	☐ No		1.
Chain of Custody Relinquished?	☐ Yes	☒ No		2.
Sampler Name and/or Signature on COC?	☐ Yes	☒ No	☐ N/A	3.
Samples Arrived within Hold Time?	☒ Yes	☐ No		4. If fecal: ☐ <8 hrs ☐ >8 hr, <24 ☐ No
Short Hold Time Analysis (<72 hr)?	☐ Yes	☒ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E.coli ☐ BOD/cBOD ☐ Hex Chrom ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other
Rush Turn Around Time Requested?	☐ Yes	☒ No		6.
Sufficient Sample Volume?	☒ Yes	☐ No		7.
Correct Containers Used?	☒ Yes	☐ No	☐ N/A	8.
-Pace Containers Used?	☒ Yes	☐ No		
Containers Intact?	☒ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☒ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC?	☒ Yes	☐ No		11. If no, write ID/Date/Time of container below: ☐ See Exceptions ENV-FRM-MIN4-0142
Matrix: ☒ Water ☐ Soil ☐ Oil ☐ Other				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☒ N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO3, H2SO4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐ Yes	☐ No	☒ N/A	☐ NaOH ☐ HNO3 ☐ H2SO4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxins/PFAS (*If adding preservative to a container, it must be added to associated field and equipment blanks--verify with PM first.)	☐ Yes	☐ No	☒ N/A	Positive for Residual Chlorine? ☐ Yes ☐ No ☐ See Exceptions ENV-FRM-MIN4-0142
				pH Paper Lot #
				Residual Chlorine / 0-6 Roll / 0-6 Strip / 0-14 Strip
Headspace in Methyl Mercury Container?	☐ Yes	☐ No	☒ N/A	13.
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☒ N/A	14. ☐ See Exceptions ENV-FRM-MIN4-0142
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☒ N/A	
3 Trip Blanks Present?	☐ Yes	☐ No	☒ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☒ N/A	Pace Trip Blank Lot # (If purchased): _____

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Piper Gibbs Date: 1/25/23

NOTE: Whenever there is a discrepancy affecting North Carolina compliance samples a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e., out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled By: NF Line: 2

ANALYTICAL REPORT

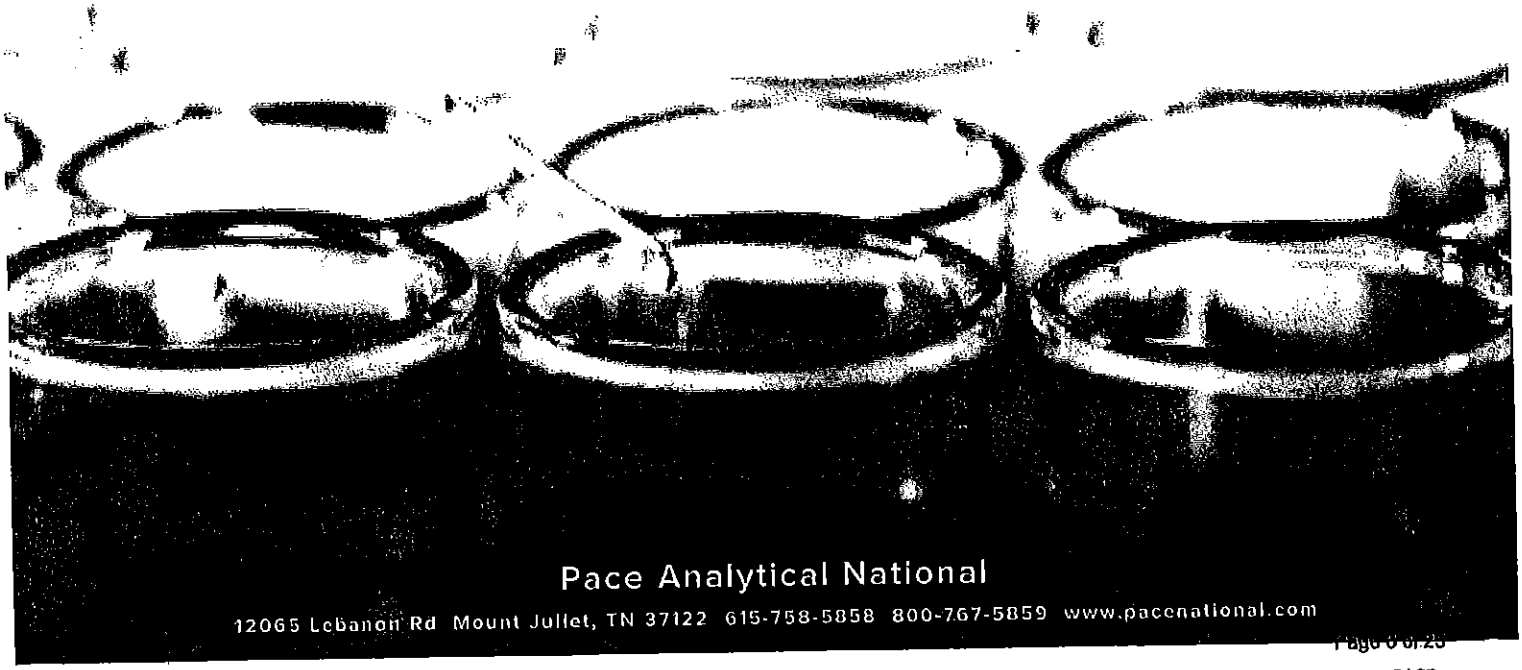
March 02, 2023

Pace Analytical - Minnesota

Sample Delivery Group:	L1579971
Samples Received:	01/27/2023
Project Number:	10640858
Description:	Work Oder:31-0547 Outfall
Site:	001
Report To:	Piper Gibbs

Entire Report Reviewed By:

Donna Eldson
Project Manager



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SAMPLE SUMMARY

23A1990-S3AR L1579971-01 Non-Potable Water

Collected by | Collected date/time 01/23/23 13:04 | Received date/time 01/27/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2006763	1	02/21/23 19:42	03/01/23 10:30	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1997123	1	01/31/23 16:02	02/01/23 22:59	RGT	Mt. Juliet, TN

23A1991-S51 L1579971-02 Non-Potable Water

Collected by | Collected date/time 01/23/23 11:42 | Received date/time 01/27/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2006763	1	02/21/23 19:42	03/01/23 10:30	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1997123	1	01/31/23 16:02	02/01/23 22:59	RGT	Mt. Juliet, TN

23A1992-S52 L1579971-03 Non-Potable Water

Collected by | Collected date/time 01/23/23 11:59 | Received date/time 01/27/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2006763	1	02/21/23 19:42	03/01/23 10:30	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1997123	1	01/31/23 16:02	02/01/23 22:59	RGT	Mt. Juliet, TN

23A1993-S10R L1579971-04 Non-Potable Water

Collected by | Collected date/time 01/23/23 11:06 | Received date/time 01/27/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2006763	1	02/21/23 19:42	03/01/23 10:30	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1997123	1	01/31/23 16:02	02/01/23 22:59	RGT	Mt. Juliet, TN

23A1994-S13 L1579971-05 Non-Potable Water

Collected by | Collected date/time 01/23/23 12:25 | Received date/time 01/27/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2006763	1	02/21/23 19:42	03/01/23 10:30	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1997123	1	01/31/23 16:02	02/01/23 22:59	RGT	Mt. Juliet, TN

23A1995-S14R L1579971-06 Non-Potable Water

Collected by | Collected date/time 01/23/23 10:40 | Received date/time 01/27/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2006763	1	02/21/23 19:42	03/01/23 10:30	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1997123	1	01/31/23 16:02	02/01/23 22:59	RGT	Mt. Juliet, TN

23A1996-FIELD BLANK L1579971-07 Non-Potable Water

Collected by | Collected date/time 01/23/23 10:18 | Received date/time 01/27/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2006763	1	02/21/23 19:42	03/01/23 10:30	SWM	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1997123	1	01/31/23 16:02	02/01/23 22:59	RGT	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Donna Eldson
Project Manager

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-228	-1.79	U	0.641	0.586	03/01/2023 10:30	WG2006763
(T) Barium	*78.7*			*30.0-143*	*03/01/2023 10:30*	WG2006763
(T) Yttrium	*111*			*30.0-136*	*03/01/2023 10:30*	WG2006763

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-226	0.107	J	0.184	0.288	02/01/2023 22:59	WG1997123
(T) Barium-133	*92.4*			*30.0-143*	*02/01/2023 22:59*	WG1997123

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.88		0.549	0.949	03/01/2023 10:30	WG2006763
(T) Barium	*68.4*			*30.0-143*	*03/01/2023 10:30*	WG2006763
(T) Yttrium	*101*			*30.0-136*	*03/01/2023 10:30*	WG2006763

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.528		0.321	0.313	02/01/2023 22:59	WG1997123
(T) Barium-133	*93.1*			*30.0-143*	*02/01/2023 22:59*	WG1997123

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.664	U	0.463	0.867	03/01/2023 10:30	WG2006763
(I) Barium	*74.4*			*30.0-143*	*03/01/2023 10:30*	WG2006763
(I) Yttrium	*112*			*30.0-136*	*03/01/2023 10:30*	WG2006763

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.462		0.300	0.315	02/01/2023 22:59	WG1997123
(I) Barium-133	*89.7*			*30.0-143*	*02/01/2023 22:59*	WG1997123

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.609	J	0.346	0.615	03/01/2023 10:30	WG2006763
(T) Barium	*93.2*			*30.0-143*	*03/01/2023 10:30*	WG2006763
(T) Yttrium	*117*			*30.0-136*	*03/01/2023 10:30*	WG2006763

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.332		0.246	0.267	02/01/2023 22:59	WG1997123
(T) Barium-133	*94.1*			*30.0-143*	*02/01/2023 22:59*	WG1997123

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-1.49	U	0.552	1.05	03/01/2023 10:30	WG2006763
(T) Barium	*72.0*			*30.0-143*	*03/01/2023 10:30*	WG2006763
(T) Yttrium	*104*			*30.0-136*	*03/01/2023 10:30*	WG2006763

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.107	J	0.157	0.237	02/01/2023 22:59	WG1997123
(T) Barium-133	*93.8*			*30.0-143*	*02/01/2023 22:59*	WG1997123

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-228	0.677	J	0.516	0.924	03/01/2023 10:30	WG2006763
(T) Barium	*69.4*			*30.0-143*	*03/01/2023 10:30*	WG2006763
(T) Yttrium	*101*			*30.0-136*	*03/01/2023 10:30*	WG2006763

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+/-	pCi/l	date / time	
RADIUM-226	0.0982	J	0.132	0.191	02/01/2023 22:59	WG1997123
(T) Barium-133	*91.6*			*30.0-143*	*02/01/2023 22:59*	WG1997123

23A1996-FIELD BLANK

Collected date/time: 01/23/23 10:18

SAMPLE RESULTS - 07

L1579971

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.03	J	0.588	1.04	03/01/2023 10:30	WG2006763
(I) Barium	*63.9*			*30.0-143*	*03/01/2023 10:30*	WG2006763
(I) Yttrium	*108*			*30.0-136*	*03/01/2023 10:30*	WG2006763

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.0733	U	0.144	0.242	02/01/2023 22:59	WG1997123
(I) Barium-133	*91.8*			*30.0-143*	*02/01/2023 22:59*	WG1997123

H249

Internal Transfer Chain of Custody

Pace Analytical
www.pacelabs.com

☐ Samples Pre-Logged into eCOC.

State Of Origin: MN
Cert. Needed: ☐ Yes ☐ No
Owner Received Date: 1/25/2023 Results Requested By: 2/16/2023

Workorder: 10640858 **Workorder Name:** Work Order: 31-0547 Ottertail

Report To	Subcontract To
Piper Gibbs Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone (612)607-1700	Pace National 12065 Lebanon Rd Mt. Juliet, TN 37122 Phone (615) 758-5858

L157997

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	# Preserved Containers: Unpreserved	Requested Analysis: Radium 226, 228	LAB USE ONLY
1	23A1990 - S3AR	PS	1/23/2023 13:04	10640858001	Water	1	X	-01
2	23A1991 - S51	PS	1/23/2023 11:42	10640858002	Water	1	X	-02
3	23A1992 - S52	PS	1/23/2023 11:59	10640858003	Water	1	X	-03
4	23A1993 - S10R	PS	1/23/2023 11:06	10640858004	Water	1	X	-04
5	23A1994 - S13	PS	1/23/2023 12:25	10640858005	Water	1	X	-05
6	23A1995 - S14R	PS	1/23/2023 10:40	10640858006	Water	1	X	-06
7	23A1996 - FIELD BLANK	PS	1/23/2023 10:18	10640858007	Water	1	X	-07

Transfers	Released By	Date/Time	Received By	Date/Time
1	CSM/Pace	1/26/23 11:25		1-27-23 8:45
2				
3				

Comments: FedEx TRK#: 5466 8888 0180
# of containers: 7
Trip Blank: No

Cooler Temperature on Receipt °C | Custody Seal Y or N | Received on Ice Y or N | Samples Intact Y or N

****In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.*

Sample Receipt Checklist

COC Seal Present/Intact:	Y N	If Applicable VOA Zero Headspace:	Y N
COC Signed/Accurate:	Y N	Pres.Correct/Check:	Y N
Bottles arrive intact:	Y N		
Correct bottles used:	Y N	Temp: NSA2	
Sufficient volume sent:	Y N	3.4 to 3.4	
RAD Screen <0.5 mR/hr:	Y N		

WG2006763

Radiochemistry by Method 904/9320

QUALITY CONTROL SUMMARY

L1579971-01,02,03,04,05,06,07

Method Blank (MB)

(MB) R3896489-1 03/01/23 10:30

	MB Result	MB Qualifier	MB Uncertainty	MB MDA
Analyte	pCi/l		+/-	pCi/l
Radium-228	0.153	J	0.320	0.280
(T) Barium	*72.6*		*72.6*	
(T) Yttrium	*107*		*107*	

L1580298-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1580298-03 03/01/23 10:30 • (DUP) R3896489-5 03/01/23 10:30

	Original Result	Original Uncertainty	Original MDA	DUP Result	DUP Uncertainty	DUP MDA	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
								%			%	
Analyte	pCi/l	+/-	pCi/l	pCi/l	+/-	pCi/l						
Radium-228	-0.698	0.592	1.09	0.301	0.370	1.09	1	200	1.43	J	20	3
(T) Barium	*69.8*			*82.0*	*82.0*							
(T) Yttrium	*118*			*109*	*109*							

Laboratory Control Sample (LCS)

(LCS) R3896489-2 03/01/23 10:30

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
			%	%	
Analyte	pCi/l	pCi/l			
Radium-228	5.00	4.33	86.6	80.0-120	
(T) Barium			*68.8*		
(T) Yttrium			*102*		

L1580298-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1580298-02 03/01/23 10:30 • (MS) R3896489-3 03/01/23 10:30 • (MSD) R3896489-4 03/01/23 10:30

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
					%	%		%			%		%
Analyte	pCi/l	pCi/l	pCi/l	pCi/l									
Radium-228	10.0	2.03	4.54	4.72	25.2	27.0	1	70.0-130	J6	J6	3.84		20
(T) Barium		*80.4*			*81.6*	*77.3*							
(T) Yttrium		*98.9*			*121*	*123*							

Method Blank (MB)

(MB) R3887458-1 02/01/23 22:59

	MB Result	MB Qualifier	MB Uncertainty	MB MDA
Analyte	pCi/l		+/-	pCi/l
Radium-226	-0.00171	U	0.0344	0.0714
(T) Barium-133	*93.2*		*93.2*	

L1580298-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1580298-01 02/01/23 22:59 • (DUP) R3887458-5 02/01/23 22:59

	Original Result	Original Uncertainty	Original MDA	DUP Result	DUP Uncertainty	DUP MDA	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
	pCi/l	+/-	pCi/l	pCi/l	+/-	pCi/l		%			%	
Analyte	0.366	0.223	0.201	0.181	0.225	0.201	1	67.4	0.581	J	20	3
Radium-226	*91.6*			*92.3*	*92.3*							
(T) Barium-133												

Laboratory Control Sample (LCS)

(LCS) R3887458-2 02/01/23 22:59

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	pCi/l	pCi/l	%	%	
Analyte	5.02	5.85	116	80.0-120	
Radium-226			*90.4*		
(T) Barium-133					

L1580298-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1580298-03 02/01/23 22:59 • (MS) R3887458-3 02/01/23 22:59 • (MSD) R3887458-4 02/01/23 22:59

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Analyte	20.0	0.133	18.9	23.0	93.6	114	1	75.0-125			19.7		20
Radium-226		*91.9*			*99.8*	*90.1*							
(T) Barium-133													

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
U	Below Detectable Limits; Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1,6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1,4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

1/27 NCF-L1579971

R5

Time estimate: oh **Time spent:** oh

Members

Nicolle Faulk (responsible) Donna Eidson

- [x] Login Clarification needed
- [ ] Chain of custody is incomplete
- [ ] Please specify Metals requested
- [ ] Please specify TCLP requested
- [ ] Received additional samples not listed on COC
- [ ] Sample IDs on containers do not match IDs on COC
- [ ] Client did not "X" analysis
- [ ] Chain of Custody is missing
- [ ] If no COC: Received by:_____
- [ ] If no COC: Date/Time:_____
- [ ] If no COC: Temp./Cont.Rec./pH:_____
- [ ] If no COC: Carrier:_____
- [ ] If no COC: Tracking #:_____
- [ ] Client informed by call
- [ ] Client informed by Email
- [ ] Client informed by Voicemail
- [ ] Date/Time:_____
- [ ] PM initials:_____
- [ ] Client Contact:_____

Comments

Nicolle Faulk *27 January 2023 2:32 PM*

Received a 1L amber, no pres per ID

Donna Eidson *27 January 2023 4:03 PM*

1L is sufficient for RA226 & RA228. Please preserve, log & send to RAD Lab for analysis.

Nicolle Faulk *28 January 2023 7:51 AM*

done

This is an exact copy of the original document
By LY Date 23Jan23
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: MS EDF

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: BarrDM@barr.com
Attn:
Address:

Quote Number:
Work Order Number: 31-0034
Lab Numbers:

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	600 HNO3	Filter? Y or N	500H2SO4	1000 HNO3	500 NaOH	Other: 150 H2SO4	*Amber None (Pace)	Analysis Required
97	S2A		23Jan23	1145	GW			1		1	N							1	See Attatched
A1990	S3AR			1304	GW			1		1	N							1	CCR 3 and CCR 4
91	S51			1142	GW			1		1	N							1	
92	S52			1159	GW			1		1	N							1	
93	S10R			1106	GW			1		1	N							1	
94	S13			1225	GW			1		1	N							1	
95	S14R			1040	GW			1		1	N							1	
96	Field Blank			1018				1		1	N							1	

Comments: **CCR wells**
*Amber None (Pace) is for Radium 226 + 228

Samples Relinquished By: [signature]
Date: 23Jan23 Time: 1640 Temp: 0.0 TM797
Samples Relinquished into: Fridge Log in Cart Other:

Samples Received By: [signature]
Date: 23Jan23 Time: 1640 Temp: 0.0C

Samples Relinquished By:
Date: Time: Temp:
Del : Samplers Other:
Transport: Ambient Ice Other:

Samples Received By:
Date: Time: Temp:
Seal Number(s) - If Used
Seals Intact? Yes No

4

CCR - Appendix IV - Assessment Monitoring

Total Concentration Parameters	**Method**
Antimony - SB	SW6020A
Arsenic	SW602A
Barium	SW6010C
Beryllium	SW6020A
Cadmium	SW6020A
Chromium, Total	SW6020A
Cobalt	SW6010C
Fluoride	EPA 300
Lead	SW6020A
Lithium	SW6010C
Mercury	EPA 245.7
Molybdenum	SW6020A
Selenium	SW6020A
Thallium	SW6020A
Radium 226 + 228	

3

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: MS, DF

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 23Jan23

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:	1203.342
Casing Diameter:	2"	Previous Static:	—
Water Level Before Purge:	68.22	Water Level After Sample:	68.22
Well Volume:	1.66 Gallons	Measurement Method:	(Elec. WL) Steel Tape

Sampling Information

Weather Conditions: Temp: 28 Wind: N-10 Sky: Cldy

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

Dedicated Equipment: (Yes) No

Well Purged Dry? Yes (No)

Time Purged Dry? —

Duplicate Sample? Yes (No) ID: —

Pumping Rate: 0.25 gpm

Time Pump Began: 1243 am / (pm)

Time of Sampling: 1304 am / (pm)

Sample EH: 31.6

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:
1250	7.19	1219	8.35	2.74	2.9	1.75	1	
1257	7.18	1221	8.36	2.75	3.0	3.5	2	
1304	7.17	1227	8.33	2.65	3.2	5.25	3	
							4	
							5	

Stabilized? (Yes) No

Amount Water Removed: 5.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: MS DF

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 23Jan23

Unique Station ID: 814830

Sample ID: S-51

Well Condition

Well Locked?	(Yes)	No
Well Labeled?	(Yes)	No
Casing Straight?	(Yes)	No

Protective Posts?	Yes	(No)
State ID Tag?	(Yes)	No
Grout Seal Intact?	(Yes)	No

Repairs Necessary:

Well Information

Well Depth: 55.60

Constructed Depth: 55.60

Casing Diameter: 2"

Water Level Before Purge: 49.56

Well Volume: 0.98 Gallons

Well Casing Elevation: 1286.904

Static Water Elevation: 1237.34

Previous Static: —

Water Level After Sample: 49.56

Measurement Method: (Elec. WL) Steel Tape

Sampling Information

Weather Conditions: Temp: 28 Wind: N-10 Sky: Cldy

Sampling Method: Grundfos (Bladder SS) Disp. Baller Whale Grab Other:

Dedicated Equipment: (Yes) No

Well Purged Dry? Yes (No)

Time Purged Dry? —

Duplicate Sample? Yes (No) ID: —

Pumping Rate: 0.25 gpm

Time Pump Began: 1130 (am) / pm

Time of Sampling: 1142 (am) / pm

Sample EH: 14.2

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

(4) Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1134	7.14	950	7.40	1.68	2.0	1	1	
1138	7.13	960	7.43	1.35	1.6	2	2	
1142	7.12	967	7.44	1.26	1.1	3	3	
							4	
							5	

Stabilized? (Yes) No

Amount Water Removed: 3 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Site: Ottertail Power Co./Hoot Lake

Sampling Personnel: MS DF

Facility ID: SW-211

Date: 23 Jan 23

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:	1215.89
Casing Diameter:	2"	Previous Static:	—
Water Level Before Purge:	70.73	Water Level After Sample:	70.79
Well Volume:	2.86 Gallons	Measurement Method:	Elec. WLI / Steel Tape

Sampling Information

Weather Conditions: Temp: 28° Wind: N-10 Sky: cldy

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: 1123 (am) / pm

Time Purged Dry? —

Time of Sampling: 1159 am / pm

Duplicate Sample? Yes (No) ID: —

Sample EH: 2.8

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

(12) Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1135	7.10	994	7.57	1.35	0.6	3	1	
1147	7.10	997	7.55	1.40	0.6	6	2	
1159	7.10	999	7.58	1.39	0.6	9	3	
							4	
							5	

Stabilized? (Yes) No

Amount Water Removed: 9 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: MS, DF

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 23 Jan 23

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:	1209.24
Casing Diameter:	2"	Previous Static:	—
Water Level Before Purge:	72.23	Water Level After Sample:	Below Pump
Well Volume:	1.36 Gallons	Measurement Method:	(Elec. WL) Steel Tape

Sampling Information

Weather Conditions: Temp: 28 Wind: N@10 Sky: cldy

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

Dedicated Equipment: (Yes) No

Well Purged Dry? (Yes) No

Time Purged Dry? 1101

Duplicate Sample? Yes (No) ID: —

Pumping Rate: 0.25 gpm

Time Pump Began: 1055 (am) / pm

Time of Sampling: 1106 (am) / pm

Sample EH: ~~934~~ 78.2

Sample Appearance: General: clear Color: none Phase: sl. Lt sed. Odor: None

(6) Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1101	7.18	918	7.95	2.76	43.0	1.50	1	
1106	7.20	937	7.26	3.14	24.9	-	2	recharge
							3	
							4	
							5	

Stabilized? Yes (No)

Amount Water Removed: 1.50 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073. 507 354 8517

Groundwater Assessment

Sampling Personnel: MS, DF

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 23Jan23

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

Constructed Depth: 90.19

Casing Diameter: 2"

Water Level Before Purge: 85.72

Well Volume: 0.74 Gallons

Well Casing Elevation: 1296.423

Static Water Elevation: 1210.7

Previous Static: —

Water Level After Sample: 85.88

Measurement Method: (Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 28 Wind: N-10 Sky: cldy

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: 1216 am / (pm)

Time of Sampling: 1225 am / pm

Sample EH: 93.5

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

(3) Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1219	7.25	1122	7.95	2.62	5.0	.75	1	
1222	7.25	1125	7.95	2.37	5.1	1.5	2	
1225	7.24	1128	7.96	2.26	5.0	2.25	3	
							4	
							5	

Stabilized? (Yes) No

Amount Water Removed: 2.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: MS

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 23Jan23

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:	1201.44
Casing Diameter:	2"	Previous Static:	—
Water Level Before Purge:	79.17	Water Level After Sample:	79.20
Well Volume:	1.29 Gallons	Measurement Method:	(Elec. WL) Steel Tape

Sampling Information

Weather Conditions: Temp: 28 Wind: N-S to 10 Sky: cldy

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

Dedicated Equipment: (Yes) No

Well Purged Dry? Yes (No)

Time Purged Dry? —

Duplicate Sample? Yes (No) ID: —

Pumping Rate: 0.25 gpm

Time Pump Began: 1022 (am) / pm

Time of Sampling: 1040 (am) / pm

Sample EH: 50.1

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

(6) Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1028	7.14	906	7.97	1.09	6.3	1.50	1	
1034	7.15	896	7.99	0.79	2.4	3.00	2	
1040	7.15	875	7.99	0.71	1.4	4.50	3	
							4	
							5	

Stabilized? (Yes) No

Amount Water Removed: 4.50 Gallons

Comments:

FB @1018
pH: 5.53
Cond: 39
Temp: 16.98
DO: 10.40
Turb: 1.4
Eh: 147.5

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: MS DF

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 23Jan23

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

MS 23Jan23

Well Depth: ~~76~~ 79.62

Well Casing Elevation: 1273.776

Constructed Depth: 79.63

Static Water Elevation: 1196.4

Casing Diameter: 2"

Previous Static: —

Water Level Before Purge: 77.37

Water Level After Sample:

Well Volume: 0.36 Gallons

Measurement Method: Elec. Wtl Steel Tape

Sampling Information

Weather Conditions: Temp: 28 Wind: N-10 Sky: cldy

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

Dedicated Equipment: Yes No

Well Purged Dry? Yes No

Time Purged Dry? —

Duplicate Sample? ~~Yes~~ ~~No~~ ID:

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

Pumping Rate: — gpm

Time Pump Began: — am / pm

Time of Sampling: — am / pm

Sample EH: —

NA

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/sample.
- NO sample

Exceptions to Protocol:

Pace Analytical™
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	MVTL	Report To:	TODD RIEGER	Attention:	AP
Address:	1126 NORTH FRONT BLDG #2	Copy To:	0	Company Name:	MVTL
	NEW ULM, MN 56073			Address:	1126 NORTH FRONT BLDG 2
Email To:	alieder@mvtl.com; trieger@mvtl.com	Purchase Order No.:	CL13299	Pace Quote Reference:	109838
Phone:	507-233-7135 Fax	Project Name:	Ottertail Power Co	Pace Project Manager:	
Requested Due Date/TAT:	standard	Project Number:	Work Order: 31-0547	Pace Profile #:	

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MN

Requested Analysis Filtered (Y/N)

Section D Required Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium 226 / 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	23A1990 - S3AR	WT				01/23/23	13:04		1										X		
2	23A1991 - S51	WT				01/23/23	11:42		1										X		
3	23A1992 - S52	WT				01/23/23	11:59		1										X		
4	23A1993 - S10R	WT				01/23/23	11:06		1										X		
5	23A1994 - S13	WT				01/23/23	12:25		1										X		
6	23A1995 -S14R	WT				01/23/23	10:40		1										X		
7	23A1996 - FIELD BLANK	WT				01/23/23	10:18		1										X		
8																					
9																					
10	Results needed by 2/16/23 OK per Piper Gibb																				
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

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.mvtl.com
MEMBER ACIL

FINAL REPORT COMPLETION DATE: 12 Sept 2023

Date Reported: 8 Sep 2023

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

Work Order #: 31-0210
Account #: 006106
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Jeff Hoffman 12 Sept 2023
Field Service Manager/Date Reviewed

[signature] 11 Sept 2023
Chemistry Lab Manager/Date Reviewed

[signature] for 11Sep2023
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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MEMBER ACIL

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

Report Date: 8 Sep 2023
Lab Number: 23-A7906
Work Order #: 31-0210
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 11 Jul 2023 10:55
Sampled By: MVTL FIELD PERSONNEL
Date Received: 11 Jul 2023 15:49
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-2A

Temp at Receipt: 4.1C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					13 Jul 23	KH
Water Digestions					12 Jul 23	KH
pH, Field	7.20	units	1.00	SM4500-H+-2011	11 Jul 23 10:55	BMW
pH	* 7.1	units	1.0	SM 4500 H+ B-2000	12 Jul 23 10:10	HO
Radium 226	-0.02	pCi/L	0.60		14 Aug 23 18:30	OL
Radium 228	0.08	pCi/L	3.00	EPA M9320	17 Aug 23 16:42	OL
Sulfate	172	mg/L	5.0	ASTM D516-11	13 Jul 23 9:24	LS
Chloride	< 3	mg/L	3	SM 4500 Cl E	13 Jul 23 9:03	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	14 Jul 23 13:40	RMB
Solids, Total Dissolved	650	mg/L	10	SM 2540 C-97	14 Jul 23 9:00	CC
Calcium	143.0	mg/L	0.500	SW6010D	14 Jul 23 15:59	RMV
Lithium	0.034	mg/L	0.020	SW6010D	14 Jul 23 15:59	RMV
Barium	0.060	mg/L	0.005	SW6010D	14 Jul 23 15:59	RMV
Cobalt	< 0.005	mg/L	0.005	SW6010D	14 Jul 23 15:59	RMV
Boron	0.127	mg/L	0.100	SW6010D	14 Jul 23 15:59	RMV
Antimony	< 0.5	ug/L	0.5	SW6020B	14 Jul 23 17:58	KAM
Arsenic	0.71	ug/L	0.50	SW6020B	14 Jul 23 17:58	KAM
Beryllium	< 0.05	ug/L	0.05	SW6020B	17 Jul 23 10:33	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	14 Jul 23 17:58	KAM
Chromium	< 0.5	ug/L	0.5	SW6020B	17 Jul 23 10:33	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	14 Jul 23 17:58	KAM
Molybdenum	1.06	ug/L	0.50	SW6020B	14 Jul 23 17:58	KAM
Selenium	< 0.5	ug/L	0.5	SW6020B	14 Jul 23 17:58	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	14 Jul 23 17:58	KAM
Fluoride	0.240	mg/L	0.020	EPA 300.0	18 Jul 23 5:04	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity - = Due to internal standard response
CERTIFICATION: MN LAB # 027-053-135 ND WW/DW # R-040

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MEMBER ACIL

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

Report Date: 8 Sep 2023
Lab Number: 23-A7907
Work Order #: 31-0210
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 11 Jul 2023 11:38
Sampled By: MVTL FIELD PERSONNEL
Date Received: 11 Jul 2023 15:49
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-3A-R

Temp at Receipt: 4.1C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					13 Jul 23	KH
Water Digestions					12 Jul 23	KH
pH, Field	7.31	units	1.00	SM4500-H+-2011	11 Jul 23 11:38	BMW
pH	* 7.3	units	1.0	SM 4500 H+ B-2000	12 Jul 23 10:10	HO
Radium 226	0.70	pCi/L	0.60		14 Aug 23 18:30	OL
Radium 228	-0.14	pCi/L	3.00	EPA M9320	17 Aug 23 16:42	OL
Sulfate	144	mg/L	5.0	ASTM D516-11	13 Jul 23 9:24	LS
Chloride	12.8	mg/L	3.0	SM 4500 Cl E	13 Jul 23 9:03	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	14 Jul 23 13:40	RMB
Solids, Total Dissolved	601	mg/L	10	SM 2540 C-97	14 Jul 23 9:00	CC
Calcium	119.0	mg/L	0.500	SW6010D	14 Jul 23 15:59	RMV
Lithium	0.021	mg/L	0.020	SW6010D	14 Jul 23 15:59	RMV
Barium	0.046	mg/L	0.005	SW6010D	14 Jul 23 15:59	RMV
Cobalt	< 0.005	mg/L	0.005	SW6010D	14 Jul 23 15:59	RMV
Boron	0.170	mg/L	0.100	SW6010D	14 Jul 23 15:59	RMV
Antimony	< 0.5	ug/L	0.5	SW6020B	14 Jul 23 17:58	KAM
Arsenic	< 0.5	ug/L	0.5	SW6020B	14 Jul 23 17:58	KAM
Beryllium	< 0.05	ug/L	0.05	SW6020B	17 Jul 23 10:33	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	14 Jul 23 17:58	KAM
Chromium	< 0.5	ug/L	0.5	SW6020B	17 Jul 23 10:33	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	14 Jul 23 17:58	KAM
Molybdenum	6.27	ug/L	0.50	SW6020B	14 Jul 23 17:58	KAM
Selenium	6.57	ug/L	0.50	SW6020B	14 Jul 23 17:58	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	14 Jul 23 17:58	KAM
Fluoride	0.230	mg/L	0.020	EPA 300.0	18 Jul 23 5:04	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

OL = Analysis performed by an Outside Laboratory.

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

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

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

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-51

Report Date: 8 Sep 2023
Lab Number: 23-A7908
Work Order #: 31-0210
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 11 Jul 2023 12:32
Sampled By: MVTL FIELD PERSONNEL
Date Received: 11 Jul 2023 15:49
PO #: 59640

Temp at Receipt: 4.1C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					12 Jul 23	KH
Water Digestions					12 Jul 23	KH
pH, Field	7.29	units	1.00	SM4500-H+-2011	11 Jul 23 12:32	BMW
pH	* 7.3	units	1.0	SM 4500 H+ B-2000	12 Jul 23 10:10	HO
Radium 226	0.62	pCi/L	0.60		14 Aug 23 18:30	OL
Radium 228	-0.08	pCi/L	3.00	EPA M9320	17 Aug 23 16:42	OL
Sulfate	51.6	mg/L	5.0	ASTM D516-11	13 Jul 23 9:24	LS
Chloride	10.4	mg/L	3.0	SM 4500 Cl E	13 Jul 23 9:03	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	14 Jul 23 13:40	RMB
Solids, Total Dissolved	451	mg/L	10	SM 2540 C-97	14 Jul 23 9:00	CC
Calcium	92.00	mg/L	0.500	SW6010D	14 Jul 23 15:59	RMV
Lithium	0.021	mg/L	0.020	SW6010D	14 Jul 23 15:59	RMV
Barium	0.064	mg/L	0.005	SW6010D	14 Jul 23 15:59	RMV
Cobalt	< 0.005	mg/L	0.005	SW6010D	14 Jul 23 15:59	RMV
Boron	0.193	mg/L	0.100	SW6010D	14 Jul 23 15:59	RMV
Antimony	< 0.5	ug/L	0.5	SW6020B	13 Jul 23 15:33	KAM
Arsenic	< 0.5	ug/L	0.5	SW6020B	13 Jul 23 15:33	KAM
Beryllium	< 0.05	ug/L	0.05	SW6020B	13 Jul 23 17:52	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	13 Jul 23 15:33	KAM
Chromium	0.58	ug/L	0.50	SW6020B	13 Jul 23 17:52	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	13 Jul 23 15:33	KAM
Molybdenum	2.40	ug/L	0.50	SW6020B	13 Jul 23 15:33	KAM
Selenium	< 1 ^	ug/L	0.5	SW6020B	13 Jul 23 15:33	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	13 Jul 23 15:33	KAM
Fluoride	0.230	mg/L	0.020	EPA 300.0	18 Jul 23 5:04	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

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

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current NELAC 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 # 027-053-136 ND NW/DW # R-040

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www.mvtl.com

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

Report Date: 8 Sep 2023
Lab Number: 23-A7909
Work Order #: 31-0210
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 11 Jul 2023 12:55
Sampled By: MVTL FIELD PERSONNEL
Date Received: 11 Jul 2023 15:49
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-52

Temp at Receipt: 4.1C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					12 Jul 23	KH
Water Digestions					12 Jul 23	KH
pH, Field	7.21	units	1.00	SM4500-H+-2011	11 Jul 23 12:55	BMW
pH	* 7.2	units	1.0	SM 4500 H+ B-2000	12 Jul 23 10:10	HO
Radium 226	3.22	pCi/L	0.60		14 Aug 23 18:30	OL
Radium 228	0.42	pCi/L	3.00	EPA M9320	17 Aug 23 16:42	OL
Sulfate	61.4	mg/L	5.0	ASTM D516-11	13 Jul 23 9:24	LS
Chloride	15.0	mg/L	3.0	SM 4500 Cl E	13 Jul 23 9:03	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	14 Jul 23 13:40	RMB
Solids, Total Dissolved	474	mg/L	10	SM 2540 C-97	14 Jul 23 9:00	CC
Calcium	104.0	mg/L	0.500	SW6010D	14 Jul 23 15:59	RMV
Lithium	0.022	mg/L	0.020	SW6010D	14 Jul 23 15:59	RMV
Barium	0.113	mg/L	0.005	SW6010D	14 Jul 23 15:59	RMV
Cobalt	< 0.005	mg/L	0.005	SW6010D	14 Jul 23 15:59	RMV
Boron	< 0.1	mg/L	0.1	SW6010D	14 Jul 23 15:59	RMV
Antimony	< 0.5	ug/L	0.5	SW6020B	13 Jul 23 15:33	KAM
Arsenic	1.70	ug/L	0.50	SW6020B	13 Jul 23 15:33	KAM
Beryllium	< 0.05	ug/L	0.05	SW6020B	13 Jul 23 17:52	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	13 Jul 23 15:33	KAM
Chromium	< 0.5	ug/L	0.5	SW6020B	13 Jul 23 17:52	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	13 Jul 23 15:33	KAM
Molybdenum	1.69	ug/L	0.50	SW6020B	13 Jul 23 15:33	KAM
Selenium	< 1 ^	ug/L	0.5	SW6020B	13 Jul 23 15:33	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	13 Jul 23 15:33	KAM
Fluoride	0.210	mg/L	0.020	EPA 300.0	18 Jul 23 5:04	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

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

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
: = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-123 ND WW/DW # R-040

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

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-10R

Report Date: 8 Sep 2023
Lab Number: 23-A7910
Work Order #: 31-0210
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 11 Jul 2023 12:14
Sampled By: MVTL FIELD PERSONNEL
Date Received: 11 Jul 2023 15:49
PO #: 59640

Temp at Receipt: 4.1C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					12 Jul 23	KH
Water Digestions					12 Jul 23	KH
pH, Field	7.44	units	1.00	SM4500-H+-2011	11 Jul 23 12:14	BMW
pH	* 7.3	units	1.0	SM 4500 H+ B-2000	12 Jul 23 10:10	HO
Radium 226	0.91	pCi/L	0.60		14 Aug 23 18:30	OL
Radium 228	3.87	pCi/L	3.00	EPA M9320	17 Aug 23 16:42	OL
Sulfate	99.2	mg/L	5.0	ASTM D516-11	13 Jul 23 9:24	LS
Chloride	12.3	mg/L	3.0	SM 4500 Cl E	13 Jul 23 9:03	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	14 Jul 23 13:40	RMB
Solids, Total Dissolved	500	mg/L	10	SM 2540 C-97	14 Jul 23 9:00	CC
Calcium	115.0	mg/L	0.500	SW6010D	14 Jul 23 15:59	RMV
Lithium	0.021	mg/L	0.020	SW6010D	14 Jul 23 15:59	RMV
Barium	0.233	mg/L	0.005	SW6010D	14 Jul 23 15:59	RMV
Cobalt	< 0.005	mg/L	0.005	SW6010D	14 Jul 23 15:59	RMV
Boron	< 0.1	mg/L	0.1	SW6010D	14 Jul 23 15:59	RMV
Antimony	< 0.5	ug/L	0.5	SW6020B	13 Jul 23 15:33	KAM
Arsenic	141 ~	ug/L	0.50	SW6020B	13 Jul 23 15:33	KAM
Beryllium	< 0.05	ug/L	0.05	SW6020B	13 Jul 23 17:52	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	13 Jul 23 15:33	KAM
Chromium	3.13	ug/L	0.50	SW6020B	13 Jul 23 17:52	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	13 Jul 23 15:33	KAM
Molybdenum	3.12	ug/L	0.50	SW6020B	13 Jul 23 15:33	KAM
Selenium	< 1 ^	ug/L	0.5	SW6020B	13 Jul 23 15:33	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	13 Jul 23 15:33	KAM
Fluoride	0.200 @	mg/L	0.020	EPA 300.0	18 Jul 23 5:04	MDH

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 MN/DW # R-040

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

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-10R

Report Date: 8 Sep 2023
Lab Number: 23-A7910
Work Order #: 31-0210
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 11 Jul 2023 12:14
Sampled By: MVTL FIELD PERSONNEL
Date Received: 11 Jul 2023 15:49
PO #: 59640

Temp at Receipt: 4.1C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

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

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

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
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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 # 027-015-135 ND WW/DW # R-040

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

Report Date: 8 Sep 2023
Lab Number: 23-A7911
Work Order #: 31-0210
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 11 Jul 2023 11:11
Sampled By: MVTL FIELD PERSONNEL
Date Received: 11 Jul 2023 15:49
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-13

Temp at Receipt: 4.1C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					12 Jul 23	KH
Water Digestions					12 Jul 23	KH
pH, Field	7.62	units	1.00	SM4500-H+-2011	11 Jul 23 11:11	BMW
pH	* 7.4	units	1.0	SM 4500 H+ B-2000	12 Jul 23 10:10	HO
Radium 226	0.16	pCi/L	0.60		14 Aug 23 18:30	OL
Radium 228	0.40	pCi/L	3.00	EPA M9320	17 Aug 23 16:42	OL
Sulfate	115	mg/L	5.0	ASTM D516-11	13 Jul 23 9:24	LS
Chloride	8.4	mg/L	3.0	SM 4500 Cl E	13 Jul 23 9:03	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	14 Jul 23 13:40	RMB
Solids, Total Dissolved	563	mg/L	10	SM 2540 C-97	14 Jul 23 9:00	CC
Calcium	118.0	mg/L	0.500	SW6010D	14 Jul 23 15:59	RMV
Lithium	0.025	mg/L	0.020	SW6010D	14 Jul 23 15:59	RMV
Barium	0.060	mg/L	0.005	SW6010D	14 Jul 23 15:59	RMV
Cobalt	< 0.005	mg/L	0.005	SW6010D	14 Jul 23 15:59	RMV
Boron	< 0.1	mg/L	0.1	SW6010D	14 Jul 23 15:59	RMV
Antimony	< 0.5	ug/L	0.5	SW6020B	13 Jul 23 15:33	KAM
Arsenic	< 0.5	ug/L	0.5	SW6020B	13 Jul 23 15:33	KAM
Beryllium	< 0.05	ug/L	0.05	SW6020B	13 Jul 23 17:52	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	13 Jul 23 15:33	KAM
Chromium	< 0.5	ug/L	0.5	SW6020B	13 Jul 23 17:52	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	13 Jul 23 15:33	KAM
Molybdenum	1.40	ug/L	0.50	SW6020B	13 Jul 23 15:33	KAM
Selenium	< 1 ^	ug/L	0.5	SW6020B	13 Jul 23 15:33	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	13 Jul 23 15:33	KAM
Fluoride	0.210	mg/L	0.020	EPA 300.0	18 Jul 23 5:04	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

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

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current NELAC standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
3 = Due to sample matrix # = Due to concentration of other analytes
| = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-053-129 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 Sep 2023
Lab Number: 23-A7912
Work Order #: 31-0210
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 11 Jul 2023 11:57
Sampled By: MVTL FIELD PERSONNEL
Date Received: 11 Jul 2023 15:49
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-14R

Temp at Receipt: 4.1C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					12 Jul 23	KH
Water Digestions					12 Jul 23	KH
pH, Field	7.26	units	1.00	SM4500-H+-2011	11 Jul 23 11:57	BMW
pH	* 7.3	units	1.0	SM 4500 H+ B-2000	12 Jul 23 10:10	HO
Radium 226	0.16	pCi/L	0.60		14 Aug 23 18:30	OL
Radium 228	0.49	pCi/L	3.00	EPA M9320	17 Aug 23 16:42	OL
Sulfate	73.3	mg/L	5.0	ASTM D516-11	13 Jul 23 9:24	LS
Chloride	4.1	mg/L	3.0	SM 4500 Cl E	13 Jul 23 9:03	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	14 Jul 23 13:40	RMB
Solids, Total Dissolved	497	mg/L	10	SM 2540 C-97	14 Jul 23 9:00	CC
Calcium	114.0	mg/L	0.500	SW6010D	14 Jul 23 15:59	RMV
Lithium	0.030	mg/L	0.020	SW6010D	14 Jul 23 15:59	RMV
Barium	0.050	mg/L	0.005	SW6010D	14 Jul 23 15:59	RMV
Cobalt	< 0.005	mg/L	0.005	SW6010D	14 Jul 23 15:59	RMV
Boron	< 0.1	mg/L	0.1	SW6010D	14 Jul 23 15:59	RMV
Antimony	< 0.5	ug/L	0.5	SW6020B	13 Jul 23 15:33	KAM
Arsenic	2.85	ug/L	0.50	SW6020B	13 Jul 23 15:33	KAM
Beryllium	< 0.05	ug/L	0.05	SW6020B	13 Jul 23 17:52	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	13 Jul 23 15:33	KAM
Chromium	< 0.5	ug/L	0.5	SW6020B	13 Jul 23 17:52	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	13 Jul 23 15:33	KAM
Molybdenum	2.44	ug/L	0.50	SW6020B	13 Jul 23 15:33	KAM
Selenium	< 1 ^	ug/L	0.5	SW6020B	13 Jul 23 15:33	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	13 Jul 23 15:33	KAM
Fluoride	0.240 @	mg/L	0.020	EPA 300.0	18 Jul 23 5:04	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

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

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-053-125 ND MW/DW # R-040

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

Report Date: 8 Sep 2023
Lab Number: 23-A7913
Work Order #: 31-0210
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 11 Jul 2023 10:40
Sampled By: MVTL FIELD PERSONNEL
Date Received: 11 Jul 2023 15:49
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: FIELD BLANK

Temp at Receipt: 4.1C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					13 Jul 23	KH
Water Digestions					13 Jul 23	KH
pH	* 6.5	units	1.0	SM 4500 H+ B-2000	12 Jul 23 10:10	HO
Radium 226	1.23	pCi/L	0.60		14 Aug 23 18:30	OL
Radium 228	0.29	pCi/L	3.00	EPA M9320	17 Aug 23 16:42	OL
Sulfate	< 5	mg/L	5	ASTM D516-11	13 Jul 23 9:24	LS
Chloride	< 3	mg/L	3	SM 4500 Cl E	13 Jul 23 9:03	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	14 Jul 23 13:40	RMB
Solids, Total Dissolved	< 10	mg/L	10	SM 2540 C-97	14 Jul 23 9:00	CC
Calcium	< 0.5	mg/L	0.5	SW6010D	14 Jul 23 17:43	TMM
Lithium	< 0.02	mg/L	0.02	SW6010D	14 Jul 23 17:43	TMM
Barium	< 0.005	mg/L	0.005	SW6010D	14 Jul 23 17:43	TMM
Cobalt	< 0.005	mg/L	0.005	SW6010D	14 Jul 23 17:43	TMM
Boron	< 0.1	mg/L	0.1	SW6010D	14 Jul 23 17:43	TMM
Antimony	< 0.5	ug/L	0.5	SW6020B	14 Jul 23 17:58	KAM
Arsenic	< 0.5	ug/L	0.5	SW6020B	14 Jul 23 17:58	KAM
Beryllium	< 0.05	ug/L	0.05	SW6020B	17 Jul 23 10:33	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	14 Jul 23 17:58	KAM
Chromium	< 0.5	ug/L	0.5	SW6020B	17 Jul 23 10:33	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	14 Jul 23 17:58	KAM
Molybdenum	< 0.5	ug/L	0.5	SW6020B	14 Jul 23 17:58	KAM
Selenium	< 0.5	ug/L	0.5	SW6020B	14 Jul 23 17:58	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	14 Jul 23 17:58	KAM
Fluoride	< 0.02	mg/L	0.02	EPA 300.0	18 Jul 23 9:36	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity ^ = Due to internal standard response
CERTIFICATION: MN LAB # 027-013-125 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.mvtl.com

MEMBER ACIL

Date Reported: 8 Sep 2023

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

Work Order #: 202331-0210
Account Number: 006106
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

LABORATORY NARRATIVE

INORGANIC & METALS ANALYSES:
No problems were encountered.

MVTL

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MEMBER
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Quality Control Report

Lab IDs: 23-A7906 to 23-A7913 **Project:** HOOT LAKE PLANT CCR **Work Order:** 202331-0210

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony ug/L	25.0 25.0	106 103	85-115 85-115	25.0 25.0	23A7844q 23A7913q	<0.5 <0.5	26.3 26.1	105 104	75-125 75-125	26.3 26.1	27.0 26.2	108 105	2.6 0.4	10 10	102 100	90-110 90-110	<0.5 <0.5
Arsenic ug/L	25.0 25.0	100 99	85-115 85-115	25.0 25.0	23A7844q 23A7913q	1.40 <0.5	27.0 24.5	102 98	75-125 75-125	27.0 24.5	26.9 25.0	102 100	0.4 2.0	10 10	96 97	90-110 90-110	<0.5 <0.5
Barium mg/L	1.000 1.000	101 105	85-115 85-115	1.00 1.00	23A7864q 23A7913qc	<0.005 <0.005	1.040 1.060	104 106	75-125 75-125	1.040 1.060	1.030 1.050	103 105	1.0 0.9	10 10	98 102	90-110 90-110	<0.005 <0.005
Beryllium ug/L	2.50 2.50	102 95	85-115 85-115	2.50 2.50	23A7844q 23A7913q	<0.1 <0.05	2.44 2.56	98 102	75-125 75-125	2.44 2.56	2.40 2.68	96 107	1.7 4.6	10 10	94 100	90-110 90-110	<0.05 <0.05
Boron mg/L	1.000 1.000	99 101	85-115 85-115	1.00 1.00	23A7864q 23A7913qc	<0.1 <0.1	1.010 1.010	101 101	75-125 75-125	1.010 1.010	1.010 1.020	101 102	0.0 1.0	10 10	96 96	90-110 90-110	<0.1 <0.1
Cadmium ug/L	5.00 5.00	105 98	85-115 85-115	5.00 5.00	23A7844q 23A7913q	<0.1 <0.1	5.02 5.04	100 101	75-125 75-125	5.02 5.04	5.13 5.05	103 101	2.2 0.2	10 10	106 102	90-110 90-110	<0.1 <0.1
Calcium mg/L	50.00 50.00	97 97	85-115 85-115	50.0 50.0	23A7864q 23A7913qc	<0.5 <0.5	50.00 48.70	100 97	75-125 75-125	50.00 48.70	49.70 48.30	99 97	0.6 0.8	10 10	99 99	90-110 90-110	<0.5 <0.5
Chloride mg/L	-	-	-	60.0	23-A7913	<3	63.3	106	86-117	63.3	62.4	104	1.4	5	95	90-110	<3
Chromium ug/L	25.0 25.0	99 98	85-115 85-115	25.0 25.0	23A7844q 23A7913q	<1 <0.5	24.4 25.1	98 100	75-125 75-125	24.4 25.1	24.0 25.1	96 100	1.7 0.0	10 10	101 102	90-110 90-110	<0.5 <0.5
Cobalt mg/L	1.000 1.000	97 98	85-115 85-115	1.00 1.00	23A7864q 23A7913qc	<0.005 <0.005	0.997 0.971	100 97	75-125 75-125	0.997 0.971	0.991 0.983	99 98	0.6 1.2	10 10	98 97	90-110 90-110	<0.005 <0.005
Fluoride mg/L	-	-	-	1.00 0.20	23-A7912 23-A7913	0.240 <0.02	1.28 0.200	104 100	75-125 75-125	1.28 0.200	1.28 0.210	104 105	0.0 4.9	10 10	102 102	90-110 90-110	<0.02
Lead ug/L	25.0 25.0	101 99	85-115 85-115	25.0 25.0	23A7844q 23A7913q	<0.5 <0.5	26.2 24.9	105 100	75-125 75-125	26.2 24.9	26.6 25.0	106 100	1.5 0.4	10 10	99 101	90-110 90-110	<0.5 <0.5
Lithium mg/L	1.000 1.000	101 104	85-115	1.00 1.00	23-A7864qc 23-A7913	<0.02 <0.02	1.030 1.050	103 105	75-125	1.030 1.050	1.040 1.050	104 105	1.0 0.0	10	101 102	90-110	<0.02 <0.02
Mercury ug/L	- -	- -	- -	0.10	23-A7932	<0.005	0.070	70	63-111	0.070	0.070	70	0.0	18	109	76-113	<0.005 <0.005

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

MEMBER
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Quality Control Report

Lab IDs: 23-A7906 to 23-A7913 **Project:** HOOT LAKE PLANT CCR **Work Order:** 202331-0210

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Molybdenum ug/L	25.0 25.0	96 92	85-115 85-115	25.0 25.0	23A7844q 23A7913q	21.7 <0.5	48.1 23.8	106 95	75-125 75-125	48.1 23.8	49.4 23.8	111 95	2.7 0.0	10 10	102 100	90-110 90-110	<0.5 <0.5
pH units	-	-	-	-	-	-	-	-	-	6.5	6.5	-	0.0	2.5	101	90-110	-
Selenium ug/L	25.0 25.0	106 111	85-115 85-115	25.0 25.0	23A7844q 23A7913q	<2 <0.5	28.8 25.7	115 103	75-125 75-125	28.8 25.7	29.5 26.5	118 106	2.4 3.1	10 10	103 100	90-110 90-110	<0.5 <0.5
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	951	964	-	1.4	7	100	85-115	<10
Sulfate mg/L	-	-	-	50.0	23-A7864	<5	43.5	87	68-132	43.5	45.2	90	3.8	5	98	80-120	<5
Thallium ug/L	5.00 5.00	100 99	85-115 85-115	5.00 5.00	23A7844q 23A7913q	<0.1 <0.1	5.37 4.97	107 99	75-125 75-125	5.37 4.97	5.39 4.97	108 99	0.4 0.0	10 10	99 100	90-110 90-110	<0.1 <0.1

Approved by: 

This is an exact copy of the original document
By DH Date 11 July 23
pages 1-4

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:**	BW MS
Report To:	Otter Tail Power Company	**Carbon Copy:**	BarrDM@barr.com		
Attn:	Paul Vukonich	Attn:		Quote Number:	
Address:	P.O. Box 496	Address:		Work Order Number:	31-210
	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 HNO3	500 NaOH	Other: 150 H2SO4	*Amber None (Pace)	Analysis Required
A7906	S2A		11/July/23	1055	GW			1		1	N							1	See Attatched
07	S3AR			1138	GW			1		1	N							1	CCR 3 and CCR 4
08	S51			1232	GW			1		1	N							1	
09	S52			1255	GW			1		1	N							1	
10	S10R			1214	GW			1		1	N							1	
11	S13			1111	GW			1		1	N							1	
12	S14R			1157	GW			1		1	N							1	
13	Field Blank		↓	1040				1		1	N							1	

Comments: **CCR wells**
*Amber None (Pace) is for Radium 226 + 228

Samples Relinquished By:				Samples Received By:	
Date: 11 July 23	Time: 1549	Temp: 4.1°C Temp50		Date: 11 July 23	Time: 1549	Temp: 4.1 C
Samples Relinquished into:	Fridge	Log in Cart	Other:			
Samples Relinquished By:				Samples Received By:		
Date:	Time:	Temp:		Date:	Time:	Temp:
Delivery:	Samplers	Other:		Seal Number(s) - If Used		
Trar t	Ambient	Ice	Other:	Seals Intact?	Yes	No

Hoot Lake Site CCR Sampling - July 2023

Site	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (gal/minute)	Goes Dry?
S2A	CCR 3 and CCR 4	79.63	2	1273.776	Bladder	Yes	< 0.25	Yes
S3AR	CCR 3 and CCR 4	78.42	2	1271.562	Bladder	Yes	< 0.25	No
S51	CCR 3 and CCR 4	55.6	2	1286.904	Bladder	Yes	< 0.25	No
S52	CCR 3 and CCR 4	88.3	2	1286.623	Bladder	Yes	< 0.25	No
S10R	CCR 3 and CCR 4	57.00	2	1281.47	Bladder	Yes	< 0.25	No
S13	CCR 3 and CCR 4	90.19	2	1296.423	Bladder	Yes	< 0.25	No
S14R	CCR 3 and CCR 4	70.86	2	1280.61	Bladder	Yes	< 0.25	Yes
Trip Blank	CCR 3 and CCR 4							

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	**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

CCR - Appendix IV - Assessment Monitoring

Total Concentration Parameters	**Method**
Antimony	SW6020A
Arsenic	SW602A
Barium	SW6010C
Beryllium	SW6020A
Cadmium	SW6020A
Chromium, Total	SW6020A
Cobalt	SW6010C
Fluoride	EPA 300
Lead	SW6020A
Lithium	SW6010C
Mercury	EPA 245.7
Molybdenum	SW6020A
Selenium	SW6020A
Thallium	SW6020A
Radium 226 + 228	

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Site: Otter Tail Power Co./ Hoot Lake

Sampling Personnel: BW, MS

Facility ID: SW-211

Date: 11 July 23

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:	1198.10
Casing Diameter:	2"	Previous Static:	1198.38
Water Level Before Purge:	75.68	Water Level After Sample:	
Well Volume:	.64 Gallons	Measurement Method:	(Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 63 Wind: Lt V Sky: Fair

Sampling Method: Grundfos (Bladder SST) Disp. Baller 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: 1046 am / pm

Time of Sampling: 1055 (am) / pm

Sample EH: 151.3

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1049	7.21	1032	9.14	6.97	0.5	.75	1	
1052	7.20	1031	9.07	6.69	0.0	1.50	2	
1055	7.20	1028	9.12	6.52	0.0	2.25	3	
							4	
							5	

Stabilized? (Yes) No

Amount Water Removed: 2.25 Gallons

Comments:

FB @ 1040

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: BW, MS

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 11 July 23

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:	1203.06
Casing Diameter:	2"	Previous Static:	1203.92
Water Level Before Purge:	68.50	Water Level After Sample:	69.77
Well Volume:	1.62 Gallons	Measurement Method:	Elec. WLI Steel Tape

Sampling Information

Weather Conditions: Temp: 60's Wind: Lt Sky: Fair

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

Dedicated Equipment: Yes No

Pumping Rate: .25 gpm

Well Purged Dry? Yes No

Time Pump Began: 1117 am / pm

Time Purged Dry? —

Time of Sampling: 1138 am / pm

Duplicate Sample? Yes No ID: —

Sample EH: -48.7

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:
1124	7.33	966	9.07	4.79	0.0	1.75	1	
1131	7.32	966	9.06	4.87	0.0	3.50	2	
1138	7.31	965	9.06	5.05	0.0	5.25	3	
							4	
							5	

Stabilized? Yes No

Amount Water Removed: 5.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: BW, MS

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 11 Jul 23

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:	56.60	Well Casing Elevation:	1286.904
Constructed Depth:	55.60	Static Water Elevation:	1236.52
Casing Diameter:	2"	Previous Static:	1238.56
Water Level Before Purge:	50.38	Water Level After Sample:	50.38
Well Volume:	.85 Gallons	Measurement Method:	(Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 64 Wind: Calm 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: .25 gpm

Time Pump Began: 1220 am / (pm)

Time of Sampling: 1232 am / (pm)

Sample EH: -101.8

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:
1224	7.31	803	8.48	6.14	0.0	1	1	
1228	7.30	802	8.47	6.36	0.0	2	2	
1232	7.29	802	8.46	6.48	0.0	3	3	
							4	
							5	

Stabilized? (Yes) No

Amount Water Removed: 3 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Site: Otter Tail Power Co./ Hoot Lake

Sampling Personnel: BM MS

Facility ID: SW-211

Date: 11 July 23

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:	1215.87
Casing Diameter:	2"	Previous Static:	1216.17
Water Level Before Purge:	70.75	Water Level After Sample:	70.75
Well Volume:	2.86 Gallons	Measurement Method:	(Elec. WL) Steel Tape

Sampling Information

Weather Conditions: Temp: 64 Wind: LGV Sky: Fair

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

Dedicated Equipment:	(Yes) No	Pumping Rate:	.26 gpm
Well Purged Dry?	Yes (No)	Time Pump Began:	1219 am / (pm)
Time Purged Dry?	—	Time of Sampling:	1255 am / (pm)
Duplicate Sample?	Yes (No) ID: —	Sample EH:	-97.6

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

Time 12	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1231	7.22	806	8.95	5.63	0.0	3	1	
1243	7.21	806	8.97	5.48	0.0	6	2	
1255	7.21	805	9.01	5.69	0.0	9	3	
							4	
							5	

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

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: BW, MS

Site: Otter Tail Power Co./ Hoot Lake
Facility ID: SW-211
Date: 11 July 23
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
Constructed Depth: 57.00
Casing Diameter: 2"
Water Level Before Purge: 72.02
Well Volume: 1.40 Gallons

Well Casing Elevation: 1281.47
Static Water Elevation: 1209.45
Previous Static: 1209.77
Water Level After Sample: Below pump
Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 64 Wind: Lvr Sky: Fair
Sampling Method: Grundfos Bladder SS/T Disp. Baller Whale Grab Other:
Dedicated Equipment: Yes No
Well Purged Dry? Yes No
Time Purged Dry? 1209
Duplicate Sample? Yes No ID: —

Pumping Rate: .25 gpm
Time Pump Began: 1203 am / pm
Time of Sampling: 1214 am / pm
Sample EH: 301

Sample Appearance: General: Cloudy Color: orange Phase: Lt Suspended Odor: None

Time 6	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1209	7.53	847	11.08	10.12	98.4	1.5	1	
							2	
1214	7.44	846	11.10	9.09	80.5	—	3	Recharge
							4	
							5	

Stabilized? Yes No

Amount Water Removed: 1.5 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: BW, MS

Site: Otter Tail Power Co./ Hoot Lake
Facility ID: SW-211
Date: 11 July 23
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: 1210.58
Casing Diameter: 2"
Previous Static: 1211.21
Water Level Before Purge: 85.84
Water Level After Sample: Below pump
Well Volume: .72 Gallons
Measurement Method: (Elec. WL) Steel Tape

Sampling Information

Weather Conditions: Temp: 60's Wind: Low Sky: Clear
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: 1102 (am) / pm
Time Purged Dry? —
Time of Sampling: 1111 (am) / pm
Duplicate Sample? Yes (No) ID: —
Sample EH: 110.2
Sample Appearance: General: Clear Color: None Phase: Light Sed. Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1105	7.67	866	11.18	7.38	1.2	.75	1	
1108	7.64	870	11.09	7.21	0.0	1.50	2	
1111	7.62	875	11.02	7.34	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: Otter Tail Power Co./ Hoot Lake

Sampling Personnel: BW, MS

Facility ID: SW-211

Date: 11 July 23

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: 1201.22

Casing Diameter: 2"

Previous Static: 1201.86

Water Level Before Purge: 79.39

Water Level After Sample: 82.89

Well Volume: 1.25 Gallons

Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 63 Wind: Lvr Sky: Fair

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

Dedicated Equipment: Yes No

Pumping Rate: 1.25 gpm

Well Purged Dry? Yes No

Time Pump Began: 1142 am/pm

Time Purged Dry? —

Time of Sampling: 1157 am/pm

Duplicate Sample? Yes No ID: —

Sample EH: -48.5

Sample Appearance: General: Color: Phase: Odor:

Time (5)	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1147	7.28	863	9.27	5.40	0.0	1.25	1	
1152	7.27	851	9.27	5.87	0.0	2.50	2	
1157	7.26	848	9.27	5.68	0.0	3.75	3	
							4	
							5	

Stabilized? Yes No

Amount Water Removed: 3.75 Gallons

Comments:

Exceptions to Protocol:

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

August 25, 2023

Todd Rieger
MVTL Laboratories
1126 North Front Street
New Ulm, MN 56073

RE: Project: 31-0210 Ottertail Co
Pace Project No.: 10664203

Dear Todd Rieger:

Enclosed are the analytical results for sample(s) received by the laboratory on August 04, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Piper J. Gibbs

Piper Gibbs
piper.gibbs@pacelabs.com
(612)607-1700
Project Manager

Enclosures

cc: Alice Lieder, MVTL Laboratories

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 31-0210 Ottertail Co
Pace Project No.: 10664203

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10664203001	23A7906 S-2A	Water	07/11/23 10:55	08/04/23 10:01
10664203002	23A7907 S-3A-R	Water	07/11/23 11:38	08/04/23 10:01
10664203003	23A7908 S-51	Water	07/11/23 12:32	08/04/23 10:01
10664203004	23A7909 5-52	Water	07/11/23 12:55	08/04/23 10:01
10664203005	23A7910 S-10R	Water	07/11/23 12:14	08/04/23 10:01
10664203006	23A7911 S-13	Water	07/11/23 11:11	08/04/23 10:01
10664203007	23A7912 S-14R	Water	07/11/23 11:57	08/04/23 10:01
10664203008	23A7913 Field blank	Water	07/11/23 10:40	08/04/23 10:01

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be com

WO# : 10664203

10664203

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	MVTL	Report To:	Todd Rieger	Attention:	AP
Address:	1126 NORTH FRONT BLDG #2	Copy To:	trieger@mvtl.com	Company Name:	MVTL
	NEW ULM, MN 56073			Address:	1126 NORTH FRONT BLDG 2
Email To:	alleder@mvtl.com	Purchase Order No.:	CL13299	Pace Quote Reference:	
Phone:	507-233-7134 Fax	Project Name:	Ottertail Co	Pace Project Manager:	
Requested Due Date/TAT:	standard	Project Number:	Work order: 31-0210	Pace Profile #:	

REGULATORY AGENCY: ☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MN

Section D Required Client Information

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WIPE WP; AIR AR; OTHER OT; TISSUE TS

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analyses Test Y/N	Requested Analysis Filtered (Y/N): 2,3,7,8 TCDD & Furans	Radium 226/228	PFAs State Pricing	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	23A7906 S-2A	WT				07/11/23	10:55		1											X		N	001
2	23A7907 S-3A-R	WT				07/11/23	11:38		1											X		N	002
3	23A7908 S-51	WT				07/11/23	12:32		1											X		N	003
4	23A7909 S-52	WT				07/11/23	12:55		1											X		N	004
5	23A7910 S-10R	WT				07/11/23	12:14		1											X		N	005
6	23A7911 S-13	WT				07/11/23	11:11		1											X		N	006
7	23A7912 S-14R	WT				07/11/23	11:57		1											X		N	007
8	23A7913 Field blank	WT				07/11/23	10:40		1											X		N	008
9																							
10																							
11	Orginal PACE # 10664203																						
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY/AFFILIATION	DATE	TIME	ACCEPTED BY/AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Barb Zins / MVTL	6/13/23	08:00am	[illegible] Pace	6/14/23	1001	1.1	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Sample Condition Upon Receipt

Client Name: MVTL

Project #: WO#: 10664203
PM: RG Due Date: 09/05/23
CLIENT: MVTL

Courier: ☐ FedEx ☐ UPS ☐ USPS ☑ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: _____ ☐ See Exceptions ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No Seals Intact? ☐ Yes ☑ No

Biological Tissue Frozen? ☐ Yes ☐ No ☑ N/A

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☑ Other

Temp Blank? ☐ Yes ☑ No

Thermometer: ☐ T1 (0461) ☐ T2 (0436) ☐ T3 (0459) ☐ T4 (0402) ☐ T5 (0178) ☐ T6 (0235) ☑ T7 (0042) ☐ T8 (0775) ☐ T9(0727) ☐ 01339252/1710

Type of Ice: ☑ Wet ☐ Blue ☐ Dry ☐ None ☐ Melted

Did Samples Originate in West Virginia? ☐ Yes ☑ No

Were All Container Temps Taken? ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6 °C

Cooler temp Read w/Temp Blank: _____ °C

Average Corrected Temp (no temp blank only): 1.1 °C

Correction Factor: -0.4

Cooler Temp Corrected w/temp blank: _____ °C

☑ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

USDA Regulated Soil: ☑ N/A, water sample/other: _____)

Date/Initials of Person Examining Contents: Mc 8-5-23

Did samples originate in a quarantine zone within the United States: AL, AR, AZ CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (ENV-FRM-MIN4-0154) and include with SCUR/COC paperwork.

Location (Check one): ☐ Duluth ☑ Minneapolis ☐ Virginia

				COMMENTS
Chain of Custody Present and Filled Out?	☑ Yes	☐ No		1.
Chain of Custody Relinquished?	☑ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☐ Yes	☑ No	☐ N/A	3.
Samples Arrived within Hold Time?	☑ Yes	☐ No		4. If fecal: ☐ <8 hrs ☐ >8 hr, <24 ☐ No
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E.coli ☐ BOD/cBOD ☐ Hex Chrom ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other
Rush Turn Around Time Requested?	☐ Yes	☑ No		6.
Sufficient Sample Volume?	☑ Yes	☐ No		7.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	8.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC?	☑ Yes	☐ No		11. If no, write ID/Date/Time of container below: ☐ See Exceptions ENV-FRM-MIN4-0142
Matrix: ☑ Water ☐ Soil ☐ Oil ☐ Other				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☑ N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO3, H2SO4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐ Yes	☐ No	☑ N/A	☐ NaOH ☐ HNO3 ☐ H2SO4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxins/PFAS (*If adding preservative to a container, it must be added to associated field and equipment blanks–verify with PM first.)	☐ Yes	☐ No	☑ N/A	Positive for Residual Chlorine? ☐ Yes ☐ No ☐ See Exceptions ENV-FRM-MIN4-0142
				pH Paper Lot #
				Residual Chlorine / 0-6 Roll / 0-6 Strip / 0-14 Strip
Headspace in Methyl Mercury Container?	☐ Yes	☐ No	☑ N/A	13.
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☑ N/A	14. ☐ See Exceptions ENV-FRM-MIN4-0142
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☑ N/A	
3 Trip Blanks Present?	☐ Yes	☐ No	☑ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	Pace Trip Blank Lot # (if purchased): _____

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Julia Fogarty Date: 8/7/2023

NOTE: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled By: HRC Line: 2

	DC#_Title: ENV-FRM-MIN4-0142 v02_Sample Condition Upon Receipt (SCUR) Exception Form
Pace	Effective Date: 09/22/2022

Workorder #: 10664203

No Temp Blank		
Read Temp	Corrected Temp	Average temp
1.3	0.9	1.1
1.3	0.9	
1.5	1.1	
1.8	1.4	

PM Notified of Out of Temp Cooler? ☐ Yes ☒ No

If yes, Indicate who was contacted, date and time.
If no, Indicate reason why.

Multiple Cooler Project? ☐ Yes ☒ No

If anything is OVER 6.0° C, you MUST document containers in this section HERE

Tracking Number	Temperature

Out of Temp Sample ID	Container Type	# of Containers

pH Adjustment Log for Preserved Samples

Sample ID	Type Of Preserve	pH Upon Receipt	Date Adjusted	Time Adjusted	Amount Added (mL)	Lot # Added	pH After	In Compliance After Addition?		Initials
								☐ Yes	☐ No	
								☐ Yes	☐ No	
								☐ Yes	☐ No	
								☐ Yes	☐ No	
								☐ Yes	☐ No	
								☐ Yes	☐ No	
								☐ Yes	☐ No	
								☐ Yes	☐ No	

Comments:

Qualtrax ID: 52763

Page 1 of 1

Internal Transfer Chain of Custody

Pace

☐ Samples Pre-Logged into eCOC

State Of Origin: MN
Cert. Needed: ☒ Yes ☐ No

Workorder: 10664203 Workorder Name: 31-0210 Ottertail Co Owner Received Date: 8/4/2023 Results Requested By: 9/5/2023

Report To	Subcontract To
Piper Gibbs Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone (612)607-1700	Pace National 12065 Lebanon Rd Mt. Juliet, TN 37122 Phone (615) 758-5858

Requested Analysis

J008

BP1U

Preserved Containers

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved						Radium 226 / 228										LAB USE ONLY
1	23A7906 S-2A	PS	7/11/2023 10:55	10664203001	Water	1						X										-01
2	23A7907 S-3A-R	PS	7/11/2023 11:38	10664203002	Water	1						X										-02
3	23A7908 S-51	PS	7/11/2023 12:32	10664203003	Water	1						X										-03
4	23A7909 S-52	PS	7/11/2023 12:55	10664203004	Water	1						X										-04
5	23A7910 S-10R	PS	7/11/2023 12:14	10664203005	Water	1						X										-05
6	23A7911 S-13	PS	7/11/2023 11:11	10664203006	Water	1						X										-06
7	23A7912 S-14R	PS	7/11/2023 11:57	10664203007	Water	1						X										-07
8	23A7913 Field blank	PS	7/11/2023 10:40	10664203008	Water	1						X										-08

LL#3490
LAB USE ONLY

Comments

Transfers	Released By	Date/Time	Received By	Date/Time
1	BCS/PACE	8/7/23 13:35		
2			Jamesen 8/8/23	0900
3				

Cooler Temperature on Receipt °C | Custody Seal (Y) or N | Received on Ice (Y) or N | Samples Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Receipt Checklist

COC Seal Present/Intact:	Y N	If Applicable	
COC Signed/Accurate:	Y N	VOA Zero Headspace:	Y N
Bottles arrive intact:	Y N	Pres.Correct/Check:	Y N
Correct bottles used:	Y N	GBAB 4.3+0=4.3	
Sufficient volume sent:	Y N		
RAD Screen <0.5 mR/hr:	Y N	6476 5639 1603	

L1643490

Date: 8/7/23	Must Arrive By: 8/8/23	Check one: AM / PM	Shipping Method (check one) FedEx: X	SpeeDee	UPS
Senders Initials: PG	Shipping account if NOT Mpls #:		*Dept. # 1003*		

Ship Package To:

Company Name: Pace National

Street Address:

Phone Number:

Fill out below only if samples weren't logged in as a sub.

Sample number	Container Type/Count	Location
10664203.001	1 BP1U	RECEIVING
10664203.002	1 BP1U	RECEIVING
10664203.003	1 BP1U	RECEIVING
10664203.004	1 BP1U	RECEIVING
10664203.005	1 BP1U	RECEIVING
10664203.006	1 BP1U	RECEIVING
10664203.007	1 BP1U	RECEIVING
10664203.008	1 BP1U	RECEIVING

Special Instructions:

ANALYTICAL REPORT

August 24, 2023

Pace Analytical - Minnesota

Sample Delivery Group:	L1643490
Samples Received:	08/08/2023
Project Number:	10664203
Description:	31-0210 Ottertail Co
Site:	001
Report To:	Piper Gibbs 1700 Elm Street Suite 200 Minneapolis, MN 55414

Entire Report Reviewed By:

Donna Eldson
Project Manager

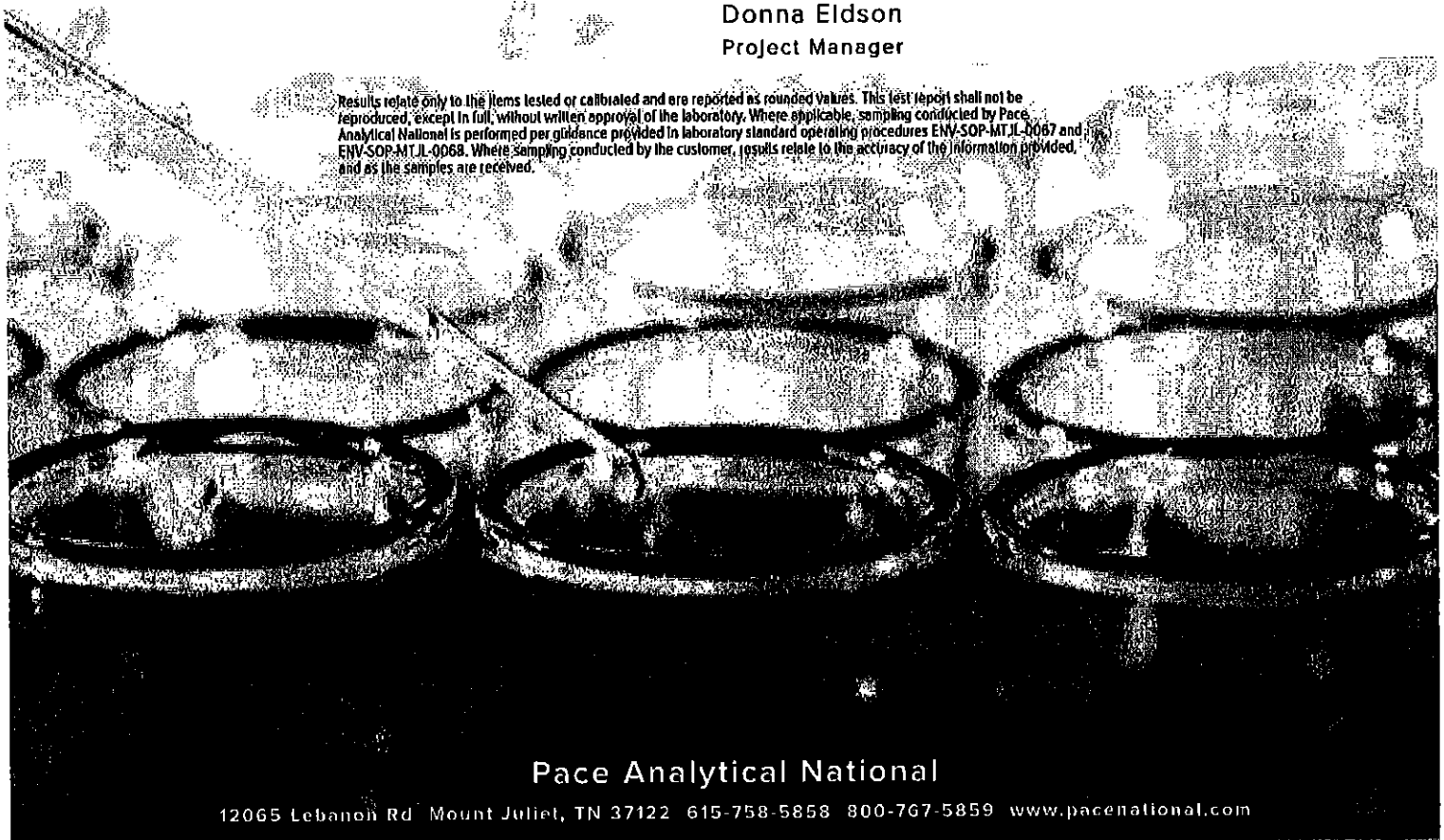

TABLE OF CONTENTS

23A7906 S-2A L1643490-01 Non-Potable Water

Collected by | Collected date/time 07/11/23 10:55 | Received date/time 08/08/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2112435	1	08/11/23 18:02	08/17/23 16:42	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2111538	1	08/11/23 13:22	08/14/23 18:30	RGT	Mt. Juliet, TN

23A7907 S-3A-R L1643490-02 Non-Potable Water

Collected by | Collected date/time 07/11/23 11:38 | Received date/time 08/08/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2112435	1	08/11/23 18:02	08/17/23 16:42	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2111538	1	08/11/23 13:22	08/14/23 18:30	RGT	Mt. Juliet, TN

23A7908 S-51 L1643490-03 Non-Potable Water

Collected by | Collected date/time 07/11/23 12:32 | Received date/time 08/08/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2112435	1	08/11/23 18:02	08/17/23 16:42	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2111538	1	08/11/23 13:22	08/14/23 18:30	RGT	Mt. Juliet, TN

23A7909 S-52 L1643490-04 Non-Potable Water

Collected by | Collected date/time 07/11/23 12:55 | Received date/time 08/08/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2112435	1	08/11/23 18:02	08/17/23 16:42	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2111538	1	08/11/23 13:22	08/14/23 18:30	RGT	Mt. Juliet, TN

23A7910 S-10R L1643490-05 Non-Potable Water

Collected by | Collected date/time 07/11/23 12:14 | Received date/time 08/08/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2112435	1	08/11/23 18:02	08/17/23 16:42	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2111538	1	08/11/23 13:22	08/14/23 18:30	RGT	Mt. Juliet, TN

23A7911 S-13 L1643490-06 Non-Potable Water

Collected by | Collected date/time 07/11/23 11:11 | Received date/time 08/08/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2112435	1	08/11/23 18:02	08/17/23 16:42	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2111538	1	08/11/23 13:22	08/14/23 18:30	RGT	Mt. Juliet, TN

23A7912 S-14R L1643490-07 Non-Potable Water

Collected by | Collected date/time 07/11/23 11:57 | Received date/time 08/08/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2112435	1	08/11/23 18:02	08/17/23 16:42	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2111538	1	08/11/23 13:22	08/14/23 18:30	RGT	Mt. Juliet, TN

SAMPLE SUMMARY

	Collected by	Collected date/time	Received date/time
23A7913 FIELD BLANK L1643490-08 Non-Potable Water		07/11/23 10:40	08/08/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2112435	1	08/11/23 18:02	08/17/23 16:42	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2111538	1	08/11/23 13:22	08/14/23 18:30	RGT	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Donna Eidson
Project Manager

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.0783	U	0.383	0.696	08/17/2023 16:42	WG2112435
(T) Barium	*134*			*30.0-143*	*08/17/2023 16:42*	WG2112435
(T) Yttrium	*103*			*30.0-136*	*08/17/2023 16:42*	WG2112435

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	-0.0184	U	0.0569	0.243	08/14/2023 18:30	WG2111538
(T) Barium-133	*68.3*			*30.0-143*	*08/14/2023 18:30*	WG2111538

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.135	U	0.328	0.609	08/17/2023 16:42	WG2112435
(T) Barium	*132*			*30.0-143*	*08/17/2023 16:42*	WG2112435
(T) Yttrium	*91.3*			*30.0-136*	*08/17/2023 16:42*	WG2112435

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.696		0.398	0.350	08/14/2023 18:30	WG2111538
(T) Barium-133	*70.1*			*30.0-143*	*08/14/2023 18:30*	WG2111538

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.0758	U	0.339	0.623	08/17/2023 16:42	WG2112435
(T) Barium	*122*			*30.0-143*	*08/17/2023 16:42*	WG2112435
(T) Yttrium	*105*			*30.0-136*	*08/17/2023 16:42*	WG2112435

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.616	J	0.572	0.712	08/14/2023 18:30	WG2111538
(T) Barium-133	*43.6*			*30.0-143*	*08/14/2023 18:30*	WG2111538

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.421	J	0.333	0.598	08/17/2023 16:42	WG2112435
(T) Barium	*146*	CT		*30.0-143*	*08/17/2023 16:42*	WG2112435
(T) Yttrium	*113*			*30.0-136*	*08/17/2023 16:42*	WG2112435

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	3.22		0.935	0.468	08/14/2023 18:30	WG2111538
(T) Barium-133	*47.9*			*30.0-143*	*08/14/2023 18:30*	WG2111538

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	3.87		0.533	0.841	08/17/2023 16:42	WG2112435
(T) Barium	*140*			*30.0-143*	*08/17/2023 16:42*	WG2112435
(T) Yttrium	*111*			*30.0-136*	*08/17/2023 16:42*	WG2112435

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.908		0.411	0.280	08/14/2023 18:30	WG2111538
(T) Barium-133	*74.4*			*30.0-143*	*08/14/2023 18:30*	WG2111538

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.400	J	0.271	0.486	08/17/2023 16:42	WG2112435
(I) Barium	*139*			*30.0-143*	*08/17/2023 16:42*	WG2112435
(I) Yttrium	*96.8*			*30.0-136*	*08/17/2023 16:42*	WG2112435

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.160	U	0.309	0.504	08/14/2023 18:30	WG2111538
(I) Barium-133	*56.7*			*30.0-143*	*08/14/2023 18:30*	WG2111538

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/- pCi/l	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.488	J	0.297	0.531	08/17/2023 16:42	WG2112435
(T) Barium	*123*			*30.0-143*	*08/17/2023 16:42*	WG2112435
(T) Yttrium	*97.3*			*30.0-136*	*08/17/2023 16:42*	WG2112435

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/- pCi/l	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.163	U	0.350	0.581	08/14/2023 18:30	WG2111538
(T) Barium-133	*50.7*			*30.0-143*	*08/14/2023 18:30*	WG2111538

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.288	J	0.293	0.530	08/17/2023 16:42	WG2112435
(T) Barium	*120*			*30.0-143*	*08/17/2023 16:42*	WG2112435
(T) Yttrium	*98.3*			*30.0-136*	*08/17/2023 16:42*	WG2112435

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	1.23		0.605	0.443	08/14/2023 18:30	WG2111538
(T) Barium-133	*53.0*			*30.0-143*	*08/14/2023 18:30*	WG2111538

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3963637-1 08/17/23 16:42

Analyte	MB Result pCi/l	MB Qualifier	MB Uncertainty +/- pCi/l	MB MDA pCi/l
Radium-228	-0.0548	U	0.181	0.332
(I) Barium	*132*		*132*	
(I) Yttrium	*99.9*		*99.9*	

L1643961-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1643961-01 08/17/23 16:42 • (DUP) R3963637-5 08/17/23 16:42

Analyte	Original Result pCi/l	Original Uncertainty +/-	Original MDA pCi/l	DUP Result pCi/l	DUP Uncertainty +/-	DUP MDA pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.552	0.219	0.00380	0.297	0.321	0.00380	1	60.2	0.657	J	20	3
(I) Barium	*122*			*133*	*133*							
(I) Yttrium	*99.0*			*113*	*113*							

Laboratory Control Sample (LCS)

(LCS) R3963637-2 08/17/23 16:42

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.92	98.3	80.0-120	
(I) Barium			*141*		
(I) Yttrium			*95.4*		

L1643453-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1643453-06 08/17/23 16:42 • (MS) R3963637-3 08/17/23 16:42 • (MSD) R3963637-4 08/17/23 16:42

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	0.712	9.07	10.3	83.6	95.5	1	70.0-130			12.3		20
(I) Barium		*127*			*123*	*130*							
(I) Yttrium		*101*			*102*	*100*							

Method Blank (MB)

(MB) R3963947-1 08/14/23 18:30

Analyte	MB Result pCi/l	MB Qualifier	MB Uncertainty +/- pCi/l	MB MDA pCi/l
Radium-226	0.0124	U	0.0747	0.150
(I) Barium-133	*47.1*		*47.1*	

L1644507-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1644507-06 08/14/23 18:30 • (DUP) R3963947-5 08/14/23 18:30

Analyte	Original Result pCi/l	Original Uncertainty +/- pCi/l	Original MDA pCi/l	DUP Result pCi/l	DUP Uncertainty +/- pCi/l	DUP MDA pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	0.339	0.259	0.300	0.101	0.191	0.300	1	200	0.533	U	20	3
(I) Barium-133	*102*			*55.8*	*55.8*							

Laboratory Control Sample (LCS)

(LCS) R3963947-2 08/14/23 18:30

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.01	5.97	119	80.0-120	
(I) Barium-133		*34.1*			

L1644507-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1644507-01 08/14/23 18:30 • (MS) R3963947-6 08/21/23 23:31 • (MSD) R3963947-7 08/21/23 23:31

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.0	1.63	20.6	21.4	94.9	98.7	1	75.0-125			3.67		20
(I) Barium-133		*64.9*			*60.4*	*32.9*							

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
C1	Tracer recovery limits have been exceeded; values are outside upper control limits.
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio-VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [16]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [14]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA-Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Internal Transfer Chain of Custody

Samples Pre-Logged into eCOC

State Of Origin: MN
Cert. Needed: [X] Yes [ ] No

Workorder: 10664203 Workorder Name: 31-0210 Otterail Co
Owner Received Date: 8/4/2023 Results Requested By: 9/5/2023

Report To	Subcontract To
Piper Gibbs Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone (612)607-1700	Pace National 12065 Lebanon Rd Mt. Juliet, TN 37122 Phone (615) 758-5858

Requested Analysis:

J008

BP1U

Preserved Containers

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved	Radium 226/228	LAB USE ONLY
1	23A7906 S-2A	PS	7/11/2023 10:55	10664203001	Water	1	X	-01
2	23A7907 S-3A-R	PS	7/11/2023 11:38	10664203002	Water	1	X	-02
3	23A7908 S-S1	PS	7/11/2023 12:32	10664203003	Water	1	X	-03
4	23A7909 S-S2	PS	7/11/2023 12:55	10664203004	Water	1	X	-04
5	23A7910 S-10R	PS	7/11/2023 12:14	10664203005	Water	1	X	-05
6	23A7911 S-13	PS	7/11/2023 11:11	10664203006	Water	1	X	-06
7	23A7912 S-14R	PS	7/11/2023 11:57	10664203007	Water	1	X	-07
8	23A7913 Field blank	PS	7/11/2023 10:40	10664203008	Water	1	X	-08

LL43190

Comments

Transfers	Released By	Date/Time	Received By	Date/Time
1	BriGS/PACE	8/4/23 13:35		
2			Jamesa 8/8/23	0900
3				

Cooler Temperature on Receipt °C | Custody Seal (Y) or N | Received on Ice (Y) or N | Samples Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Receipt Checklist

COC Seal Present/Intact:	Y N	If Applicable	
COC Signed/Accurate:	Y N	VOA Zero Headspace:	Y N
Bottles arrive intact:	Y N	Pres.Correct/Check:	Y N
Correct Bottles Used:	Y N	GBAS 4.3+0=4.3	
Sufficient Volume Sent:	Y N		
RAD Screen <0.5 mR/hr:	Y N	6476 5639 1603	

L1643490

Date: 8/7/23	Must Arrive By: 8/8/23	Check one: AM / PM	Shipping Method (check one) FedEx: X	SpeeDee	UPS
Senders Initials: PG	Shipping account if NOT Mpls #:		*Dept. # 1003*		

Ship Package To:

Company Name: Race National

Street Address:

Phone Number:

Fill out below only if samples weren't logged in as a sub.

Sample number	Container Type/Count	Location
10664203 001	1 BP1U	RECEIVING
10664203 002	1 BP1U	RECEIVING
10664203 003	1 BP1U	RECEIVING
10664203 004	1 BP1U	RECEIVING
10664203 005	1 BP1U	RECEIVING
10664203 006	1 BP1U	RECEIVING
10664203 007	1 BP1U	RECEIVING
10664203 008	1 BP1U	RECEIVING

Special Instructions:

L095c, (12/01)

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.mvtl.com
MEMBER ACIL

FINAL REPORT COMPLETION DATE: 27 Nov 23 AK

Date Reported: 22 Nov 2023

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

Work Order #: 31-0257
Account #: 006106
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Jeff Hoffman 22 Nov 23
Field Service Manager/Date Reviewed

22Nov23
Chemistry Lab Manager/Date Reviewed

22NOV23
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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1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com
MEMBER ACIL

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

Report Date: 22 Nov 2023
Lab Number: 23-A8908
Work Order #: 31-0257
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 3 Oct 2023 13:06
Sampled By: MVTL FIELD PERSONNEL
Date Received: 3 Oct 2023 17:48
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-3A-R

Temp at Receipt: 4.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					4 Oct 23	KAM
Water Digestions					4 Oct 23	KAM
pH, Field	7.70	units	1.00	SM4500-H+-2011	3 Oct 23 13:06	MS
pH	* 7.3	units	1.0	SM 4500 H+ B-2000	4 Oct 23 15:30	HO
Radium 226	0.56	pCi/L	0.60		31 Oct 23 17:03	OL
Radium 228	0.88	pCi/L	3.00	EPA M9320	3 Nov 23 16:58	OL
Sulfate	137	mg/L	5.0	ASTM D516-11	5 Oct 23 8:26	SS
Chloride	12.1	mg/L	3.0	SM 4500 Cl E	5 Oct 23 9:43	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	6 Oct 23 18:57	RMB
Solids, Total Dissolved	624	mg/L	10	SM 2540 C-97	5 Oct 23 9:40	CC
Calcium	123.0	mg/L	0.500	SW6010D	5 Oct 23 14:45	TMM
Lithium	0.021	mg/L	0.020	SW6010D	5 Oct 23 14:45	TMM
Barium	0.045	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Beryllium	< 0.005	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Chromium	< 0.01	mg/L	0.01	SW6010D	5 Oct 23 14:45	TMM
Cobalt	< 0.005	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Molybdenum	< 0.015	mg/L	0.015	SW6010D	5 Oct 23 14:45	TMM
Boron	0.165	mg/L	0.100	SW6010D	5 Oct 23 14:45	TMM
Antimony	0.51	ug/L	0.50	SW6020B	5 Oct 23 16:25	KAM
Arsenic	< 0.5	ug/L	0.5	SW6020B	5 Oct 23 16:25	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	5 Oct 23 16:25	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	5 Oct 23 16:25	KAM
Selenium	3.54	ug/L	0.50	SW6020B	5 Oct 23 16:25	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	5 Oct 23 16:25	KAM
Fluoride	0.180	mg/L	0.020	EPA 300.0	5 Oct 23 13:23	MDK

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

OL = Analysis performed by an Outside Laboratory.

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

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
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MEMBER ACIL

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

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-51

Report Date: 22 Nov 2023
Lab Number: 23-A8909
Work Order #: 31-0257
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 3 Oct 2023 11:48
Sampled By: MVTL FIELD PERSONNEL
Date Received: 3 Oct 2023 17:48
PO #: 59640

Temp at Receipt: 4.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					4 Oct 23	KAM
Water Digestions					4 Oct 23	KAM
pH, Field	7.19	units	1.00	SM4500-H+-2011	3 Oct 23 11:48	BMW
pH	* 7.3	units	1.0	SM 4500 H+ B-2000	4 Oct 23 15:30	HO
Radium 226	0.59	pCi/L	0.60		31 Oct 23 17:03	OL
Radium 228	0.14	pCi/L	3.00	EPA M9320	3 Nov 23 16:58	OL
Sulfate	47.4	mg/L	5.0	ASTM D516-11	5 Oct 23 8:26	SS
Chloride	9.1	mg/L	3.0	SM 4500 Cl E	5 Oct 23 8:43	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	6 Oct 23 18:57	RMB
Solids, Total Dissolved	457	mg/L	10	SM 2540 C-97	5 Oct 23 9:40	CC
Calcium	93.10	mg/L	0.500	SW6010D	5 Oct 23 14:45	TMM
Lithium	< 0.02	mg/L	0.02	SW6010D	5 Oct 23 14:45	TMM
Barium	0.062	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Beryllium	< 0.005	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Chromium	< 0.01	mg/L	0.01	SW6010D	5 Oct 23 14:45	TMM
Cobalt	< 0.005	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Molybdenum	< 0.015	mg/L	0.015	SW6010D	5 Oct 23 14:45	TMM
Boron	0.193	mg/L	0.100	SW6010D	5 Oct 23 14:45	TMM
Antimony	< 0.5	ug/L	0.5	SW6020B	5 Oct 23 16:25	KAM
Arsenic	< 0.5	ug/L	0.5	SW6020B	5 Oct 23 16:25	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	5 Oct 23 16:25	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	5 Oct 23 16:25	KAM
Selenium	0.57	ug/L	0.50	SW6020B	5 Oct 23 16:25	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	5 Oct 23 16:25	KAM
Fluoride	0.220	mg/L	0.020	EPA 300.0	5 Oct 23 13:23	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 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: 22 Nov 2023
Lab Number: 23-A8910
Work Order #: 31-0257
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 3 Oct 2023 12:29
Sampled By: MVTL FIELD PERSONNEL
Date Received: 3 Oct 2023 17:48
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-52

Temp at Receipt: 4.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					4 Oct 23	KAM
Water Digestions					4 Oct 23	KAM
pH, Field	6.91	units	1.00	SM4500-H+-2011	3 Oct 23 12:29	BMW
pH	* 7.2	units	1.0	SM 4500 H+ B-2000	4 Oct 23 15:30	HO
Radium 226	0.18	pCi/L	0.60		31 Oct 23 17:03	OL
Radium 228	0.89	pCi/L	3.00	EPA M9320	3 Nov 23 16:58	OL
Sulfate	65.6	mg/L	5.0	ASTM D516-11	5 Oct 23 8:26	SS
Chloride	14.7	mg/L	3.0	SM 4500 Cl E	5 Oct 23 9:43	KRS
Mercury	< 0.005	ug/L	0.005	EPA 245.7	6 Oct 23 18:57	RMB
Solids, Total Dissolved	441	mg/L	10	SM 2540 C-97	5 Oct 23 9:40	CC
Calcium	107.0	mg/L	0.500	SW6010D	5 Oct 23 14:45	TMM
Lithium	0.021	mg/L	0.020	SW6010D	5 Oct 23 14:45	TMM
Barium	0.112	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Beryllium	< 0.005	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Chromium	< 0.01	mg/L	0.01	SW6010D	5 Oct 23 14:45	TMM
Cobalt	< 0.005	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Molybdenum	< 0.015	mg/L	0.015	SW6010D	5 Oct 23 14:45	TMM
Boron	< 0.1	mg/L	0.1	SW6010D	5 Oct 23 14:45	TMM
Antimony	< 0.5	ug/L	0.5	SW6020B	5 Oct 23 16:25	KAM
Arsenic	1.60	ug/L	0.50	SW6020B	5 Oct 23 16:25	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	5 Oct 23 16:25	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	5 Oct 23 16:25	KAM
Selenium	< 0.5	ug/L	0.5	SW6020B	5 Oct 23 16:25	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	5 Oct 23 16:25	KAM
Fluoride	0.190	mg/L	0.020	EPA 300.0	5 Oct 23 13:20	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

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

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

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-10R

Report Date: 22 Nov 2023
Lab Number: 23-A8911
Work Order #: 31-0257
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 3 Oct 2023 12:01
Sampled By: MVTL FIELD PERSONNEL
Date Received: 3 Oct 2023 17:48
PO #: 59640

Temp at Receipt: 4.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					4 Oct 23	KAM
Water Digestions					4 Oct 23	KAM
pH, Field	7.22	units	1.00	SM4500-H+-2011	3 Oct 23 12:01	MS
pH	* 7.3	units	1.0	SM 4500 H+ B-2000	4 Oct 23 15:30	HO
Radium 226	0.14	pCi/L	0.60		31 Oct 23 17:03	OL
Radium 228	0.29	pCi/L	3.00	EPA M9320	3 Nov 23 16:58	OL
Sulfate	104	mg/L	5.0	ASTM D516-11	5 Oct 23 8:26	SS
Chloride	11.5	mg/L	3.0	SM 4500 Cl E	5 Oct 23 8:43	KNM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	6 Oct 23 18:57	RMB
Solids, Total Dissolved	504	mg/L	10	SM 2540 C-97	5 Oct 23 9:40	CC
Calcium	117.0	mg/L	0.500	SW6010D	5 Oct 23 14:45	TMM
Lithium	0.021	mg/L	0.020	SW6010D	5 Oct 23 14:45	TMM
Barium	0.099	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Beryllium	< 0.005	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Chromium	< 0.01	mg/L	0.01	SW6010D	5 Oct 23 14:45	TMM
Cobalt	< 0.005	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Molybdenum	< 0.015	mg/L	0.015	SW6010D	5 Oct 23 14:45	TMM
Boron	< 0.1	mg/L	0.1	SW6010D	5 Oct 23 14:45	TMM
Antimony	< 0.5	ug/L	0.5	SW6020B	5 Oct 23 16:25	KAM
Arsenic	7.06	ug/L	0.50	SW6020B	5 Oct 23 16:25	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	5 Oct 23 16:25	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	5 Oct 23 16:25	KAM
Selenium	< 0.5	ug/L	0.5	SW6020B	5 Oct 23 16:25	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	5 Oct 23 16:25	KAM
Fluoride	0.170	mg/L	0.020	EPA 300.0	5 Oct 23 13:23	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
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Minneapolis, MN 55414
1-612-607-1700

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

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-13

Report Date: 22 Nov 2023
Lab Number: 23-A8935
Work Order #: 31-0257
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 3 Oct 2023 11:25
Sampled By: MVTL FIELD PERSONNEL
Date Received: 3 Oct 2023 17:48
PO #: 59640

Temp at Receipt: 4.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					4 Oct 23	KAM
Water Digestions					4 Oct 23	KAM
pH, Field	6.68	units	1.00	SM4500-H+-2011	3 Oct 23 11:25	BMW
pH	* 7.3	units	1.0	SM 4500 H+ B-2000	4 Oct 23 16:34	HO
Radium 226	0.38	pCi/L	0.60		31 Oct 23 17:03	OL
Radium 228	0.47	pCi/L	3.00	EPA M9320	3 Nov 23 16:58	OL
Sulfate	127	mg/L	5.0	ASTM D516-11	5 Oct 23 8:44	SS
Chloride	8.4	mg/L	3.0	SM 4500 Cl E	5 Oct 23 9:01	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	6 Oct 23 18:57	RMB
Solids, Total Dissolved	680	mg/L	10	SM 2540 C-97	5 Oct 23 10.41	CC
Calcium	128.0	mg/L	0.500	SW6010D	5 Oct 23 14:45	TMM
Lithium	0.027	mg/L	0.020	SW6010D	5 Oct 23 14:45	TMM
Barium	0.064	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Beryllium	< 0.005	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Chromium	< 0.01	mg/L	0.01	SW6010D	5 Oct 23 14:45	TMM
Cobalt	< 0.005	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Molybdenum	< 0.015	mg/L	0.015	SW6010D	5 Oct 23 14:45	TMM
Boron	0.102	mg/L	0.100	SW6010D	5 Oct 23 14:45	TMM
Antimony	< 0.5	ug/L	0.5	SW6020B	5 Oct 23 16:25	KAM
Arsenic	< 0.5	ug/L	0.5	SW6020B	5 Oct 23 16:25	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	5 Oct 23 16:25	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	5 Oct 23 16:25	KAM
Selenium	0.53	ug/L	0.50	SW6020B	5 Oct 23 16:25	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	5 Oct 23.16:25	KAM
Fluoride	0.200	mg/L	0.020	EPA 300.0	5 Oct 23 18:38	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
0 = 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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OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 22 Nov 2023
Lab Number: 23-A8936
Work Order #: 31-0257
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 3 Oct 2023 12:35
Sampled By: MVTL FIELD PERSONNEL
Date Received: 3 Oct 2023 17:48
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-14R

Temp at Receipt: 4.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					4 Oct 23	KAM
Water Digestions					4 Oct 23	KAM
pH, Field	7.42	units	1.00	SM4500-H+-2011	3 Oct 23 12:35	MS
pH	* 7.2	units	1.0	SM 4500 H+ B-2000	4 Oct 23 16:34	HO
Radium 226	0.44	pCi/L	0.60		31 Oct 23 17:03	OL
Radium 228	0.37	pCi/L	3.00	EPA M9320	3 Nov 23 16:58	OL
Sulfate	83.2	mg/L	5.0	ASTM D516-11	5 Oct 23 9:02	SS
Chloride	4.0	mg/L	3.0	SM 4500 Cl E	5 Oct 23 9:19	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	6 Oct 23 18:57	RMB
Solids, Total Dissolved	501	mg/L	10	SM 2540 C-97	5 Oct 23 10:41	CC
Calcium	119.0	mg/L	0.500	SW6010D	5 Oct 23 14:45	TMM
Lithium	0.032	mg/L	0.020	SW6010D	5 Oct 23 14:45	TMM
Barium	0.050	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Beryllium	< 0.005	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Chromium	< 0.01	mg/L	0.01	SW6010D	5 Oct 23 14:45	TMM
Cobalt	< 0.005	mg/L	0.005	SW6010D	5 Oct 23 14:45	TMM
Molybdenum	< 0.015	mg/L	0.015	SW6010D	5 Oct 23 14:45	TMM
Boron	< 0.1	mg/L	0.1	SW6010D	5 Oct 23 14:45	TMM
Antimony	< 0.5	ug/L	0.5	SW6020B	5 Oct 23 16:25	KAM
Arsenic	2.44	ug/L	0.50	SW6020B	5 Oct 23 16:25	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	5 Oct 23 16:25	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	5 Oct 23 16:25	KAM
Selenium	< 0.5	ug/L	0.5	SW6020B	5 Oct 23 16:25	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	5 Oct 23 16:25	KAM
Fluoride	0.220 @	mg/L	0.020	EPA 300.0	5 Oct 23 9:53	MDH

* Holding Time Exceeded

Radium 226 subcontracted to:
Pace Analytical Services Inc.
1700 Elm Street Suite 200
Minneapolis, MN 55414
1-612-607-1700

Radium 228 subcontracted to:
Pace Analytical Services Inc.
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1-612-607-1700

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Date Reported: 22 Nov 2023

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

Work Order #: 202331-0257
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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OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 22 Nov 2023
Lab Number: 23-A8937
Work Order #: 31-0257
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 3 Oct 2023 12:35
Sampled By: MVTL FIELD PERSONNEL
Date Received: 3 Oct 2023 17:48
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S-2A

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Misc Comment	LOW WATER LEVEL-NO SAMPLE				

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

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Quality Control Report

Lab IDs: 23-A8908 to 23-A8936 Project: HOOT LAKE PLANT CCR Work Order: 202331-0257

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig. Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony ug/L	25.0	105	85-115	25.0	23A8928	< 0.5	25.6	102	75-125	25.6	25.6	102	0.0	10	98	90-110	< 0.5
Arsenic ug/L	25.0	107	85-115	25.0	23A8928	3.49	30.3	107	75-125	30.3	30.3	107	0.0	10	100	90-110	< 0.5
Barium mg/L	1.000	104	85-115	1.00	23A8929	0.089	1.150	106	75-125	1.150	1.170	108	1.7	10	98	90-110	< 0.005
Beryllium mg/L	1.000	102	85-115	1.00	23A8929	< 0.005	1.050	105	75-125	1.050	1.070	107	1.9	10	101	90-110	< 0.005
Boron mg/L	1.000	105	85-115	1.00	23A8929	< 0.1	1.120	112	75-125	1.120	1.140	114	1.8	10	98	90-110	< 0.1
Cadmium ug/L	5.00	105	85-115	5.00	23A8928	< 0.1	5.26	105	75-125	5.26	5.41	108	2.8	10	102	90-110	< 0.1
Calcium mg/L	50.00	104	85-115	50.0	23A8929	36.20	89.40	106	75-125	89.40	90.50	109	1.2	10	101	90-110	< 0.5
Chloride mg/L	- - -	- - -	- - -	60.0 60.0 60.0	23-A8918 23-A8935 23-A8936	11.9 8.4 4.0	73.0 68.3 63.0	102 100 98	80-120 80-120 80-120	73.0 68.3 63.0	72.2 67.1 63.8	100 98 100	1.1 1.8 1.3	10 10 10	96 95 95	90-110 90-110 90-110	< 3 < 3 < 3
Chromium mg/L	1.000	100	85-115	1.00	23A8929	< 0.01	1.030	103	75-125	1.030	1.030	103	0.0	10	96	90-110	< 0.01
Cobalt mg/L	1.000	105	85-115	1.00	23A8929	< 0.005	1.060	106	75-125	1.060	1.070	107	0.9	10	101	90-110	< 0.005
Fluoride mg/L	- - -	- - -	- - -	1.00 0.20 1.00	23-A8913 23-A8927 23-A8936	0.230 < 0.02 0.220	1.18 0.190 1.16	95 95 94	80-120 80-120 80-120	1.18 0.190 1.16	1.20 0.190 1.14	97 95 92	1.7 0.0 1.7	10 10 10	97 98 98	90-110 90-110 90-110	< 0.02 < 0.02 -
Lead ug/L	25.0	100	85-115	25.0	23A8928	0.70	26.0	101	75-125	26.0	26.7	104	2.7	10	100	90-110	< 0.5
Lithium mg/L	1.000	104	85-115	1.00	23-A8929	< 0.02	1.050	105	75-125	1.050	1.080	108	2.8	10	100	90-110	< 0.02
Mercury ug/L	-	-	-	0.10	23-A8936	< 0.005	0.078	78	63-111	0.078	0.079	79	1.3	18	104	76-113	< 0.005
Molybdenum mg/L	1.000	101	85-115	1.00	23A8929	< 0.015	1.050	105	75-125	1.050	1.050	105	0.0	10	100	90-110	< 0.015
pH units	- -	- -	- -	- -	- -	- -	- -	- -	- -	7.3 7.2	7.3 7.2	- -	0.0 0.0	2.5 2.5	101 101	90-110 90-110	- -
Selenium ug/L	25.0	111	85-115	25.0	23A8928	< 0.5	27.8	111	75-125	27.8	27.2	109	2.2	10	101	90-110	< 0.5
Solids, Total Dissolved mg/L	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	579 < 10 501	574 < 10 504	- - -	0.9 0.0 0.6	7 * 7	100 100	85-115 85-115	< 10 < 10

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: 23-A8908 to 23-A8936 Project: HOOT LAKE PLANT CCR Work Order: 202331-0257

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
Sulfate mg/L	-	-	-	50.0	23-A8909	47.4	104	113	80-120	104	99.4	104	4.5	10	95	80-120	<5
	-	-	-	50.0	23-A8920	60.4	108	95	80-120	108	108	95	0.0	10	100	80-120	<5
	-	-	-	50.0	23-A8928	8.6	53.0	89	80-120	53.0	50.7	84	4.4	10	100	80-120	<5
Thallium ug/L	5.00	100	85-115	5.00	23A8928	<0.1	5.17	103	75-125	5.17	5.24	105	1.3	10	100	90-110	<0.1

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

Approved by: 

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

November 07, 2023

Todd Rieger
MVTL Laboratories
1126 North Front Street
New Ulm, MN 56073

RE: Project: 31-0257 Otter Tail Power
Pace Project No.: 10671232

Dear Todd Rieger:

Enclosed are the analytical results for sample(s) received by the laboratory on October 05, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Piper J. Gibbs

Piper Gibbs
piper.gibbs@pacelabs.com
(612)607-1700
Project Manager

Enclosures

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 31-0257 Otter Tail Power
Pace Project No.: 10671232

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10671232001	23A8908 - S-3A-R	Water	10/03/23 13:06	10/05/23 09:59
10671232002	23A8909-S-51	Water	10/03/23 11:48	10/05/23 09:59
10671232003	23A8910-S-52	Water	10/03/23 12:29	10/05/23 09:59
10671232004	23A8911-S-10R	Water	10/03/23 12:01	10/05/23 09:59
10671232005	23A8935-S-13	Water	10/03/23 11:25	10/05/23 09:59
10671232006	23A8936-S-14R	Water	10/03/23 12:35	10/05/23 09:59

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Do

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be complete

WO# : 10671232

10671232

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	MVTL	Report To:	Todd Rieger	Attention:	AP
Address:	1126 NORTH FRONT BLDG #2	Copy To:	trieger@mvtl.com	Company Name:	MVTL
	NEW ULM, MN 56073			Address:	1126 NORTH FRONT BLDG 2
Email To:	alieder@mvtl.com	Purchase Order No.:	CL13299	Pace Quote Reference:	
Phone:	507-233-7134 Fax:	Project Name:	Otter Tail Power	Pace Project Manager:	
Requested Due Date/TAT:	standard	Project Number:	Work order: 31-0257	Pace Profile #:	

REGULATORY AGENCY: ☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location: MN

Section D Required Client Information

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WIPE WP; AIR AR; OTHER OT; TISSUE TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test: 2,3,7,8 TCDD method 1613	Radium 226/228	PFAs State Pricing	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	23A8908 - S-3A-R	WT				10/03/23	13:08		1										x		N	001
2	23A8909 -S-51	WT				10/03/23	11:48		1										x		N	002
3	23A8910 - S-52	WT				10/03/23	12:29		1										x		N	003
4	23A8911 - S-10R	WT				10/03/23	12:01		1										x		N	004
5	23A8935 - S-13	WT				10/03/23	11:26		1										x		N	005
6	23A8936 - S-14R	WT				10/03/23	12:35		1										x		N	006
7																						
8	EQuIS LabMN EDD is needed																					
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
				Pace	10/5/23	7:54	3.6	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

DCI#_Title: ENV-FRM-MIN4-0150 v13_Sample Condition Upon Receipt (SCUR)
Effective Date: 4/14/2023

Sample Condition Upon Receipt

Client Name: MVTL

Project #: **WO# : 10671232**

PM: PG Due Date: 11/03/23
CLIENT: MVTL

Courier: ☐ FedEx ☐ UPS ☐ USPS ☑ Client ☐ Pace ☐ SpeeDee ☐ Commercial

☐ See Exceptions ENV-FRM-MIN4-0142

Tracking Number: _____

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No Seals Intact? ☐ Yes ☑ No Biological Tissue Frozen? ☐ Yes ☐ No ☑ N/A

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other Temp Blank? ☑ Yes ☐ No

Thermometer: ☐ T1 (0461) ☐ T2 (0436) ☐ T3 (0459) ☐ T4 (0402) ☐ T5 (0178) ☐ T6 (0235) ☑ T7 (0042) ☐ T8 (0775) ☐ T9(0727) ☐ 01339252/1710 Type of Ice: ☑ Wet ☐ Blue ☐ Dry ☐ None ☐ Melted

Did Samples Originate in West Virginia? ☐ Yes ☑ No Were All Container Temps Taken? ☐ Yes ☐ No ☒ N/A

Temp should be above freezing to 6 °C Cooler temp Read w/Temp Blank: 3.4 °C

Correction Factor: +0.2 Cooler Temp Corrected w/temp blank: 3.6 °C

Average Corrected Temp (no temp blank only): _____ °C

☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

USDA Regulated Soil: (☑ N/A, water sample/other: _____) Date/Initials of Person Examining Contents: EC 10-5-23

Did samples originate in a quarantine zone within the United States: AL, AR, AZ CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (ENV-FRM-MIN4-0154) and include with SCUR/COC paperwork.

Location (Check one): ☐ Duluth ☑ Minneapolis ☐ Virginia

				COMMENTS
Chain of Custody Present and Filled Out?	☑ Yes	☐ No		1.
Chain of Custody Relinquished?	☑ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☑ Yes	☐ No		4. If fecal: ☐ <8 hrs ☐ >8 hr, <24 ☐ No
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E coli ☐ BOD/cBOD ☐ Hex Chrom ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other _____
Rush Turn Around Time Requested?	☐ Yes	☑ No		6.
Sufficient Sample Volume?	☑ Yes	☐ No		7. 2 BP1Ns received for each
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	8. sample
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC?	☑ Yes	☐ No		11. If no, write ID/Date/Time of container below: ☐ See Exceptions ENV-FRM-MIN4-0142
Matrix: ☑ Water ☐ Soil ☐ Oil ☐ Other				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☑ N/A	12. Sample # Ph Not taken of Radium samples
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO3, H2SO4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐ Yes	☐ No	☑ N/A	☐ NaOH ☐ HNO3 ☐ H2SO4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxins/PFAS (*If adding preservative to a container, it must be added to associated field and equipment blanks–verify with PM first.)	☐ Yes	☐ No	☑ N/A	Positive for Residual Chlorine? ☐ Yes ☐ No ☐ See Exceptions ENV-FRM-MIN4-0142
				pH Paper Lot #
				Residual Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Headspace in Methyl Mercury Container?	☐ Yes	☐ No	☑ N/A	13.
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☑ N/A	14. ☐ See Exceptions ENV-FRM-MIN4-0142
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☑ N/A	
3 Trip Blanks Present?	☐ Yes	☐ No	☑ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	Pace Trip Blank Lot # (if purchased): _____

Field Data Required? ☐ Yes ☐ No

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Ryan J. Gibbs Date: 10/5/23

NOTE: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DENR Certification Office (i.e., out of hold, incorrect preservative, out of temp, incorrect container).

Labeled By: EC Line: N

Internal Transfer Chain of Custody

Pace

☐ Rush Multiplier____X
☐ Samples Pre-Logged into eCOC

State Of Origin: MN
Cert Needed: ☑ Yes ☐ No
Owner Received Date: 10/5/2023 Results Requested By: 11/3/2023

Workorder: 10671232 Workorder Name: 31-0257 Otter Tail Power

Report To:	Subcontract To:
Piper Gibbs Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone (612)607-1700	Pace National 12065 Lebanon Rd Mt. Juliet, TN 37122 Phone (615) 758-5858

Requested Analysis

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: HNO3	Radium 226/228	A060
1	23A8909 - S-3A-R	PS	10/3/2023 13:06	10671232001	Water	2	X	-01
2	23A8908-S-51	PS	10/3/2023 11:48	10671232002	Water	2	X	-02
3	23A8910-S-52	PS	10/3/2023 12:29	10671232003	Water	2	X	-03
4	23A8911-S-10R	PS	10/3/2023 12:01	10671232004	Water	2	X	-04
5	23A8935-S-13	PS	10/3/2023 11:25	10671232005	Water	2	X	-05
6	23A8936-S-14R	PS	10/3/2023 12:35	10671232006	Water	2	X	-06

LAB USE ONLY

Transfers	Released By	Date/Time	Received By	Date/Time
1		10/5/23 1652		10/7/23 0900
2				
3				

Comments:

Cooler Temperature on Receipt °C | Custody Seal (Y) or N | Received on Ice (Y) or N | Samples Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

17.0+0=17.0 COC

Sample Receipt Checklist

		If Applicable	
COC Seal Present/Intact:		VOA Zero Headspace:	
COC Signed/Accurate:		Preservation Correct/Checked:	
Bottles Arrive Intact:			
Correct Bottles Used:			
Sufficient Volume Sent:			
RAD Screen <0.5 mR/hr:			

L1664026

Pace

Ship To:
Pace National
12065 Lebanon Rd
Mt. Juliet, TN 37122
Phone (615) 758-5858

INTER_LABORATORY WORK ORDER # 10671232
(To be completed by sending lab)

Sending Project No:	10671232
Receiving Project No:	
Check Box for Consolidated Invoice:	☐
Date Prepared:	10/05/23
REQUESTED COMPLETION DATE:	11/3/2023

Sending Region	IR10-Minnesota	Sending Project Mgr.	Piper Gibbs
Receiving Region	IR850-Pace National	External Client	MVTL Laboratories
State of Sample Origin	MN	QC Deliverable	STD REPORT

All questions should be addressed to sending project manager.

Requested Reportable Units ________ Report Wet or Dry Weight? Dry Weight ☐ IRWO Lab Need to run? Cert. Needed ________

WORK REQUESTED

Method Description	Container Type	Quantity of Containers	Preservative	Quantity of Samples	Acode	Acode Desc
Radium 226/228	BP1N	12	HNO3	6	SI-38RAD	SUB PASI RAD

Special Requirements: Report C, QC Limits (C), EquIS LabMN EDD

FOR ANALYTICAL WORK COMPLETED THIS SECTION ALSO

Return Samples to Sending Region: ☐ Yes ☑ No

DISPOSITION of FORM

Original sent to the receiving lab - Copy kept at the sending lab.
When work completed: Original sent to the ABM at the receiving laboratory. Copies are made to corporate as needed.

ANALYTICAL REPORT

November 07, 2023

Pace Analytical - Minnesota

Sample Delivery Group:	L1664026
Samples Received:	10/07/2023
Project Number:	10671232
Description:	31-0257 Otter Tail Power
Site:	001
Report To:	Piper Gibbs

Entire Report Reviewed By:

Donna Eldson
Project Manager

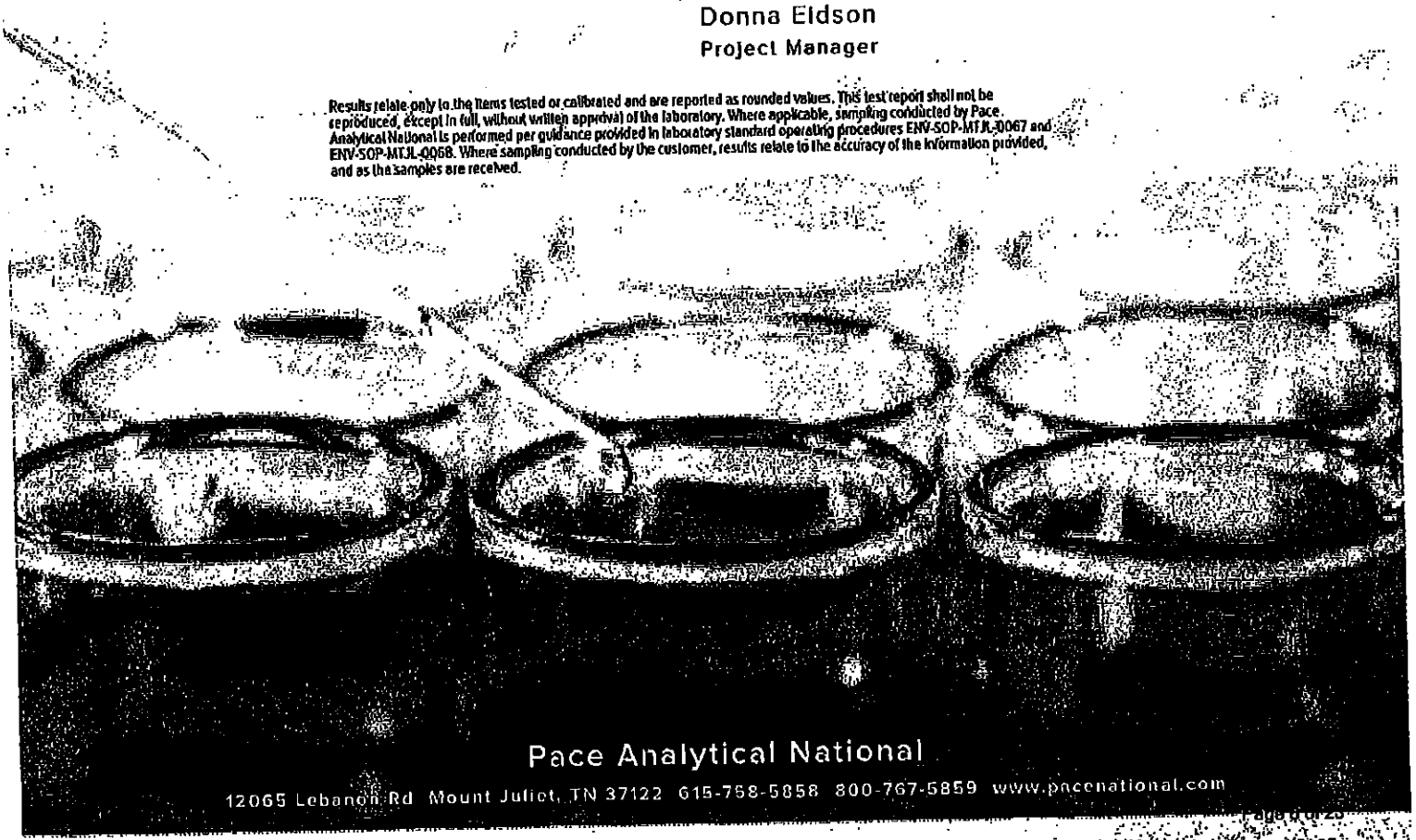

TABLE OF CONTENTS

SAMPLE SUMMARY

23A8908-S-3A-R L1664026-01 Non-Potable Water

Collected by | Collected date/time: 10/03/23 13:06 | Received date/time: 10/07/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2158738	1	10/26/23 19:18	11/03/23 16:58	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2158842	1	10/27/23 16:05	10/31/23 17:03	RGT	Mt. Juliet, TN

23A8909-S-51 L1664026-02 Non-Potable Water

Collected by | Collected date/time: 10/03/23 11:48 | Received date/time: 10/07/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2158738	1	10/26/23 19:18	11/03/23 16:58	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2158842	1	10/27/23 16:05	10/31/23 17:03	RGT	Mt. Juliet, TN

23A8910-S-52 L1664026-03 Non-Potable Water

Collected by | Collected date/time: 10/03/23 12:29 | Received date/time: 10/07/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2158738	1	10/26/23 19:18	11/03/23 16:58	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2158842	1	10/27/23 16:05	10/31/23 17:03	RGT	Mt. Juliet, TN

23A8911-S-10R L1664026-04 Non-Potable Water

Collected by | Collected date/time: 10/03/23 12:01 | Received date/time: 10/07/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2158738	1	10/26/23 19:18	11/03/23 16:58	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2158842	1	10/27/23 16:05	10/31/23 17:03	RGT	Mt. Juliet, TN

23A8935-S-13 L1664026-05 Non-Potable Water

Collected by | Collected date/time: 10/03/23 11:25 | Received date/time: 10/07/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2158738	1	10/26/23 19:18	11/03/23 16:58	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2158842	1	10/27/23 16:05	10/31/23 17:03	RGT	Mt. Juliet, TN

23A8936-S-14R L1664026-06 Non-Potable Water

Collected by | Collected date/time: 10/03/23 12:35 | Received date/time: 10/07/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2158738	1	10/26/23 19:18	11/03/23 16:58	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2158842	1	10/27/23 16:05	10/31/23 17:03	RGT	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Donna Eidson
Project Manager

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.875		0.232		0.395		11/03/2023 16:58	WG2158738
(T) Barium	*87.7*					*30.0-143*	*11/03/2023 16:58*	WG2158738
(T) Yttrium	*111*					*30.0-136*	*11/03/2023 16:58*	WG2158738

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.565		0.386		0.418		10/31/2023 17:03	WG2158842
(T) Barium-133	*77.9*					*30.0-143*	*10/31/2023 17:03*	WG2158842

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.137	U	0.377		0.688		11/03/2023 16:58	WG2158738
(T) Barium	*57.8*					*30.0-143*	*11/03/2023 16:58*	WG2158738
(T) Yttrium	*109*					*30.0-136*	*11/03/2023 16:58*	WG2158738

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.588		0.409		0.428		10/31/2023 17:03	WG2158842
(T) Barium-133	*67.7*					*30.0-143*	*10/31/2023 17:03*	WG2158842

Cp
Tc
Ss
Cn
Sr
Qc
Gl
Al
Sc

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.890		0.218		0.368		11/03/2023 16:58	WG2158738
(T) Barium	*112*					*30.0-143*	*11/03/2023 16:58*	WG2158738
(T) Yttrium	*105*					*30.0-136*	*11/03/2023 16:58*	WG2158738

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.180	J	0.202		0.267		10/31/2023 17:03	WG2158842
(T) Barium-133	*89.2*					*30.0-143*	*10/31/2023 17:03*	WG2158842

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.287	J	0.253		0.455		11/03/2023 16:58	WG2158738
(T) Barium	*86.4*					*30.0-143*	*11/03/2023 16:58*	WG2158738
(T) Yttrium	*104*					*30.0-136*	*11/03/2023 16:58*	WG2158738

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.137	J	0.237		0.370		10/31/2023 17:03	WG2158842
(T) Barium-133	*75.1*					*30.0-143*	*10/31/2023 17:03*	WG2158842

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.467	J	0.265		0.471		11/03/2023 16:58	WG2158738
(T) Barium	*86.1*					*30.0-143*	*11/03/2023 16:58*	WG2158738
(T) Yttrium	*107*					*30.0-136*	*11/03/2023 16:58*	WG2158738

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.380		0.275		0.262		10/31/2023 17:03	WG2158842
(T) Barium-133	*82.3*					*30.0-143*	*10/31/2023 17:03*	WG2158842

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.373	J	0.332		0.593		11/03/2023 16:58	WG2158738
(T) Barium	*85.9*					*30.0-143*	*11/03/2023 16:58*	WG2158738
(T) Yttrium	*112*					*30.0-136*	*11/03/2023 16:58*	WG2158738

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE +/-	TPU +/-	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.440		0.316		0.333		10/31/2023 17:03	WG2158842
(T) Barium-133	*71.0*					*30.0-143*	*10/31/2023 17:03*	WG2158842

Method Blank (MB)

(MB) R3996144-1 11/03/23 16:58

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE +/-	MB MDA pCi/l	MB Lc pCi/l
Radium-228	0.317		0.167	0.297	
(T) Barium	100		100		
(T) Yttrium	111		111		

L1663489-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1663489-02 11/03/23 16:58 • (DUP) R3996144-5 11/03/23 16:58

Analyte	Original Result pCi/l	Original 2 sigma CE +/-	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE +/-	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.541	0.314	0.558		1.52	0.324	0.542		94.7	2.16		20	3
(T) Barium	127				131	131							
(T) Yttrium	96.7				98.4	98.4							

Laboratory Control Sample (LCS)

(LCS) R3996144-2 11/03/23 16:58

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.10	82.0	80.0-120	
(T) Barium			99.3		
(T) Yttrium			98.6		

L1664041-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1664041-03 11/03/23 16:58 • (MS) R3996144-3 11/03/23 16:58 • (MSD) R3996144-4 11/03/23 16:58

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	0.335	8.71	9.40	83.8	90.7	1	70.0-130			7.63		20
(T) Barium		128			111	122							
(T) Yttrium		112			103	97.7							

Method Blank (MB)

(MB) R3994212-1 10/31/23 17:02

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE +/-	MB MDA pCi/l	MB Lc pCi/l
Radium-226	0.0233	U	0.0477	0.0788	
(T) Barium-133	*64.4*		*64.4*		

L1664026-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1664026-05 10/31/23 17:03 • (DUP) R3994212-5 10/31/23 17:02

Analyte	Original Result pCi/l	Original 2 sigma CE +/-	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE +/-	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	0.380	0.275	0.262		0.323	0.283	0.330		16.1	0.143	J	20	3
(T) Barium-133	*82.3*				*76.8*	*76.8*							

Laboratory Control Sample (LCS)

(LCS) R3994212-2 10/31/23 17:02

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.00	5.62	112	80.0-120	
(T) Barium-133			*51.6*		

L1663698-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1663698-01 10/31/23 17:03 • (MS) R3994212-3 10/31/23 17:02 • (MSD) R3994212-4 10/31/23 17:02

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.0	3.22	26.2	28.1	115	125	1	75.0-125			7.14		20
(T) Barium-133		*51.2*			*56.1*	*58.4*							

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits; Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660
Alaska	17-026
Arizona	AZ0612
Arkansas	88-0469
California	2932
Colorado	TN00003
Connecticut	PH-0197
Florida	E87487
Georgia	NELAP
Georgia [1]	923
Idaho	TN00003
Illinois	200008
Indiana	C-TN-01
Iowa	364
Kansas	E-10277
Kentucky [1,6]	KY90010
Kentucky [2]	16
Louisiana	AI30792
Louisiana	LA018
Maine	TN00003
Maryland	324
Massachusetts	M-TN003
Michigan	9958
Minnesota	047-999-395
Mississippi	TN00003
Missouri	340
Montana	CERT0086
A2LA – ISO 17025	1461.01
A2LA – ISO 17025 [5]	1461.02
Canada	1461.01
EPA–Crypto	TN00003
Nebraska	NE-OS-15-05
Nevada	TN000032021-1
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico [1]	TN00003
New York	11742
North Carolina	Env375
North Carolina [1]	DW21704
North Carolina [3]	41
North Dakota	R-140
Ohio–VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	LA000356
South Carolina	84004002
South Dakota	n/a
Tennessee [1,4]	2006
Texas	T104704245-20-18
Texas [5]	LAB0152
Utah	TN000032021-11
Vermont	VT2006
Virginia	110033
Washington	C847
West Virginia	233
Wisconsin	998093910
Wyoming	A2LA
ANAB-LAP,LLC EMLAP	100789
DOD	1461.01
USDA	P330-15-00234

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

[1] Cp
[2] Tc
[3] Ss
[4] Cn
[5] Sr
[6] Qc
[7] Gl
[8] Al
[9] Sc

Internal Transfer Chain of Custody

Pace

☐ Rush Multiplier_____X
☐ Samples Pre-Logged into eCOC

State Of Origin: MN
Cert. Needed: ☑ Yes ☐ No
Owner Received Date: 10/5/2023 Results Requested By: 11/3/2023

Workorder: 10671232 Workorder Name: 31-0257 Otter Tail Power

Report To	Subcontract To
Piper Gibbs Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone (612)607-1700	Pace National 12065 Lebanon Rd Mt. Juliet, TN 37122 Phone (615) 758-5858

Requested Analysis: Radium 226/228

A060

L1664024

Item	Sample ID	Sample type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: HNO3	Radium 226/228	LAB USE ONLY
1	23A8908 - S-3A-R	PS	10/3/2023 13:06	10671232001	Water	2	X	-01
2	23A8909-S-51	PS	10/3/2023 11:48	10671232002	Water	2	X	-02
3	23A8910-S-52	PS	10/3/2023 12:29	10671232003	Water	2	X	-03
4	23A8911-S-10R	PS	10/3/2023 12:01	10671232004	Water	2	X	-04
5	23A8935-S-13	PS	10/3/2023 11:25	10671232005	Water	2	X	-05
6	23A8936-S-14R	PS	10/3/2023 12:35	10671232006	Water	2	X	-06

Transfers	Released By	Date/Time	Received By	Date/Time
1	[signature]	10/6/23 1652	[signature]	10/7/23 0900
2				
3				

Comments: HB 10/7

Cooler Temperature on Receipt ____ °C | Custody Seal (Y) or N | Received on Ice (Y) or (N) | Samples Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

17.0+0=17.0 CCAS

Sample Receipt Checklist
COC Seal Present/Intact: Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
RA Screen <0.5 mR/hr: Y N
If Applicable
VOA Zero Headspace: Y N
Pres. Correct/Check: Y N

L1664026

Pace®

Ship To:
Pace National
12065 Lebanon Rd
Mt. Juliet, TN 37122
Phone (615) 758-5858

INTER_LABORATORY WORK ORDER # 10671232
(To be completed by sending lab)

Sending Project No:	10671232
Receiving Project No:	
Check Box for Consolidated Invoice:	☐
Date Prepared:	10/05/23
REQUESTED COMPLETION DATE:	11/3/2023

Sending Region	IR10-Minnesota	Sending Project Mgr.	Piper Gibbs
Receiving Region	IR850-Pace National	External Client	MVTL Laboratories
State of Sample Origin	MN	QC Deliverable	STD REPORT

All questions should be addressed to sending project manager.

Requested Reportable Units ________ Report Wet or Dry Weight? Dry Weight ☐ IRWO Lab Need to run? Cert. Needed ________

WORK REQUESTED

Method Description	Container Type	Quantity of containers	Preservative	Quantity of Samples	Acode	Acode Desc
Radium 226/228	BP1N	12	HNO3	6	SI-38RAD	SUB PASI RAD

Special Requirements: Report C, QC Limits (C) EquIS LabMN EDD

FOR ANALYTICAL WORK COMPLETED THIS SECTION ALSO

Return Samples to Sending Region: ☐ Yes ☑ No

DISPOSITION of FORM

Original sent to the receiving lab - Copy kept at the sending lab.
When work completed: Original sent to the ABM at the receiving laboratory. Copies are made to corporate as needed.

Minnesota Valley Testing Laboratories

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

This is an exact copy of the original document
By AS Date 4 Oct 23
Pages 1-11

Field Service Chain of Custody Record

Project Name: Otter Tail Power Co. Hoot Lake Plant		**Project Type:** CCR	**Name of Samplers:**
Report To: Otter Tail Power Company		**Carbon Copy:** BarrDM@barr.com	
Attn: Paul Vukonich		**Attn:**	**Quote Number:**
Address: P.O. Box 496		**Address:**	**Work Order Number:** 31-257
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 HNO3	500 NaOH	Other: 150 H2SO4	*2-1000 HNO3 (Pace)	Analysis Required
37	S2A			105	GW			1		1	N							2	See Attatched
A8908	S3AR			1306	GW			1		1	N							2	CCR 3 and CCR 4
09	S51			1148	GW			1		1	N							2	
10	S52			1229	GW			1		1	N							2	
11	S10R			1201	GW			1		1	N							2	
A8935	S13			1135	GW			1		1	N							2	
36	S14R			1235	GW			1		1	N							2	
	~~Field Blank~~							~~1~~		~~1~~	~~N~~						~~-~~	~~2~~	

Comments: **CCR wells**
*Amber None (Pace) is for Radium 226 + 228

Samples Relinquished By:				Samples Received By: A. Fredin	
Date:	Time: 1748	Temp: 4.3 -0.3 = 4.0		Date: 4 Oct 23	Time: 7:00 am Temp: 4.0 c
Samples Relinquished into:	Fridge	~~Log in Cart~~	Other:		
Samples Relinquished By:				Samples Received By:	
Date:	Time:	Temp:		Date:	Time: Temp:
Del: Samplers	Other:			Seal Number(s) - If Used	
Transport: Ambient	Ice	Other:		Seals Intact? Yes	No

Hoot Lake Site CCR Sampling - October 2023

Site	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (gal/minute)	Goes Dry?
S2A	CCR 3 and CCR 4	79.63	2	1273.776	Bladder	Yes	< 0.25	Yes
S3AR	CCR 3 and CCR 4	78.42	2	1271.562	Bladder	Yes	< 0.25	No
S51	CCR 3 and CCR 4	55.6	2	1286.904	Bladder	Yes	< 0.25	No
S52	CCR 3 and CCR 4	88.3	2	1286.623	Bladder	Yes	< 0.25	No
S10R	CCR 3 and CCR 4	57.00	2	1281.47	Bladder	Yes	< 0.25	No
S13	CCR 3 and CCR 4	90.19	2	1296.423	Bladder	Yes	< 0.25	No
S14R	CCR 3 and CCR 4	70.86	2	1280.61	Bladder	Yes	< 0.25	Yes
Trip Blank	CCR 3 and CCR 4							

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	**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

CCR - Appendix IV - Assessment Monitoring

Total Concentration Parameters	Method
Antimony	SW6020A
Arsenic	SW602A
Barium	SW6010C
Beryllium	SW6020A
Cadmium	SW6020A
Chromium, Total	SW6020A
Cobalt	SW6010C
Fluoride	EPA 300
Lead	SW6020A
Lithium	SW6010C
Mercury	EPA 245.7
Molybdenum	SW6020A
Selenium	SW6020A
Thallium	SW6020A
Radium 226 + 228 - Rush !	

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: 30 Oct 23

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: 78.42C

Constructed Depth: 78.42

Casing Diameter: 2"

Water Level Before Purge: 68.50

Well Volume: 1.61 Gallons

Well Casing Elevation: 1271.562

Static Water Elevation: 1203.04

Previous Static: —

Water Level After Sample: 68.95

Measurement Method: (Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 76 Wind: S-20 Sky: Rain

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

Dedicated Equipment: (Yes) No

Well Purged Dry? Yes (No)

Time Purged Dry?

Duplicate Sample? Yes (No) ID: —

Pumping Rate: 1.25 gpm

Time Pump Began: 1245 am / (pm)

Time of Sampling: 1306 am / (pm)

Sample EH: ~28.0

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

(S) Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1252	7.73	896	9.93	3.09	0.0	1.75	1	
1259	7.71	899	9.89	3.00	0.0	3.5	2	
1306	7.70	902	9.78	2.95	0.0	5.25	3	
							4	
							5	

Stabilized? (Yes) No

Amount Water Removed: 5.25 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: BW

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 3 OCT 23

Unique Station ID: 814830

Sample ID: S-61

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

Constructed Depth: 55.60

Casing Diameter: 2"

Water Level Before Purge: 50.45

Well Volume: .84 Gallons

Well Casing Elevation: 1286.904

Static Water Elevation: 1236.45

Previous Static: 1236.92

Water Level After Sample: 50.45

Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 77 Wind: SW10 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: .25 gpm

Time Pump Began: 1136 am pm

Time of Sampling: 1148 am pm

Sample EH: -80.6

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1140	7.29	731	10.69	5.96	0.0	1	1	
1144	7.21	741	10.38	5.74	0.0	2	2	
1148	7.19	744	10.27	5.59	0.0	3	3	
							4	
							5	

Stabilized? Yes No

Amount Water Removed: 3 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: BW

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 3 OCT 23

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: 88.80

Well Casing Elevation: 1286.623

Constructed Depth: 86.30

Static Water Elevation: 1215.42

Casing Diameter: 2"

Previous Static: 1215.75

Water Level Before Purge: 71.20

Water Level After Sample: 71.20

Well Volume: 2.79 Gallons

Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 72 Wind: SW Sky: Rain

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: 1153 am pm

Time Purged Dry? —

Time of Sampling: 1229 am pm

Duplicate Sample? Yes No ID: —

Sample EH: -13.5

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1205	6.90	786	9.23	.14	0.0	3	1	
1217	6.90	786	9.34	.18	0.0	6	2	
1229	6.91	786	9.33	.21	0.0	9	3	
							4	
							5	

Stabilized? Yes No

Amount Water Removed: Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: MJ

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 30oct23

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: 1205.88

Casing Diameter: 2"

Previous Static: —

Water Level Before Purge: 75.59

Water Level After Sample:

Well Volume: 0.82 Gallons

Measurement Method: Elec. Well Steel Tape

Sampling Information

Weather Conditions: Temp: 76 Wind: S-20 Sky: Rain

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

Dedicated Equipment: (Yes) No

Pumping Rate: .25 gpm

Well Purged Dry? Yes (No)

Time Pump Began: 1149 am / pm

Time Purged Dry?

Time of Sampling: 1201 am / pm

Duplicate Sample? Yes (No) ID: —

Sample EH: 321.2

Sample Appearance: General: Clear Color: None Phase: 4 Seal Odor: None

(4) Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1153	7.22	846	10.15	1.42	12.5	1	1	
1157	7.21	846	10.04	1.32	13.2	2	2	
1201	7.22	845	9.98	1.24	5.8	3	3	
							4	
							5	

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

Comments:

- well water became slightly cloudy since dirt work & solar panels have been installed.

Exceptions to Protocol:

TCR

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel:

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 30-Jul-07

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

Constructed Depth: 90.19

Casing Diameter: 2"

Water Level Before Purge: 85.76

Well Volume: 0.75 Gallons

Well Casing Elevation: 1296.423

Static Water Elevation: 1210.66

Previous Static: —

Water Level After Sample: 85.81

Measurement Method: Elec. WL / Steel Tape

Sampling Information

Weather Conditions: Temp: 76 Wind: SE-20 Sky: cldy

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

Dedicated Equipment: Yes / No

Well Purged Dry? Yes / No

Time Purged Dry? —

Duplicate Sample? Yes / No ID: —

Pumping Rate: .25 gpm

Time Pump Began: 1115 am / pm

Time of Sampling: 1145 am / pm

Sample EH: 143.1

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

(3) Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1118	6.28	958	12.69	9.46	0.0	.75	1	
1121	6.39	948	12.73	9.06	0.0	1.5	2	
1125	6.68	940	12.61	9.07	0.0	2.25	3	
							4	
							5	

Stabilized? Yes / No

Amount Water Removed: 2.25 Gallons

Comments:

EBQ 1110

+ CCR

Exceptions to Protocol:

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: 30 Oct 23

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:	1200.7
Casing Diameter:	2"	Previous Static:	—
Water Level Before Purge:	79.91	Water Level After Sample:	Below Pump
Well Volume:	1.17 Gallons	Measurement Method:	(Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 76 Wind: S 2C Sky: Rain

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

Dedicated Equipment: (Yes) No — Pumping Rate: .25 gpm

Well Purged Dry? Yes (No) — Time Pump Began: 1220 am / (pm)

Time Purged Dry? — Time of Sampling: 1235 am (pm)

Duplicate Sample? Yes (No) ID: — Sample EH: -13.1

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1225	7.41	866	11.00	4.95	0.0	1.25	1	
1230	7.41	870	10.91	4.81	0.0	2.5	2	
1235	7.42	879	10.86	4.89	0.0	3.75	3	
							4	
							5	

Stabilized? (Yes) No — Amount Water Removed: 3.75 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Site: Otter Tail Power Co./ Hoot Lake

Sampling Personnel: BH

Facility ID: SW-211

Date: 3 00 23

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: 1195.81

Casing Diameter: 2"

Previous Static: 1196.14

Water Level Before Purge: 77.97

Water Level After Sample: —

Well Volume: 27 Gallons

Measurement Method: Elec. WL / Steel Tape

Sampling Information

Weather Conditions: Temp: 69 Wind: SE 10 Sky: Light rain

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

Dedicated Equipment: ~~Yes~~ No

Pumping Rate: — gpm

Well Purged Dry? ~~Yes~~ ~~No~~

Time Pump Began: — am / pm

Time Purged Dry? —

Time of Sampling: 1235 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: * unable to get Bladder pump to work due to the water level being so low.

* No Sample

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company:	MVTL
Address:	1126 NORTH FRONT BLDG #2
	NEW ULM, MN 56073
Email To:	alieder@mvtl.com
Phone: 507-233-7134	Fax
Requested Due Date/TAT:	standard

Section B Required Project Information:

Report To:	Todd Rieger
Copy To:	trieger@mvtl.com
Purchase Order No.:	CL13299
Project Name:	Otter Tail Power
Project Number:	Work order: 31-0257

Section C Invoice Information:

Attention:	AP
Company Name:	MVTL
Address:	1126 NORTH FRONT BLDG 2
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY: ☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MN

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WIPE WP; AIR AR; OTHER OT; TISSUE TS

ITEM #	SAMPLE ID	MATRIX CODE (use valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	2,3,7,8 TCDD method 16	Radium 226/228	PFAs State Pricing	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	23A8908 - S-3A-R	WT				10/03/23	13:06		1											X		N	
2	23A8909 -S-51	WT				10/03/23	11:48		1											X		N	
3	23A8910 - S-52	WT				10/03/23	12:29		1											X		N	
4	23A8911 - S-10R	WT				10/03/23	12:01		1											X		N	
5	23A8935 - S-13	WT				10/03/23	11:25		1											X		N	
6	23A8936 - S-14R	WT				10/03/23	12:35		1											X		N	
7																							
8	EQuIS LabMN EDD is needed																						
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Appendix B

Groundwater Flow Calculations

Hoot Lake Ash Disposal Facility Groundwater Velocity Calculation

Sampling Date	1/23/2022

Upgradient (S-52)

Top of Casing Elevation	1286.62	ft amsl	*Groundwater Monitoring System Report (Barr, 2016)*
Depth to Water	70.73	ft below TOC	
Water Level Elevation	1215.89	ft amsl	

Downgradient (S-2A)

Top of Casing Elevation	1272.90	ft amsl	*Groundwater Monitoring System Report (Barr, 2016)*
Depth to Water	77.37	ft below TOC	
Water Level Elevation	1195.53	ft amsl	

horizontal hydraulic	2.30E-03	cm/s	*Groundwater Monitoring System Report (Barr, 2016)*
conductivity (Kh)	6.52E+00	ft/day	
porosity (n)	0.25		*Groundwater Monitoring System Report (Barr, 2016)*
horizontal distance	1131	ft	
WL elevation difference	20.36	ft	
gradient (i)	0.018	ft/ft	
linear velocity (V)	0.4695	ft/day	
V	171.5	ft/yr	

Hoot Lake Ash Disposal Facility Groundwater Velocity Calculation

Sampling Date	7/11/2023

Upgradient (S-52)

Top of Casing Elevation	1286.62	ft amsl	*Groundwater Monitoring System Report (Barr, 2016)*
Depth to Water	70.75	ft below TOC	
Water Level Elevation	1215.87	ft amsl	

Downgradient (S-2A)

Top of Casing Elevation	1272.90	ft amsl	*Groundwater Monitoring System Report (Barr, 2016)*
Depth to Water	75.68	ft below TOC	
Water Level Elevation	1197.22	ft amsl	

horizontal hydraulic conductivity (Kh)	2.30E-03	cm/s	*Groundwater Monitoring System Report (Barr, 2016)*
	6.52E+00	ft/day	
porosity (n)	0.25		*Groundwater Monitoring System Report (Barr, 2016)*
horizontal distance	1131	ft	
WL elevation difference	18.65	ft	
gradient (i)	0.016	ft/ft	
linear velocity (V)	0.4300	ft/day	
V	157.1	ft/yr	

Hoot Lake Ash Disposal Facility Groundwater Velocity Calculation

Sampling Date	10/3/2023

Upgradient (S-52)

Top of Casing Elevation	1286.62	ft amsl	*Groundwater Monitoring System Report (Barr, 2016)*
Depth to Water	71.20	ft below TOC	
Water Level Elevation	1215.42	ft amsl	

Downgradient (S-2A)

Top of Casing Elevation	1272.90	ft amsl	*Groundwater Monitoring System Report (Barr, 2016)*
Depth to Water	77.97	ft below TOC	
Water Level Elevation	1194.93	ft amsl	

horizontal hydraulic conductivity (Kh)	2.30E-03	cm/s	*Groundwater Monitoring System Report (Barr, 2016)*
	6.52E+00	ft/day	
porosity (n)	0.25		*Groundwater Monitoring System Report (Barr, 2016)*
horizontal distance	1131	ft	
WL elevation difference	20.49	ft	
gradient (i)	0.018	ft/ft	
linear velocity (V)	0.4725	ft/day	
V	172.6	ft/yr	