2024 Annual Groundwater Monitoring and Corrective Action Report

Ash Landfill

Hoot Lake Plant

Fergus Falls, Minnesota

Prepared for
Otter Tail Power Company

Prepared by
Barr Engineering Co.

January 2025

2024 Annual Groundwater Monitoring and Corrective Action Report

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Hoot Lake Plant
Fergus Falls, Minnesota

January 2025

Contents

Tables

Figures

Appendices

Abbreviations

CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
GWPS	Groundwater Protection Standards
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 2024 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 May 2024 monitoring data identified SSIs for the following: pH at S-10R and total dissolved solids (TDS) 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 2024 monitoring data identified SSIs for the following: Calcium at S-10R and TDS 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. The Ash Landfill entered post-closure care on January 11, 2024.

This 2024 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 2024, 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 2024 on May 2, October 1, and October 22. 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; Figure 1 • Figure 2, • Figure 3, 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 2024. 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 2025 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 2024.

2.2 Monitoring and Analytical Results

Groundwater samples were collected from monitoring wells S-51, S-52, S-10R, S-13, S-14R, and S-3A-R during two semiannual assessment monitoring sampling events in 2024 (Table 2). Monitoring well S-2A did not have sufficient volume to sample during any semiannual sampling events in 2024. A total of twelve groundwater samples were collected and analyzed for the constituents listed in Appendix III and Appendix IV (Part 257) in 2024 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 and Figure 3.

2.3 Monitoring Program Status

The Ash Landfill transitioned to assessment monitoring from detection monitoring on November 2, 2022. Two semiannual assessment monitoring events occurred during 2024. The landfill remains under assessment monitoring at the end of 2024.

Table 2 2024 Groundwater Sampling Summary

Monitoring Location	May 2024 Semiannual Sampling	October 2024 Semiannual Sampling
Date	May 2, 2024	October 1 and 22, 2024
S-51 (background)	• Appendix III & IV	• Appendix III & IV
S-52 (background)	• Appendix III & IV	• Appendix III & IV
S-10R	• Appendix III & IV	• Appendix III & IV
S-13	• Appendix III & IV	• Appendix III & IV
S-14R	• Appendix III & IV	• Appendix III & IV
S-2A	• Insufficient volume	• Water level only (insufficient volume)
S-3A-R	• Appendix III & IV	• Appendix III & IV
Number of Samples	• **6**	• **6**

2.4 Key Actions Completed/Problems Encountered

The following key actions were completed for the groundwater monitoring program during 2024:

- Completed semiannual groundwater sampling under the assessment monitoring program during May and October 2024 in accordance with the CCR Rule.

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 all assessment monitoring events in 2024. Water levels at S-2A were below the screened interval for three of the last four sampling events; however, four other wells are present downgradient of the Ash Landfill, so no additional monitoring system modifications are recommended at this time.

2.5 Key Activities for the Upcoming Year

The following key groundwater monitoring program activities are planned for 2025:

- Continue the assessment monitoring program in accordance with the CCR Rule.
- Evaluate sampling efforts and results at monitoring well S-2A. If sampling efforts are unsuccessful, evaluate the monitoring well network to determine whether monitoring well S-2A can be removed from the monitoring program while retaining 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-10R	S-10R	S-13	S-13	S-14R	S-14R	S-3A-R
	Date	5/02/2024	10/01/2024	5/02/2024	10/01/2024	5/02/2024	10/22/2024	5/02/2024
	Sample Type	N	N	N	N	N	N	N
Parameter	Units							
Appendix III								
Boron, Total	mg/l	< 0.1 U	< 0.1 U	< 0.1 U	**0.110**	< 0.1 U	< 0.1 U	**0.137**
Calcium, Total	mg/l	**107.0**	**148.0**	**111.0**	**123.0**	**103.0**	**112.0**	**104.0**
Chloride	mg/l	**12.3**	**10.1**	**6.8**	**7.4**	**4.5**	**4.1**	**12.9**
Fluoride	mg/l	**0.190**	**0.160**	**0.220**	**0.210**	**0.230**	**0.210**	**0.190**
pH, Field	pH units	**7.46**	**7.30**	**7.22**	**7.26**	**7.44**	**6.85**	**7.42**
Solids, total dissolved	mg/l	**520**	**506**	**549**	**583**	**491**	**479**	**543**
Sulfate, as SO4	mg/l	**106**	**66.7**	**81.1**	**91.9**	**80.0**	**69.8**	**118**
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
Arsenic, Total	mg/l	**0.00708**	**0.0208**	< 0.0005 U	< 0.0005 U	**0.00268**	**0.00336**	< 0.0005 U
Barium, Total	mg/l	**0.097**	**0.191**	**0.053**	**0.083**	**0.045**	**0.048**	**0.037**
Beryllium, Total	mg/l	< 0.00005 U	**0.00015**	< 0.00005 U	< 0.00005 U	< 0.00005 U	< 0.00005 U	< 0.00005 U
Cadmium, Total	mg/l	< 0.0001 U	**0.00012**	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U	< 0.0001 U
Chromium, Total	mg/l	**0.00088**	**0.0115**	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.01 U	< 0.0005 U
Cobalt, Total	mg/l	< 0.005 U	**0.007**	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U
Lead, Total	mg/l	< 0.0005 U	**0.00446**	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U
Lithium, Total	mg/l	**0.020**	**0.025**	**0.025**	**0.026**	**0.027**	**0.029**	< 0.02 U
Mercury, Total	mg/l	< 0.000005 U	**0.000011**	< 0.000005 U	< 0.000005 U	< 0.000005 U	< 0.000005 U	< 0.000005 U
Molybdenum, Total	mg/l	**0.00199**	**0.00118**	**0.00132**	**0.00120**	**0.00244**	**0.00255**	**0.00184**
Selenium, Total	mg/l	< 0.0005 U	**0.00155**	**0.00098**	**0.00095**	< 0.0005 U	< 0.0005 U	**0.00278**
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
Radium 226	pCi/l	**0.553 +/- 0.309**	**0.760 +/- 0.370**	**0.413 +/- 0.256**	0.197 +/- 0.256 ND	**0.465 +/- 0.263**	0.297 +/- 0.282 ND	**0.967 +/- 0.366**
Radium 228	pCi/l	**0.978 +/- 0.289**	**2.90 +/- 0.450**	0.203 +/- 0.346 ND	1.14 +/- 0.353 UB	**1.24 +/- 0.249**	**1.13 +/- 0.531**	0.190 +/- 0.308 ND
Radium, combined (226+228) [Barr Calculation]	pCi/l	**1.531 +/- 0.423**	**3.66 +/- 0.583**	**0.616 +/- 0.430 q**	0.197 +/- 0.256 ND	**1.705 +/- 0.362**	**1.43 +/- 0.601 q**	**1.157 +/- 0.478 q**
Other								
Groundwater elevation, Field	ft amsl	**1209.28**	**1210.36**	**1210.8**	**1211.67**	**1201.81**	**1201.57**	**1203.11**

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-3A-R	S-51	S-51	S-52	S-52	QC
	Date	10/01/2024	5/02/2024	10/01/2024	5/02/2024	10/01/2024	10/01/2024
	Sample Type	N	N	N	N	N	FB
Parameter	Units						
Appendix III							
Boron, Total	mg/l	**0.115**	**0.187**	**0.212**	< 0.1 U	< 0.1 U	< 0.1 U
Calcium, Total	mg/l	**106.0**	**79.20**	**81.30**	**99.00**	**99.40**	< 0.5 U
Chloride	mg/l	**12.3**	**7.7**	**8.1**	**14.6**	**14.5**	< 3 U
Fluoride	mg/l	**0.180**	**0.240**	**0.240**	**0.200**	**0.190**	< 0.02 U
pH, Field	pH units	**7.21**	**7.38**	**6.42**	**7.31**	**6.08**	--
Solids, total dissolved	mg/l	**531**	**444**	**456**	**457**	**459**	< 10 U
Sulfate, as SO4	mg/l	**92.2**	**51.9**	**52.1**	**66.1**	**59.5**	< 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
Arsenic, Total	mg/l	< 0.0005 U	< 0.0005 U	**0.00059**	**0.00180**	**0.00177**	< 0.0005 U
Barium, Total	mg/l	**0.038**	**0.055**	**0.060**	**0.104**	**0.107**	< 0.005 U
Beryllium, Total	mg/l	< 0.00005 U	< 0.00005 U	< 0.00005 U	< 0.00005 U	< 0.00005 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
Chromium, Total	mg/l	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 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
Lead, Total	mg/l	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U
Lithium, Total	mg/l	< 0.02 U	< 0.02 U	< 0.02 U	**0.020**	< 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
Molybdenum, Total	mg/l	**0.00174**	**0.00260**	**0.00191**	**0.00187**	**0.00176**	< 0.0005 U
Selenium, Total	mg/l	**0.00256**	**0.00074**	< 0.0005 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
Radium 226	pCi/l	0.0234 +/- 0.178 ND	**0.346 +/- 0.249**	0.0627 +/- 0.257 ND	0.201 +/- 0.225 ND	0.0841 +/- 0.233 ND	0.0912 +/- 0.196 ND
Radium 228	pCi/l	0.374 +/- 0.238 ND	0.0923 +/- 0.357 ND	1.08 +/- 0.337 UB	**0.746 +/- 0.275**	1.06 +/- 0.380 UB	**0.585 +/- 0.285**
Radium, combined (226+228) [Barr Calculation]	pCi/l	0.397 +/- 0.297 ND	**0.438 +/- 0.435 q**	0.0627 +/- 0.257 ND	**0.947 +/- 0.355 q**	0.0841 +/- 0.233 ND	**0.676 +/- 0.346 q**
Other							
Groundwater elevation, Field	ft amsl	**1203.14**	**1236.6**	**1239.41**	**1215.78**	**1217.26**	--

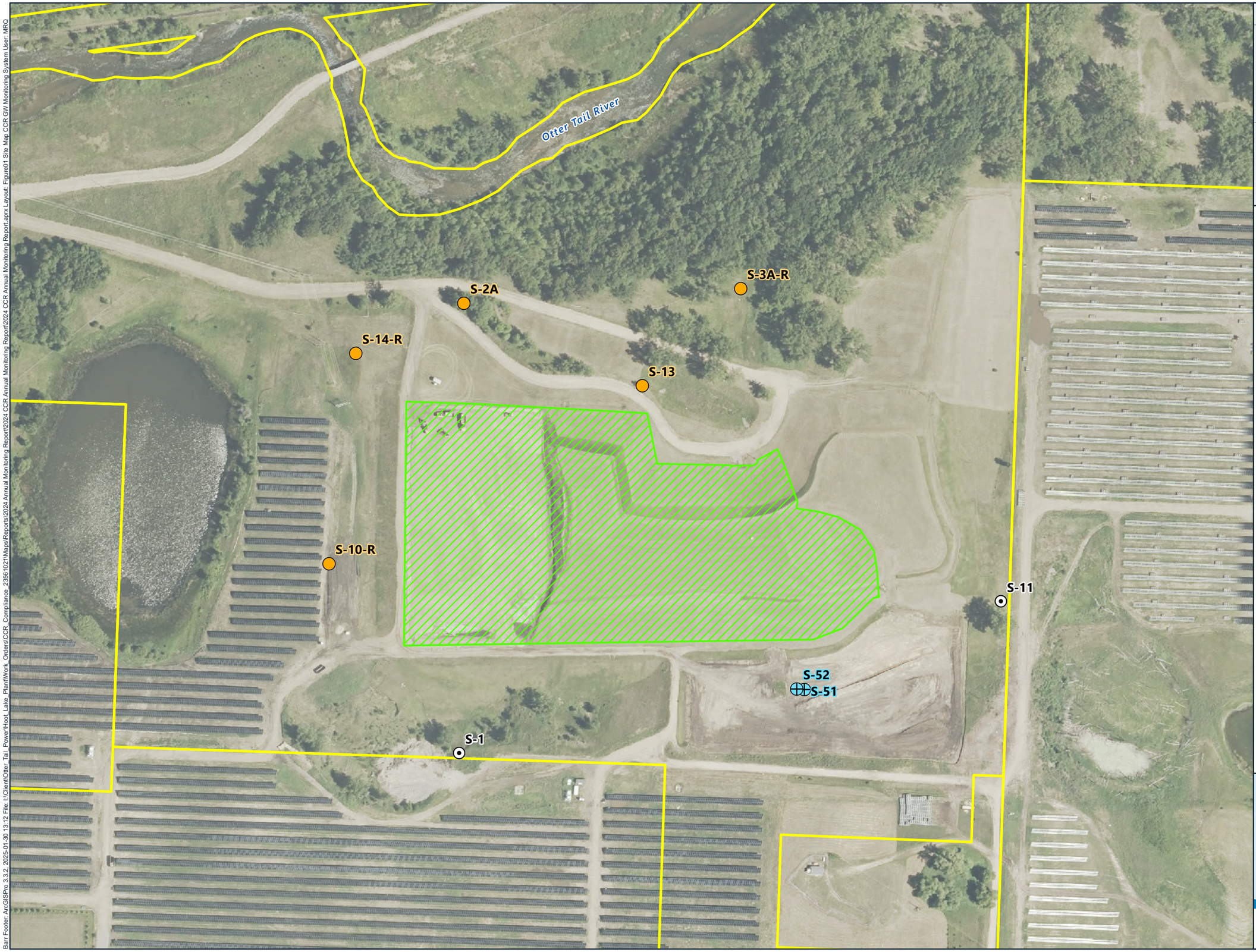
N	Sample Type: Normal Detection Monitoring
FB	Sample Type: Field Blank
ND	The analyte was analyzed for, but was not detected.
q	The combined radium result includes both detected and not detected values.
U	The analyte was analyzed for, but was not detected.
UB	The analyte was detected in one of the associated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

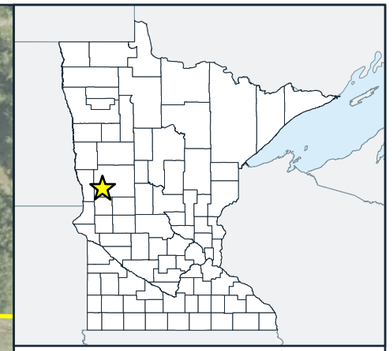
Table 4
Appendix III Background Concentrations and Appendix IV Groundwater Protection Standards (GWPS)
Hoot Lake Station
Otter Tail Power Company

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





- Downgradient Monitoring Well
- Upgradient Monitoring Well
- Water Level Only Well
- Existing CCR Landfill (IL002)
- Otter Tail Power Company Parcels

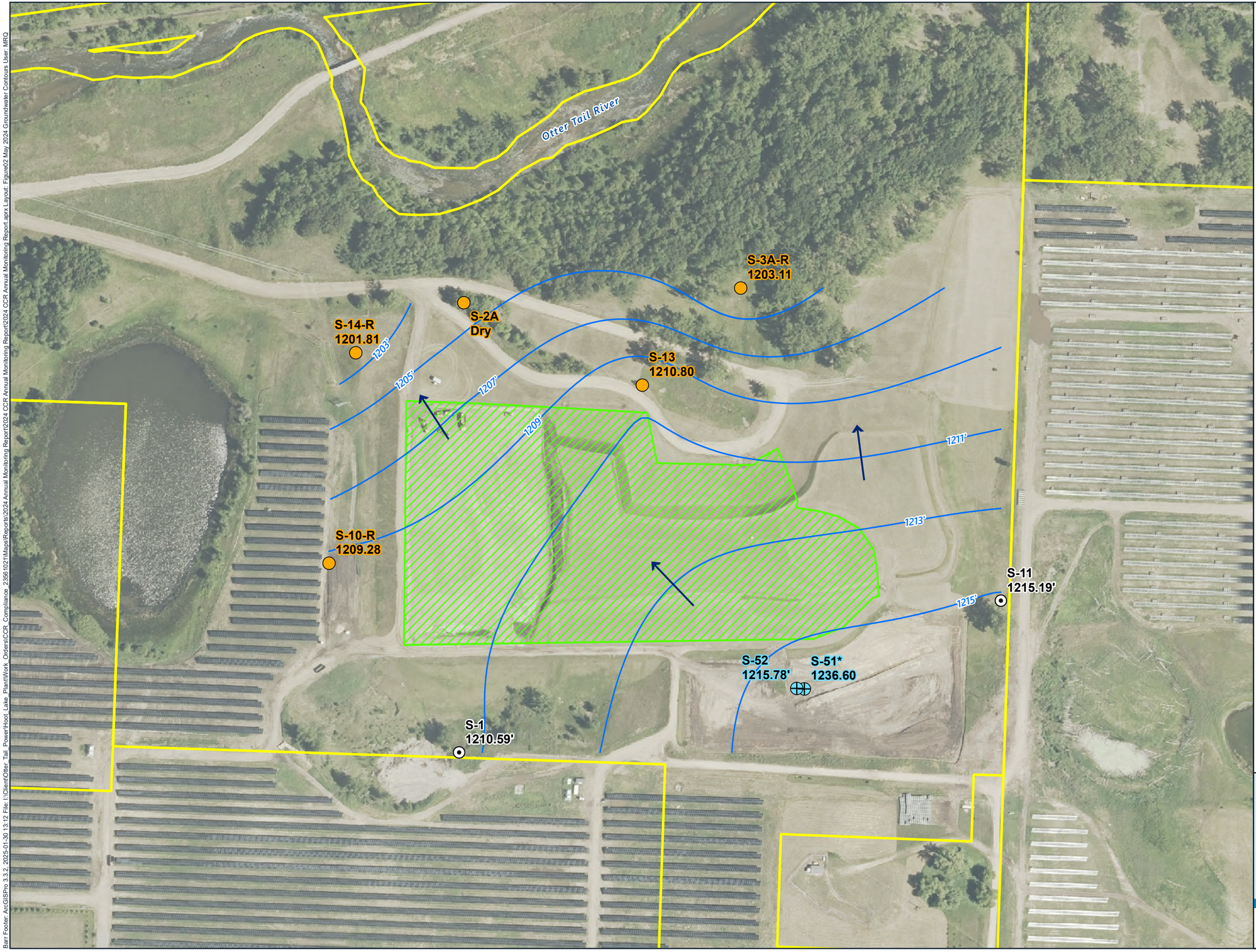
0 200 400
Feet

Imagery Source: USDA NAIP (2023)

CCR Groundwater Monitoring System Location
Hoot Lake Ash Landfill
Otter Tail Power Company
Fergus Falls, MN

FIGURE 1

BARR



Downgradient Monitoring Well

Upgradient Monitoring Well

Water Level Only Well

May 2024 Groundwater Contour (ft MSL)

Groundwater Flow Direction

Existing CCR Landfill (IL002)

Otter Tail Power Company Parcels

Note:
Groundwater elevations measured on May 2, 2024.

* Water level not included in contouring. Indicates level of intermediate aquifer.

0 200 400
Feet

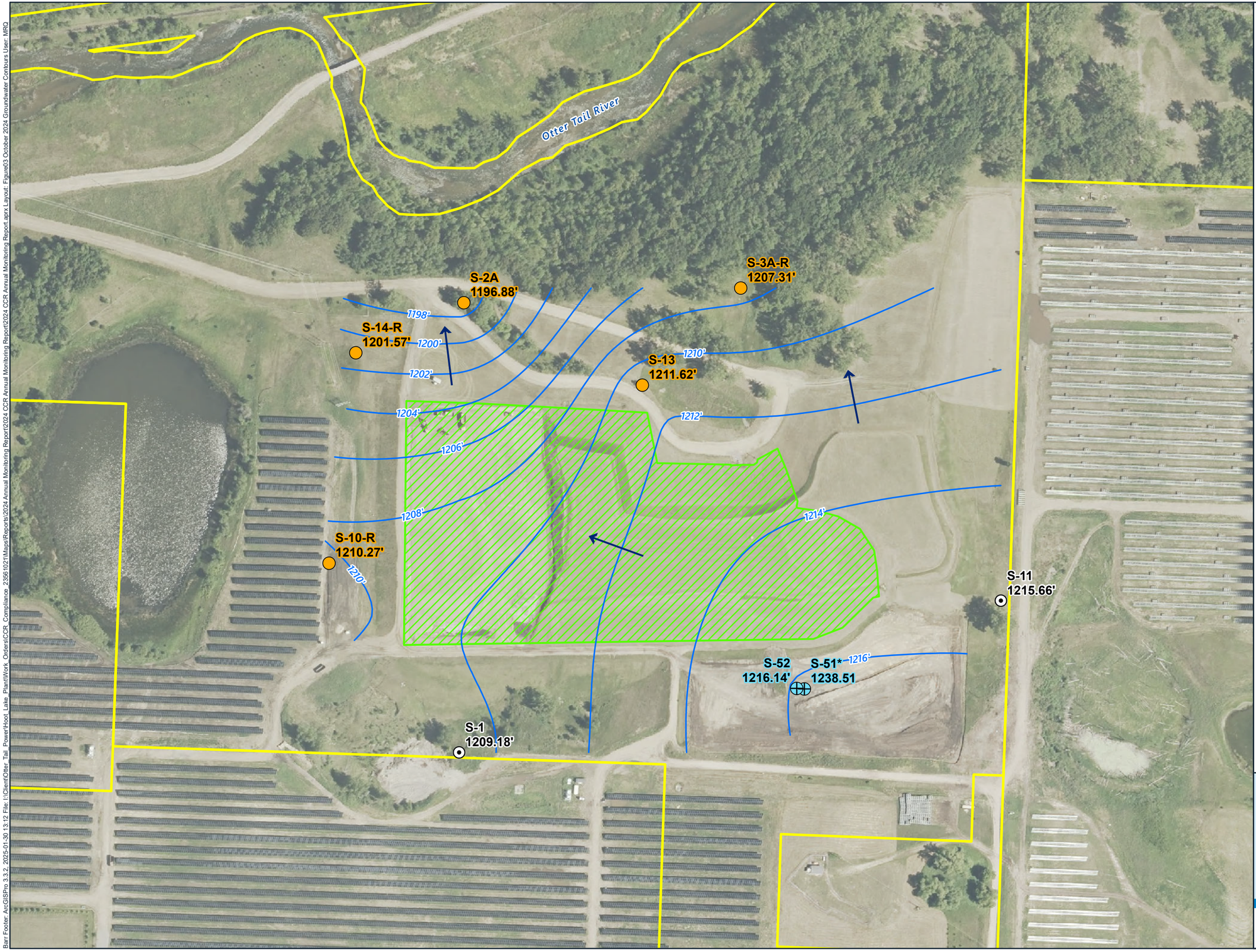
Imagery Source: USDA NAIP (2023)

May 2024
Groundwater Contours
Hoot Lake Ash Landfill
Otter Tail Power Company
Fergus Falls, MN

FIGURE 2

BARR

Barr Footer: ArcGISPro 3.3.2, 2025-01-30 13:12 File: I:\Client\Otter_Tail_Power\Hoot_Lake_Plant\Work_Orders\CCR_Compliance_23561021\Maps\Reports\2024 Annual Monitoring Report\2024 CCR Annual Monitoring Report.aprx Layout: Figure02 May 2024 Groundwater Contours User: MRQ



- Downgradient Monitoring Well
- Upgradient Monitoring Well
- Water Level Only Well
- October 2024 Groundwater Contour (ft MSL)
- Groundwater Flow Direction
- Existing CCR Landfill (IL002)
- Otter Tail Power Company Parcels

Note:
Groundwater elevations measured on October 22, 2024.

* Water level not included in contouring. Indicates level of intermediate aquifer.

N

0 200 400
Feet

Imagery Source: USDA NAIP (2023)

October 2024
Groundwater Contours
Hoot Lake Ash Landfill
Otter Tail Power Company
Fergus Falls, MN

FIGURE 3

BARR

Appendices

Appendix A

Field and Laboratory Reports

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: 20 Jun 24 AH

Date Reported: 19 Jun 2024

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

Work Order #: 31-0066
Account #: 006106
PO #: 59640

Project Name: HOOT LAKE PLANT-CCR

20 June 24
Field Service Manager/Date Reviewed

19 June 24
Chemistry Lab Manager/Date Reviewed

19 June 2024
Quality Assurance Director/Date Reviewed

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

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

MINNESOTA VALLEY TESTING LABORATORIES, INC.
1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
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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: S3AR

Report Date: 19 Jun 2024
Lab Number: 24-A1425
Work Order #: 31-0066
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 2 May 2024 14:56
Sampled By: MVTL FIELD PERSONNEL
Date Received: 2 May 2024 19:00
PO #: 59640

Temp at Receipt: 2.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					6 May 24	JN
Water Digestions					6 May 24	JN
pH, Field	7.42	units	1.00	SM4500-H+-2011	2 May 24 14:56	BMW
pH	* 7.0	units	1.0	SM 4500 H+ B-2000	3 May 24 10:49	CC
Radium 226	0.97	pCi/L	0.60		4 Jun 24 18:03	OL
Radium 228	0.19	pCi/L	3.00	EPA M9320	7 Jun 24 21:45	OL
Sulfate	118	mg/L	5.0	ASTM D516-11	16 May 24 10:07	KRM
Chloride	12.9	mg/L	3.0	SM 4500 Cl E	14 May 24 9:13	LNK
Mercury	< 0.005	ug/L	0.005	EPA 245.7	7 May 24 13:55	RMB
	See Narrative					
Solids, Total Dissolved	543	mg/L	10	SM 2540 C-97	7 May 24 9:40	CC
Calcium	104.0	mg/L	0.500	SW6010D	7 May 24 12:55	TMM
Lithium	< 0.02	mg/L	0.02	SW6010D	7 May 24 12:55	TMM
Barium	0.037	mg/L	0.005	SW6010D	7 May 24 12:55	TMM
Cobalt	< 0.005	mg/L	0.005	SW6010D	7 May 24 12:55	TMM
Boron	0.137	mg/L	0.100	SW6010D	7 May 24 12:55	TMM
Antimony	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Arsenic	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Beryllium	< 0.05	ug/L	0.05	SW6020B	9 May 24 0:20	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	9 May 24 12:46	KAM
Chromium	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Molybdenum	1.84	ug/L	0.50	SW6020B	9 May 24 0:20	KAM
Selenium	2.78	ug/L	0.50	SW6020B	9 May 24 0:20	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	9 May 24 0:20	KAM
Fluoride	0.190	mg/L	0.020	EPA 300.0	8 May 24 0:18	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.
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! = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 ND WW/DW # R-040

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OTTER TAIL POWER CO
PO BOX 496
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Report Date: 19 Jun 2024
Lab Number: 24-A1426
Work Order #: 31-0066
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 2 May 2024 12:27
Sampled By: MVTL FIELD PERSONNEL
Date Received: 2 May 2024 19:00
PO #: 59640

Project Name: HOOT LAKE PLANT-CCR

Sample Description: S51

Temp at Receipt: 2.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					6 May 24	JN
Water Digestions					6 May 24	JN
pH, Field	7.38	units	1.00	SM4500-H+-2011	2 May 24 12:27	BMW
pH	* 7.0	units	1.0	SM 4500 H+ B-2000	3 May 24 10:49	CC
Radium 226	0.35	pCi/L	0.60		4 Jun 24 18:03	OL
Radium 228	0.09	pCi/L	3.00	EPA M9320	7 Jun 24 21:45	OL
Sulfate	51.9	mg/L	5.0	ASTM D516-11	16 May 24 10:07	KRM
Chloride	7.7	mg/L	3.0	SM 4500 Cl E	14 May 24 9:13	LNK
Mercury	< 0.005	ug/L	0.005	EPA 245.7	7 May 24 13:55	RMB
	See Narrative					
Solids, Total Dissolved	444	mg/L	10	SM 2540 C-97	7 May 24 9:40	CC
Calcium	79.20	mg/L	0.500	SW6010D	7 May 24 12:55	TMM
Lithium	< 0.02	mg/L	0.02	SW6010D	7 May 24 12:55	TMM
Barium	0.055	mg/L	0.005	SW6010D	7 May 24 12:55	TMM
Cobalt	< 0.005	mg/L	0.005	SW6010D	7 May 24 12:55	TMM
Boron	0.187	mg/L	0.100	SW6010D	7 May 24 12:55	TMM
Antimony	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Arsenic	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Beryllium	< 0.05	ug/L	0.05	SW6020B	9 May 24 0:20	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	9 May 24 12:46	KAM
Chromium	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Molybdenum	2.60	ug/L	0.50	SW6020B	9 May 24 0:20	KAM
Selenium	0.74	ug/L	0.50	SW6020B	9 May 24 0:20	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	9 May 24 0:20	KAM
Fluoride	0.240	mg/L	0.020	EPA 300.0	8 May 24 0:18	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.

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

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PO BOX 496
FERGUS FALLS MN 56538-0496

Project Name: HOOT LAKE PLANT-CCR

Sample Description: S52

Report Date: 19 Jun 2024
Lab Number: 24-A1427
Work Order #: 31-0066
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 2 May 2024 12:05
Sampled By: MVTL FIELD PERSONNEL
Date Received: 2 May 2024 19:00
PO #: 59640

Temp at Receipt: 2.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					6 May 24	JN
Water Digestions					6 May 24	JN
pH, Field	7.31	units	1.00	SM4500-H+-2011	2 May 24 12:05	BMW
pH	* 6.8	units	1.0	SM 4500 H+ B-2000	3 May 24 10:49	CC
Radium 226	0.20	pCi/L	0.60		4 Jun 24 18:03	OL
Radium 228	0.75	pCi/L	3.00	EPA M9320	7 Jun 24 21:45	OL
Sulfate	66.1	mg/L	5.0	ASTM D516-11	16 May 24 10:25	KRM
Chloride	14.6	mg/L	3.0	SM 4500 Cl E	14 May 24 9:31	LNK
Mercury	< 0.005	ug/L	0.005	EPA 245.7	7 May 24 13:55	RMB
	See Narrative					
Solids, Total Dissolved	457	mg/L	10	SM 2540 C-97	7 May 24 9:40	CC
Calcium	99.00	mg/L	0.500	SW6010D	7 May 24 12:55	TMM
Lithium	0.020	mg/L	0.020	SW6010D	7 May 24 12:55	TMM
Barium	0.104	mg/L	0.005	SW6010D	7 May 24 12:55	TMM
Cobalt	< 0.005	mg/L	0.005	SW6010D	7 May 24 12:55	TMM
Boron	< 0.1	mg/L	0.1	SW6010D	7 May 24 12:55	TMM
Antimony	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Arsenic	1.80	ug/L	0.50	SW6020B	9 May 24 0:20	KAM
Beryllium	< 0.05	ug/L	0.05	SW6020B	9 May 24 0:20	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	9 May 24 12:46	KAM
Chromium	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Molybdenum	1.87	ug/L	0.50	SW6020B	9 May 24 0:20	KAM
Selenium	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	9 May 24 0:20	KAM
Fluoride	0.200	mg/L	0.020	EPA 300.0	8 May 24 0:18	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: S10R

Report Date: 19 Jun 2024
Lab Number: 24-A1428
Work Order #: 31-0066
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 2 May 2024 14:00
Sampled By: MVTL FIELD PERSONNEL
Date Received: 2 May 2024 19:00
PO #: 59640

Temp at Receipt: 2.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					6 May 24	JN
Water Digestions					6 May 24	JN
pH, Field	7.46	units	1.00	SM4500-H+-2011	2 May 24 14:00	BMW
pH	* 6.8	units	1.0	SM 4500 H+ B-2000	3 May 24 10:49	CC
Radium 226	0.55	pCi/L	0.60		4 Jun 24 18:04	OL
Radium 228	0.98	pCi/L	3.00	EPA M9320	7 Jun 24 21:45	OL
Sulfate	106	mg/L	5.0	ASTM D516-11	16 May 24 10:25	KRM
Chloride	12.3	mg/L	3.0	SM 4500 Cl E	14 May 24 9:31	LNK
Mercury	< 0.005 See Narrative	ug/L	0.005	EPA 245.7	7 May 24 13:55	RMB
Solids, Total Dissolved	520	mg/L	10	SM 2540 C-97	7 May 24 9:40	CC
Calcium	107.0	mg/L	0.500	SW6010D	7 May 24 12:55	TMM
Lithium	0.020	mg/L	0.020	SW6010D	7 May 24 12:55	TMM
Barium	0.097	mg/L	0.005	SW6010D	7 May 24 12:55	TMM
Cobalt	< 0.005	mg/L	0.005	SW6010D	7 May 24 12:55	TMM
Boron	< 0.1	mg/L	0.1	SW6010D	7 May 24 12:55	TMM
Antimony	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Arsenic	7.08	ug/L	0.50	SW6020B	9 May 24 0:20	KAM
Beryllium	< 0.05	ug/L	0.05	SW6020B	9 May 24 0:20	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	9 May 24 12:46	KAM
Chromium	0.88	ug/L	0.50	SW6020B	9 May 24 0:20	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Molybdenum	1.99	ug/L	0.50	SW6020B	9 May 24 0:20	KAM
Selenium	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	9 May 24 0:20	KAM
Fluoride	0.190 @	mg/L	0.020	EPA 300.0	8 May 24 0:18	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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RL = Reporting Limit
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FERGUS FALLS MN 56538-0496

Report Date: 19 Jun 2024
Lab Number: 24-A1429
Work Order #: 31-0066
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 2 May 2024 11:23
Sampled By: MVTL FIELD PERSONNEL
Date Received: 2 May 2024 19:00
PO #: 59640

Project Name: HOOT LAKE PLANT-CCR

Sample Description: S13

Temp at Receipt: 2.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					6 May 24	JN
Water Digestions					6 May 24	JN
pH, Field	7.22	units	1.00	SM4500-H+-2011	2 May 24 11:28	BMW
pH	* 7.0	units	1.0	SM 4500 H+ B-2000	3 May 24 10:49	CC
Radium 226	0.41	pCi/L	0.60		4 Jun 24 18:04	OL
Radium 228	0.20	pCi/L	3.00	EPA M9320	7 Jun 24 21:45	OL
Sulfate	81.1 @	mg/L	5.0	ASTM D516-11	16 May 24 10:25	KRM
Chloride	6.8	mg/L	3.0	SM 4500 Cl E	14 May 24 9:31	LNK
Mercury	< 0.005	ug/L	0.005	EPA 245.7	7 May 24 13:55	RMB
	See Narrative					
Solids, Total Dissolved	549	mg/L	10	SM 2540 C-97	7 May 24 9:40	CC
Calcium	111.0	mg/L	0.500	SW6010D	7 May 24 12:55	TMM
Lithium	0.025	mg/L	0.020	SW6010D	7 May 24 12:55	TMM
Barium	0.053	mg/L	0.005	SW6010D	7 May 24 12:55	TMM
Cobalt	< 0.005	mg/L	0.005	SW6010D	7 May 24 12:55	TMM
Boron	< 0.1	mg/L	0.1	SW6010D	7 May 24 12:55	TMM
Antimony	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Arsenic	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Beryllium	< 0.05	ug/L	0.05	SW6020B	9 May 24 0:20	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	9 May 24 12:46	KAM
Chromium	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Molybdenum	1.32	ug/L	0.50	SW6020B	9 May 24 0:20	KAM
Selenium	0.98	ug/L	0.50	SW6020B	9 May 24 0:20	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	9 May 24 0:20	KAM
Fluoride	0.220 @	mg/L	0.020	EPA 300.0	8 May 24 5:32	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:
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1700 Elm Street Suite 200
Minneapolis, MN 55414
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Project Name: HOOT LAKE PLANT-CCR

Sample Description: S14R

Report Date: 19 Jun 2024
Lab Number: 24-A1430
Work Order #: 31-0066
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 2 May 2024 13:13
Sampled By: MVTL FIELD PERSONNEL
Date Received: 2 May 2024 19:00
PO #: 59640

Temp at Receipt: 2.3C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					6 May 24	JN
Water Digestions					6 May 24	JN
pH, Field	7.44	units	1.00	SM4500-H+-2011	2 May 24 13:13	BMW
pH	* 7.0	units	1.0	SM 4500 H+ B-2000	3 May 24 10:49	CC
Radium 226	0.46	pCi/L	0.60		4 Jun 24 18:04	OL
Radium 228	1.24	pCi/L	3.00	EPA M9320	7 Jun 24 21:45	OL
Sulfate	80.0	mg/L	5.0	ASTM D516-11	16 May 24 10:25	KRM
Chloride	4.5	mg/L	3.0	SM 4500 Cl E	14 May 24 9:31	LNK
Mercury	< 0.005	ug/L	0.005	EPA 245.7	7 May 24 13:55	RMB
	See Narrative					
Solids, Total Dissolved	491	mg/L	10	SM 2540 C-97	7 May 24 9:40	CC
Calcium	103.0	mg/L	0.500	SW6010D	7 May 24 12:55	TMM
Lithium	0.027	mg/L	0.020	SW6010D	7 May 24 12:55	TMM
Barium	0.045	mg/L	0.005	SW6010D	7 May 24 12:55	TMM
Cobalt	< 0.005	mg/L	0.005	SW6010D	7 May 24 12:55	TMM
Boron	< 0.1	mg/L	0.1	SW6010D	7 May 24 12:55	TMM
Antimony	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Arsenic	2.68	ug/L	0.50	SW6020B	9 May 24 0:20	KAM
Beryllium	< 0.05	ug/L	0.05	SW6020B	9 May 24 0:20	KAM
Cadmium	< 0.1	ug/L	0.1	SW6020B	9 May 24 12:46	KAM
Chromium	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Lead	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Molybdenum	2.44	ug/L	0.50	SW6020B	9 May 24 0:20	KAM
Selenium	< 0.5	ug/L	0.5	SW6020B	9 May 24 0:20	KAM
Thallium	< 0.1	ug/L	0.1	SW6020B	9 May 24 0:20	KAM
Fluoride	0.230	mg/L	0.020	EPA 300.0	8 May 24 5:32	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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Date Reported: 19 Jun 2024

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

Work Order #: 202431-0066
Account Number: 006106
PO #: 59640

Project Name: HOOT LAKE PLANT-CCR

LABORATORY NARRATIVE

INORGANIC AND METALS ANALYSES:
The mercury matrix spike duplicate recovery was outside of acceptable limits for samples 24-A1425 through 24-A1430. Mercury was reported based on acceptable matrix spike recovery and acceptable duplication of the matrix spikes.

No other problems were encountered with these analyses.

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Report Date: 19 Jun 2024
Lab Number: 24-A1431
Work Order #: 31-0066
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 2 May 2024
Sampled By: MVTL FIELD PERSONNEL
Date Received: 2 May 2024 19:00
PO #: 59640

Project Name: HOOT LAKE PLANT-CCR

Sample Description: S2A

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Misc Comment	NO SAMPLE/DRY				

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 # 027-015-125 ND WW/DW # R-040

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Quality Control Report

Lab IDs: 24-A1425 to 24-A1430 **Project:** HOOT LAKE PLANT-CCR **Work Order:** 202431-0066

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	24A1399q	< 0.5	26.8	107	75-125	26.8	26.9	108	0.4	10	104	90-110	< 0.5
Arsenic ug/L	25.0	101	85-115	25.0	24A1399q	1.46	27.7	105	75-125	27.7	27.8	105	0.4	10	99	90-110	< 0.5
Barium mg/L	1.000	93	85-115	1.00	24A1399qc	0.075	1.020	94	75-125	1.020	1.080	100	5.7	10	99	90-110	< 0.005
Beryllium ug/L	2.50	98	85-115	2.50	24A1399q	< 0.05	2.59	104	75-125	2.59	2.66	106	2.7	10	104	90-110	< 0.05
Boron mg/L	1.000	93	85-115	1.00	24A1399qc	< 0.1	0.978	98	75-125	0.978	1.060	106	8.0	10	97	90-110	< 0.1
Cadmium ug/L	5.00	101	85-115	5.00	24-A1399	< 0.1	5.14	103	75-125	5.14	5.38	108	4.6	10	103	90-110	< 0.1
Calcium mg/L	50.00	91	85-115	50.0	24A1399qc	34.00	78.60	89	75-125	78.60	84.00	100	6.6	10	100	90-110	< 0.5
Chloride mg/L	- -	- -	- -	60.0 60.0	24-A1398 24-A1462	< 3 30.2	62.6 95.5	104 109	80-120 80-120	62.6 95.5	64.3 94.7	107 108	2.7 0.8	10 10	93 98	90-110 90-110	< 3 < 3
Chromium ug/L	25.0	100	85-115	25.0	24A1399q	< 0.5	24.8	99	75-125	24.8	25.2	101	1.6	10	100	90-110	< 0.5
Cobalt mg/L	1.000	93	85-115	1.00	24A1399qc	< 0.005	0.905	90	75-125	0.905	0.969	97	6.8	10	99	90-110	< 0.005
Fluoride mg/L	- -	- -	- -	0.20 1.00	24-A1398 24-A1429	< 0.02 0.220	0.200 1.22	100 100	75-125 75-125	0.200 1.22	0.210 1.23	105 101	4.9 0.8	10 10	102 101	90-110 90-110	< 0.02 -
Lead ug/L	25.0	100	85-115	25.0	24A1399q	< 0.5	25.5	102	75-125	25.5	25.6	102	0.4	10	100	90-110	< 0.5
Lithium mg/L	1.000	94	85-115	1.00	24-A1399qc	< 0.02	0.936	94	75-125	0.936	1.000	100	6.6	10	101	90-110	< 0.02
Mercury ug/L	-	-	-	0.10	24-A1400	< 0.005	0.107	107	63-111	0.107	0.113	113	5.5	18	101	76-113	< 0.005
Molybdenum ug/L	25.0	100	85-115	25.0	24A1399q	0.90	27.0	104	75-125	27.0	26.8	104	0.7	10	100	90-110	< 0.5
pH units	-	-	-	-	-	-	-	-	-	7.7	7.7	-	0.0	2.5	101	90-110	-
Selenium ug/L	25.0	101	85-115	25.0	24A1399q	< 0.5	27.1	108	75-125	27.1	26.8	107	1.1	10	102	90-110	< 0.5
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	414	410	-	1.0	10	101	85-115	< 10
Sulfate mg/L	- -	- -	- -	50.0 500	24-A1405 24-A1429	< 5 81.1	49.5 602	99 104	80-120 80-120	49.5 602	49.6 598	99 103	0.2 0.7	10 10	86 85	80-120 80-120	< 5 < 5
Thallium ug/L	5.00	99	85-115	5.00	24A1399q	< 0.1	5.09	102	75-125	5.09	5.20	104	2.1	10	100	90-110	< 0.1

Mercury matrix spike duplicate recovery was outside of acceptance limits, see narrative.

Approved by: 

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

June 12, 2024

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

RE: Project: 31-0066 Otter Tail Power
Pace Project No.: 10691860

Dear Todd Rieger:

Enclosed are the analytical results for sample(s) received by the laboratory on May 06, 2024. 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)607-6456
Project Manager

Enclosures

cc: Barb Zins, MVTL

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

SAMPLE SUMMARY

Project: 31-0066 Otter Tail Power
Pace Project No.: 10691860

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10691860001	**24-A1425**	Water	05/02/24 14:56	05/06/24 09:40
10691860002	**24-A1426**	Water	05/02/24 12:27	05/06/24 09:40
10691860003	**24-A1427**	Water	05/02/24 12:05	05/06/24 09:40
10691860004	**24-A1428**	Water	05/02/24 14:00	05/06/24 09:40
10691860005	**24-A1429**	Water	05/02/24 11:23	05/06/24 09:40
10691860006	**24-A1430**	Water	05/02/24 13:13	05/06/24 09:40

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Docume

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

WO#:10691860

10691860

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:	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: 31-0066	Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MN

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information — SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	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	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	Y/N	Analysis Test: 2,3,7,8 TCDD method161	Radium 226/228	PFAs State Pricing	Dioxins/Furans	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	24-A1425		WT				05/02/24	14:56		1												x			N	001
2	24-A1426		WT				05/02/24	12:27		1												x			N	002
3	24-A1427		WT				05/02/24	12:05		1												x			N	003
4	24-A1428		WT				05/02/24	14:00		1												x			N	004
5	24-A1429		WT				05/02/24	11:23		1												x			N	005
6	24-A1430		WT				05/02/24	13:13		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)
	Barb Zins / MVTL	5/6/24	7:00	[signature]	5/6/24	940	1.1	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.

ENV-FRM-MIN4-0150 v16_Sample Condition Upon Receipt

CLIENT NAME: MVTL **PROJECT #:**

WO#:10691860
PM: RG Due Date: 05/05/24
CLIENT: MVTL

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

TRACKING NUMBER: ________ ☐ See Exceptions form ENV-FRM-MIN4-0142

Custody Seal on Coole/Box Present: ☐ YES ☑ NO **Seals Intact:** ☐ YES ☑ NO **Biological Tissue Frozen:** ☐ YES ☐ NO ☑ N/A

Packing Material: ☐ Bubble Bags ☐ Bubble Wrap ☑ None ☐ Other **Temp Blank:** ☑ YES ☐ NO **Type of Ice:** ☐ Blue ☐ Dry ☑ Wet ☐ Melted ☐ None

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

Did Samples Originate in West Virginia: ☐ YES ☐ NO	**Were All Container Temps taken:** ☐ YES ☐ NO ☑ N/A
Correction Factor: -0.3 **Cooler Temp Read w/Temp Blank:** 1.4 °C **Cooler Temp Corrected w/Temp Blank:** 1.1 °C	**Average Corrected Temp (no Temp Blank Only):** ____ °C
NOTE: Temp should be above freezing to 6°C.	☐ See Exceptions Form ENV-FRM-MIN4-0142 ☐ 1 Container

USDA Regulated Soil: ☑ N/A – Water Sample/Other (describe): ____	**Initials & Date of Person Examining Contents:** EC 5-6-24
Did Samples originate from one of the following states (check maps) – AL, AR, AZ, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA: ☐ YES ☐ NO	Did samples originate from a foreign source (International, including Hawaii and Puerto Rico): ☐ YES ☐ NO

NOTE: 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	YES	NO	N/A	COMMENT(S)
Chain of Custody Present and Filled Out?	☑	☐		1.
Chain of Custody Relinquished?	☑	☐		2.
Sampler Name and/or Signature on COC?	☐	☑	☐	3.
Samples Arrived within Hold Time?	☑	☐		4. If Fecal: ☐ <8 hrs ☐ >8 hr, <24 hr ☐ No
Short Hold Time Analysis (<72 hr)?	☐	☑		5. ☐ BOD / cBOD ☐ Fecal coliform ☐ Hex Chrom ☐ HPC ☐ Nitrate ☐ Nitrite ☐ Ortho Phos ☐ Total coliform/*E. coli* ☐ Other: ____
Rush Turn Around Time Requested?	☐	☑		6.
Sufficient Sample Volume?	☑	☐		7. 2 BPINs recieved for each
Correct Containers Used?	☑	☐	☐	8. sample
– Pace Containers Used?	☑	☐		
Containers Intact?	☑	☐		9.
Field Filtered Volume Received for Dissolved Tests?	☐	☐	☑	10. Is sediment visible in the dissolved container: ☐ YES ☐ NO
Is sufficient information available to reconcile the samples to the COC? **NOTE:** If ID/Date/Time don't match fill out section 11. Matrix: ☐ Oil ☐ Soil ☑ Water ☐ Other	☑	☐		11. **If NO, write ID/Date/Time of container below:** ☐ See Exceptions form ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☑	☐	☐	12. Sample #: 001-006
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, < 2 pH, NaOH > 9 Sulfide, NaOH > 10 Cyanide)	☑	☐	☐	☑ HNO_3 <2 ☐ H_2SO_4 ☐ NaOH ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC, Oil & Grease, DRO/8015 (water) and Dioxins/PFAS	☐	☐	☑	Positive for Residual Chlorine: ☐ YES ☐ NO
NOTE: If adding preservation to the container, **verify with the PM first.** Clients may require adding preservative to the field and equipment blanks when this occurs.				pH Paper Lot #: Residual Chlorine: — ; 0-6 Roll: 213923 ; 0-6 Strip: — ; 0-14 Strip: — ☐ See Exceptions form ENV-FRM-MIN4-0142
Headspace in Methyl Mercury Container?	☐	☐	☑	13.
Extra labels present on soil VOA or WIDRO containers?	☐	☐	☑	14.
Headspace in VOA Vials (greater than 6mm)?	☐	☐	☑	☐ See Exceptions form ENV-FRM-MIN4-0142
Trip Blanks Present?	☐	☐	☑	15.
Trip Blank Custody Seals Present?	☐	☐	☑	Pace Trip Blank Lot # (if purchased): ____

CLIENT NOTIFICATION / RESOLUTION **FIELD DATA REQUIRED:** ☐ YES ☐ NO

Person Contacted: ________ Date & Time: ________

Comments / Resolution: ________

Project Manager Review: Piper J Gibbs **Date:** 5/6/24

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

Labeled By: EC **Line:** 3

ANALYTICAL REPORT

June 12, 2024

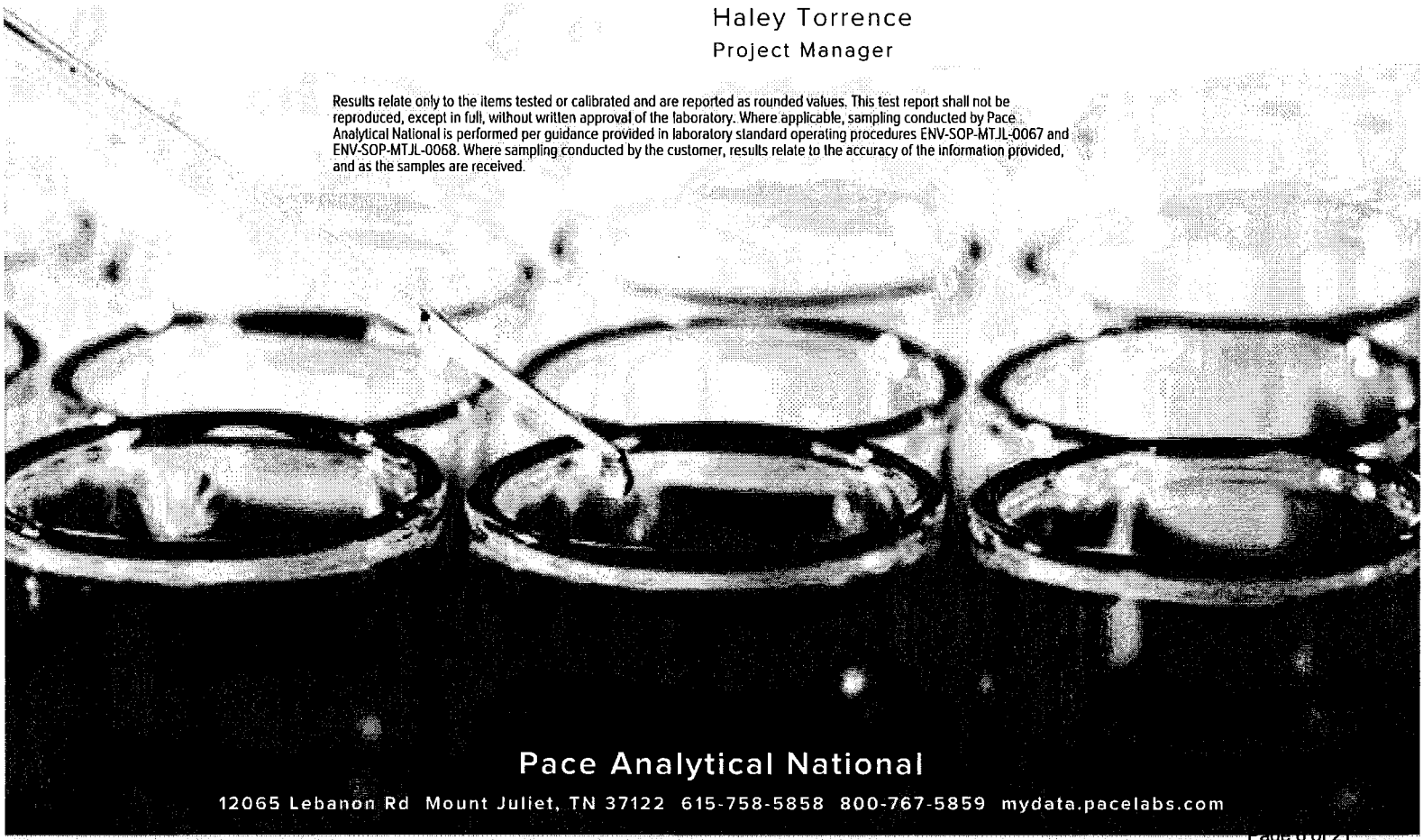
1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Pace Analytical - Minnesota

Sample Delivery Group:	L1733872
Samples Received:	05/08/2024
Project Number:	10691860
Description:	31-0066 Otter Tail Power
Site:	001
Report To:	Piper Gibbs
	1700 Elm Street Suite 200
	Minneapolis, MN 55414

Entire Report Reviewed By: Haley Torrence

Haley Torrence
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

TABLE OF CONTENTS

SAMPLE SUMMARY

24-A1425 L1733872-01 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/02/24 14:56	05/08/24 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2294469	1	05/29/24 08:13	06/07/24 21:45	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2294380	1	05/31/24 11:42	06/07/24 21:45	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2294380	1	05/31/24 11:42	06/04/24 18:03	ZRG	Mt. Juliet, TN

24-A1426 L1733872-02 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/02/24 12:27	05/08/24 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2294469	1	05/29/24 08:13	06/07/24 21:45	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2294380	1	05/31/24 11:42	06/07/24 21:45	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2294380	1	05/31/24 11:42	06/04/24 18:03	ZRG	Mt. Juliet, TN

24-A1427 L1733872-03 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/02/24 12:05	05/08/24 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2294469	1	05/29/24 08:13	06/07/24 21:45	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2294380	1	05/31/24 11:42	06/07/24 21:45	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2294380	1	05/31/24 11:42	06/04/24 18:03	ZRG	Mt. Juliet, TN

24-A1428 L1733872-04 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/02/24 14:00	05/08/24 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2294469	1	05/29/24 08:13	06/07/24 21:45	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2294380	1	05/31/24 11:42	06/07/24 21:45	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2294380	1	05/31/24 11:42	06/04/24 18:04	ZRG	Mt. Juliet, TN

24-A1429 L1733872-05 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/02/24 11:23	05/08/24 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2294469	1	05/29/24 08:13	06/07/24 21:45	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2294380	1	05/31/24 11:42	06/07/24 21:45	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2294380	1	05/31/24 11:42	06/04/24 18:04	ZRG	Mt. Juliet, TN

24-A1430 L1733872-06 Non-Potable Water

Collected by	Collected date/time	Received date/time
	05/02/24 13:13	05/08/24 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2294469	1	05/29/24 08:13	06/07/24 21:45	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2294380	1	05/31/24 11:42	06/07/24 21:45	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2294380	1	05/31/24 11:42	06/04/24 18:04	ZRG	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.

Haley Torrence

Haley Torrence
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	0.190	U	0.308	0.417	0.576	0.301	06/07/2024 21:45	WG2294469
(T) Barium	*83.7*					*30.0-143*	*06/07/2024 21:45*	WG2294469
(T) Yttrium	*102*					*30.0-136*	*06/07/2024 21:45*	WG2294469

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.16		0.478	0.605	06/07/2024 21:45	WG2294380

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	0.967		0.366	0.173	0.185	0.145	06/04/2024 18:03	WG2294380
(T) Barium-133	*89.8*					*30.0-143*	*06/04/2024 18:03*	WG2294380

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	0.0923	U	0.357	0.477	0.672	0.351	06/07/2024 21:45	WG2294469
(T) Barium	*81.8*					*30.0-143*	*06/07/2024 21:45*	WG2294469
(T) Yttrium	*84.1*					*30.0-136*	*06/07/2024 21:45*	WG2294469

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.438	J	0.435	0.703	06/07/2024 21:45	WG2294380

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	0.346		0.249	0.0977	0.205	0.169	06/04/2024 18:03	WG2294380
(T) Barium-133	*76.7*					*30.0-143*	*06/04/2024 18:03*	WG2294380

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	0.746		0.275	0.382	0.496	0.260	06/07/2024 21:45	WG2294469
(T) Barium	*87.4*					*30.0-143*	*06/07/2024 21:45*	WG2294469
(T) Yttrium	*97.2*					*30.0-136*	*06/07/2024 21:45*	WG2294469

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.946		0.355	0.578	06/07/2024 21:45	WG2294380

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	0.201	J	0.225	0.0762	0.297	0.221	06/04/2024 18:03	WG2294380
(T) Barium-133	*69.9*					*30.0-143*	*06/04/2024 18:03*	WG2294380

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	0.978		0.289	0.407	0.513	0.271	06/07/2024 21:45	WG2294469
(T) Barium	*73.6*					*30.0-143*	*06/07/2024 21:45*	WG2294469
(T) Yttrium	*100*					*30.0-136*	*06/07/2024 21:45*	WG2294469

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty +/-	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.53		0.423	0.566	06/07/2024 21:45	WG2294380

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	0.553		0.309	0.130	0.239	0.182	06/04/2024 18:04	WG2294380
(T) Barium-133	*82.5*					*30.0-143*	*06/04/2024 18:04*	WG2294380

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	0.203	U	0.346	0.484	0.653	0.344	06/07/2024 21:45	WG2294469
(T) Barium	*59.3*					*30.0-143*	*06/07/2024 21:45*	WG2294469
(T) Yttrium	*108*					*30.0-136*	*06/07/2024 21:45*	WG2294469

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.616	J	0.430	0.665	06/07/2024 21:45	WG2294380

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	0.413		0.256	0.110	0.124	0.124	06/04/2024 18:04	WG2294380
(T) Barium-133	*82.8*					*30.0-143*	*06/04/2024 18:04*	WG2294380

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	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	1.24		0.249	0.363	0.424	0.226	06/07/2024 21:45	WG2294469
(T) Barium	*78.4*					*30.0-143*	*06/07/2024 21:45*	WG2294469
(T) Yttrium	*119*					*30.0-136*	*06/07/2024 21:45*	WG2294469

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.71		0.362	0.440	06/07/2024 21:45	WG2294380

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.465		0.263	0.117	0.116	0.116	06/04/2024 18:04	WG2294380
(T) Barium-133	*85.6*					*30.0-143*	*06/04/2024 18:04*	WG2294380

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

Method Blank (MB)

(MB) R4080395-1 06/07/24 21:45

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE +/-	MB MDA pCi/l	MB Lc pCi/l
Radium-228	0.113	U	0.177	0.334	0.175
(T) Barium	*90.7*		*90.7*		
(T) Yttrium	*91.9*		*91.9*		

L1734486-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1734486-03 06/07/24 21:45 • (DUP) R4080395-5 06/07/24 21:45

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	1.68	0.391	0.686	0.360	1.23	0.370	0.662	0.346	31.2	0.843		20	3
(T) Barium	*88.7*				*97.7*	*97.7*							
(T) Yttrium	*105*				*98.5*	*98.5*							

Laboratory Control Sample (LCS)

(LCS) R4080395-2 06/07/24 21:45

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.02	80.5	80.0-120	
(T) Barium			*103*		
(T) Yttrium			*99.4*		

Method Blank (MB)

(MB) R4077947-1 06/04/24 18:03

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE +/- pCi/l	MB MDA pCi/l	MB Lc pCi/l
Radium-226	-0.0206	U	0.0668	0.142	0.0929
(T) Barium-133	*66.2*		*66.2*		

L1735676-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1735676-01 06/04/24 18:04 • (DUP) R4077947-5 06/04/24 18:03

Analyte	Original Result pCi/l	Original 2 sigma CE +/- pCi/l	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE +/- pCi/l	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	0.285	0.221	0.193	0.160	0.346	0.363	0.481	0.318	19.4	0.144	J	20	3
(T) Barium-133	*91.9*				*76.6*	*76.6*							

Laboratory Control Sample (LCS)

(LCS) R4077947-2 06/04/24 18:03

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.00	6.16	123	75.0-125	
(T) Barium-133			*59.2*		

L1732817-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1732817-09 06/04/24 18:03 • (MS) R4077947-3 06/04/24 18:03 • (MSD) R4077947-4 06/04/24 18:03

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	-0.0391	23.8	22.8	119	114	1	75.0-125			4.59		20
(T) Barium-133		*79.8*			*64.5*	*80.5*							

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

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	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.

Internal Transfer Chain of Covody

H191

☐ Rush Multiplier_____X
☐ Samples Pre-Logged into eCOC

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

Workorder: 10691860 **Workorder Name:** 31-0066 Otter Tail Power **Owner Received Date:** 5/6/2024 **Results Requested By:** 6/5/2024

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

L1733672

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: HNO3	Radium 226/228	LAB USE ONLY
1	24-A1425	PS	5/2/2024 14:56	10691860001	Water	1	X	-01
2	24-A1426	PS	5/2/2024 12:27	10691860002	Water	1	X	-02
3	24-A1427	PS	5/2/2024 12:05	10691860003	Water	1	X	-03
4	24-A1428	PS	5/2/2024 14:00	10691860004	Water	1	X	-04
5	24-A1429	PS	5/2/2024 11:23	10691860005	Water	1	X	-05
6	24-A1430	PS	5/2/2024 13:13	10691860006	Water	1	X	-06

Transfers	Released By	Date/Time	Received By	Date/Time
1	Bri Ceer /PACE	5/7/24 15:00	Easton Orgon	5/8/24 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.*

1.0+0.1=1.1 EBA6

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
RAD Screen <0.5 mR/hr: ✓Y _N

If Applicable
VOA Zero Headspace: _Y _N
Pres. Correct/Check: _Y _N

6476 5643 6863

L1733872

Pace

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

INTER_LABORATORY WORK ORDER # 10691860
(To be completed by sending lab)

Sending Project No:	10691860
Receiving Project No:	
Check Box for Consolidated Invoice:	☐
Date Prepared:	05/06/24
REQUESTED COMPLETION DATE:	**6/5/2024**

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: stndMN Report Wet or Dry Weight? Dry Weight ☐ IRWO Lab Need to run? Cert. Needed: MN

WORK REQUESTED

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

Special Requirements: Report C, QC Limits (C),FR Only no EDD (0)

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.

This is an exact copy of the original document
By AR Date 2 May 24
pages 1-11

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:** BLR, NM	
Report To: Otter Tail Power Company	**Carbon Copy:** BarrDM@barr.com	Quote Number:	
Attn: Paul Vukonich	Attn:	Work Order Number: 31-0066	
Address: P.O. Box 496 Fergus Falls, MN 56038-0496	Address:	Lab Numbers:	
Phone: 218-739-8349			

Sample Information							Bottle Type												Analysis
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	VOC Set	1000 none	1000 HNO3	500 HNO3	Filter? Y or N	500 HNO3	Filter? Y or N	500H2SO4	1000 HNO3	500 NaOH	Other: 150 H2SO4	*2-1000 HNO3 (Pace)	Analysis Required
31	S2A		2May24	NS	~~GW~~			1		1	N							2	See Attatched
A1425	S3AR			1456	GW			1		1	N							2	CCR 3 and CCR 4
26	S51			1227	GW			1		1	N							2	
27	S52			1205	GW			1		1	N							2	
28	S10R			1400	GW			1		1	N							2	
29	S13			1123	GW			1		1	N							2	
30	S14R			1313	GW			1		1	N							2	
	~~Field Blank~~							1		1	N							~~2~~	

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

* NO Field Blank

Samples Relinquished By: BLR, NM			Samples Received By: A. Ruedy		
Date: 2 May 24	Time: 1900	Temp: 2.3 TM77	Date: 2 May 24	Time: 1900	Temp: 2.3C
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		
Tran. :: Ambient	Ice	Other:	Seals Intact? Yes	No	

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

Spring 2024

2024 - Hoot Lake Site CCR Sampling

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. Make sure CCR 3 and CCR 4 parmaters are printed and a part of the COC.

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

We usually schedule in early May and early October.

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

Sampling Personnel: NM

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 2may 24

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: 78.48

Well Casing Elevation: 1271.562

Constructed Depth: 78.42

Static Water Elevation: 1203.112

Casing Diameter: 2"

Previous Static: —

Water Level Before Purge: 68.45

Water Level After Sample: 70.32

Well Volume: 1.60 Gallons

Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 50° Wind: SSE Sky: Cloudy

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

Dedicated Equipment: Yes No

Pumping Rate: .25 gpm

Well Purged Dry? Yes No

Time Pump Began: 1435 am / pm

Time Purged Dry? —

Time of Sampling: 1456 am / pm

Duplicate Sample? Yes No ID: —

Sample EH: −61.2

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1442	7.43	915	8.86	4.49	1.8	1.75	1	
1449	7.43	916	8.86	4.54	1.9	3.50	2	
1456	7.42	915	8.86	4.57	1.9	5.25	3	
							4	
							5	

Stabilized? Yes No

Amount Water Removed: 5.25 Gallons

Comments:

45 60 PSI

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: NM

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 2 may 24

Unique Station ID: 814830

Sample ID: S-51

Well Condition

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

Repairs Necessary:

Well Information

Well Depth:	55.60	Well Casing Elevation:	1286.904
Constructed Depth:	55.60	Static Water Elevation:	1236.404
Casing Diameter:	2"	Previous Static:	—
Water Level Before Purge:	50.50	Water Level After Sample:	50.90
Well Volume:	0.43 Gallons	Measurement Method:	(Elec. W.l) Steel Tape

Sampling Information

Weather Conditions: Temp: 50 Wind: 11 SE Sky: cloudy

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

Dedicated Equipment:	(Yes) No	Pumping Rate:	.25 gpm
Well Purged Dry?	Yes (No)	Time Pump Began:	1215 am / (pm)
Time Purged Dry?	—	Time of Sampling:	1227 am / (pm)
Duplicate Sample?	Yes (No) ID: —	Sample EH:	66.8

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:
1219	7.37	795	8.04	1.79	0.4	1	1	
1223	7.37	795	8.04	1.83	1.5	2	2	
1227	7.38	795	8.04	1.81	0.9	3	3	
							4	
							5	

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

Comments: 37psi

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: NM

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 7may24

Unique Station ID:

Sample ID: S-52

Well Condition

Well Locked? Yes ~~No~~ NM 7may24

Well Labeled? Yes ~~No~~

Casing Straight? Yes No

Protective Posts? ~~Yes~~ No

State ID Tag? Yes No

Grout Seal Intact? Yes No

Repairs Necessary:

Well Information

Well Depth: 88.30

Constructed Depth: 88.30

Casing Diameter: 2"

Water Level Before Purge: 70.84

Well Volume: 2.84 Gallons

Well Casing Elevation: 1286.623

Static Water Elevation: 1215.783

Previous Static: —

Water Level After Sample: 70.89

Measurement Method: Elec. WLI Steel Tape

Sampling Information

Weather Conditions: Temp: 51° Wind: 12E 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: 1129 am / pm

Time of Sampling: 1205 am / pm

Sample EH: -86.2

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

Time (N)	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1141	7.30	813	7.95	1.20	1.3	3	1	
1153	7.30	812	7.96	1.13	1.0	6	2	
1205	7.31	812	7.98	1.11	0.8	9	3	
							4	
							5	

Stabilized? Yes No

Amount Water Removed: 9 Gallons

Comments:

55psi

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: BW NM

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 2 May 24

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:	1209.28
Casing Diameter:	2"	Previous Static:	—
Water Level Before Purge:	72.19	Water Level After Sample:	Below Pump
Well Volume:	1.37 Gallons	Measurement Method:	(Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 50° Wind: 11 SE Sky: cloudy

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

Dedicated Equipment:	(Yes) No	Pumping Rate:	.25 gpm
Well Purged Dry?	(Yes) No	Time Pump Began:	1355 am / (pm)
Time Purged Dry?	1400	Time of Sampling:	1400 am / (pm)
Duplicate Sample?	Yes (No) ID: —	Sample EH:	35.3

Sample Appearance: General: cloudy Color: tan Phase: lt. sed Odor: sulfurous

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1400	7.46	856	9.14	5.36	113.5	1.5	1	
							2	
							3	
							4	
1405	—	—	—	—	—	—	5	recharge

Stabilized? Yes (No) Amount Water Removed: 1.5 Gallons

Comments: insufficient volume for recharge reading

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: BW

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 2 May 24

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:	1210.80
Casing Diameter:	2"	Previous Static:	1210.89
Water Level Before Purge:	86.62	Water Level After Sample:	85.62
Well Volume:	.75 Gallons	Measurement Method:	(Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 52 Wind: LW Sky: Light 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: 1114 (am) / pm

Time Purged Dry? — — Time of Sampling: 1123 (am) / pm

Duplicate Sample? Yes (No) ID: — — Sample EH: 87.9

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1117	7.15	754	10.79	2.09	8.2	.75	1	
1120	7.19	764	10.84	2.07	0.0	1.50	2	
1123	7.22	764	10.87	2.05	0.0	2.25	3	
							4	
							5	

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

Comments:

EB @ 1110

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: NM

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 2 may 24

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:	1201.81
Casing Diameter:	2"	Previous Static:	—
Water Level Before Purge:	78.80	Water Level After Sample:	79.62
Well Volume:	1.35 Gallons	Measurement Method:	Elec. Wtl / Steel Tape

Sampling Information

Weather Conditions: Temp: 50 Wind: 11 S E 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: 1255 am / pm

Time of Sampling: 1313 am / pm

Sample EH: -50.8

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

WM (1) 2 may 24

(6) Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
~~1301~~ 1301	7.44	856	8.69	5.01	.2	1.5	1	
1307	7.42	855	8.69	5.19	0.8	3.0	2	
1313	7.44	854	8.70	5.69	3.3	4.5	3	
							4	
							5	

Stabilized? Yes No

Amount Water Removed: 4.5 Gallons

Comments: 53 psi

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: NM

Site: Ottertail Power Co./Hoot Lake

Facility ID: SW-211

Date: 2 may 24

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: —

Casing Diameter: 2"

Previous Static: —

Water Level Before Purge: —

Water Level After Sample: —

Well Volume: — Gallons

Measurement Method: Elec. WLI Steel Tape

Sampling Information

Weather Conditions: Temp: 50° Wind: 11 SE Sky: Cloudy

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

Dedicated Equipment: Yes No

Pumping Rate: .75 gpm

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

Time Pump Began: 1345 am / pm

Time Purged Dry? —

Time of Sampling: — 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:

50psi

-No Sample / Dry
- Insufficient Volume to purge

Exceptions to Protocol:

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

MEMBER ACIL

FINAL REPORT COMPLETION DATE: 17 Dec 2024

Date Reported: 17 Dec 2024

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

Work Order #: 31-0136
Account #: 006106
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

17 Dec 24
Field Service Manager/Date Reviewed

17 Dec 24
Chemistry Lab Manager/Date Reviewed

17 Dec 2024
Quality Assurance Director/Date Reviewed

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

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

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

Report Date: 17 Dec 2024
Lab Number: 24-A2535
Work Order #: 31-0136
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 1 Oct 2024 14:36
Sampled By: MVTL FIELD PERSONNEL
Date Received: 1 Oct 2024 18:30
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S3AR

Temp at Receipt: 0.5C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					3 Oct 24	NS
Water Digestions					9 Oct 24	NS
pH, Field	7.21	units	1.00	SM4500-H+-2011	1 Oct 24 14:36	NM
pH	* 7.4	units	1.0	SM 4500 H+ B-2000	2 Oct 24 12:30	CC
Radium 226	0.02	pCi/L	0.60		4 Dec 24 10:23	OL
Radium 228	0.37	pCi/L	3.00	EPA M9320	4 Dec 24 17:25	OL
Sulfate	92.2	mg/L	5.0	ASTM D516-11	7 Oct 24 8:09	AKF
Chloride	12.3	mg/L	3.0	SM 4500 Cl E	8 Oct 24 13:58	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	4 Oct 24 14:40	RMB
Solids, Total Dissolved	531	mg/L	10	SM 2540 C-97	3 Oct 24 9:40	CC
	See Narrative					
Calcium	106.0	mg/L	0.500	SW6010D	10 Oct 24 16:57	RMV
Lithium	< 0.02	mg/L	0.02	SW6010D	10 Oct 24 16:57	RMV
Barium	0.038	mg/L	0.005	SW6010D	10 Oct 24 16:57	RMV
Cobalt	< 0.005	mg/L	0.005	SW6010D	10 Oct 24 16:57	RMV
Boron	0.115	mg/L	0.100	SW6010D	10 Oct 24 16:57	RMV
Antimony	< 0.5	ug/L	0.5	SW6020B	4 Oct 24 16:01	SS
Arsenic	< 0.5	ug/L	0.5	SW6020B	7 Oct 24 10:06	SS
Beryllium	< 0.05	ug/L	0.05	SW6020B	7 Oct 24 12:58	SS
Cadmium	< 0.1	ug/L	0.1	SW6020B	4 Oct 24 16:01	SS
Chromium	< 0.5	ug/L	0.5	SW6020B	7 Oct 24 10:06	SS
Lead	< 0.5	ug/L	0.5	SW6020B	7 Oct 24 10:06	SS
Molybdenum	1.74	ug/L	0.50	SW6020B	4 Oct 24 16:01	SS
Selenium	2.56	ug/L	0.50	SW6020B	7 Oct 24 14:30	SS
Thallium	< 0.1	ug/L	0.1	SW6020B	7 Oct 24 10:06	SS
Fluoride	0.180	mg/L	0.020	EPA 300.0	5 Oct 24 15:09	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

Project Name: HOOT LAKE PLANT CCR

Sample Description: S51

Report Date: 17 Dec 2024
Lab Number: 24-A2536
Work Order #: 31-0136
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 1 Oct 2024 11:55
Sampled By: MVTL FIELD PERSONNEL
Date Received: 1 Oct 2024 18:30
PO #: 59640

Temp at Receipt: 0.5C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					3 Oct 24	NS
Water Digestions					9 Oct 24	NS
pH, Field	6.42	units	1.00	SM4500-H+-2011	1 Oct 24 11:55	BMW
pH	* 7.4	units	1.0	SM 4500 H+ B-2000	2 Oct 24 12:30	CC
Radium 226	0.06	pCi/L	0.60		4 Dec 24 10:23	OL
Radium 228	1.08	pCi/L	3.00	EPA M9320	4 Dec 24 17:25	OL
Sulfate	52.1	mg/L	5.0	ASTM D516-11	7 Oct 24 8:09	AKF
Chloride	8.1	mg/L	3.0	SM 4500 Cl E	8 Oct 24 13:58	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	4 Oct 24 14:40	RMB
Solids, Total Dissolved	456	mg/L	10	SM 2540 C-97	3 Oct 24 9:40	CC
	See Narrative					
Calcium	81.30	mg/L	0.500	SW6010D	10 Oct 24 16:57	RMV
Lithium	< 0.02	mg/L	0.02	SW6010D	10 Oct 24 16:57	RMV
Barium	0.060	mg/L	0.005	SW6010D	10 Oct 24 16:57	RMV
Cobalt	< 0.005	mg/L	0.005	SW6010D	10 Oct 24 16:57	RMV
Boron	0.212	mg/L	0.100	SW6010D	10 Oct 24 16:57	RMV
Antimony	< 0.5	ug/L	0.5	SW6020B	4 Oct 24 16:01	SS
Arsenic	0.59	ug/L	0.50	SW6020B	7 Oct 24 10:06	SS
Beryllium	< 0.05	ug/L	0.05	SW6020B	7 Oct 24 12:58	SS
Cadmium	< 0.1	ug/L	0.1	SW6020B	4 Oct 24 16:01	SS
Chromium	< 0.5	ug/L	0.5	SW6020B	7 Oct 24 10:06	SS
Lead	< 0.5	ug/L	0.5	SW6020B	7 Oct 24 10:06	SS
Molybdenum	1.91	ug/L	0.50	SW6020B	4 Oct 24 16:01	SS
Selenium	< 0.5	ug/L	0.5	SW6020B	7 Oct 24 14:30	SS
Thallium	< 0.1	ug/L	0.1	SW6020B	7 Oct 24 10:06	SS
Fluoride	0.240	mg/L	0.020	EPA 300.0	5 Oct 24 15:09	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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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: S52

Report Date: 17 Dec 2024
Lab Number: 24-A2537
Work Order #: 31-0136
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 1 Oct 2024 12:38
Sampled By: MVTL FIELD PERSONNEL
Date Received: 1 Oct 2024 18:30
PO #: 59640

Temp at Receipt: 0.5C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					3 Oct 24	NS
Water Digestions					9 Oct 24	NS
pH, Field	6.08	units	1.00	SM4500-H+-2011	1 Oct 24 12:38	BMW
pH	* 7.3	units	1.0	SM 4500 H+ B-2000	2 Oct 24 12:30	CC
Radium 226	0.08	pCi/L	0.60		4 Dec 24 10:23	OL
Radium 228	1.06	pCi/L	3.00	EPA M9320	4 Dec 24 17:25	OL
Sulfate	59.5	mg/L	5.0	ASTM D516-11	7 Oct 24 8:09	AKF
Chloride	14.5	mg/L	3.0	SM 4500 Cl E	8 Oct 24 13:58	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	4 Oct 24 14:40	RMB
Solids, Total Dissolved	459	mg/L	10	SM 2540 C-97	3 Oct 24 9:40	CC
	See Narrative					
Calcium	99.40	mg/L	0.500	SW6010D	10 Oct 24 16:57	RMV
Lithium	< 0.02	mg/L	0.02	SW6010D	10 Oct 24 16:57	RMV
Barium	0.107	mg/L	0.005	SW6010D	10 Oct 24 16:57	RMV
Cobalt	< 0.005	mg/L	0.005	SW6010D	10 Oct 24 16:57	RMV
Boron	< 0.1	mg/L	0.1	SW6010D	10 Oct 24 16:57	RMV
Antimony	< 0.5	ug/L	0.5	SW6020B	4 Oct 24 16:01	SS
Arsenic	1.77	ug/L	0.50	SW6020B	7 Oct 24 10:06	SS
Beryllium	< 0.05	ug/L	0.05	SW6020B	7 Oct 24 12:58	SS
Cadmium	< 0.1	ug/L	0.1	SW6020B	4 Oct 24 16:01	SS
Chromium	< 0.5	ug/L	0.5	SW6020B	7 Oct 24 10:06	SS
Lead	< 0.5	ug/L	0.5	SW6020B	7 Oct 24 10:06	SS
Molybdenum	1.76	ug/L	0.50	SW6020B	4 Oct 24 16:01	SS
Selenium	< 0.5	ug/L	0.5	SW6020B	7 Oct 24 14:30	SS
Thallium	< 0.1	ug/L	0.1	SW6020B	7 Oct 24 10:06	SS
Fluoride	0.190 @	mg/L	0.020	EPA 300.0	5 Oct 24 15:09	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
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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: S10R

Report Date: 17 Dec 2024
Lab Number: 24-A2538
Work Order #: 31-0136
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 1 Oct 2024 13:27
Sampled By: MVTL FIELD PERSONNEL
Date Received: 1 Oct 2024 18:30
PO #: 59640

Temp at Receipt: 0.5C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					14 Oct 24	NS
Water Digestions					9 Oct 24	NS
pH, Field	7.30	units	1.00	SM4500-H+-2011	1 Oct 24 13:22	NM
pH	* 7.2	units	1.0	SM 4500 H+ B-2000	2 Oct 24 12:30	CC
Radium 226	0.76	pCi/L	0.60		4 Dec 24 10:23	OL
Radium 228	2.90	pCi/L	3.00	EPA M9320	4 Dec 24 17:25	OL
Sulfate	66.7 @	mg/L	5.0	ASTM D516-11	7 Oct 24 8:09	AKF
Chloride	10.1	mg/L	3.0	SM 4500 Cl E	8 Oct 24 13:58	KRM
Mercury	0.011	ug/L	0.005	EPA 245.7	4 Oct 24 14:40	RMB
Solids, Total Dissolved	506	mg/L	10	SM 2540 C-97	3 Oct 24 9:40	CC
	See Narrative					
Calcium	148.0	mg/L	0.500	SW6010D	10 Oct 24 18:01	RMV
Lithium	0.025	mg/L	0.020	SW6010D	10 Oct 24 18:01	RMV
Barium	0.191	mg/L	0.005	SW6010D	10 Oct 24 18:01	RMV
Cobalt	0.007	mg/L	0.005	SW6010D	10 Oct 24 18:01	RMV
Boron	< 0.1	mg/L	0.1	SW6010D	10 Oct 24 18:01	RMV
Antimony	< 0.5	ug/L	0.5	SW6020B	15 Oct 24 13:38	SS
Arsenic	20.8	ug/L	0.50	SW6020B	15 Oct 24 15:31	SS
Beryllium	0.15	ug/L	0.05	SW6020B	16 Oct 24 9:03	SS
Cadmium	0.12	ug/L	0.10	SW6020B	15 Oct 24 13:38	SS
Chromium	11.5	ug/L	0.50	SW6020B	15 Oct 24 15:31	SS
Lead	4.46	ug/L	0.50	SW6020B	15 Oct 24 15:31	SS
Molybdenum	1.18	ug/L	0.50	SW6020B	15 Oct 24 13:38	SS
Selenium	1.55	ug/L	0.50	SW6020B	15 Oct 24 15:31	SS
Thallium	< 0.1	ug/L	0.1	SW6020B	15 Oct 24 15:31	SS
Fluoride	0.160 @	mg/L	0.020	EPA 300.0	5 Oct 24 15:09	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: S13

Report Date: 17 Dec 2024
Lab Number: 24-A2539
Work Order #: 31-0136
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 1 Oct 2024 11:47
Sampled By: MVTL FIELD PERSONNEL
Date Received: 1 Oct 2024 18:30
PO #: 59640

Temp at Receipt: 0.5C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					3 Oct 24	NS
Water Digestions					9 Oct 24	NS
pH, Field	7.26	units	1.00	SM4500-H+-2011	1 Oct 24 11:47	NM
pH	* 7.4	units	1.0	SM 4500 H+ B-2000	2 Oct 24 12:50	CC
Radium 226	0.20	pCi/L	0.60		4 Dec 24 10:23	OL
Radium 228	1.14	pCi/L	3.00	EPA M9320	4 Dec 24 17:25	OL
Sulfate	91.9 @	mg/L	5.0	ASTM D516-11	7 Oct 24 8:09	AKF
Chloride	7.4	mg/L	3.0	SM 4500 Cl E	8 Oct 24 13:58	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	4 Oct 24 14:40	RMB
Solids, Total Dissolved	583	mg/L	10	SM 2540 C-97	3 Oct 24 10:15	CC
	See Narrative					
Calcium	123.0	mg/L	0.500	SW6010D	10 Oct 24 16:57	RMV
Lithium	0.026	mg/L	0.020	SW6010D	10 Oct 24 16:57	RMV
Barium	0.083	mg/L	0.005	SW6010D	10 Oct 24 16:57	RMV
Cobalt	< 0.005	mg/L	0.005	SW6010D	10 Oct 24 16:57	RMV
Boron	0.110	mg/L	0.100	SW6010D	10 Oct 24 16:57	RMV
Antimony	< 0.5	ug/L	0.5	SW6020B	4 Oct 24 16:01	SS
Arsenic	< 0.5	ug/L	0.5	SW6020B	7 Oct 24 10:06	SS
Beryllium	< 0.05	ug/L	0.05	SW6020B	7 Oct 24 12:58	SS
Cadmium	< 0.1	ug/L	0.1	SW6020B	4 Oct 24 16:01	SS
Chromium	< 0.5	ug/L	0.5	SW6020B	7 Oct 24 10:06	SS
Lead	< 0.5	ug/L	0.5	SW6020B	7 Oct 24 10:06	SS
Molybdenum	1.20	ug/L	0.50	SW6020B	4 Oct 24 16:01	SS
Selenium	0.95	ug/L	0.50	SW6020B	7 Oct 24 14:30	SS
Thallium	< 0.1	ug/L	0.1	SW6020B	7 Oct 24 10:06	SS
Fluoride	0.210	mg/L	0.020	EPA 300.0	5 Oct 24 15:09	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

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: 17 Dec 2024

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

Work Order #: 202431-0136
Account Number: 006106
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

LABORATORY NARRATIVE

INORGANIC AND METALS ANALYSES:
The Total Dissolved Solids analysis batch associated with samples 24-A2535 through 24-A2540 did not contain a sufficient ammount of blanks to meet QC requirements. Data was reported based on acceptable results for the blank that was analyzed as part of the batch and acceptability of all other batch QC.

No other problems were encountered with these analyses.

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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: FIELD BLANK

Report Date: 17 Dec 2024
Lab Number: 24-A2540
Work Order #: 31-0136
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 1 Oct 2024 11:00
Sampled By: MVTL FIELD PERSONNEL
Date Received: 1 Oct 2024 18:30
PO #: 59640

Temp at Receipt: 0.5C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					3 Oct 24	NS
Water Digestions					9 Oct 24	NS
pH	* 8.1	units	1.0	SM 4500 H+ B-2000	2 Oct 24 12:50	CC
Radium 226	0.09	pCi/L	0.60		4 Dec 24 10:23	OL
Radium 228	0.58	pCi/L	3.00	EPA M9320	4 Dec 24 17:25	OL
Sulfate	< 5	mg/L	5	ASTM D516-11	7 Oct 24 8:09	AKF
Chloride	< 3	mg/L	3	SM 4500 Cl E	8 Oct 24 13:58	KRM
Mercury	< 0.005	ug/L	0.005	EPA 245.7	4 Oct 24 14:40	RMB
Solids, Total Dissolved	< 10	mg/L	10	SM 2540 C-97	3 Oct 24 10:15	CC
	See Narrative					
Calcium	< 0.5	mg/L	0.5	SW6010D	10 Oct 24 16:57	RMV
Lithium	< 0.02	mg/L	0.02	SW6010D	10 Oct 24 16:57	RMV
Barium	< 0.005	mg/L	0.005	SW6010D	10 Oct 24 16:57	RMV
Cobalt	< 0.005	mg/L	0.005	SW6010D	10 Oct 24 16:57	RMV
Boron	< 0.1	mg/L	0.1	SW6010D	10 Oct 24 16:57	RMV
Antimony	< 0.5	ug/L	0.5	SW6020B	4 Oct 24 16:01	SS
Arsenic	< 0.5	ug/L	0.5	SW6020B	7 Oct 24 10:06	SS
Beryllium	< 0.05	ug/L	0.05	SW6020B	7 Oct 24 12:58	SS
Cadmium	< 0.1	ug/L	0.1	SW6020B	4 Oct 24 16:01	SS
Chromium	< 0.5	ug/L	0.5	SW6020B	7 Oct 24 10:06	SS
Lead	< 0.5	ug/L	0.5	SW6020B	7 Oct 24 10:06	SS
Molybdenum	< 0.5	ug/L	0.5	SW6020B	4 Oct 24 16:01	SS
Selenium	< 0.5	ug/L	0.5	SW6020B	7 Oct 24 14:30	SS
Thallium	< 0.1	ug/L	0.1	SW6020B	7 Oct 24 10:06	SS
Fluoride	< 0.02	mg/L	0.02	EPA 300.0	5 Oct 24 15:09	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.

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The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = 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: 17 Dec 2024
Lab Number: 24-A2541
Work Order #: 31-0136
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 1 Oct 2024
Sampled By: MVTL FIELD PERSONNEL
Date Received: 1 Oct 2024 18:30
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S2A

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Misc Comment	INSUFFICIENT VOLUME-NO SAMPLE					
Well Depth, Field	79.62	feet	NA	Field	1 Oct 24	BMW
Water Level Before Purge	78.00	feet	NA	NA	1 Oct 24	BMW
Static Elevation, Field	1195.78	ft	NA	Field	1 Oct 24	BMW

No collection time supplied by the client.

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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www.mvtl.com

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

Report Date: 17 Dec 2024
Lab Number: 24-A2542
Work Order #: 31-0136
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 1 Oct 2024
Sampled By: MVTL FIELD PERSONNEL
Date Received: 1 Oct 2024 18:30
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

Sample Description: S14R

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Misc Comment	UNABLE TO PURGE-NO SAMPLE					
Well Depth, Field	87.11	feet	NA	Field	1 Oct 24	NM
Water Level Before Purge	79.07	feet	NA	NA	1 Oct 24	NM
Static Elevation, Field	1201.54	ft	NA	Field	1 Oct 24	NM

No collection time supplied by the client.

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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Quality Control Report

Lab IDs: 24-A2535 to 24-A2540 **Project:** HOOT LAKE PLANT CCR **Work Order:** 202431-0136

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	104 108	85-115 85-115	25.0 25.0	24A2535q 24A2538q	< 0.5 < 0.5	26.6 27.5	106 110	75-125 75-125	26.6 27.5	27.4 29.0	110 116	3.0 5.3	10 10	100 104	90-110 90-110	< 0.5 < 0.5
Arsenic ug/L	25.0 25.0	105 104	85-115 85-115	25.0 25.0	24A2535qc 24A2538q	< 0.5 20.8	27.2 48.1	109 109	75-125 75-125	27.2 48.1	27.7 47.6	111 107	1.8 1.0	10 10	100 100	90-110 90-110	< 0.5 < 0.5
Barium mg/L	1.000 1.000	103 107	85-115 85-115	1.00 1.00	a2536qc a2543qc	0.060 < 0.005	1.050 1.060	99 106	75-125 75-125	1.050 1.060	1.110 1.060	105 106	5.6 0.0	10 10	102 103	90-110 90-110	< 0.005 < 0.005
Beryllium ug/L	2.50 2.50	98 100	85-115 85-115	2.50 2.50	24A2535q 24A2538q	< 0.05 0.15	2.34 2.38	94 89	75-125 75-125	2.34 2.38	2.37 2.34	95 88	1.3 1.7	10 10	105 98	90-110 90-110	< 0.05 < 0.05
Boron mg/L	1.000 1.000	95 96	85-115 85-115	1.00 1.00	a2536qc a2543qc	0.212 < 0.1	1.260 0.956	105 96	75-125 75-125	1.260 0.956	1.230 0.952	102 95	2.4 0.4	10 10	92 92	90-110 90-110	< 0.1 < 0.1
Cadmium ug/L	5.00 5.00	104 109	85-115 85-115	5.00 5.00	24A2535q 24A2538q	< 0.1 0.12	5.16 5.62	103 110	75-125 75-125	5.16 5.62	5.30 5.93	106 116	2.7 5.4	10 10	100 95	90-110 90-110	< 0.1 < 0.1
Calcium mg/L	50.00 50.00	98 101	85-115 85-115	50.0 50.0	a2536qc a2543qc	81.30 < 0.5	126.0 50.00	89 100	75-125 75-125	126.0 50.00	133.0 49.60	103 99	5.4 0.8	10 10	101 101	90-110 90-110	< 0.5 < 0.5
Chloride mg/L	-	-	-	60.0	24-A2543	< 3	60.6	101	80-120	60.6	59.6	99	1.7	20	93	90-110	< 3
Chromium ug/L	25.0 25.0	102 103	85-115 85-115	25.0 25.0	24A2535q 24A2538q	< 0.5 11.5	24.0 37.7	96 105	75-125 75-125	24.0 37.7	24.9 36.9	100 102	3.7 2.1	10 10	100 101	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	a2536qc a2543qc	< 0.005 < 0.005	0.994 0.964	99 96	75-125 75-125	0.994 0.964	0.974 0.962	97 96	2.0 0.2	10 10	98 98	90-110 90-110	< 0.005 < 0.005
Fluoride mg/L	-	-	-	0.20	24-A2540	< 0.02	0.190	95	80-120	0.190	0.200	100	5.1	10	98	90-110	< 0.02
Lead ug/L	25.0 25.0	102 100	85-115 85-115	25.0 25.0	24A2535q 24A2538q	< 0.5 4.46	26.1 29.4	104 100	75-125 75-125	26.1 29.4	26.2 30.0	105 102	0.4 2.0	10 10	101 101	90-110 90-110	< 0.5 < 0.5
Lithium mg/L	1.000 1.000	99 101	85-115 85-115	1.00 1.00	24-A2536 24-A2543	< 0.02 < 0.02	0.978 1.000	98 100	75-125 75-125	0.978 1.000	1.010 1.010	101 101	3.2 1.0	10 10	96 96	90-110 90-110	< 0.02 < 0.02
Mercury ug/L	-	-	-	0.10	24-A2539	< 0.005	0.085	85	63-111	0.085	0.087	87	2.3	18	97	76-113	< 0.005

MVTL

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Quality Control Report

Lab IDs: 24-A2535 to 24-A2540 **Project:** HOOT LAKE PLANT CCR **Work Order:** 202431-0136

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	98 91	85-115 85-115	25.0 25.0	24A2535q 24A2538q	1.74 1.18	27.0 25.3	101 96	75-125 75-125	27.0 25.3	27.5 26.4	103 101	1.8 4.3	10 10	98 96	90-110 90-110	< 0.5 < 0.5
pH units	- -	- -	- -	- -	- -	- -	- -	- -	- -	7.2 7.4	7.2 7.4	- -	0.0 0.0	2.5 2.5	101 101	90-110 90-110	- -
Selenium ug/L	25.0 25.0	112 109	85-115 85-115	25.0 25.0	24-A2535 24A2538q	2.56 1.55	31.8 29.9	117 113	75-125 75-125	31.8 29.9	31.3 28.6	115 108	1.6 4.4	10 10	103 104	90-110 90-110	< 0.5 < 0.5
Solids, Total Dissolved mg/L	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	420 470 583	414 430 613	- - -	1.4 8.9 5.0	10 10 10	98 100 -	85-115 85-115 -	< 10 - -
Sulfate mg/L	-	-	-	50.0	24-A2543	< 5	45.4	91	80-120	45.4	47.5	95	4.5	20	95	85-115	< 5
Thallium ug/L	5.00 5.00	102 98	85-115 85-115	5.00 5.00	24A2535q 24A2538q	< 0.1 < 0.1	5.24 5.10	105 102	75-125 75-125	5.24 5.10	5.34 5.24	107 105	1.9 2.7	10 10	101 100	90-110 90-110	< 0.1 < 0.1

Approved by: 

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

December 13, 2024

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

RE: Project: Ottertail Power 31-0136
Pace Project No.: 10710364

Dear Todd Rieger:

Enclosed are the analytical results for sample(s) received by the laboratory on October 03, 2024. 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)607-6456
Project Manager

Enclosures

cc: Barb Zins, MVTL

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

SAMPLE SUMMARY

Project: Ottertail Power 31-0136
Pace Project No.: 10710364

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10710364001	24A2535 - S3AR	Water	10/01/24 14:36	10/03/24 10:31
10710364002	24A2536 - S51	Water	10/01/24 11:55	10/03/24 10:31
10710364003	24A2537 - S52	Water	10/01/24 12:38	10/03/24 10:31
10710364004	24A2538 - S10R	Water	10/01/24 13:27	10/03/24 10:31
10710364005	24A2539 - S13	Water	10/01/24 11:47	10/03/24 10:31
10710364006	24A2540 - Field Blank	Water	10/01/24 11:00	10/03/24 10:31

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www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Doc

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

WO# : 10710364

10710364

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 and bzins@mvtl.com	Company Name: MVTL
NEW ULM, MN 56073	alieder@mvtl.com	Address: 1126 NORTH FRONT BLDG 2
Email To: alieder@mvtl.com	Purchase Order No.: CR13299	Pace Quote Reference:
Phone: 507-354-8517 Fax:	Project Name: Ottertail Power	Pace Project Manager:
Requested Due Date/TAT: standard	Project Number: Work Order: 31-0136	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☑ OTHER WW

Site Location STATE: MN

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	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	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 Y/N	2,3,7,8 TCDD method161	Radium 226/228	PFAs State Pricing	Dioxins/Furans	VOC's by 8260	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	24A2535 - S3AR		WT				10/01/24	14:36		1												X				N	001
2	24A2536 - S51		WT				10/01/24	11:55		1												X				N	002
3	24A2537 - S52		WT				10/01/24	12:38		1												X				N	003
4	24A2538 - S10R		WT				10/01/24	13:27		1												X				N	004
5	24A2539 - S13		WT				10/01/24	11:47		1												X				N	005
6	24A2540 - Field Blank		WT				10/01/24	11:00		1												X				N	006
7																												
8																												
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)
							2.4	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.

ENV-FRM-MIN4-0150 v17_Sample Condition Upon Receipt

Date Received:

CLIENT NAME: MVTL PROJECT #: **WO#: 10710364**

PM: PG Due Date: 11/01/24

CLIENT: MVTL

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

TRACKING NUMBER: _____ ☐ See Exceptions form 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 Bags ☑ Bubble Wrap ☐ None ☐ Other Temp Blank: ☑ YES ☐ NO Type of Ice: ☐ Blue ☐ Dry ☑ Wet ☐ Melted ☐ None

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

Did Samples Originate in West Virginia: ☐ YES ☑ NO	Were All Container Temps taken: ☐ YES ☐ NO ☑ N/A
Correction Factor: -0.3 Cooler Temp Read w/Temp Blank: 2.7 °C Cooler Temp Corrected w/Temp Blank: 2.4 °C	Average Corrected Temp (no Temp Blank Only): _____ °C
NOTE: Temp should be above freezing to 6°C.	☐ See Exceptions Form ENV-FRM-MIN4-0142 ☐ 1 Container
USDA Regulated Soil: ☑ N/A – Water Sample/Other (describe): _____	Initials & Date of Person Examining Contents: CRV 10/3/24
Did Samples originate from one of the following states (check maps) – AL, AR, AZ, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA: ☐ YES ☐ NO	Did samples originate from a foreign source (international, including Hawaii and Puerto Rico): ☐ YES ☐ NO
NOTE: 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	YES	NO	N/A	COMMENT(S)
Chain of Custody Present and Filled Out?	☑	☐		1.
Chain of Custody Relinquished?	☑	☐		2.
Sampler Name and/or Signature on COC?	☐	☑	☐	3.
Samples Arrived within Hold Time?	☑	☐		4. If Fecal: ☐ <8 hrs ☐ >8 hr, <24 hr ☐ No
Short Hold Time Analysis (<72 hr)?	☐	☑		5. ☐ BOD / cBOD ☐ Fecal coliform ☐ Hex Chrom ☐ HPC ☐ Nitrate ☐ Nitrite ☐ Ortho Phos ☐ Total coliform/*E. coli* ☐ Other: _____
Rush Turn Around Time Requested?	☐	☑		6.
Sufficient Sample Volume?	☑	☐		7. received 2 BPIN per
Correct Containers Used?	☑	☐	☐	8. samples
-- Pace Containers Used?	☐	☑		
Containers Intact?	☑	☐		9.
Field Filtered Volume Received for Dissolved Tests?	☐	☐	☑	10. Is sediment visible in the dissolved container: ☐ YES ☐ NO
Is sufficient information available to reconcile the samples to the COC? **NOTE:** If ID/Date/Time don't match fill out section 11. Matrix: ☐ Oil ☐ Soil ☑ Water ☐ Other	☑	☐		11. **If NO, write ID/Date/Time of container below:** ☐ See Exceptions form ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☑	☐	☐	12. Sample #: 001 - 006
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, < 2 pH, NaOH > 9 Sulfide, NaOH > 10 Cyanide)	☑	☐	☐	2 2 ☑ HNO_3 ☐ H_2SO_4 ☐ NaOH ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC, Oil & Grease, DRO/8015 (water) and Dioxins/PFAS	☐	☐	☑	Positive for Residual Chlorine: ☐ YES ☐ NO
NOTE: If adding preservation to the container, **verify with the PM first.** Clients may require adding preservative to the field and equipment blanks when this occurs.				pH Paper Lot # (Residual Chlorine / 0-6 Roll / 0-6 Strip / 0-14 Strip): 205224 ☐ See Exceptions form ENV-FRM-MIN4-0142
Headspace in Methyl Mercury Container?	☐	☐	☑	13.
Extra labels present on soil VOA or WIDRO containers?	☐	☐	☑	14.
Headspace in VOA Vials (greater than 6mm)?	☐	☐	☑	☐ See Exceptions form ENV-FRM-MIN4-0140
Trip Blanks Present?	☐	☐	☑	15.
Trip Blank Custody Seals Present?	☐	☐	☐	Pace Trip Blank Lot # (if purchased): _____

CLIENT NOTIFICATION / RESOLUTION **FIELD DATA REQUIRED:** ☐ YES ☐ NO

Person Contacted: _____ Date & Time: _____

Comments / Resolution: _____

Project Manager Review: Ryan J Gibbs Date: 10/4/24

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

Labeled By: Cr1 Line: 3

Minnesota Valley Testing
Laboratories, Inc.
1126 North Front Street
New Ulm, MN 56073
507-233-7131
Fax 507-359-1231

P.O. Number: CL13299

To:	Ship To (if different address):
Pace Analytical 1700 Elm Street SE Suite# 200 Minneapolis, MN 55414	

P.O. Date	Placed By	Date Expected	Ship Via	F.O.B.	Terms
2-Oct-24	Todd Rieger	N/A	N/A	N/A	Net 30

QTY.	Description	Unit Price	Total
			$ -
	Lab ID# 24A2535-40		$
	WO# 31-0136		$ -
			$ -
6	Radium 226/228	$ [redacted]	$ [redacted]
			$ -
6	Disposal Fee	$ [redacted]	$ [redacted]
1	Environmental Impact	$ [redacted]	$ [redacted]
			$ -
			$ -
			$ -
			$ -
			$ -
			$ -
	email results to trieger@mvtl.com		$ -
			$ -
			$ -
		Shipping & handling	
		Subtotal	$ [redacted]
		Sales Tax	
		Total Due	$ [redacted]

Authorized Signature

Internal Transfer Chain of Custody

Pace

☐ Rush Multiplier_____X
☐ Samples Pre-Logged into eCOC

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

Workorder: 10710364 **Workorder Name:** Ottertail Power 31-0136
Owner Received Date: 10/3/2024 **Results Requested By:** 11/1/2024

Report To	Subcontract To
Piper Gibbs Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone (612)607-6456	Pace National 12065 Lebanon Rd Mt. Juliet, TN 37122 Phone (615) 758-5858

Requested Analysis

L1803954
K001

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: HNO3						Radium 226/228												LAB USE ONLY
1	24A2535 - S3AR	PS	10/1/2024 14:36	10710364001	Water	2						X												-01
2	24A2536 - S51	PS	10/1/2024 11:55	10710364002	Water	2						X												-02
3	24A2537 - S52	PS	10/1/2024 12:38	10710364003	Water	2						X												-03
4	24A2538 - S10R	PS	10/1/2024 13:27	10710364004	Water	2						X												-04
5	24A2539 - S13	PS	10/1/2024 11:47	10710364005	Water	2						X												-05
6	24A2540 - Field Blank	PS	10/1/2024 11:00	10710364006	Water	2						X												-06

Transfers	Released By	Date/Time	Received By	Date/Time
1	[signature] 11/25/24	15:00		
2			[signature]	11/26/24 0900
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.

4243 5576 4481 12.3+0=12.3 CG A9

Sample Receipt Checklist
eal Present/Intact: ✓Y _N
igned/Accurate: ✓Y _N
es arrive intact: ✓Y _N
ct bottles used: ✓Y _N
cient volume sent: ✓Y _N
rren <0.5 mR/hr: ✓Y _N
If Applicable
VOA Zero Headspace: _Y _N
Pres. Correct/Check: ✓Y _N

4803954

Pace

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

INTER_LABORATORY WORK ORDER # 10710364
(To be completed by sending lab)

Sending Project No:	10710364
Receiving Project No:	
Check Box for Consolidated Invoice:	☐
Date Prepared:	10/04/24
REQUESTED COMPLETION DATE:	**11/1/2024**

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),FR Only no EDD (0)

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

December 09, 2024

Tc
Ss
Cn
Sr
Qc
Gl
Al
Sc

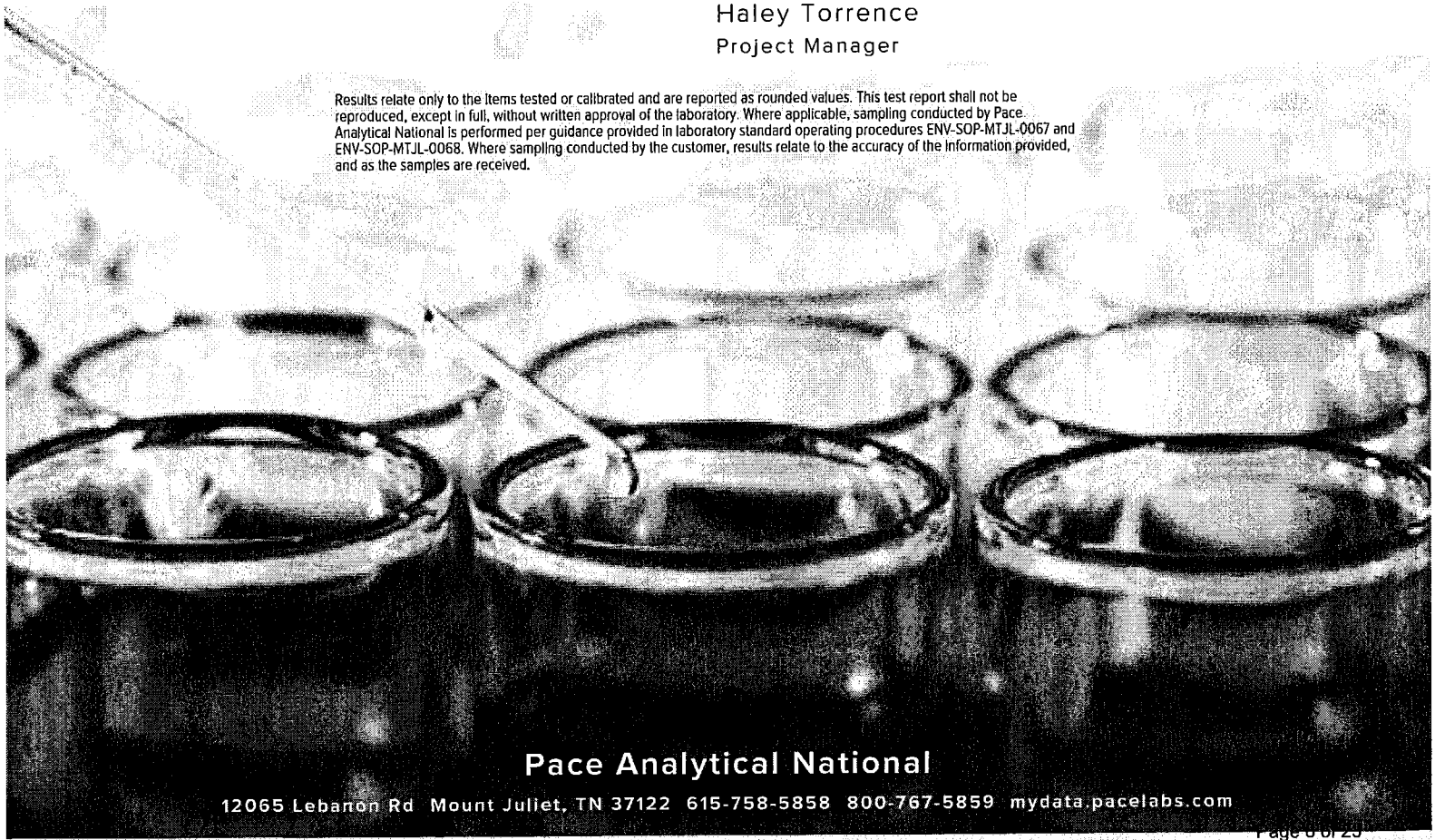
Pace Analytical - Minnesota

Sample Delivery Group:	L1803954
Samples Received:	11/26/2024
Project Number:	10710364
Description:	Ottertail Power 31-0136
Site:	001
Report To:	Piper Gibbs

Entire Report Reviewed By: Haley Torrence

Haley Torrence
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

TABLE OF CONTENTS

SAMPLE SUMMARY

24A2535-S3AR L1803954-01 Non-Potable Water

Collected by | Collected date/time 10/01/24 14:36 | Received date/time 11/26/24 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2408794	1	11/27/24 12:50	12/04/24 17:25	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2409673	1	12/02/24 11:58	12/04/24 10:23	ZRG	Mt. Juliet, TN

24A2536-S51 L1803954-02 Non-Potable Water

Collected by | Collected date/time 10/01/24 11:55 | Received date/time 11/26/24 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2408794	1	11/27/24 12:50	12/04/24 17:25	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2409673	1	12/02/24 11:58	12/04/24 10:23	ZRG	Mt. Juliet, TN

24A2537-S52 L1803954-03 Non-Potable Water

Collected by | Collected date/time 10/01/24 12:38 | Received date/time 11/26/24 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2408794	1	11/27/24 12:50	12/04/24 17:25	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2409673	1	12/02/24 11:58	12/04/24 10:23	ZRG	Mt. Juliet, TN

24A2538-S10R L1803954-04 Non-Potable Water

Collected by | Collected date/time 10/01/24 13:27 | Received date/time 11/26/24 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2408794	1	11/27/24 12:50	12/04/24 17:25	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2409673	1	12/02/24 11:58	12/04/24 10:23	ZRG	Mt. Juliet, TN

24A2539-S13 L1803954-05 Non-Potable Water

Collected by | Collected date/time 10/01/24 11:47 | Received date/time 11/26/24 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2408794	1	11/27/24 12:50	12/04/24 17:25	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2409673	1	12/02/24 11:58	12/04/24 10:23	ZRG	Mt. Juliet, TN

24A2540-FIELD BLANK L1803954-06 Non-Potable Water

Collected by | Collected date/time 10/01/24 11:00 | Received date/time 11/26/24 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2408794	1	11/27/24 12:50	12/04/24 17:25	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2409673	1	12/02/24 11:58	12/04/24 10:23	ZRG	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.

Haley Torrence

Haley Torrence
Project Manager

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+/-	+/-	pCi/l	pCi/l	date / time	
RADIUM-228	0.374	J	0.238	0.436	0.441	0.231	12/04/2024 17:25	WG2408794
(T) Barium	*101*					*30.0-143*	*12/04/2024 17:25*	WG2408794
(T) Yttrium	*113*					*30.0-136*	*12/04/2024 17:25*	WG2408794

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+/-	+/-	pCi/l	pCi/l	date / time	
RADIUM-226	0.0234	U	0.178	0.224	0.335	0.227	12/04/2024 10:23	WG2409673
(T) Barium-133	*101*					*30.0-143*	*12/04/2024 10:23*	WG2409673

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+/-	+/-	pCi/l	pCi/l	date / time	
RADIUM-228	1.08		0.337	0.568	0.609	0.318	12/04/2024 17:25	WG2408794
(T) Barium	*109*					*30.0-143*	*12/04/2024 17:25*	WG2408794
(T) Yttrium	*76.5*					*30.0-136*	*12/04/2024 17:25*	WG2408794

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+/-	+/-	pCi/l	pCi/l	date / time	
RADIUM-226	0.0627	U	0.257	0.400	0.441	0.288	12/04/2024 10:23	WG2409673
(T) Barium-133	*94.4*					*30.0-143*	*12/04/2024 10:23*	WG2409673

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	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+/-	+/-	pCi/l	pCi/l	date / time	
RADIUM-228	1.06		0.380	0.627	0.692	0.361	12/04/2024 17:25	WG2408794
(T) Barium	*80.1*					*30.0-143*	*12/04/2024 17:25*	WG2408794
(T) Yttrium	*80.7*					*30.0-136*	*12/04/2024 17:25*	WG2408794

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+/-	+/-	pCi/l	pCi/l	date / time	
RADIUM-226	0.0841	U	0.233	0.331	0.388	0.258	12/04/2024 10:23	WG2409673
(T) Barium-133	*106*					*30.0-143*	*12/04/2024 10:23*	WG2409673

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	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+/-	+/-	pCi/l	pCi/l	date / time	
RADIUM-228	2.90		0.450	0.754	0.772	0.403	12/04/2024 17:25	WG2408794
(T) Barium	*97.5*					*30.0-143*	*12/04/2024 17:25*	WG2408794
(T) Yttrium	*85.7*					*30.0-136*	*12/04/2024 17:25*	WG2408794

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+/-	+/-	pCi/l	pCi/l	date / time	
RADIUM-226	0.760		0.370	0.706	0.310	0.215	12/04/2024 10:23	WG2409673
(T) Barium-133	*110*					*30.0-143*	*12/04/2024 10:23*	WG2409673

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+/-	+/-	pCi/l	pCi/l	date / time	
RADIUM-228	1.14		0.353	0.577	0.637	0.332	12/04/2024 17:25	WG2408794
(T) Barium	*89.2*					*30.0-143*	*12/04/2024 17:25*	WG2408794
(T) Yttrium	*87.3*					*30.0-136*	*12/04/2024 17:25*	WG2408794

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+/-	+/-	pCi/l	pCi/l	date / time	
RADIUM-226	0.197	J	0.256	0.400	0.364	0.242	12/04/2024 10:23	WG2409673
(T) Barium-133	*98.5*					*30.0-143*	*12/04/2024 10:23*	WG2409673

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	0.585		0.285	0.489	0.525	0.274	12/04/2024 17:25	WG2408794
(T) Barium	*103*					*30.0-143*	*12/04/2024 17:25*	WG2408794
(T) Yttrium	*94.6*					*30.0-136*	*12/04/2024 17:25*	WG2408794

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	0.0912	U	0.196	0.305	0.325	0.225	12/04/2024 10:23	WG2409673
(T) Barium-133	*104*					*30.0-143*	*12/04/2024 10:23*	WG2409673

Method Blank (MB)

(MB) R4154375-1 12/04/24 14:19

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE +/- pCi/l	MB MDA pCi/l	MB Lc pCi/l
Radium-228	0.444		0.186	0.357	0.188
(T) Barium	*112*		*112*		
(T) Yttrium	*71.4*		*71.4*		

L1801640-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1801640-07 12/04/24 17:25 • (DUP) R4154375-5 12/04/24 14:19

Analyte	Original Result pCi/l	Original 2 sigma CE +/- pCi/l	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE +/- pCi/l	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	1.52	0.309	0.538	0.284	1.06	0.373	0.709	0.370	35.4	0.941		20	3
(T) Barium	*91.2*				*122*	*122*							
(T) Yttrium	*85.4*				*90.4*	*90.4*							

Laboratory Control Sample (LCS)

(LCS) R4154375-2 12/04/24 14:19

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.69	114	80.0-120	
(T) Barium			*112*		
(T) Yttrium			*94.0*		

L1801640-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1801640-05 12/05/24 17:45 • (MS) R4154375-3 12/04/24 14:19 • (MSD) R4154375-4 12/04/24 14:19

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	6.67	16.6	14.5	99.3	78.3	1	70.0-130			13.5		20
(T) Barium		*116*			*103*	*93.8*							
(T) Yttrium		*90.6*			*54.5*	*64.0*							

Method Blank (MB)

(MB) R4153543-1 12/04/24 10:23

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE +/-	MB MDA pCi/l	MB Lc pCi/l
Radium-226	0.0449	J	0.0578	0.0817	0.0534
(T) Barium-133	*103*		*103*		

L1803954-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1803954-06 12/04/24 10:23 • (DUP) R4153543-5 12/04/24 10:23

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	0.0912	0.196	0.325	0.225	0.0668	0.181	0.310	0.211	31.0	0.0917	U	20	3
(T) Barium-133	*104*				*95.7*	*95.7*							

Laboratory Control Sample (LCS)

(LCS) R4153543-2 12/04/24 10:23

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.00	4.82	96.3	80.0-120	
(T) Barium-133			*98.2*		

L1798042-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1798042-01 12/04/24 10:23 • (MS) R4153543-3 12/04/24 10:23 • (MSD) R4153543-4 12/04/24 10:23

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	0.0967	20.3	17.0	101	84.5	1	75.0-125			17.9		20
(T) Barium-133		*109*			*109*	*59.9*							

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
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.

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

Pace

☐ Rush Multiplier____X
☐ Samples Pre-Logged into eCOC

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

Workorder: 10710364 **Workorder Name:** Ottertail Power 31-0136 **Owner Received Date:** 10/3/2024 **Results Requested By:** 11/1/2024

Report To	Subcontract To
Piper Gibbs Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone (612)607-6456	Pace National 12065 Lebanon Rd Mt. Juliet, TN 37122 Phone (615) 758-5858

L1803954
K001

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: HNO3	Requested Analysis: Radium 226/228	LAB USE ONLY
1	24A2535 - S3AR	PS	10/1/2024 14:36	10710364001	Water	2	X	-01
2	24A2536 - S51	PS	10/1/2024 11:55	10710364002	Water	2	X	-02
3	24A2537 - S52	PS	10/1/2024 12:38	10710364003	Water	2	X	-03
4	24A2538 - S10R	PS	10/1/2024 13:27	10710364004	Water	2	X	-04
5	24A2539 - S13	PS	10/1/2024 11:47	10710364005	Water	2	X	-05
6	24A2540 - Field Blank	PS	10/1/2024 11:00	10710364006	Water	2	X	-06

Transfers	Released By	Date/Time	Received By	Date/Time
1	Cory/Pace	11/25/24 15:20	Hanley Robertson	11/26/24 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.

4243 5576 4481 12.3+0=12.3 CG A9

Sample Receipt Checklist
eal Present/Intact: Y N
igned/Accurate: Y N
es arrive intact: Y N
ct bottles used: Y N
cient volume sent: Y N
reen <0.5 mR/hr: Y N

If Applicable
VOA Zero Headspace: Y N
Pres. Correct/Check: Y N

L803954

INTER_LABORATORY WORK ORDER # 10710364
(To be completed by sending lab)

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

Sending Project No:	10710364
Receiving Project No:	
Check Box for Consolidated Invoice:	☐
Date Prepared:	10/04/24
REQUESTED COMPLETION DATE:	**11/1/2024**

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),FR Only no EDD (0)

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.

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.

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 and bzins@mvtl.com	Company Name:	MVTL
	NEW ULM, MN 56073		alieder@mvtl.com	Address:	1126 NORTH FRONT BLDG 2
Email To:	alieder@mvtl.com	Purchase Order No.:	CR13299	Pace Quote Reference:	
Phone:	507-354-8517 Fax:	Project Name:	Ottertail Power	Pace Project Manager:	
Requested Due Date/TAT:	standard	Project Number:	Work Order: 31-0136	Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☑ OTHER WW

Site Location STATE: MN

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

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	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	Y/N	Analysis Test: 2,3,7,8 TCDD method161	Radium 226/228	PFAs State Pricing	Dioxins/Furans	VOC's by 8260	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	24A2535 - S3AR	WT				10/01/24	14:36		1											X					N	
2	24A2536 - S51	WT				10/01/24	11:55		1											X					N	
3	24A2537 - S52	WT				10/01/24	12:38		1											X					N	
4	24A2538 - S10R	WT				10/01/24	13:27		1											X					N	
5	24A2539 - S13	WT				10/01/24	11:47		1											X					N	
6	24A2540 - Field Blank	WT				10/01/24	11:00		1											X					N	
7																										
8																										
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.

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, NM
Report To:	Otter Tail Power Company	**Carbon Copy:**	BarrDM@barr.com	Quote Number:	
Attn:	Paul Vukonich	Attn:		Work Order Number:	31-136
Address:	P.O. Box 496	Address:		Lab Numbers:	
	Fergus Falls, MN 56038-0496				
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
	S2A		10Oct24	NS	GW			1		1	N							2	See Attatched
A2535	S3AR			1436	GW			1		1	N							2	CCR 3 and CCR 4
36	S51			1155	GW			1		1	N							2	
37	S52			1238	GW			1		1	N							2	
38	S10R			1327	GW			1		1	N							2	
39	S13			1147	GW			1		1	N							2	
	S14R			NS	GW			1		1	N							2	
40	Field Blank			1100				1		1	N							2	

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

Samples Relinquished By:	BM			Samples Received By:	SP ROI
Date:	10Oct24	Time: 1870	Temp: 0.5 IR785	Date: 10 Oct 24	Time: 1830 Temp: 0.5 785
Samples Relinquished into:		Fridge	Log in Cart Other:		
Samples Relinquished By:				Samples Received By:	
Date:		Time:	Temp:	Date:	Time: Temp:
Deliver:	Samplers	Other:		Seal Number(s) - If Used	
Trans:	Ambient	Ice	Other:	Seals Intact? Yes	No

2024 - Hoot Lake Site CCR Sampling

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. Make sure CCR 3 and CCR 4 parmaters are printed and a part of the COC.

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

We usually schedule in early May and early October.

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

Sampling Personnel: NM

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 1 Oct 24

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: 78.48

Constructed Depth: 78.42

Casing Diameter: 2"

Water Level Before Purge: 68.42

Well Volume: 1.64 Gallons

Well Casing Elevation: 1271.562

Static Water Elevation: 1203.142

Previous Static:

Water Level After Sample: 68.54

Measurement Method: (Elec. WLI) Steel Tape

Sampling Information

Weather Conditions: Temp: 60° Wind: 12W Sky: Fair

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

Dedicated Equipment: (Yes) No

Well Purged Dry? Yes (No)

Time Purged Dry? —

Duplicate Sample? Yes (No) ID: —

Pumping Rate: 0.25 gpm

Time Pump Began: 1415 am / (pm)

Time of Sampling: 1436 am / (pm)

Sample EH: 72.0

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

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1422	7.20	867	12.5	3.97	3.41	1.75	1	
1429	7.21	867	12.01	4.18	3.42	3.50	2	
1436	7.21	866	12.04	4.07	3.82	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: PW

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 1 Oct 24

Unique Station ID: 814830

Sample ID: S-51

Well Condition

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

Repairs Necessary:

Well Information

Well Depth: 55.60

Constructed Depth: 55.60

Casing Diameter: 2"

Water Level Before Purge: 47.49

Well Volume: 1.32 Gallons

Well Casing Elevation: 1286.904

Static Water Elevation: 1239.41

Previous Static: 1238.81

Water Level After Sample: 47.49

Measurement Method: Elec. WL / Steel Tape

Sampling Information

Weather Conditions: Temp: 74 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: 1137 am / pm

Time of Sampling: 1155 am / pm

Sample EH: -17.5

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

Time 6	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1143	6.40	403	10.90	1.84	4.5	1.5	1	
1149	6.42	403	10.92	1.79	0.0	3.0	2	
1155	6.42	402	10.95	1.77	0.0	4.5	3	
							4	
							5	

Stabilized? Yes No

Amount Water Removed: 4.5 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: BW

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 1 Oct 24

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

Constructed Depth: 88.30

Casing Diameter: 2"

Water Level Before Purge: 69.36

Well Volume: 3.09 Gallons

Well Casing Elevation: 1286.623

Static Water Elevation: 1217.26

Previous Static: 1216.49

Water Level After Sample: 69.36

Measurement Method: Elec. W/L Steel Tape

Sampling Information

Weather Conditions: Temp: 74 Wind: Lt V 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: Duplicate

Pumping Rate: .25 gpm

Time Pump Began: 1159 am / pm

Time of Sampling: 1238 am / pm

Sample EH: -56.0

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

Time 13	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1212	6.05	402	10.57	4.11	4.3	3.25	1	
1225	6.06	402	10.59	4.04	0.0	6.50	2	
1238	6.08	402	10.67	3.96	0.0	9.75	3	
							4	
							5	

Stabilized? Yes No

Amount Water Removed: 9.75 Gallons

Comments:

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: NM

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 1 Oct 24

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:

Well Volume: 1.55 Gallons

Well Casing Elevation: 1281.47

Static Water Elevation: 1210.36

Previous Static:

Water Level After Sample: Below Pump

Measurement Method: (Elec. WL) Steel Tape

Sampling Information

Weather Conditions: Temp: 60° Wind: NW 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? 1322

Duplicate Sample? Yes (No) ID:

Pumping Rate: 0.25 gpm

Time Pump Began: 1315 am / pm

Time of Sampling: 1323 am / pm

Sample EH: 115.5

Sample Appearance: General: Cloudy Color: tan Phase: Lt. Sed Odor: Sulfurous

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1322	7.30	850	14.1	7.24	252	1.75	1	
1327							2	recharge
							3	
							4	
							5	

Stabilized? Yes (No)

Amount Water Removed: 1.75 Gallons

Comments:

* insufficient volume for recharg reading

Exceptions to Protocol:

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: NM

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 2 Oct 24

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: 84.75

Well Volume: 0.90 Gallons

Well Casing Elevation: 1296.423

Static Water Elevation: 1211.673

Previous Static: —

Water Level After Sample: 84.79

Measurement Method: Elec. WL Steel Tape

Sampling Information

Weather Conditions: Temp: 60° Wind: 12W Sky: Fair

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

Dedicated Equipment: Yes No

Well Purged Dry? Yes No

Time Purged Dry? —

Duplicate Sample? Yes No ID: —

Pumping Rate: 0.25 gpm

Time Pump Began: 1135 am / pm

Time of Sampling: 1147 am / pm

Sample EH: 68.1

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

Time (4)	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1139	7.26	914	12.34	0.57	Ø	1	1	
1143	7.26	914	12.46	0.57	Ø	2	2	
1147	7.26	914	12.52	0.55	Ø	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: 1 OCT 24

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:	1195.78
Casing Diameter:	2"	Previous Static:	1197.83
Water Level Before Purge:	78.00	Water Level After Sample:	—
Well Volume:	.26 Gallons	Measurement Method:	Elec. WLI / Steel Tape

Sampling Information

Weather Conditions: Temp: 74 Wind: LW Sky: Fair

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

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

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

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

Stabilized? Yes No Amount Water Removed: Gallons

Comments:

Exceptions to Protocol: * Insufficient volume to purge/sample!
* No sample!

Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073 507 354 8517

Groundwater Assessment

Sampling Personnel: NM

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 2 Oct 24

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: 1201.54

Casing Diameter: 2"

Previous Static: —

Water Level Before Purge: 79.07

Water Level After Sample: ~~79.07~~

Well Volume: 1.31 Gallons

Measurement Method: Elec. WLI Steel Tape

Sampling Information

Weather Conditions: Temp: 60° Wind: 12W Sky: Fair

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

Dedicated Equipment: Yes No

Pumping Rate: 0.25 gpm

Well Purged Dry? Yes No

Time Pump Began: 1230 am / pm

Time Purged Dry? —

Time of Sampling: — 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: 0 Gallons

Comments:

Exceptions to Protocol:

* White tubing plugged up with dirt/insects unable to purge well.

* NO SAMPLE

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: 17 Dec 24 AR

Date Reported: 17 Dec 2024

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

Work Order #: 31-0156
Account #: 006106
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

17 Dec 24
Field Service Manager/Date Reviewed

17 Dec 24
Chemistry Lab Manager/Date Reviewed

17 Dec 2024
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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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: S14R

Report Date: 17 Dec 2024
Lab Number: 24-A3106
Work Order #: 31-0156
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 22 Oct 2024 12:03
Sampled By: MVTL FIELD PERSONNEL
Date Received: 22 Oct 2024 16:05
PO #: 59640

Temp at Receipt: 0.2C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Misc Comment						
MS Water Digestions					24 Oct 24	NS
Water Digestions					24 Oct 24	NS
pH, Field	6.85	units	1.00	SM4500-H+-2011	22 Oct 24 12:03	BMW
pH	* 7.2	units	1.0	SM 4500 H+ B-2000	23 Oct 24 16:15	CC
Radium 226	0.30	pCi/L	0.60		3 Dec 24 0:45	OL
Radium 228	1.13	pCi/L	3.00	EPA M9320	5 Dec 24 22:10	OL
Sulfate	69.8 @	mg/L	5.0	ASTM D516-11	24 Oct 24 13:46	KRM
Chloride	4.1	mg/L	3.0	SM 4500 Cl E	29 Oct 24 13:40	SB
Mercury	< 0.005	ug/L	0.005	EPA 245.7	25 Oct 24 15:46	RMB
Solids, Total Dissolved	479	mg/L	10	SM 2540 C-97	24 Oct 24 9:11	CC
Calcium	112.0	mg/L	0.500	SW6010D	28 Oct 24 14:23	RMV
Lithium	0.029	mg/L	0.020	SW6010D	28 Oct 24 14:23	RMV
Barium	0.048	mg/L	0.005	SW6010D	28 Oct 24 14:23	RMV
Chromium	< 0.01	mg/L	0.01	SW6010D	28 Oct 24 14:23	RMV
Cobalt	< 0.005	mg/L	0.005	SW6010D	28 Oct 24 14:23	RMV
Boron	< 0.1	mg/L	0.1	SW6010D	28 Oct 24 14:23	RMV
Antimony	< 0.5	ug/L	0.5	SW6020B	28 Oct 24 10:16	SS
Arsenic	3.36	ug/L	0.50	SW6020B	28 Oct 24 10:16	SS
Beryllium	< 0.05	ug/L	0.05	SW6020B	28 Oct 24 10:16	SS
Cadmium	< 0.1	ug/L	0.1	SW6020B	28 Oct 24 10:16	SS
Lead	< 0.5	ug/L	0.5	SW6020B	28 Oct 24 10:16	SS
Molybdenum	2.55	ug/L	0.50	SW6020B	28 Oct 24 10:16	SS
Selenium	< 0.5	ug/L	0.5	SW6020B	28 Oct 24 10:16	SS
Thallium	< 0.1	ug/L	0.1	SW6020B	28 Oct 24 10:16	SS
Fluoride	0.210 @	mg/L	0.020	EPA 300.0	31 Oct 24 2:07	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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www.mvtl.com
MEMBER ACIL

Date Reported: 17 Dec 2024

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

Work Order #: 202431-0156
Account Number: 006106
PO #: 59640

Project Name: HOOT LAKE PLANT CCR

LABORATORY NARRATIVE

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

MVTL

MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 N. Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
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www.mvtl.com

MEMBER
ACIL

Quality Control Report

Lab ID: 24-A3106 **Project:** HOOT LAKE PLANT CCR **Work Order:** 202431-0156

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony ug/L	25.0	104	85-115	25.0	24A3106q	< 0.5	27.6	110	75-125	27.6	30.1	120	8.7	10	103	90-110	< 0.5
Arsenic ug/L	25.0	102	85-115	25.0	24A3106q	3.36	30.6	109	75-125	30.6	32.7	117	6.6	10	99	90-110	< 0.5
Barium mg/L	1.000	100	85-115	1.00	24A3106q	0.048	1.050	100	75-125	1.050	1.050	100	0.0	10	97	90-110	< 0.005
Beryllium ug/L	2.50	86	85-115	2.50	24A3106q	< 0.05	2.34	94	75-125	2.34	2.50	100	6.6	10	94	90-110	< 0.05
Boron mg/L	1.000	96	85-115	1.00	24A3106q	< 0.1	1.050	105	75-125	1.050	1.050	105	0.0	10	93	90-110	< 0.1
Cadmium ug/L	5.00	102	85-115	5.00	24A3106q	< 0.1	5.17	103	75-125	5.17	5.67	113	9.2	10	98	90-110	< 0.1
Calcium mg/L	50.00	94	85-115	50.0	24A3106q	112.0	157.0	90	75-125	157.0	159.0	94	1.3	20	100	90-110	< 0.5
Chloride mg/L	-	-	-	60.0	24-A3122	32.3	93.1	101	80-120	93.1	93.8	102	0.7	10	93	90-110	< 3
Chromium mg/L	1.000	92	85-115	1.00	24A3106q	< 0.01	0.925	92	75-125	0.925	0.926	93	0.1	10	94	90-110	< 0.01
Cobalt mg/L	1.000	96	85-115	1.00	24A3106q	< 0.005	0.921	92	75-125	0.921	0.922	92	0.1	10	96	90-110	< 0.005
Fluoride mg/L	-	-	-	1.00	24-A3090	0.210	1.27	106	80-120	1.27	1.29	108	1.6	10	102	90-110	< 0.02
Lead ug/L	25.0	99	85-115	25.0	24A3106q	< 0.5	26.5	106	75-125	26.5	28.3	113	6.6	10	101	90-110	< 0.5
Lithium mg/L	1.000	101	85-115	1.00	24-A3106	0.029	1.020	99	75-125	1.020	1.030	100	1.0	10	97	90-110	< 0.02
Mercury ug/L	-	-	-	0.10	24-A3039	< 0.005	0.064	64	63-111	0.064	0.067	67	4.6	18	92	76-113	< 0.005
Molybdenum ug/L	25.0	96	85-115	25.0	24A3106q	2.55	28.2	103	75-125	28.2	30.6	112	8.2	10	100	90-110	< 0.5
pH units	-	-	-	-	-	-	-	-	-	7.2	7.2	-	0.0	2.5	101	90-110	-
Selenium ug/L	25.0	107	85-115	25.0	24A3106q	< 0.5	29.0	116	75-125	29.0	30.6	122	5.4	10	104	90-110	< 0.5
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	473	473	-	0.0	10	101	85-115	< 10
Sulfate mg/L	-	-	-	500	24-A3106	69.8	472	80	80-120	472	572	100	19.2	20	93	85-115	< 5
Thallium ug/L	5.00	98	85-115	5.00	24A3106q	< 0.1	5.29	106	75-125	5.29	5.71	114	7.6	10	99	90-110	< 0.1

Approved by: _____

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

December 13, 2024

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

RE: Project: 31-0156 Ottertail Power
Pace Project No.: 10713297

Dear Todd Rieger:

Enclosed are the analytical results for sample(s) received by the laboratory on October 24, 2024. 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)607-6456
Project Manager

Enclosures

cc: Barb Zins, MVTL

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

SAMPLE SUMMARY

Project: 31-0156 Ottertail Power
Pace Project No.: 10713297

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10713297001	**24A3106 S14R**	Water	10/22/24 12:03	10/24/24 11:40

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:	trieger@mvtl.com and bzins@mvtl.com	Company Name:	MVTL
	NEW ULM, MN 56073		alieder@mvtl.com	Address:	1126 NORTH FRONT BLDG 2
Email To:	alieder@mvtl.com	Purchase Order No.:	CR13299	Pace Quote Reference:	
Phone:	507-354-8517 Fax:	Project Name:	Ottertail Power	Pace Project Manager:	
Requested Due Date/TAT:	standard	Project Number:	Work Order: 31-0156	Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☑ OTHER WW

Site Location STATE: MN

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

Requested Analysis Filtered (Y/N)

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	TIME	COMPOSITE END/GRAB DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test	2,3,7,8 TCDD method161	Radium 226/228	PFAs 1633 - State Pricing	Dioxins/Furans	VOC's by 8260	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	24A3106 S14R	WT				10/22/24	12:03		1											X				N	001
2																									
3																									
4																									
5																									
6																									
7																									
8	Need NQulS LabMN EDD																								
9																									
10	Also from last week need the EDD for																								
11	Pace sample 10712045																								
12																									

WO#: 10713297
10713297

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
				N:ll V/Pace	10/23/24	1149	15	Y	Y	
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

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

Page 3 of 18

*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.

F-ALL-Q-020rev.08, 12-Oct-2007

ENV-FRM-MIN4-0150 v17_Sample Condition Upon Receipt

CLIENT NAME: MVTL PROJECT #: WO#:10713297

PM: PG Due Date: 11/22/24

CLIENT: MVTL

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

TRACKING NUMBER: _____ ☐ See Exceptions form 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 Bags ☐ Bubble Wrap ☐ None ☐ Other Temp Blank: ☑ YES ☐ NO Type of Ice: ☐ Blue ☐ Dry ☑ Wet ☐ Melted ☐ None

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

Did Samples Originate in West Virginia: ☐ YES ☑ NO	Were All Container Temps taken: ☐ YES ☐ NO ☐ N/A
Correction Factor: -0.3 Cooler Temp Read w/Temp Blank: 1.8 °C Cooler Temp Corrected w/Temp Blank: 1.5 °C	Average Corrected Temp (no Temp Blank Only): _____ °C
NOTE: Temp should be above freezing to 6°C.	☐ See Exceptions Form ENV-FRM-MIN4-0142 ☐ 1 Container
USDA Regulated Soil: ☑ N/A – Water Sample/Other (describe): _____	Initials & Date of Person Examining Contents: VLK 10/25/24
Did Samples originate from one of the following states (check maps) – AL, AR, AZ, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA: ☐ YES ☐ NO	Did samples originate from a foreign source (international, including Hawaii and Puerto Rico): ☐ YES ☐ NO
NOTE: 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	YES	NO	N/A	COMMENT(S)
Chain of Custody Present and Filled Out?	☑	☐		1.
Chain of Custody Relinquished?	☐	☑		2.
Sampler Name and/or Signature on COC?	☐	☑	☐	3.
Samples Arrived within Hold Time?	☑	☐		4. If Fecal: ☐ <8 hrs ☐ >8 hr, <24 hr ☐ No
Short Hold Time Analysis (<72 hr)?	☐	☑		5. ☐ BOD / cBOD ☐ Fecal coliform ☐ Hex Chrom ☐ HPC ☐ Nitrate ☐ Nitrite ☐ Ortho Phos ☐ Total coliform/*E. coli* ☐ Other:
Rush Turn Around Time Requested?	☐	☑		6.
Sufficient Sample Volume?	☑	☐		7. 2 BPN
Correct Containers Used?	☑	☐	☐	8.
– Pace Containers Used?	☐	☑		
Containers Intact?	☑	☐		9.
Field Filtered Volume Received for Dissolved Tests?	☐	☑	☐	10. Is sediment visible in the dissolved container: ☐ YES ☐ NO
Is sufficient information available to reconcile the samples to the COC? NOTE: If ID/Date/Time don't match fill out section 11. Matrix: ☐ Oil ☐ Soil ☑ Water ☐ Other	☑	☐		11. If NO, write ID/Date/Time of container below: ☐ See Exceptions form ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☑	☐	☐	12. Sample #: 2/2
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, < 2 pH, NaOH > 9 Sulfide, NaOH > 10 Cyanide)	☑	☐	☐	☑ HNO_3 ☐ H_2SO_4 ☐ NaOH ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC, Oil & Grease, DRO/8015 (water) and Dioxins/PFAS	☐	☐	☑	Positive for Residual Chlorine: ☐ YES ☐ NO
NOTE: If adding preservation to the container, verify with the PM first. Clients may require adding preservative to the field and equipment blanks when this occurs.				pH Paper Lot # (Residual Chlorine / 0-6 Roll / 0-6 Strip / 0-14 Strip): 205224
				☐ See Exceptions form ENV-FRM-MIN4-0142
Headspace in Methyl Mercury Container?	☐	☐	☑	13.
Extra labels present on soil VOA or WIDRO containers?	☐	☐	☑	14.
Headspace in VOA Vials (greater than 6mm)?	☐	☐	☑	☐ See Exceptions form ENV-FRM-MIN4-0140
Trip Blanks Present?	☐	☐	☑	15.
Trip Blank Custody Seals Present?	☐	☐	☑	Pace Trip Blank Lot # (if purchased): _____

CLIENT NOTIFICATION / RESOLUTION FIELD DATA REQUIRED: ☐ YES ☐ NO

Person Contacted: _____ Date & Time: _____

Comments / Resolution: _____

Project Manager Review: Ryper J Gibbs Date: 10/25/24

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

Labeled By: VLK Line: 2

Minnesota Valley Testing
Laboratories, Inc.
1126 North Front Street
New Ulm, MN 56073
507-233-7131
Fax 507-359-1231

P.O. Number: CL13299

To:	Ship To (if different address):
Pace Analytical 1700 Elm Street SE Suite# 200 Minneapolis, MN 55414	

P.O. Date	Placed By	Date Expected	Ship Via	F.O.B.	Terms
23-Oct-24	Todd Rieger	N/A	N/A	N/A	Net 30

QTY.	Description	Unit Price	Total
			$ -
	Lab ID# 24A3106		$
	WO# 31-0156		$ -
			$ -
1	Radium 226/228	$ [redacted]	$ [redacted]
			$ -
1	Disposal Fee	$ [redacted]	$ [redacted]
1	Environmental Impact	$ [redacted]	$ [redacted]
			$ -
			$ -
			$ -
			$ -
			$ -
			$ -
	email results to trieger@mvtl.com		$ -
			$ -
			$ -
		Shipping & handling	
		Subtotal	$ [redacted]
		Sales Tax	
		Total Due	$ [redacted]

Authorized Signature

Internal Transfer Chain of Custody

D182 Pace

Rush Multiplier ____X	State Of Origin: MN
Samples Pre-Logged into eCOC	Cert. Needed: [X] Yes [ ] No

Workorder: 10713297 **Workorder Name:** 31-0156 Ottertail Power **Owner Received Date:** 10/24/2024 **Results Requested By:** 12/9/2024

Report To	Subcontract To
Piper Gibbs Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone (612)607-6456	Pace National 12065 Lebanon Rd Mt. Juliet, TN 37122 Phone (615) 758-5858

Requested Analysis: Radium 226/228

Preserved Containers

L1806192

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	HNO3						Radium 226/228	LAB USE ONLY
1	24A3106 S14R	PS	10/22/2024 12:03	10713297001	Water	1						X	-01
2													
3													
4													
5													

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	Nick V/Pace	11/22/24 1655	[signature]	11-23-24 0900	
2					
3					

Cooler Temperature on Receipt 3.3/0=3.3 °C TL49 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 total ER1

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
Sufficient volume sent: Y N
RA Screen <0.5 mR/hr: Y N

424355 7U 4307

Pace

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

INTER_LABORATORY WORK ORDER # 10713297
(To be completed by sending lab)

Sending Project No:	10713297
Receiving Project No:	
Check Box for Consolidated Invoice:	☐
Date Prepared:	11/22/24
REQUESTED COMPLETION DATE:	**12/9/2024**

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		HNO3	1	SI-38RAD	SUB PASI RAD

Special Requirements: Report C, QC Limits (C),MN Standard With QC (513)

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

December 10, 2024

Pace Analytical - Minnesota

Sample Delivery Group:	L1803492
Samples Received:	11/23/2024
Project Number:	10713297
Description:	31-0156 Ottertail Power
Site:	001
Report To:	Piper Gibbs 1700 Elm Street Suite 200 Minneapolis, MN 55414

Entire Report Reviewed By:

Naomi M Sackett
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

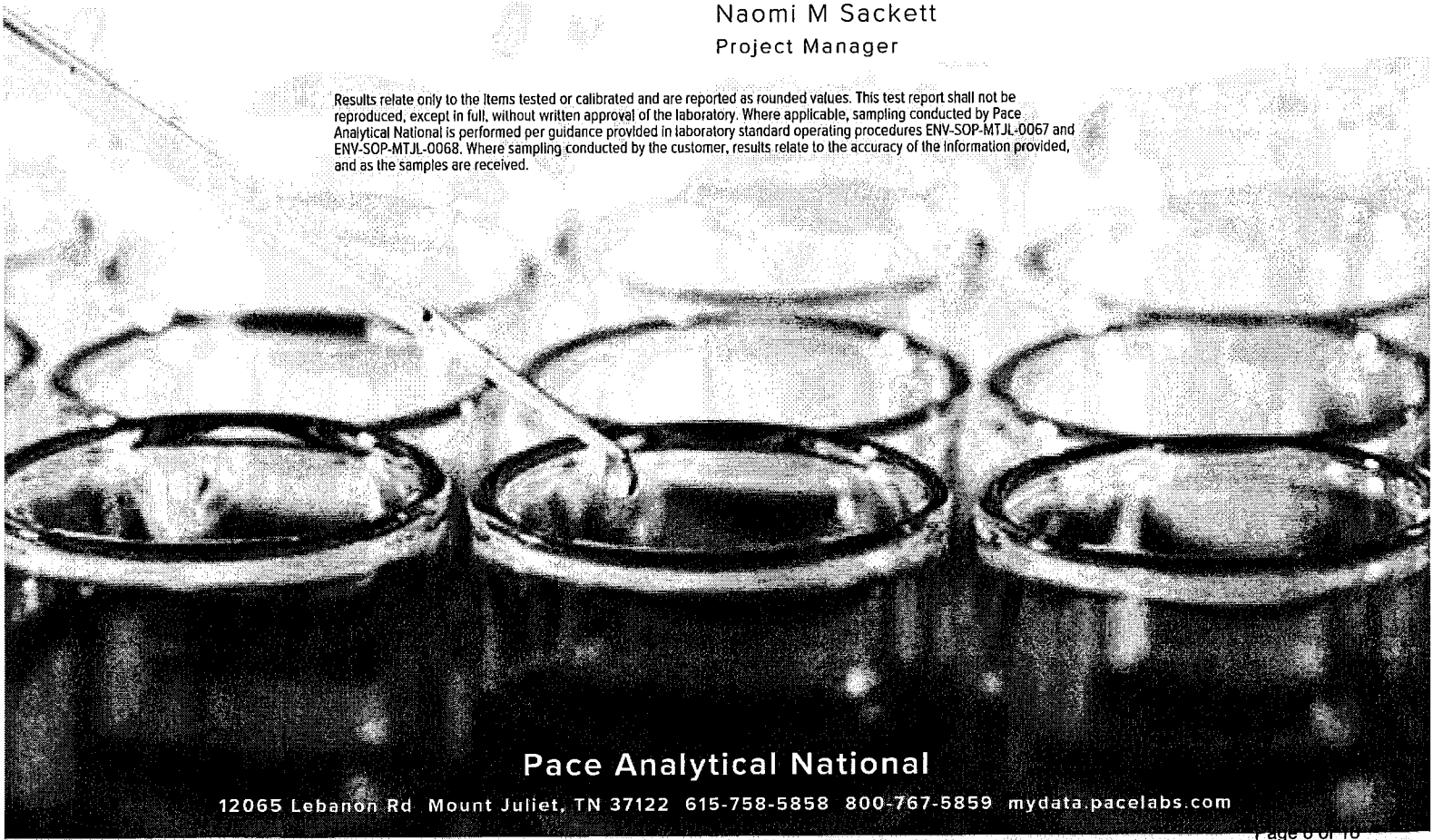

TABLE OF CONTENTS

SAMPLE SUMMARY

24A3106 S14R L1803492-01 Non-Potable Water			Collected by	Collected date/time 10/22/24 12:03	Received date/time 11/23/24 09:00	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2408366	1	11/26/24 00:03	12/05/24 22:10	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2408871	1	11/27/24 11:12	12/03/24 00:45	ZRG	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.

Naomi M Sackett
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	1.13		0.531	0.993	1.01	0.530	12/05/2024 22:10	WG2408366
(T) Barium	*104*					*30.0-143*	*12/05/2024 22:10*	WG2408366
(T) Yttrium	*130*					*30.0-136*	*12/05/2024 22:10*	WG2408366

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	0.297	J	0.282	0.452	0.363	0.236	12/03/2024 00:45	WG2408871
(T) Barium-133	*98.5*					*30.0-143*	*12/03/2024 00:45*	WG2408871

Method Blank (MB)

(MB) R4155617-1 12/05/24 17:45

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE +/- pCi/l	MB MDA pCi/l	MB Lc pCi/l
Radium-228	0.169	J	0.136	0.252	0.133
(T) Barium	*105*		*105*		
(T) Yttrium	*103*		*103*		

L1801250-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1801250-03 12/05/24 22:10 • (DUP) R4155617-5 12/05/24 17:45

Analyte	Original Result pCi/l	Original 2 sigma CE +/- pCi/l	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE +/- pCi/l	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.424	0.255	0.491	0.260	0.465	0.508	0.940	0.490	9.22	0.0721	J	20	3
(T) Barium	*112*				*91.0*	*91.0*							
(T) Yttrium	*118*				*75.0*	*75.0*							

Laboratory Control Sample (LCS)

(LCS) R4155617-2 12/05/24 17:45

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.39	87.8	80.0-120	
(T) Barium			*103*		
(T) Yttrium			*112*		

L1799989-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1799989-01 12/05/24 17:45 • (MS) R4155617-3 12/05/24 17:45 • (MSD) R4155617-4 12/05/24 17:45

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	16.7	0.636	14.8	15.5	84.9	88.8	1	70.0-130			4.29		20
(T) Barium		*103*			*121*	*102*							
(T) Yttrium		*85.3*			*111*	*89.5*							

Method Blank (MB)

(MB) R4152999-1 12/02/24 10:23

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE +/- pCi/l	MB MDA pCi/l	MB Lc pCi/l
Radium-226	0.0180	U	0.0327	0.0542	0.0349
(T) Barium-133	*75.9*		*75.9*		

L1800789-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1800789-01 12/02/24 10:32 • (DUP) R4152999-5 12/02/24 10:32

Analyte	Original Result pCi/l	Original 2 sigma CE +/- pCi/l	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE +/- pCi/l	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	0.232	0.234	0.306	0.203	0.158	0.206	0.294	0.199	38.3	0.239	J	20	3
(T) Barium-133	*104*				*99.7*	*99.7*							

Laboratory Control Sample (LCS)

(LCS) R4152999-2 12/02/24 10:32

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.00	4.64	92.7	80.0-120	
(T) Barium-133			*84.3*		

L1802809-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1802809-01 12/02/24 10:32 • (MS) R4152999-3 12/02/24 10:32 • (MSD) R4152999-4 12/02/24 10:32

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	0.310	16.9	17.3	83.0	84.7	1	75.0-125			1.99		20
(T) Barium-133		*89.8*			*90.3*	*95.7*							

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	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.

Internal Transfer Chain of Custody

D182 Pace

Rush Multiplier_____X
Samples Pre-Logged into eCOC

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

Workorder: 10713297 Workorder Name: 31-0156 Ottertail Power
Owner Received Date: 10/24/2024 Results Requested By: 12/9/2024

Report To	Subcontract To
Piper Gibbs Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone (612)607-6456	Pace National 12065 Lebanon Rd Mt. Juliet, TN 37122 Phone (615) 758-5858

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: HNO3	Requested Analysis: Radium 226/228	LAB USE ONLY L1806892
1	24A3106 S14R	PS	10/22/2024 12:03	10713297001	Water	1	X	-01
2								
3								
4								
5								

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	Nick V/Pace	11/22/24 1655	[signature]	11-23-24 0900	
2					
3					

Cooler Temperature on Receipt 3.3+0=3.3 °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 total ER1

		If Applicable	
COC Seal Present/Intact:	Y_N	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		
Sufficient volume sent:	Y_N		
RA Screen <0.5 mR/hr:	Y_N		

4243 5576 4307

Pace

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

INTER_LABORATORY WORK ORDER # 10713297
(To be completed by sending lab)

Sending Project No:	10713297
Receiving Project No:	
Check Box for Consolidated Invoice:	☐
Date Prepared:	11/22/24
REQUESTED COMPLETION DATE:	**12/9/2024**

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		HNO3	1	SI-38RAD	SUB PASI RAD

Special Requirements: Report C, QC Limits (C),MN Standard With QC (513)

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.

This is an exact copy of the original document

By AR Date 23 Oct 24

pages 1-5

Minnesota Valley Testing Laboratories

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

Field Service Chain of Custody Record

Project Name:	Otter Tail Power Co. Hoot Lake Plant	**Project Type:** CCR	**Name of Samplers:** BW
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: 31-0156
	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
					GW														See Attatched
					GW														CCR 3 and CCR 4
					GW														
					GW														
					GW														
					GW														
A3104	S14R		22Oct24	1203	GW			1		1	N							2	

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

Samples Relinquished By:	BW			Samples Received By:	
Date: 22Oct24	Time: 1605	Temp: 0.2 TM 724		Date: 23Oct24	Time 07:55	Temp: 0.2 C TM 724
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		
Tran t:	Ambient	Ice	Other:	Seals Intact?	Yes	No

2024 - Hoot Lake Site CCR Sampling

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. Make sure CCR 3 and CCR 4 parmaters are printed and a part of the COC.

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

We usually schedule in early May and early October.

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

Sampling Personnel: BW

Site: Otter Tail Power Co./ Hoot Lake

Facility ID: SW-211

Date: 22 OCT 24

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:	1201.57
Casing Diameter:	2"	Previous Static:	1201.61
Water Level Before Purge:	79.04	Water Level After Sample:	79.04
Well Volume:	1.32 Gallons	Measurement Method:	Elec. WL / Steel Tape

Sampling Information

Weather Conditions: Temp: 60 Wind: CLM Sky: Fair

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

Dedicated Equipment: Yes No

Pumping Rate: ~25 gpm

Well Purged Dry? Yes No

Time Pump Began: 1145 am / pm

Time Purged Dry? —

Time of Sampling: 1203 am / pm

Duplicate Sample? Yes No ID: —

Sample EH: 8.C

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:
1151	6.78	863	11.34	2.54	7.2	1.5	1	
1157	6.81	862	11.37	2.40	0.0	3.0	2	
1203	6.85	862	11.42	2.33	0.0	4.5	3	
							4	
							5	

Stabilized? Yes No

Amount Water Removed: 4.5 Gallons

Comments:

Exceptions to Protocol:

Appendix B

Groundwater Flow Rate Calculation

Hoot Lake Ash Disposal Facility Groundwater Velocity Calculation

Sampling Date	10/1/2024

Upgradient (S-52)

Top of Casing Elevation	1286.62	ft amsl	*Groundwater Monitoring System Report (Barr, 2016)*
Depth to Water	69.36	ft below TOC	
Water Level Elevation	1217.26	ft amsl	

Downgradient (S-2A)

Top of Casing Elevation	1272.90	ft amsl	*Groundwater Monitoring System Report (Barr, 2016)*
Depth to Water	78.00	ft below TOC	
Water Level Elevation	1194.90	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	22.36	ft	
gradient (i)	0.020	ft/ft	
linear velocity (V)	0.5156	ft/day	
V	**188.3**	ft/yr	

Hoot Lake Ash Disposal Facility Groundwater Velocity Calculation

Sampling Date	5/2/2024

Upgradient (S-52)

Top of Casing Elevation	1286.62	ft amsl	*Groundwater Monitoring System Report (Barr, 2016)*
Depth to Water	70.84	ft below TOC	
Water Level Elevation	1215.78	ft amsl	

Downgradient (S-14R)

Top of Casing Elevation	1280.61	ft amsl	*Groundwater Monitoring System Report (Barr, 2016)*
Depth to Water	78.80	ft below TOC	
Water Level Elevation	1201.81	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	1240	ft	
WL elevation difference	13.97	ft	
gradient (i)	0.011	ft/ft	
linear velocity (V)	0.2938	ft/day	
V	**107.3**	ft/yr	