



# **2021 Annual Groundwater Monitoring and Corrective Action Report**

***Blue Pit***

***Coyote Station  
Beulah, North Dakota***

Prepared for  
Otter Tail Power Company

January 2022

2021 Annual Groundwater Monitoring and Corrective Action Report

Blue Pit

Coyote Station  
Beulah, North Dakota

January 2022

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## Acronyms

<b>Acronym</b>	<b>Description</b>
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
NDAC	North Dakota Administrative Code
NDDEQ	North Dakota Department of Environmental Quality
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 §257.94(e)(6). The CCR unit operated under the detection monitoring program described in 40 CFR §257.94 and NDAC 33.1-20-08-06-04 at the start and at the end of the 2021 annual reporting period. The monitoring program did not identify any statistically significant increases over background for any of the detection monitoring constituents listed in appendix III to the EPA CCR Rule and appendix I to the NDDEQ CCR Rule; therefore, constituents listed in appendix IV to the EPA CCR Rule and appendix II to the NDDEQ CCR Rule were not monitored and the corrective action provisions of the CCR Rules were not triggered.

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# 1.0 Introduction

Otter Tail Power Company (OTP) operates the Coyote Station (Coyote), located near Beulah, North Dakota. Coyote is a coal-fired electrical generating plant, operation of which results in coal combustion residuals (CCR) as a by-product. The Blue Pit is an existing CCR landfill at Coyote that 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) and the North Dakota Department of Environmental Quality (NDDEQ) CCR Rule (North Dakota Administrative Code [NDAC] Title 33.1, Article 20, Chapter 8). The Blue Pit is shown on Figure 1.

This 2021 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) describes the monitoring program and results for the Blue Pit at Coyote. The Blue Pit is currently in detection monitoring as described by 40 CFR 257.94 of the EPA CCR Rule and NDAC 33.1-20-08-06-04 of the NDDEQ CCR Rule.

## 1.1 Purpose

As stated in 40 CFR 257.90(e) and NDAC 33.1-20-08-06-01(e), the purpose of the Annual Report is to:

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

## 1.2 Status of the Groundwater Monitoring and Corrective Action Program

Baseline monitoring was completed in 2017, as documented in the 2017 Annual Groundwater Monitoring and Corrective Action Report, Blue Pit Area (Barr, 2018). The detection monitoring program, which is the evaluation of groundwater monitoring data for statistically significant increases (SSIs) over background levels for the detection monitoring constituents listed in appendix III to the EPA CCR Rule and appendix I to the NDDEQ CCR Rule, began on October 17, 2017, and continued through 2021. In 2021, the monitoring program did not identify any statistically significant increases over background for any of the detection monitoring constituents listed in the CCR Rules; therefore, assessment monitoring constituents listed in appendix IV to the EPA CCR Rule and appendix II to the NDDEQ CCR Rule were not monitored and the corrective action provisions of the CCR Rules were not triggered.

## 1.3 CCR Rule Requirements

This Annual Report has been prepared in accordance with the requirements of 40 CFR 257.90(e) of the EPA CCR Rule and NDAC 33.1-20-08-06-01(e) of the NDDEQ CCR Rule, as outlined in the following Table 1.

**Table 1 CCR Rule Requirements**

EPA CCR Rule Reference (40 CFR)	NDDEQ CCR Rule Reference (NDAC)	Content Required in Report	Location
§257.90(e)(1)	§33.1-20-08-06-01(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)	§33.1-20-08-06-01(e)(2)	Discuss any new or decommissioned monitoring wells	Section 2.1.2 Changes to Monitoring System
§257.90(e)(3)	§33.1-20-08-06-01(e)(3)	All monitoring data obtained under §257.90 through §257.98 and §33.1-20-08-06; provide the number and date groundwater samples were collected, and the monitoring (i.e., detection or assessment)	Section 2.2 Monitoring and Analytical Results; Table 2, Figure 2, Figure 3, Appendices
§257.90(e)(4)	§33.1-20-08-06-01(e)(4)	Discuss any transition between monitoring programs	Not applicable – no transition between monitoring programs occurred
§257.90(e)(5)	§33.1-20-08-06-01(e)(5)	Other information specified in §257.90 through §257.98	Throughout report
§257.90(e)(6)	n/a	Overview at beginning of annual report	Executive Summary

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## 2.0 Groundwater Monitoring and Corrective Action Program

This section documents the status of the groundwater monitoring and corrective action program for the Blue Pit for 2021. The groundwater monitoring system is described in Section 2.1, the monitoring and analytical results are described in Section 2.2, key actions completed and problems encountered are described in Section 2.3, and key activities planned for 2022 are described in Section 2.4.

### 2.1 Groundwater Monitoring System

#### 2.1.1 Documentation

Figure 1 shows an aerial image of the Blue Pit and all upgradient (background) and downgradient monitoring wells, including the well identification numbers, that are part of the groundwater monitoring system, as required by 40 CFR 257.90(e)(1) and NDAC 33.1-20-08-06-01(e)(1). Further details on the monitoring system and the Blue Pit monitoring wells are included in the Groundwater Monitoring System Report, Coyote Station Blue Pit Area (Barr, 2016).

#### 2.1.2 Changes to Monitoring System

The groundwater monitoring system was unchanged in 2021.

### 2.2 Monitoring and Analytical Results

Groundwater samples were collected during two semiannual sampling events. A total of 12 groundwater samples (six monitoring wells and two sampling events) were collected and analyzed for the detection monitoring constituents in 2021 under the detection monitoring program, consistent with the requirements of 40 CFR 257.94(c) and NDAC 33.1-20-08-06-04(c). Dates of sampling are reported on the field data sheets, and analytical laboratory reports are presented in Appendix A. Results are summarized in Table 2. Groundwater flow data, as required by 40 CFR 257.93(c) and NDAC 33.1-20-08-06-03(c), are presented in Figure 2, Figure 3, and Appendix B.

### 2.3 Key Actions Completed/Problems Encountered

The following key actions were completed for the groundwater monitoring program during 2021:

- Completed semiannual detection monitoring sampling for each background and downgradient well.
- Evaluated monitoring results pursuant to 40 CFR 257.93(h) and NDAC 33.1-20-08-06-03(h).
- Determined that a statistically significant increase over background levels did not occur for the detection monitoring constituents at any downgradient monitoring well during the semiannual detection monitoring sampling events. Statistical analysis was conducted according to the Statistical Analysis Plan, Appendix B of the CCR Groundwater Sampling and Analysis Plan (Carlson McCain, 2017).

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Problems were not encountered during the reporting period.

## **2.4 Key Activities for Upcoming Year**

The following key groundwater monitoring program activities are planned for 2022:

- Evaluate analytical results from both 2022 semiannual detection monitoring events for statistically significant increases (SSIs) according to the Statistical Analysis Plan (Carlson McCain, 2017).
- Continue the detection monitoring program in accordance with the CCR Rules.

**Table 2  
Groundwater Analytical Data Summary  
Coyote Station  
Otter Tail Power Company**

Location			BLUE 6	BLUE 6	BLUE 7	BLUE 7	BLUE 13	BLUE 13	BLUE 14	BLUE 14	BLUE 15	BLUE 15	BLUE 16	BLUE 16
Date			5/11/2021	10/05/2021	5/10/2021	10/04/2021	5/11/2021	10/05/2021	5/10/2021	10/05/2021	5/11/2021	10/05/2021	5/10/2021	10/05/2021
Sample Type			N	N	N	N	N	N	N	N	N	N	N	N
Parameter	Analysis Location	Units												
Appendix III Parameters														
Boron	Lab	mg/l	0.38	0.39	0.37	0.39	< 0.5 U	0.58	0.51	0.59	0.48	0.50	0.38	0.37
Calcium	Lab	mg/l	197	194	177	171	304	155	268	248	155	161	168	165
Chloride	Lab	mg/l	9.5	10.7	9.2	10.2	46.6	41.9	10.5	11.3	11.7	12.4	12.0	13.1
Fluoride	Lab	mg/l	0.18	0.18	0.19	0.20	0.25	0.26	0.14	0.14	0.18	0.16	0.20	0.19
pH	Field	pH units	6.83	6.54	6.67	6.64	6.67	6.82	6.72	6.75	6.63	6.51	6.63	6.56
Solids, total dissolved	Lab	mg/l	1990	2020	1770	2160	5030	5070	4480	4530	2860	2950	2120	2230
Sulfate, as SO4	Lab	mg/l	916	889	906	880	2610	2310	2300	2120	1060	1080	1010	1030
Groundwater elevation	Field	ft amsl	1914.95	1914.86	1913.53	1913.94	1940.78	1939.92	1919.26	1919.30	1914.79	1914.80	1915.50	1915.34

- Not analyzed/Not available.
- N Sample Type: Normal.
- U The analyte was analyzed for, but was not detected.

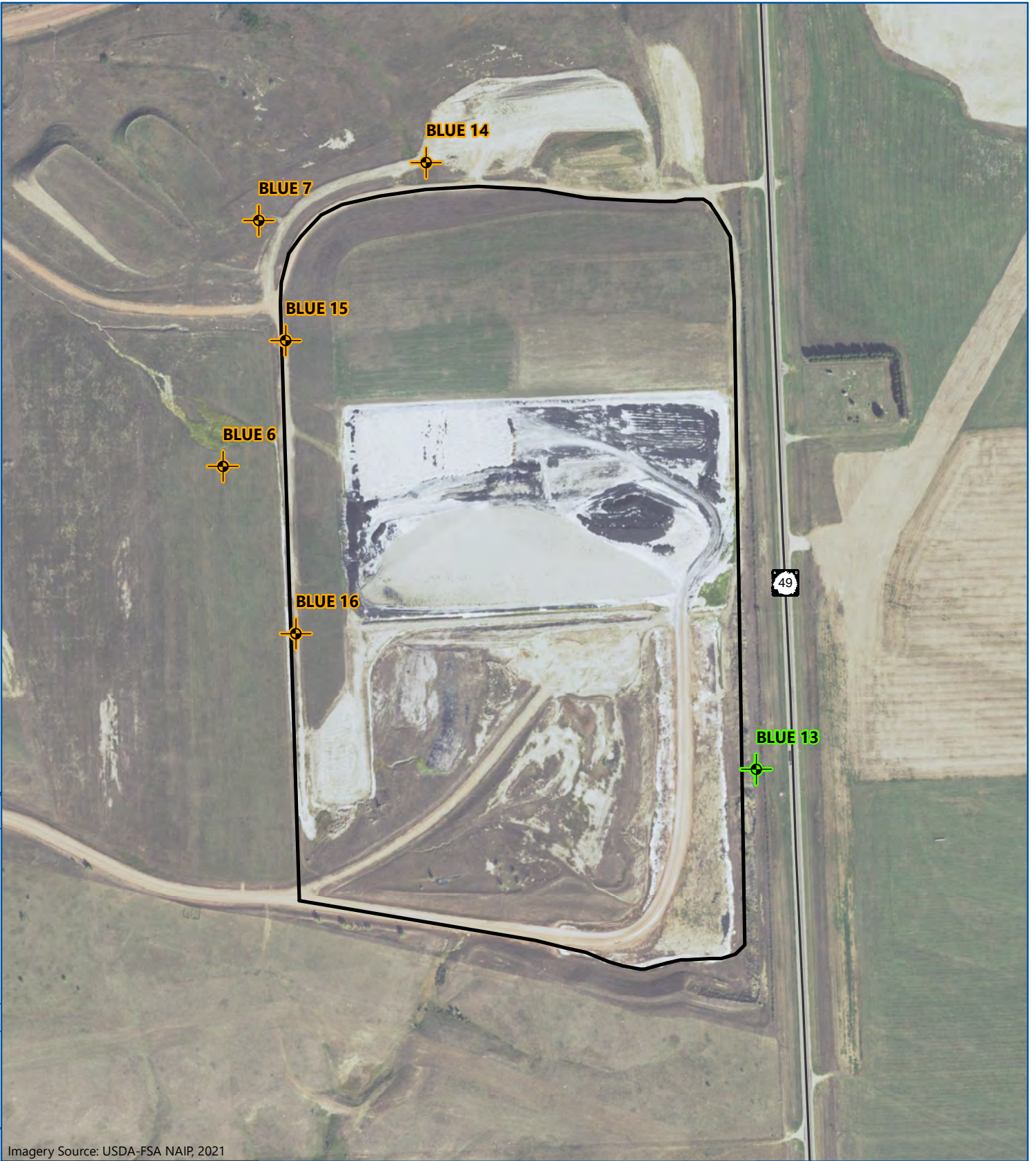
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## 3.0 References

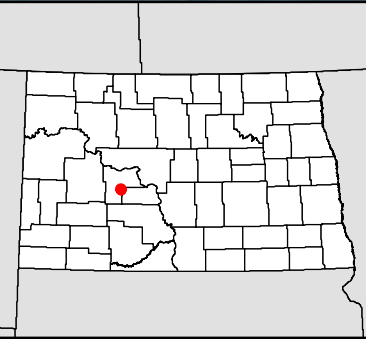
- Barr, 2018. 2017 Annual Groundwater Monitoring and Corrective Action Report, Coyote Station Blue Pit Area. Prepared for Otter Tail Power Company. January 2018.
- Barr, 2016. Groundwater Monitoring System Report, Coyote Station Blue Pit Area. Prepared for Otter Tail Power Company. November 2016.
- Carlson McCain, 2017. CCR Groundwater Sampling and Analysis Plan (Including Statistical Method Selection and Certification), Coyote Station Blue Pit. Prepared for Otter Tail Power Company. October 2017.




## Figures

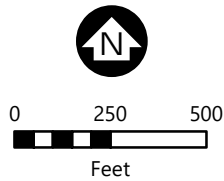




Imagery Source: USDA-FSA NAIP, 2021



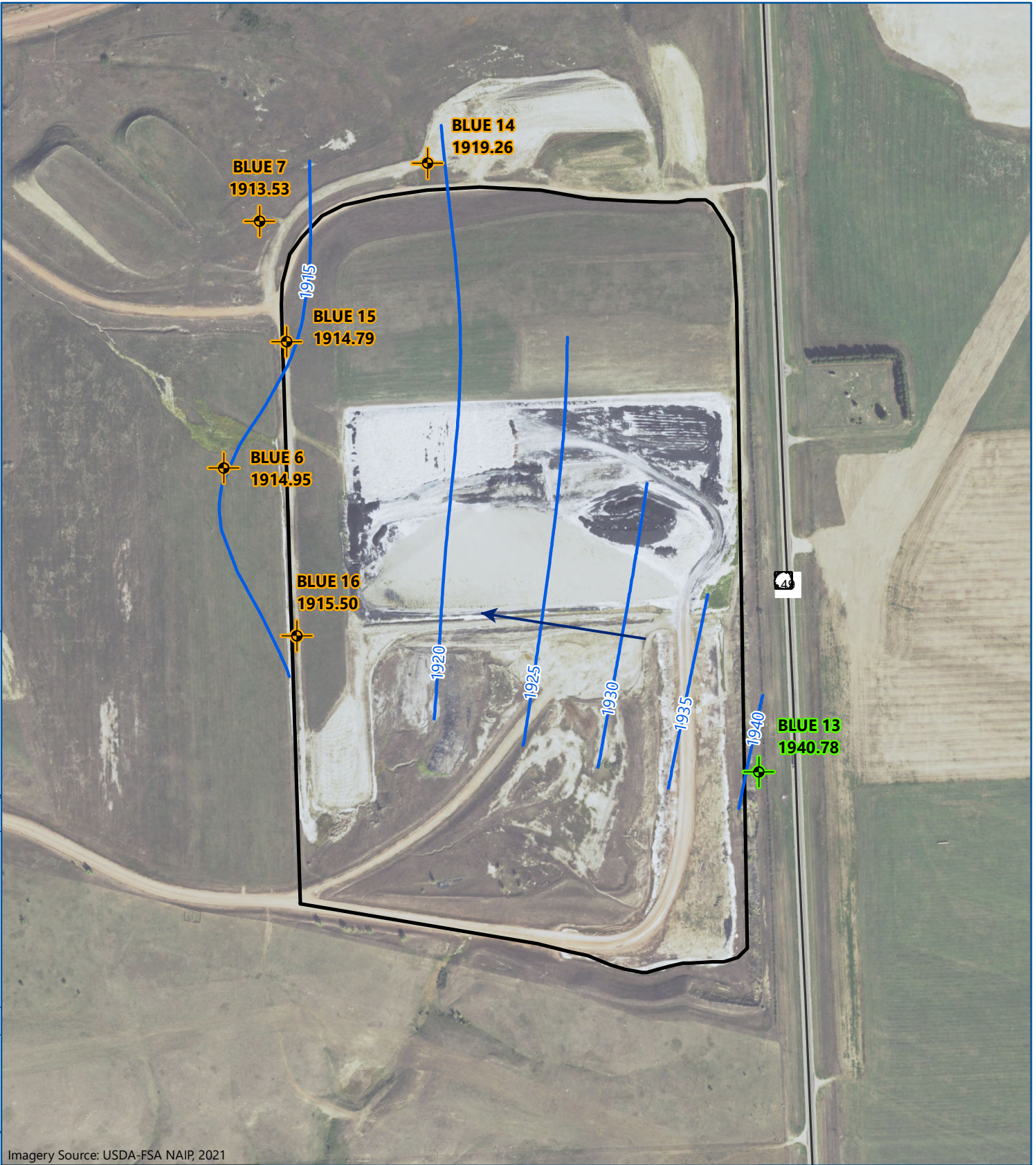
-  Upgradient Monitoring Well
-  Downgradient Monitoring Well
-  Blue Pit



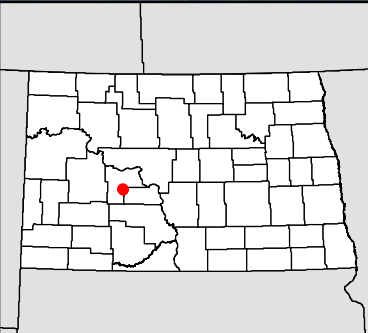
**BLUE PIT LOCATION**  
Coyote Station  
Otter Tail Power Company  
Beulah, North Dakota






**FIGURE 1**

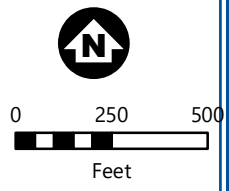




Imagery Source: USDA-FSA NAIP, 2021



-  Upgradient Monitoring Well
-  Downgradient Monitoring Well
-  Groundwater Contour
-  Groundwater Flow Direction
-  Blue Pit

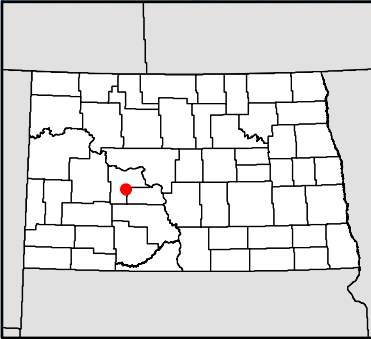


**GROUNDWATER CONTOURS**  
MAY 10-11, 2021  
Blue Pit  
Coyote Station  
Otter Tail Power Company  
Beulah, North Dakota

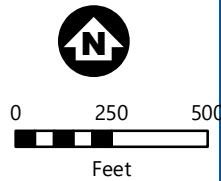
**FIGURE 2**



Imagery Source: USDA-FSA NAIP, 2021

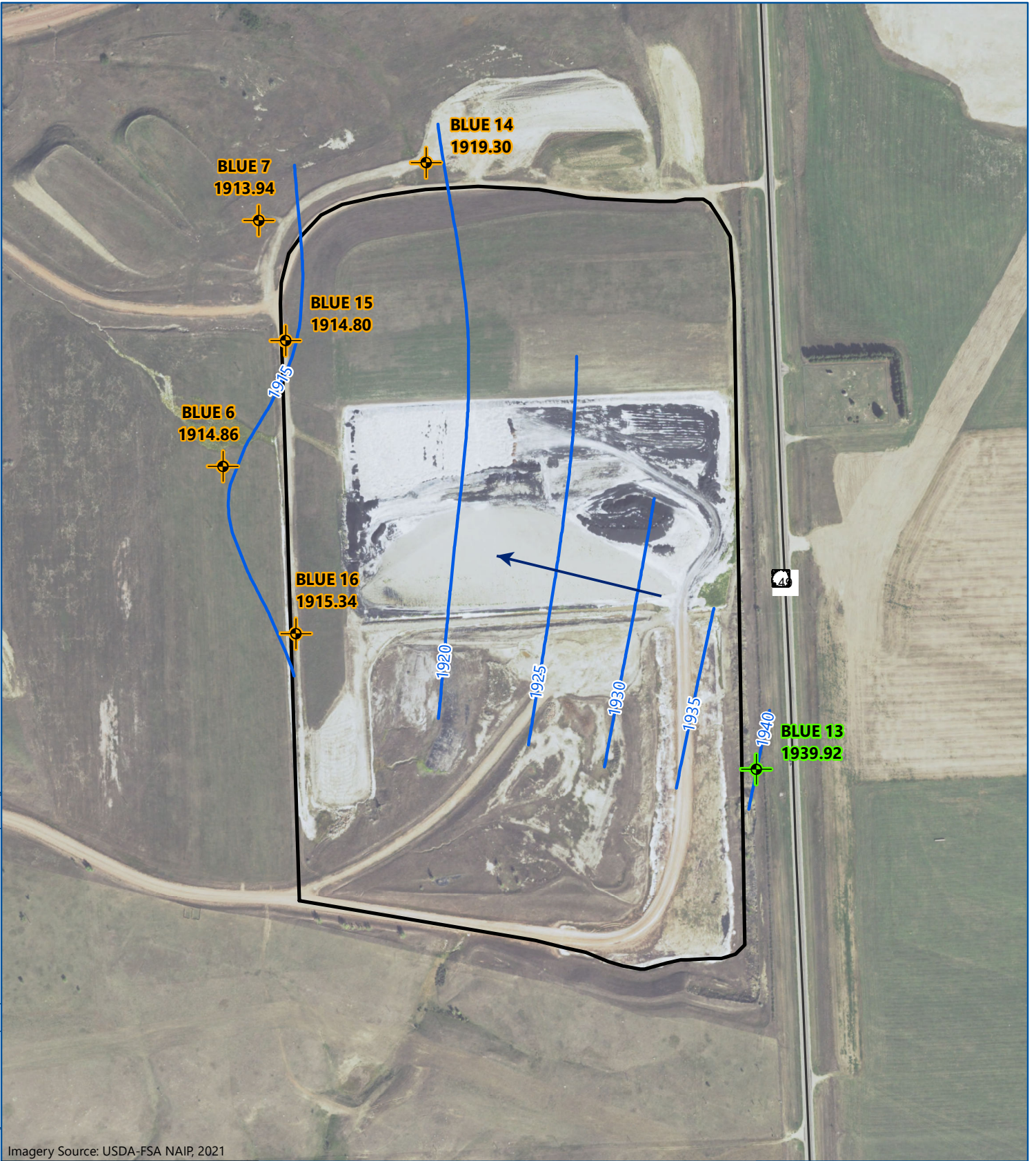


- Upgradient Monitoring Well
- Downgradient Monitoring Well
- Groundwater Contour
- Groundwater Flow Direction
- Blue Pit



**GROUNDWATER CONTOURS**  
OCTOBER 4-5, 2021  
Blue Pit  
Coyote Station  
Otter Tail Power Company  
Beulah, North Dakota

FIGURE 3



## Appendices

## **Appendix A**

### **Laboratory Reports and Field Sheets**





# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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



Page: 1 of 7

## CERTIFICATE of ANALYSIS - CCR

Josh Hollen  
Otter Tail Power Co.  
PO Box 496  
Fergus Falls MN 56538-0496

Report Date: 24 May 21  
Lab Number: 21-W1196  
Work Order #: 82-1074  
Account #: 006106  
Date Sampled: 11 May 21  
Date Received: 12 May 21 8:00  
Sampled By: MVTL Field Services

Project Name: OTP Coyote-Blue

PO #: 59625

Sample Description: FB Blue

Temp at Receipt: 0.1C

Event and Year: Spring 2021

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	12 May 21	RAA
Lab, pH	* 6.9	s.u.	0.1	SM4500-H+-B-11	17 May 21 14:27	RAA
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	12 May 21 17:00	RAA
Sulfate	< 5	mg/l	5.00	ASTM D516-11	19 May 21 14:17	SD
Chloride	< 2	mg/l	2.0	SM4500-Cl-E-11	21 May 21 13:39	SD
Total Dissolved Solids	< 10	mg/l	10	USGS I1750-85	14 May 21 13:50	RAA
Calcium - Total	< 1	mg/l	1.0	6010D	14 May 21 13:52	MDE
Boron - Total	< 0.1	mg/l	0.10	6010D	17 May 21 14:29	MDE

\* Holding time exceeded

Approved by:

Claudette K. Carroll <sup>CC</sup> 8 Jun 21

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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: ND # ND-00016



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



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## CERTIFICATE of ANALYSIS - CCR

Josh Hollen  
Otter Tail Power Co.  
PO Box 496  
Fergus Falls MN 56538-0496

Report Date: 24 May 21  
Lab Number: 21-W1197  
Work Order #: 82-1074  
Account #: 006106  
Date Sampled: 11 May 21 8:19  
Date Received: 12 May 21 8:00  
Sampled By: MVTL Field Services

Project Name: OTP Coyote-Blue

PO #: 59625

Sample Description: Blue 6

Temp at Receipt: 0.1C

Event and Year: Spring 2021

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	12 May 21	RAA
Field pH	6.83	s.u.	0.1	SM 4500 H+ B	11 May 21 8:19	DJN
Lab, pH	* 6.9	s.u.	0.1	SM4500-H+-B-11	12 May 21 17:00	RAA
Field Appearance	Partly Cloudy		NA	SM 2110	11 May 21 8:19	DJN
Field Temperature	8.21	Degrees C	0.1	SM 2550B	11 May 21 8:19	DJN
Field Conductivity	2327	umhos/cm	1	EPA 120.1	11 May 21 8:19	DJN
Fluoride	0.18	mg/l	0.10	SM4500-F-C	12 May 21 17:00	RAA
Sulfate	916	mg/l	5.00	ASTM D516-11	19 May 21 14:17	SD
Chloride	9.5	mg/l	2.0	SM4500-Cl-E-11	21 May 21 13:39	SD
Total Dissolved Solids	1990	mg/l	10	USGS I1750-85	14 May 21 13:50	RAA
Calcium - Total	197	mg/l	1.0	6010D	14 May 21 13:52	MDE
Boron - Total	0.38	mg/l	0.10	6010D	17 May 21 14:29	MDE

\* Holding time exceeded

Approved by:

Claudette K. Carroll

CC  
8 Jun 21

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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## CERTIFICATE of ANALYSIS - CCR

Josh Hollen  
Otter Tail Power Co.  
PO Box 496  
Fergus Falls MN 56538-0496

Report Date: 24 May 21  
Lab Number: 21-W1198  
Work Order #: 82-1074  
Account #: 006106  
Date Sampled: 10 May 21 14:20  
Date Received: 12 May 21 8:00  
Sampled By: MVTL Field Services

Project Name: OTP Coyote-Blue

PO #: 59625

Sample Description: Blue 7

Temp at Receipt: 0.1C

Event and Year: Spring 2021

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	12 May 21	RAA
Field pH	6.67	s.u.	0.1	SM 4500 H+ B	10 May 21 14:20	DJN
Lab, pH	* 7.0	s.u.	0.1	SM4500-H+-B-11	12 May 21 17:00	RAA
Field Appearance	Clear		NA	SM 2110	10 May 21 14:20	DJN
Field Temperature	12.0	Degrees C	0.1	SM 2550B	10 May 21 14:20	DJN
Field Conductivity	2657	umhos/cm	1	EPA 120.1	10 May 21 14:20	DJN
Fluoride	0.19	mg/l	0.10	SM4500-F-C	12 May 21 17:00	RAA
Sulfate	906	mg/l	5.00	ASTM D516-11	19 May 21 14:38	SD
Chloride	9.2	mg/l	2.0	SM4500-Cl-E-11	21 May 21 13:39	SD
Total Dissolved Solids	1770	mg/l	10	USGS I1750-85	14 May 21 13:50	RAA
Calcium - Total	177	mg/l	1.0	6010D	14 May 21 13:52	MDE
Boron - Total	0.37	mg/l	0.10	6010D	17 May 21 15:29	MDE

\* Holding time exceeded

Approved by: Claudette K. Carroll <sup>CC</sup> 8 Jun 21

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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## CERTIFICATE of ANALYSIS - CCR

Josh Hollen  
Otter Tail Power Co.  
PO Box 496  
Fergus Falls MN 56538-0496

Report Date: 24 May 21  
Lab Number: 21-W1199  
Work Order #: 82-1074  
Account #: 006106  
Date Sampled: 11 May 21 10:23  
Date Received: 12 May 21 8:00  
Sampled By: MVTL Field Services

Project Name: OTP Coyote-Blue

PO #: 59625

Sample Description: Blue 13

Temp at Receipt: 0.1C

Event and Year: Spring 2021

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	12 May 21	RAA
Field pH	6.67	s.u.	0.1	SM 4500 H+ B	11 May 21 10:23	DJN
Lab, pH	* 7.0	s.u.	0.1	SM4500-H+-B-11	12 May 21 17:00	RAA
Field Appearance	Clear		NA	SM 2110	11 May 21 10:23	DJN
Field Temperature	10.9	Degrees C	0.1	SM 2550B	11 May 21 10:23	DJN
Field Conductivity	5346	umhos/cm	1	EPA 120.1	11 May 21 10:23	DJN
Fluoride	0.25	mg/l	0.10	SM4500-F-C	12 May 21 17:00	RAA
Sulfate	2610	mg/l	5.00	ASTM D516-11	19 May 21 14:38	SD
Chloride	46.6	mg/l	2.0	SM4500-CL-E-11	21 May 21 14:15	SD
Total Dissolved Solids	5030	mg/l	10	USGS I1750-85	14 May 21 13:50	RAA
Calcium - Total	304	mg/l	1.0	6010D	14 May 21 13:52	MDE
Boron - Total	< 0.5 @	mg/l	0.10	6010D	17 May 21 15:29	MDE

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*CC  
8 Jun 21*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

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! = Due to sample quantity

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## CERTIFICATE of ANALYSIS - CCR

Josh Hollen  
Otter Tail Power Co.  
PO Box 496  
Fergus Falls MN 56538-0496

Report Date: 24 May 21  
Lab Number: 21-W1200  
Work Order #: 82-1074  
Account #: 006106  
Date Sampled: 10 May 21 12:34  
Date Received: 12 May 21 8:00  
Sampled By: MVTL Field Services

Project Name: OTP Coyote-Blue

PO #: 59625

Sample Description: Blue 14

Temp at Receipt: 0.1C

Event and Year: Spring 2021

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	12 May 21	RAA
Field pH	6.72	s.u.	0.1	SM 4500 H+ B	10 May 21 12:34	DJN
Lab, pH	* 7.0	s.u.	0.1	SM4500-H+-B-11	12 May 21 17:00	RAA
Field Appearance	Clear		NA	SM 2110	10 May 21 12:34	DJN
Field Temperature	10.4	Degrees C	0.1	SM 2550B	10 May 21 12:34	DJN
Field Conductivity	5356	umhos/cm	1	EPA 120.1	10 May 21 12:34	DJN
Fluoride	0.14	mg/l	0.10	SM4500-F-C	12 May 21 17:00	RAA
Sulfate	2300	mg/l	5.00	ASTM D516-11	19 May 21 14:38	SD
Chloride	10.5	mg/l	2.0	SM4500-Cl-E-11	21 May 21 14:15	SD
Total Dissolved Solids	4480	mg/l	10	USGS I1750-85	14 May 21 13:50	RAA
Calcium - Total	268	mg/l	1.0	6010D	14 May 21 14:52	MDE
Boron - Total	0.51	mg/l	0.10	6010D	17 May 21 15:29	MDE

\* Holding time exceeded

Approved by:

Claudette K. Carroll

*C*  
8 Jun 21

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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CERTIFICATION: ND # ND-00016



# 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



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## CERTIFICATE of ANALYSIS - CCR

Josh Hollen  
Otter Tail Power Co.  
PO Box 496  
Fergus Falls MN 56538-0496

Report Date: 24 May 21  
Lab Number: 21-W1201  
Work Order #: 82-1074  
Account #: 006106  
Date Sampled: 11 May 21 9:50  
Date Received: 12 May 21 8:00  
Sampled By: MVTL Field Services

Project Name: OTP Coyote-Blue

PO #: 59625

Sample Description: Blue 15

Temp at Receipt: 0.1C

Event and Year: Spring 2021

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	12 May 21	RAA
Field pH	6.63	s.u.	0.1	SM 4500 H+ B	11 May 21 9:50	DJN
Lab, pH	* 6.9	s.u.	0.1	SM4500-H+-B-11	12 May 21 17:00	RAA
Field Appearance	Clear		NA	SM 2110	11 May 21 9:50	DJN
Field Temperature	9.82	Degrees C	0.1	SM 2550B	11 May 21 9:50	DJN
Field Conductivity	3731	umhos/cm	1	EPA 120.1	11 May 21 9:50	DJN
Fluoride	0.18	mg/l	0.10	SM4500-F-C	12 May 21 17:00	RAA
Sulfate	1060	mg/l	5.00	ASTM D516-11	19 May 21 14:38	SD
Chloride	11.7	mg/l	2.0	SM4500-CL-E-11	21 May 21 14:15	SD
Total Dissolved Solids	2860	mg/l	10	USGS I1750-85	14 May 21 13:50	RAA
Calcium - Total	155	mg/l	1.0	6010D	14 May 21 14:52	MDE
Boron - Total	0.48	mg/l	0.10	6010D	17 May 21 15:29	MDE

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*CC  
8 Jun 21*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

@ = Due to sample matrix  
! = Due to sample quantity

# = Due to concentration of other analytes  
+ = Due to internal standard response

CERTIFICATION: ND # ND-00016





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## CERTIFICATE of ANALYSIS - CCR

Josh Hollen  
Otter Tail Power Co.  
PO Box 496  
Fergus Falls MN 56538-0496

Report Date: 24 May 21  
Lab Number: 21-W1202  
Work Order #: 82-1074  
Account #: 006106  
Date Sampled: 10 May 21 16:33  
Date Received: 12 May 21 8:00  
Sampled By: MVTL Field Services

Project Name: OTP Coyote-Blue

PO #: 59625

Sample Description: Blue 16

Temp at Receipt: 0.1C

Event and Year: Spring 2021

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	12 May 21	RAA
Field pH	6.63	s.u.	0.1	SM 4500 H+ B	10 May 21 16:33	DJN
Lab, pH	* 7.0	s.u.	0.1	SM4500-H+-B-11	12 May 21 17:00	RAA
Field Appearance	Clear		NA	SM 2110	10 May 21 16:33	DJN
Field Temperature	12.0	Degrees C	0.1	SM 2550B	10 May 21 16:33	DJN
Field Conductivity	2837	umhos/cm	1	EPA 120.1	10 May 21 16:33	DJN
Fluoride	0.20	mg/l	0.10	SM4500-F-C	12 May 21 17:00	RAA
Sulfate	1010	mg/l	5.00	ASTM D516-11	19 May 21 14:38	SD
Chloride	12.0	mg/l	2.0	SM4500-Cl-E-11	21 May 21 14:15	SD
Total Dissolved Solids	2120	mg/l	10	USGS I1750-85	14 May 21 13:50	RAA
Calcium - Total	168	mg/l	1.0	6010D	14 May 21 14:52	MDE
Boron - Total	0.38	mg/l	0.10	6010D	17 May 21 15:29	MDE

\* Holding time exceeded

Approved by:

Claudette K. Carroll

CC  
8 Jun 21

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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: ND # ND-00016



2616 E. Broadway Ave  
Bismarck, ND 58501  
(701) 258-9720

# Chain of Custody Record

<b>Project Name:</b> OTP Coyote - Blue CCR		<b>Event:</b> Spring 2021 Fall 2020 <sup>15 May 21</sup>	<b>Work Order Number:</b> 82-1074
<b>Report To:</b> Otter Tail Power <b>Attn:</b> Josh Hollen <b>Address:</b> PO Box 496 Fergus Falls, MN 56538-0496 <b>Phone:</b> <b>Email:</b> <a href="mailto:jhollen@otpc.com">jhollen@otpc.com</a>		<b>CC:</b>	<b>Collected By:</b> Darren Nieswaag

Lab Number	Sample ID	Date	Time	Sample Type	Nitric					Temp (°C)	Spec. Cond.	pH	Appearance (clear, partly cloudy, cloudy)	Analysis Required
					1 Liter Raw	500 mL Nitric	500 mL Nitric (filtered)	250 mL Sulfuric	1 Liter Nitric					
W1196	FB Blue	11 May 21	NA	GW	X	X				NA	NA	NA	NA	
W1197	Blue 6	11 May 21	0819	GW	X	X				8.21	2327	6.83	104 Partly cloudy	
W1198	Blue 7/MS7/MSD7	10 May 21	1420	GW	3	3				11.97	2657	6.67	20.1 clear	
W1199	Blue 13	11 May 21	1023	GW	X	X				10.86	5346	6.67	85.7 clear	
W1200	Blue 14	10 May 21	1234	GW	X	X				10.38	5356	6.72	6.58 clear	
W1201	Blue 15	11 May 21	0958	GW	X	X				9.82	3731	6.63	10.4 clear	
W1202	Blue 16	10 May 21	1633	GW	X	X				11.95	2837	6.63	20.4 clear	

OTP CCR App 3

Comments:

Relinquished By		Sample Condition		Received By	
Name	Date/Time	Location	Temp (°C)	Name	Date/Time
	11 May 21 1856	<del>Log In</del> Walk In #2	0.1 TM562 / <del>NM80</del>		12 May 21 0800
1					
2					



**Quality Control Report**

Lab IDs: 21-W1196 to 21-W1202

Project: OTP Coyote-Blue

Work Order: 202182-1074

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Boron - Total mg/l	0.40	108	80-120	0.400	21-W1086	0.40	0.82	105	75-125	0.82	0.81	102	1.2	20	-	-	< 0.1
	0.40	102	80-120	0.400	21-W1198	0.37	0.76	97	75-125	0.76	0.77	100	1.3	20	-	-	< 0.1
															-	-	< 0.1
															-	-	< 0.1
															-	-	< 0.1
Calcium - Total mg/l	100	113	80-120	100	21-W1198Q	177	267	90	75-125	267	270	93	1.1	20	-	-	< 1
	100	113	80-120	500	21W1200q	268	785	103	75-125	785	780	102	0.6	20	-	-	< 1
															-	-	< 1
															-	-	< 1
															-	-	< 1
Chloride mg/l	30.0	91	80-120	60.0	21-D1408	117	183	110	80-120	183	187	117	2.2	20	-	-	< 2
	30.0	97	80-120	30.0	21-W1198	9.2	34.5	84	80-120	34.5	34.4	84	0.3	20	-	-	< 2
	30.0	91	80-120	30.0	21-W1208	< 2	26.5	88	80-120	26.5	26.6	89	0.4	20	-	-	< 2
	30.0	92	80-120	80-120											-	-	< 2
															-	-	< 2
Fluoride mg/l	0.50	108	90-110	0.500	21-W1198	0.19	0.76	114	80-120	0.76	0.75	112	1.3	20	-	-	< 0.1
pH units	-	-	-	-	-	-	-	-	-	8.4	8.4	-	0.0	20	-	-	-
	-	-	-	-	-	-	-	-	-	7.0	7.0	-	0.0	20	-	-	-
Sulfate mg/l	100	104	80-120	100	21-W1196	< 5	104	104	80-120	104	104	104	0.0	20	-	-	< 5
	100	104	80-120	500	21-W1198	906	1420	103	80-120	1420	1400	99	1.4	20	-	-	< 5
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	1770	2050	-	14.7	20	-	-	< 10
	-	-	-	-	-	-	-	-	-	6000	5920	-	1.3	20	-	-	< 10
	-	-	-	-	-	-	-	-	-	4550	4530	-	0.4	20	-	-	< 10

Samples were received on ice, on 12 May 2021 at 0800.

Temperature upon receipt at the Bismarck laboratory was 0.1°C.

All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.

With the exception of pH, all holding times were met.

Approved methodology was followed for all sample analyses.

All acceptance criteria were met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/duplicates unless noted here:

Approved by: \_\_\_\_\_

*C. Gaudin*  
 8 Jun 21



# Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: OTP Coyote

Event: Spring 2021

Sample ID: Blue 6

Sampling Personal: B. Jaramila

Weather Conditions: Temp: 35 °F Wind: Light @ Precip: Sunny / Partly Cloudy / Cloudy

## WELL INFORMATION

Well Locked?	YES	<del>NO</del>	
Well Labeled?	YES	NO	
Casing Strait?	YES	NO	
Grout Seal Intact?	YES	NO	Not Visible
Repairs Necessary?			
Casing Diameter:	2"		
Water Level Before Purge:	67.28	ft	
Total Depth of Well:	79.10	ft	
Well Volume:	7.1	liters	
Depth to Top of Pump:		ft	
Water Level After Sample:	70.53	ft	
Measurement Method:	Electric Water Level Indicator		

## SAMPLING INFORMATION

Purging Method:	Bladder	Control Settings:
Sampling Method:	Bladder	Purge: Sec.
Dedicated Equipment?	<del>YES</del> NO	Recover: Sec.
Duplicate Sample?	YES <del>NO</del>	PSI:
Duplicate Sample ID:		
Bottle List:		
1 Liter Raw		
500mL Nitric		

## FIELD READINGS

Stabilization Parameters (3 Consecutive)	Temp. (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±10	Turbidity (NTU) <5.0	Water Level (ft)	Pumping Rate mL/Min	Liters Removed	Appearance or Comment Clarity, Color, Odor, Ect.	
Purge Date	Time									clear, slightly turbid, turbid	
	0928	Start of Well Purge									
	0933	9.07	2404	6.99	9.51	62.9	54.7	68.294	100	500	CL
	0953	9.02	2417	7.03	6.22	60.4	57.1	STOP	300	6000	CL
	1001	- Purged dry									
	0814	Purged 5 min before sample									
	0816	8.21	2327	6.83	9.22	64.2	104	68.40	100	500	ST

Well Stabilized? YES ~~NO~~

Total Volume Purged: 200 / 7,000 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH			Turbidity (NTU)			Appearance or Comment Clarity, Color, Odor, Ect.
11 May 21	0819	8.21	2327	6.83	9.22	64.2	104	68.40		ST

Comments: 11 May 21: 67.31' before purge



# Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: OTP Coyote

Event: Spring 2021

Sample ID: Blue 7

Sampling Personal: Darwin Niebman

Weather Conditions: Temp: 54 °F Wind: N @ 10 Precip: Sunny / Partly Cloudy / Cloudy

### WELL INFORMATION

Well Locked?	<u>YES</u>	NO
Well Labeled?	<u>YES</u>	NO
Casing Strait?	<u>YES</u>	NO
Grout Seal Intact?	<u>YES</u>	NO
Repairs Necessary?		<u>Not Visible</u>
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>84.80</u>	ft
Total Depth of Well:	<u>97.66</u>	ft
Well Volume:	<u>8.0</u>	liters
Depth to Top of Pump:		ft
Water Level After Sample:	<u>84.85</u>	ft
Measurement Method:	<u>Electric Water Level Indicator</u>	

### SAMPLING INFORMATION

Purging Method:	<u>Bladder</u>	Control Settings:
Sampling Method:	<u>Bladder</u>	Purge: <u>3</u> Sec.
Dedicated Equipment?	<u>YES</u> <u>NO</u>	Recover: <u>57</u> Sec.
Duplicate Sample?	<u>YES</u>	PSI: <u>1</u>
Duplicate Sample ID:	<u>MS/MSD</u>	
Bottle List:		
<u>1 Liter Raw</u>		
<u>500mL Nitric</u>		
<u>X 3</u>		

### FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±10	Turbidity (NTU) <5.0	Water Level (ft)	Pumping Rate mL/Min	Liters Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time										
	<u>1300</u>	<u>Start of Well Purge</u>									
	<u>1305</u>	<u>13.22</u>	<u>2994</u>	<u>6.78</u>	<u>6.02</u>	<u>-62.8</u>	<u>26.6</u>	<u>84.85</u>	<u>100</u>	<u>500</u>	<u>CL</u>
	<u>1335</u>	<u>11.93</u>	<u>2591</u>	<u>6.75</u>	<u>0.22</u>	<u>-102.2</u>	<u>42.8</u>	<u>84.85</u>	<u>100</u>	<u>3000</u>	<u>CL</u>
	<u>1405</u>	<u>11.80</u>	<u>2620</u>	<u>6.69</u>	<u>0.13</u>	<u>-112.5</u>	<u>26.4</u>	<u>84.85</u>	<u>100</u>	<u>3000</u>	<u>CL</u>
	<u>1410</u>	<u>11.90</u>	<u>2644</u>	<u>6.68</u>	<u>0.18</u>	<u>-115.0</u>	<u>19.4</u>	<u>84.85</u>	<u>100</u>	<u>500</u>	<u>CL</u>
	<u>1415</u>	<u>11.84</u>	<u>2656</u>	<u>6.68</u>	<u>0.20</u>	<u>-116.8</u>	<u>19.6</u>	<u>84.85</u>	<u>100</u>	<u>500</u>	<u>CL</u>
	<u>1420</u>	<u>11.97</u>	<u>2657</u>	<u>6.67</u>	<u>0.15</u>	<u>-117.1</u>	<u>20.1</u>	<u>84.85</u>	<u>100</u>	<u>500</u>	<u>CL</u>

Well Stabilized? YES NO

Total Volume Purged: 8,000 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH		Turbidity (NTU)			Appearance or Comment Clarity, Color, Odor, Ect.
<u>10 May 21</u>	<u>1420</u>	<u>11.97</u>	<u>2657</u>	<u>6.67</u>		<u>20.1</u>			<u>CL</u>

Comments:





# Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: OTP Coyote

Event: Spring 2021

Sample ID: Blue 14

Sampling Personal: Damon Nierway

Weather Conditions: Temp: 52 °F Wind: Light @ Precip: Sunny / Partly Cloudy / Cloudy

### WELL INFORMATION

Well Locked?	<u>YES</u>	<u>NO</u>
Well Labeled?	<u>YES</u>	<u>NO</u>
Casing Strait?	<u>YES</u>	<u>NO</u>
Grout Seal Intact?	<u>YES</u>	<u>NO</u>
Repairs Necessary?	<u>Not Visible</u>	
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>80.29</u>	ft
Total Depth of Well:	<u>87.00</u>	ft
Well Volume:	<u>4.2</u>	liters
Depth to Top of Pump:		ft
Water Level After Sample:	<u>83.18</u>	ft
Measurement Method:	<u>Electric Water Level Indicator</u>	

### SAMPLING INFORMATION

Purging Method:	<u>Bladder</u>	Control Settings:
Sampling Method:	<u>Bladder</u>	Purge: <u>3</u> Sec.
Dedicated Equipment?	<u>YES</u>	Recover: <u>57</u> Sec.
Duplicate Sample?	<u>YES</u>	PSI:
Duplicate Sample ID:	<u>✓</u>	
Bottle List:		
<u>1 Liter Raw</u>		
<u>500mL Nitric</u>		

### FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±10	Turbidity (NTU) <5.0	Water Level (ft)	Pumping Rate mL/Min	Liters Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	Start of Well Purge									
	<u>1114</u>										
	<u>1119</u>	<u>10.58</u>	<u>5409</u>	<u>6.87</u>	<u>2.41</u>	<u>-61.5</u>	<u>99.7</u>	<u>80.66</u>	<u>100</u>	<u>500</u>	<u>clear</u>
	<u>1149</u>	<u>10.34</u>	<u>5400</u>	<u>6.71</u>	<u>2.47</u>	<u>-65.4</u>	<u>43.7</u>	<u>81.36</u>	<u>100</u>	<u>3000</u>	<u>clear</u>
	<u>1219</u>	<u>10.31</u>	<u>5385</u>	<u>6.69</u>	<u>0.75</u>	<u>-78.0</u>	<u>7.11</u>	<u>82.34</u>	<u>100</u>	<u>300</u>	<u>clear</u>
	<u>1224</u>	<u>10.26</u>	<u>5353</u>	<u>6.70</u>	<u>0.78</u>	<u>-79.9</u>	<u>6.90</u>	<u>82.42</u>	<u>100</u>	<u>500</u>	<u>clear</u>
	<u>1229</u>	<u>10.34</u>	<u>5357</u>	<u>6.70</u>	<u>0.74</u>	<u>-80.1</u>	<u>6.73</u>	<u>82.52</u>	<u>100</u>	<u>500</u>	<u>clear</u>
	<u>1234</u>	<u>10.38</u>	<u>5356</u>	<u>6.72</u>	<u>0.71</u>	<u>-81.4</u>	<u>6.58</u>	<u>82.68</u>	<u>100</u>	<u>500</u>	<u>clear</u>

Well Stabilized? YES NO

Total Volume Purged: 8,000 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
<u>10 May 21</u>	<u>1234</u>	<u>10.38</u>	<u>5356</u>	<u>6.72</u>	<u>6.58</u>	<u>clear</u>

Comments:



# Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: OTP Coyote

Event: Spring 2021

Sample ID: Blue 13

Sampling Personal: Darren Nicolson

Weather Conditions: Temp: 54 °F Wind: Light @ Precip: Sunny / Partly Cloudy / Cloudy

### WELL INFORMATION

Well Locked?	YES	<del>NO</del>
Well Labeled?	<del>YES</del>	NO
Casing Strait?	<del>YES</del>	NO
Grout Seal Intact?	YES	<del>NO</del> Not Visible
Repairs Necessary?		
Casing Diameter:	2"	
Water Level Before Purge:	104.49 ft	
Total Depth of Well:	116.65 ft	
Well Volume:	7.5 liters	
Depth to Top of Pump:	114.05 ft	
Water Level After Sample:	ft	
Measurement Method:	Electric Water Level Indicator	

### SAMPLING INFORMATION

Purging Method:	Bladder	Control Settings:
Sampling Method:	Bladder	Purge: <u>5</u> Sec.
Dedicated Equipment?	<del>YES</del> <u>NO</u>	Recover: <u>25</u> Sec.
Duplicate Sample?	YES <u>NO</u>	PSI:
Duplicate Sample ID:		
Bottle List:		
1 Liter Raw		
500mL Nitric		

### FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±10	Turbidity (NTU) <5.0	Water Level (ft)	Pumping Rate mL/Min	Liters Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time										clear, slightly turbid, turbid
	1010	Start of Well Purge									
	1015	10.22	4919	6.33	1.12	-69.2	21.8	107.91	300	4,500	cl
	1035	11.22	4758	6.28	1.46	-68.2	8.83	111.92	300	6,000	cl
	1045	restarted switched pump									
	1050	START									
	1105	10.42	5617	6.67	1.33	-74.5	55.7	114.05	300	4,500	
	1018	purged well for 5 min.									
11 May 21	1023	10.86	5346	6.67	4.65	-29.4	85.7	108.08	100	500	cl

Well Stabilized? YES ~~(NO)~~ Total Volume Purged: 65,500 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH			Turbidity (NTU)				Appearance or Comment Clarity, Color, Odor, Ect.
11 May 21	1023	10.86	5346	6.67	4.65	-29.4	85.7	100	500		cl

Comments: 1035 had issue with pump started again at 1050



# Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: OTP Coyote

Event: Spring 2021

Sample ID: Blue 15

Sampling Personal: Darren McWay

Weather Conditions: Temp: 35 °F Wind: Light @ Precip: Sunny / Partly Cloudy / Cloudy

### WELL INFORMATION

Well Locked?	YES <del>NO</del>
Well Labeled?	<del>YES</del> NO
Casing Strait?	<del>YES</del> NO
Grout Seal Intact?	<del>YES</del> NO
Repairs Necessary?	Not Visible
Casing Diameter:	<u>2"</u>
Water Level Before Purge:	<u>81.09</u> ft
Total Depth of Well:	<u>87.85</u> ft
Well Volume:	<u>42</u> liters
Depth to Top of Pump:	<u>-</u> ft
Water Level After Sample:	<u>81.40</u> ft
Measurement Method:	<u>Electric Water Level Indicator</u>

### SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES <del>NO</del>
Duplicate Sample?	YES <del>NO</del>
Duplicate Sample ID:	
Bottle List:	
1 Liter Raw	
500mL Nitric	
Control Settings:	
Purge:	<u>3</u> Sec.
Recover:	<u>57</u> Sec.
PSI:	

### FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±10	Turbidity (NTU) <5.0	Water Level (ft)	Pumping Rate mL/Min	Liters Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time										clear, slightly turbid, turbid
	<u>0838</u>	Start of Well Purge									
	<u>0843</u>	<u>8.04</u>	<u>3588</u>	<u>6.67</u>	<u>3.04</u>	<u>-173</u>	<u>121</u>	<u>81.28</u>	<u>100</u>	<u>500</u>	<u>ST</u>
	<u>0913</u>	<u>8.90</u>	<u>3714</u>	<u>6.63</u>	<u>0.66</u>	<u>-404</u>	<u>56.4</u>	<u>81.38</u>	<u>100</u>	<u>3000</u>	<u>clear</u>
	<u>0943</u>	<u>9.58</u>	<u>3729</u>	<u>6.63</u>	<u>0.58</u>	<u>-429</u>	<u>16.8</u>	<u>81.38</u>	<u>100</u>	<u>3000</u>	<u>clear</u>
	<u>0948</u>	<u>9.61</u>	<u>3723</u>	<u>6.63</u>	<u>0.63</u>	<u>-419</u>	<u>12.9</u>	<u>81.38</u>	<u>100</u>	<u>500</u>	<u>clear</u>
	<u>0953</u>	<u>9.73</u>	<u>3728</u>	<u>6.63</u>	<u>0.60</u>	<u>-425</u>	<u>12.4</u>	<u>81.38</u>	<u>100</u>	<u>500</u>	<u>clear</u>
	<u>0958</u>	<u>9.82</u>	<u>3731</u>	<u>6.63</u>	<u>0.64</u>	<u>-420</u>	<u>10.4</u>	<u>81.38</u>	<u>100</u>	<u>500</u>	<u>clear</u>

Well Stabilized? YES ~~NO~~ Total Volume Purged: 8000 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
<u>11 May 21</u>	<u>0958</u>	<u>9.82</u>	<u>3731</u>	<u>6.63</u>	<u>10.4</u>	<u>clear</u>

Comments:



# Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: OTP Coyote

Event: Spring 2021

Sample ID: Blue 16

Sampling Personal: Dawn Mesway

Weather Conditions: Temp: 57 °F Wind: NO @ 10 Precip: Sunny / Partly Cloudy / Cloudy

### WELL INFORMATION

Well Locked?	<u>YES</u>	NO
Well Labeled?	<u>YES</u>	NO
Casing Strait?	<u>YES</u>	NO
Grout Seal Intact?	<u>YES</u>	NO
Repairs Necessary?		Not Visible
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>80.44</u> ft	
Total Depth of Well:	<u>97.52</u> ft	
Well Volume:	<u>10.6</u> liters	
Depth to Top of Pump:	ft	
Water Level After Sample:	<u>80.28</u> ft	
Measurement Method:	<u>Electric Water Level Indicator</u>	

### SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES <u>NO</u>
Duplicate Sample?	YES <u>NO</u>
Duplicate Sample ID:	<u>1</u>
Bottle List:	
1 Liter Raw	
500mL Nitric	
Control Settings:	
Purge:	<u>7</u> Sec.
Recover:	<u>57</u> Sec.
PSI:	

### FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±10	Turbidity (NTU) <5.0	Water Level (ft)	Pumping Rate mL/Min	Liters Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time										clear, slightly turbid, turbid
	<u>1513</u>	Start of Well Purge									
	<u>1518</u>	<u>17.41</u>	<u>2761</u>	<u>6.65</u>	<u>1.15</u>	<u>-90.7</u>	<u>187</u>	<u>80.43</u>	<u>100</u>	<u>500</u>	<u>ST</u>
	<u>1548</u>	<u>12.00</u>	<u>2825</u>	<u>6.60</u>	<u>0.20</u>	<u>-97.1</u>	<u>63.5</u>	<u>80.46</u>	<u>100</u>	<u>3000</u>	<u>CU</u>
	<u>1618</u>	<u>11.97</u>	<u>2819</u>	<u>6.65</u>	<u>0.20</u>	<u>-80.3</u>	<u>33.7</u>	<u>80.48</u>	<u>100</u>	<u>3000</u>	<u>CU</u>
	<u>1623</u>	<u>11.94</u>	<u>2843</u>	<u>6.66</u>	<u>0.25</u>	<u>-81.8</u>	<u>23.1</u>	<u>80.47</u>	<u>100</u>	<u>500</u>	<u>CU</u>
	<u>1628</u>	<u>11.79</u>	<u>2829</u>	<u>6.63</u>	<u>0.29</u>	<u>-86.8</u>	<u>20.0</u>	<u>80.48</u>	<u>100</u>	<u>500</u>	<u>CU</u>
	<u>1633</u>	<u>11.95</u>	<u>2837</u>	<u>6.63</u>	<u>0.22</u>	<u>-88.9</u>	<u>20.4</u>	<u>80.48</u>	<u>100</u>	<u>500</u>	<u>CU</u>

Well Stabilized? YES NO

Total Volume Purged: 8,000 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
<u>10 May 21</u>	<u>1633</u>	<u>11.95</u>	<u>2837</u>	<u>6.63</u>	<u>20.4</u>	<u>CU</u>

Comments:



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Page: 1 of 7

## CERTIFICATE of ANALYSIS - CCR

Josh Hollen  
Otter Tail Power Co.  
PO Box 496  
Fergus Falls MN 56538-0496

Report Date: 28 Oct 21  
Lab Number: 21-W3824  
Work Order #: 82-2744  
Account #: 006106  
Date Sampled: 5 Oct 21  
Date Received: 7 Oct 21 8:00  
Sampled By: MVTL Field Service

Project Name: OTP Coyote - Blue CCR

Sample Description: FB Blue

PO #: 59625

Event and Year: Fall 2021

Temp at Receipt: 4.6C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	7 Oct 21	AC
Lab, pH	* 8.4	s.u.	0.1	SM4500-H+-B-11	7 Oct 21 17:00	RAA
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	7 Oct 21 17:00	RAA
Sulfate	< 5	mg/l	5.00	ASTM D516-11	8 Oct 21 9:45	SD
Chloride	< 2	mg/l	2.0	SM4500-Cl-E-11	7 Oct 21 16:21	SD
Total Dissolved Solids	< 10	mg/l	10	USGS I1750-85	7 Oct 21 14:00	RAA
Calcium - Total	< 1	mg/l	1.0	6010D	8 Oct 21 10:49	MDE
Boron - Total	< 0.1	mg/l	0.10	6010D	11 Oct 21 10:27	SZ

\* Holding time exceeded

Approved by:

Claudette K. Carroll

CC  
28OCT21

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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: ND # ND-00016



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www.mvtl.com



Page: 2 of 7

## CERTIFICATE of ANALYSIS - CCR

Josh Hollen  
Otter Tail Power Co.  
PO Box 496  
Fergus Falls MN 56538-0496

Report Date: 28 Oct 21  
Lab Number: 21-W3825  
Work Order #: 82-2744  
Account #: 006106  
Date Sampled: 5 Oct 21 9:58  
Date Received: 7 Oct 21 8:00  
Sampled By: MVTL Field Service

Project Name: OTP Coyote - Blue CCR

PO #: 59625

Sample Description: Blue 6

Temp at Receipt: 4.6C

Event and Year: Fall 2021

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	7 Oct 21	AC
Field pH	6.54	s.u.	0.1	SM 4500 H+ B	5 Oct 21 9:58	JSM
Lab, pH	* 6.8	s.u.	0.1	SM4500-H+-B-11	7 Oct 21 17:00	RAA
Field Appearance	Clear		NA	SM 2110	5 Oct 21 9:58	JSM
Field Temperature	11.9	Degrees C	0.1	SM 2550B	5 Oct 21 9:58	JSM
Field Conductivity	2516	umhos/cm	1	EPA 120.1	5 Oct 21 9:58	JSM
Fluoride	0.18	mg/l	0.10	SM4500-F-C	7 Oct 21 17:00	RAA
Sulfate	889	mg/l	5.00	ASTM D516-11	8 Oct 21 10:36	SD
Chloride	10.7	mg/l	2.0	SM4500-Cl-E-11	7 Oct 21 16:21	SD
Total Dissolved Solids	2020	mg/l	10	USGS I1750-85	7 Oct 21 13:44	AC
Calcium - Total	194	mg/l	1.0	6010D	8 Oct 21 11:49	MDE
Boron - Total	0.39	mg/l	0.10	6010D	11 Oct 21 10:27	SZ

\* Holding time exceeded

Approved by:

Claudette K. Carroll

CC  
28OCT21

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

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! = Due to sample quantity

# = Due to concentration of other analytes  
+ = Due to internal standard response

CERTIFICATION: ND # ND-00016





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Page: 3 of 7

## CERTIFICATE of ANALYSIS - CCR

Josh Hollen  
Otter Tail Power Co.  
PO Box 496  
Fergus Falls MN 56538-0496

Report Date: 28 Oct 21  
Lab Number: 21-W3826  
Work Order #: 82-2744  
Account #: 006106  
Date Sampled: 4 Oct 21 13:20  
Date Received: 7 Oct 21 8:00  
Sampled By: MVTl Field Service

Project Name: OTP Coyote - Blue CCR

PO #: 59625

Sample Description: Blue 7

Temp at Receipt: 4.6C

Event and Year: Fall 2021

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	7 Oct 21	AC
Field pH	6.64	s.u.	0.1	SM 4500 H+ B	4 Oct 21 13:20	JSM
Lab, pH	* 6.9	s.u.	0.1	SM4500-H+-B-11	7 Oct 21 17:00	RAA
Field Appearance	Clear		NA	SM 2110	4 Oct 21 13:20	JSM
Field Temperature	16.4	Degrees C	0.1	SM 2550B	4 Oct 21 13:20	JSM
Field Conductivity	2763	umhos/cm	1	EPA 120.1	4 Oct 21 13:20	JSM
Fluoride	0.20	mg/l	0.10	SM4500-F-C	7 Oct 21 17:00	RAA
Sulfate	880	mg/l	5.00	ASTM D516-11	8 Oct 21 10:36	SD
Chloride	10.2	mg/l	2.0	SM4500-Cl-E-11	7 Oct 21 16:43	SD
Total Dissolved Solids	2160	mg/l	10	USGS I1750-85	7 Oct 21 13:44	AC
Calcium - Total	171	mg/l	1.0	6010D	8 Oct 21 11:49	MDE
Boron - Total	0.39	mg/l	0.10	6010D	11 Oct 21 10:27	SZ

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*28 OCT 21*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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: ND # ND-00016



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Page: 4 of 7

## CERTIFICATE of ANALYSIS - CCR

Josh Hollen  
Otter Tail Power Co.  
PO Box 496  
Fergus Falls MN 56538-0496

Report Date: 28 Oct 21  
Lab Number: 21-W3827  
Work Order #: 82-2744  
Account #: 006106  
Date Sampled: 5 Oct 21 8:52  
Date Received: 7 Oct 21 8:00  
Sampled By: MVTL Field Service

Project Name: OTP Coyote - Blue CCR

PO #: 59625

Sample Description: Blue 13

Temp at Receipt: 4.6C

Event and Year: Fall 2021

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	7 Oct 21	AC
Field pH	6.82	s.u.	0.1	SM 4500 H+ B	5 Oct 21 8:52	JSM
Lab, pH	* 7.0	s.u.	0.1	SM4500-H+-B-11	7 Oct 21 17:00	RAA
Field Appearance	Clear		NA	SM 2110	5 Oct 21 8:52	JSM
Field Temperature	11.0	Degrees C	0.1	SM 2550B	5 Oct 21 8:52	JSM
Field Conductivity	6148	umhos/cm	1	EPA 120.1	5 Oct 21 8:52	JSM
Fluoride	0.26	mg/l	0.10	SM4500-F-C	7 Oct 21 17:00	RAA
Sulfate	2310	mg/l	5.00	ASTM D516-11	8 Oct 21 10:36	SD
Chloride	41.9	mg/l	2.0	SM4500-Cl-E-11	7 Oct 21 16:43	SD
Total Dissolved Solids	5070	mg/l	10	USGS I1750-85	7 Oct 21 13:44	AC
Calcium - Total	155	mg/l	1.0	6010D	27 Oct 21 11:55	MDE
Boron - Total	0.58	mg/l	0.10	6010D	11 Oct 21 10:27	SZ

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*CC*  
*28 OCT 21*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

@ = Due to sample matrix  
! = Due to sample quantity

# = Due to concentration of other analytes  
+ = Due to internal standard response

CERTIFICATION: ND # ND-00016





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Page: 5 of 7

## CERTIFICATE of ANALYSIS - CCR

Josh Hollen  
Otter Tail Power Co.  
PO Box 496  
Fergus Falls MN 56538-0496

Report Date: 28 Oct 21  
Lab Number: 21-W3828  
Work Order #: 82-2744  
Account #: 006106  
Date Sampled: 5 Oct 21 14:26  
Date Received: 7 Oct 21 8:00  
Sampled By: MVTL Field Service

Project Name: OTP Coyote - Blue CCR

PO #: 59625

Sample Description: Blue 14

Temp at Receipt: 4.6C

Event and Year: Fall 2021

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	7 Oct 21	AC
Field pH	6.75	s.u.	0.1	SM 4500 H+ B	5 Oct 21 14:26	JSM
Lab, pH	* 7.0	s.u.	0.1	SM4500-H+-B-11	7 Oct 21 17:00	RAA
Field Appearance	Clear		NA	SM 2110	5 Oct 21 14:26	JSM
Field Temperature	15.8	Degrees C	0.1	SM 2550B	5 Oct 21 14:26	JSM
Field Conductivity	5505	umhos/cm	1	EPA 120.1	5 Oct 21 14:26	JSM
Fluoride	0.14	mg/l	0.10	SM4500-F-C	7 Oct 21 17:00	RAA
Sulfate	2120	mg/l	5.00	ASTM D516-11	8 Oct 21 10:36	SD
Chloride	11.3	mg/l	2.0	SM4500-Cl-E-11	7 Oct 21 16:43	SD
Total Dissolved Solids	4530	mg/l	10	USGS I1750-85	7 Oct 21 13:44	AC
Calcium - Total	248	mg/l	1.0	6010D	8 Oct 21 11:49	MDE
Boron - Total	0.59	mg/l	0.10	6010D	11 Oct 21 10:27	SZ

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*CC*  
*28 OCT 21*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

@ = Due to sample matrix  
! = Due to sample quantity

# = Due to concentration of other analytes  
+ = Due to internal standard response

CERTIFICATION: ND # ND-00016



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## CERTIFICATE of ANALYSIS - CCR

Josh Hollen  
Otter Tail Power Co.  
PO Box 496  
Fergus Falls MN 56538-0496

Report Date: 28 Oct 21  
Lab Number: 21-W3829  
Work Order #: 82-2744  
Account #: 006106  
Date Sampled: 5 Oct 21 12:46  
Date Received: 7 Oct 21 8:00  
Sampled By: MVTL Field Service

Project Name: OTP Coyote - Blue CCR

PO #: 59625

Sample Description: Blue 15

Temp at Receipt: 4.6C

Event and Year: Fall 2021

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	7 Oct 21	AC
Field pH	6.51	s.u.	0.1	SM 4500 H+ B	5 Oct 21 12:46	JSM
Lab, pH	* 6.7	s.u.	0.1	SM4500-H+-B-11	7 Oct 21 17:00	RAA
Field Appearance	Clear		NA	SM 2110	5 Oct 21 12:46	JSM
Field Temperature	14.2	Degrees C	0.1	SM 2550B	5 Oct 21 12:46	JSM
Field Conductivity	3949	umhos/cm	1	EPA 120.1	5 Oct 21 12:46	JSM
Fluoride	0.16	mg/l	0.10	SM4500-F-C	7 Oct 21 17:00	RAA
Sulfate	1080	mg/l	5.00	ASTM D516-11	8 Oct 21 10:36	SD
Chloride	12.4	mg/l	2.0	SM4500-Cl-E-11	7 Oct 21 16:43	SD
Total Dissolved Solids	2950	mg/l	10	USGS I1750-85	7 Oct 21 13:44	AC
Calcium - Total	161	mg/l	1.0	6010D	8 Oct 21 11:49	MDE
Boron - Total	0.50	mg/l	0.10	6010D	11 Oct 21 10:27	SZ

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*AC*  
*28 OCT 21*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

@ = Due to sample matrix  
! = Due to sample quantity

# = Due to concentration of other analytes  
+ = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Page: 7 of 7

## CERTIFICATE of ANALYSIS - CCR

Josh Hollen  
Otter Tail Power Co.  
PO Box 496  
Fergus Falls MN 56538-0496

Report Date: 28 Oct 21  
Lab Number: 21-W3830  
Work Order #: 82-2744  
Account #: 006106  
Date Sampled: 5 Oct 21 11:37  
Date Received: 7 Oct 21 8:00  
Sampled By: MVTL Field Service

Project Name: OTP Coyote - Blue CCR

PO #: 59625

Sample Description: Blue 16

Temp at Receipt: 4.6C

Event and Year: Fall 2021

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	7 Oct 21	AC
Field pH	6.56	s.u.	0.1	SM 4500 H+ B	5 Oct 21 11:37	JSM
Lab, pH	* 6.8	s.u.	0.1	SM4500-H+-B-11	7 Oct 21 17:00	RAA
Field Appearance	Clear		NA	SM 2110	5 Oct 21 11:37	JSM
Field Temperature	13.5	Degrees C	0.1	SM 2550B	5 Oct 21 11:37	JSM
Field Conductivity	2847	umhos/cm	1	EPA 120.1	5 Oct 21 11:37	JSM
Fluoride	0.19	mg/l	0.10	SM4500-F-C	7 Oct 21 17:00	RAA
Sulfate	1030	mg/l	5.00	ASTM D516-11	8 Oct 21 10:36	SD
Chloride	13.1	mg/l	2.0	SM4500-Cl-E-11	7 Oct 21 16:43	SD
Total Dissolved Solids	2230	mg/l	10	USGS I1750-85	7 Oct 21 13:44	AC
Calcium - Total	165	mg/l	1.0	6010D	8 Oct 21 11:49	MDE
Boron - Total	0.37	mg/l	0.10	6010D	11 Oct 21 10:27	SZ

\* Holding time exceeded

Approved by:

Claudette K. Carroll

lc  
28 OCT 21

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

CERTIFICATION: ND # ND-00016



**Quality Control Report**

Lab IDs: 21-W3824 to 21-W3830

Project: OTP Coyote - Blue CCR

Work Order: 202182-2744

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Boron - Total mg/l	0.40	102	80-120	0.400	21-D3067	0.34	0.70	90	75-125	0.70	0.69	88	1.4	20	-	-	< 0.1
				80.0	21-M2637	70.0	142	90	75-125	142	144	92	1.4	20	-	-	< 0.1
				0.400	21-W3826	0.39	0.75	90	75-125	0.75	0.74	88	1.3	20	-	-	
Calcium - Total mg/l	100	108	80-120	2000	21W3812q	2940	4560	81	75-125	4560	4600	83	0.9	20	-	-	< 1
	100	106	80-120	500	21W3828q	248	710	92	75-125	710	710	92	0.0	20	-	-	< 1
	100	111	80-120	500	21D3286q	27.8	550	104	75-125	550	550	104	0.0	20	-	-	< 1
				500	21W3827q	155	660	101	75-125	660	665	102	0.8	20	-	-	< 1
Chloride mg/l	30.0	93	80-120	30.0	21-W3826	10.2	35.9	86	80-120	35.9	36.1	86	0.6	20	-	-	< 2
	30.0	93	80-120												-	-	< 2
Fluoride mg/l	0.50	106	90-110	0.500	21-W3844	0.72	1.29	114	80-120	1.29	1.28	112	0.8	20	-	-	< 0.1
	0.50	106	90-110	0.500	21-W3826	0.20	0.74	108	80-120	0.74	0.74	108	0.0	20	-	-	< 0.1
				0.500	21-W3837	0.31	0.80	98	80-120	0.80	0.80	98	0.0	20	-	-	
pH units	-	-	-	-	-	-	-	-	-	6.9	6.8	-	1.5	20	-	-	-
	-	-	-	-	-	-	-	-	-	6.8	6.9	-	1.5	20	-	-	-
Sulfate mg/l	100	96	80-120	100	21-W3824	< 5	93.1	93	80-120	93.1	93.9	94	0.9	20	-	-	< 5
	100	94	80-120	500	21-W3826	880	1300	84	80-120	1300	1300	84	0.0	20	-	-	< 5
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	2230	2210	-	0.9	20	-	-	< 10
	-	-	-	-	-	-	-	-	-	2890	2850	-	1.4	20	-	-	

Samples were received in good condition on 7 Oct 2021 at 0800.

Temperature upon receipt at the Bismarck laboratory was 4.6°C.

All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.

With the exception of pH, all holding times were met.

Approved methodology was followed for all sample analyses.

All acceptance criteria were met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/duplicates unless noted here:

Approved by: C. Cantor  
 28 OCT 21



# Field Datasheet

Groundwater Assessment

Company: OTP Coyote  
 Event: Fall 2021  
 Sample ID: Blue 6  
 Sampling Personal: J. [Signature]

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Weather Conditions: Temp: 65°F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

### WELL INFORMATION

Well Locked?	YES	<del>NO</del>
Well Labeled?	<del>YES</del>	NO
Casing Strait?	<del>YES</del>	NO
Grout Seal Intact?	YES	<del>NO</del> Not Visible
Repairs Necessary?		
Casing Diameter:	2"	
Water Level Before Purge:	67.37	ft
Total Depth of Well:	79.12	ft
Well Volume:	1.2	liters
Depth to Top of Pump:	71.80	ft
Water Level After Sample:	71.05	ft
Measurement Method:	Electric Water Level Indicator	

### SAMPLING INFORMATION

Purging Method:	Bladder
Sampling Method:	Bladder
Dedicated Equipment?	YES <del>NO</del>
Duplicate Sample?	YES <del>NO</del>
Duplicate Sample ID:	

Control Settings:	
Purge:	5 Sec.
Recover:	55 Sec.
PSI:	100

Bottle List:	
1 Liter Raw	
500mL Nitric	

### FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±10	Turbidity (NTU) <5.0	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time										
	1105	Start of Well Purge									
4 Oct 21	1110	14.25	2609	6.66	2.92	178.0	55.64	68.45	100.0	500.0	Clear
	1140	19.43	2405	6.84	10.94	96.2	89.45	71.80	300.0	9000.0	
								8"			
	0953							69.02			
5 Oct 21	0958	11.94	2516	6.54	2.57	96.7	73.78	70.10	800.0	5000	Clear

Well Stabilized? YES ~~NO~~

Total Volume Purged: 10,000.0 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH		Turbidity (NTU)		Appearance or Comment Clarity, Color, Odor, Ect.
5 Oct 21	0958	11.94	2516	6.54		73.78		Clear

Comments:



# Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: OTP Coyote

Event: Fall 2021

Sample ID: Blue 7

Sampling Personal: [Signature]

Weather Conditions: Temp: 80 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

## WELL INFORMATION

Well Locked?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
Well Labeled?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
Casing Strait?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
Grout Seal Intact?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO <u>Not Visible</u>
Repairs Necessary?		
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>84.39</u>	ft
Total Depth of Well:	<u>97.65</u>	ft
Well Volume:	<u>-</u>	liters
Depth to Top of Pump:	<u>-</u>	ft
Water Level After Sample:	<u>85.43</u>	ft
Measurement Method:	<u>Electric Water Level Indicator</u>	

## SAMPLING INFORMATION

Purging Method:	<u>Bladder 1"</u>	Control Settings:
Sampling Method:	<u>Bladder 1"</u>	Purge: <u>5</u> Sec.
Dedicated Equipment?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Recover: <u>15</u> Sec.
Duplicate Sample?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	PSI: <u>40</u>
Duplicate Sample ID:	<u>MS/MSX</u>	
Bottle List:		
<u>1 Liter Raw</u>		
<u>500mL Nitric</u>		

## FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±10	Turbidity (NTU) <5.0	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	Start of Well Purge									
<u>4 Oct 21</u>	<u>1200</u>										
	<u>1205</u>	<u>21.25</u>	<u>2589</u>	<u>6.74</u>	<u>3.70</u>	<u>62.4</u>	<u>35.36</u>	<u>85.42</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1235</u>	<u>16.03</u>	<u>2704</u>	<u>6.67</u>	<u>0.14</u>	<u>-4.3</u>	<u>40.78</u>	<u>85.42</u>	<u>100.0</u>	<u>3000.0</u>	<u>Clear</u>
	<u>1305</u>	<u>16.39</u>	<u>2765</u>	<u>6.64</u>	<u>0.10</u>	<u>-11.9</u>	<u>26.41</u>	<u>85.43</u>	<u>100.0</u>	<u>3000.0</u>	<u>Clear</u>
	<u>1310</u>	<u>16.64</u>	<u>2752</u>	<u>6.64</u>	<u>0.10</u>	<u>-13.3</u>	<u>24.32</u>	<u>85.43</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1315</u>	<u>16.15</u>	<u>2760</u>	<u>6.64</u>	<u>0.10</u>	<u>-13.7</u>	<u>23.42</u>	<u>85.43</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1320</u>	<u>16.45</u>	<u>2763</u>	<u>6.64</u>	<u>0.09</u>	<u>-14.5</u>	<u>20.57</u>	<u>85.43</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>

Well Stabilized?  YES  NO Total Volume Purged: 8000.0 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
<u>4 Oct 21</u>	<u>1320</u>	<u>16.45</u>	<u>2763</u>	<u>6.64</u>	<u>20.57</u>	<u>Clear</u>

Comments:



# Field Datasheet

Groundwater Assessment

Company: OTP Coyote

Event: Fall 2021

Sample ID: Blue 13

Sampling Personal: [Signature]

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Weather Conditions: Temp: 60 °F Wind: S @ 5-10 Precip: Sunny / (Partly Cloudy) / Cloudy

## WELL INFORMATION

Well Locked?	<u>YES</u>	<u>NO</u>
Well Labeled?	<u>YES</u>	<u>NO</u>
Casing Strait?	<u>YES</u>	<u>NO</u>
Grout Seal Intact?	<u>YES</u>	<u>NO</u>
Repairs Necessary?	<u>Not Visible</u>	
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>105.35</u>	ft
Total Depth of Well:	<u>116.65</u>	ft
Well Volume:	<u>7.5</u>	liters
Depth to Top of Pump:	<u>114.98</u>	ft
Water Level After Sample:	<u>110.95</u>	ft
Measurement Method:	<u>Electric Water Level Indicator</u>	

## SAMPLING INFORMATION

Purging Method:	<u>Bladder</u>
Sampling Method:	<u>Bladder</u>
Dedicated Equipment?	<u>YES</u> <u>NO</u>
Duplicate Sample?	<u>YES</u> <u>NO</u>
Duplicate Sample ID:	<u>—</u>

Control Settings:	
Purge: <u>5</u>	Sec.
Recover: <u>55</u>	Sec.
PSI: <u>100</u>	

Bottle List:	
<u>1 Liter Raw</u>	
<u>500mL Nitric</u>	

## FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±10	Turbidity (NTU) <5.0	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time										clear, slightly turbid, turbid
	<u>1005</u>	<u>Start of Well Purge</u>									
	<u>1010</u>	<u>12.21</u>	<u>4881</u>	<u>6.46</u>	<u>2.61</u>	<u>223.9</u>	<u>129.32</u>	<u>107.70</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
<u>4 Oct 21</u>	<u>1040</u>	<u>12.63</u>	<u>5184</u>	<u>6.43</u>	<u>1.12</u>	<u>173.7</u>	<u>73.41</u>	<u>114.98</u>	<u>300.0</u>	<u>900.0</u>	<u>Clear</u>
		<u>Purged An</u>									
<u>5 Oct 21</u>	<u>0847</u>	<u>Purged well for 5 min to clear line</u>									
	<u>0852</u>	<u>11.02</u>	<u>6148</u>	<u>6.82</u>	<u>2.73</u>	<u>176.0</u>	<u>15.62</u>	<u>108.70</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>

Well Stabilized? YES NO Total Volume Purged: 10,000.0 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
<u>5 Oct 21</u>	<u>0852</u>	<u>11.02</u>	<u>6148</u>	<u>6.82</u>	<u>15.62</u>	<u>Clear</u>

Comments:



# Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: OTP Coyote

Event: Fall 2021

Sample ID: Blue 14

Sampling Personal: [Signature]

Weather Conditions: Temp: 70°F Wind: S @ S-10 Precip: Sunny / Partly Cloudy / Cloudy

### WELL INFORMATION

Well Locked?	YES <del>NO</del>
Well Labeled?	YES <del>NO</del>
Casing Strait?	YES <del>NO</del>
Grout Seal Intact?	YES <del>NO</del> <u>Not Visible</u>
Repairs Necessary?	
Casing Diameter:	<u>2"</u>
Water Level Before Purge:	<u>80.25</u> ft
Total Depth of Well:	<u>      </u> ft
Well Volume:	<u>      </u> liters
Depth to Top of Pump:	<u>      </u> ft
Water Level After Sample:	<u>85.13</u> ft
Measurement Method:	<u>Electric Water Level Indicator</u>

### SAMPLING INFORMATION

Purging Method:	<u>Bladder</u>
Sampling Method:	<u>Bladder</u>
Dedicated Equipment?	YES <del>NO</del>
Duplicate Sample?	YES <del>NO</del>
Duplicate Sample ID:	<u>      </u>
Bottle List:	
<u>1 Liter Raw</u>	
<u>500mL Nitric</u>	
Control Settings:	
Purge:	<u>5</u> Sec.
Recover:	<u>55</u> Sec.
PSI:	<u>60</u>

### FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±10	Turbidity (NTU) <5.0	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time	Start of Well Purge									
5 Oct 21	1306										
	1311	12.60	5606	6.70	0.17	76.5	117.75	81.15	100.0	500.0	Slightly Turbid
	1341	14.46	5503	6.73	0.16	21.6	54.18	83.06	100.0	3000.0	Clear
	1411	14.73	5495	6.77	0.13	3.0	40.58	84.24	100.0	3000.0	Clear
	1416	15.64	5507	6.75	0.16	2.1	75.57	84.33	100.0	500.0	Clear
	1421	15.87	5519	6.75	0.18	4.6	80.32	84.47	100.0	500.0	Clear
	1426	15.77	5505	6.75	0.29	10.3	78.46	84.58	100.0	500.0	Clear

Well Stabilized? YES ~~NO~~ Total Volume Purged: 8000.0 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
5 Oct 21	1426	15.77	5505	6.75	78.46	Clear

Comments: Collected Field Plank @ 1305





# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: OTP Coyote

Event: Fall 2021

Sample ID: Blue 15

Sampling Personal: Jy Mj

Weather Conditions: Temp: 70°F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

### WELL INFORMATION

Well Locked?	<u>YES</u>	<u>NO</u>	
Well Labeled?	<u>YES</u>	<u>NO</u>	
Casing Strait?	<u>YES</u>	<u>NO</u>	
Grout Seal Intact?	<u>YES</u>	<u>NO</u>	Not Visible
Repairs Necessary?			
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>81.08</u>	ft	
Total Depth of Well:	<u>—</u>	ft	
Well Volume:	<u>—</u>	liters	
Depth to Top of Pump:	<u>—</u>	ft	
Water Level After Sample:	<u>82.53</u>	ft	
Measurement Method:	<u>Electric Water Level Indicator</u>		

### SAMPLING INFORMATION

Purging Method:	<u>Bladder</u>
Sampling Method:	<u>Bladder</u>
Dedicated Equipment?	<u>YES</u> <u>NO</u>
Duplicate Sample?	<u>YES</u> <u>NO</u>
Duplicate Sample ID:	<u>—</u>

Control Settings:	
Purge: <u>5</u>	Sec.
Recover: <u>55</u>	Sec.
PSI: <u>60</u>	

Bottle List:	
<u>1 Liter Raw</u>	
<u>500mL Nitric</u>	

### FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±10	Turbidity (NTU) <5.0	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
Purge Date	Time										
		<u>Start of Well Purge</u>									
<u>5 Oct 21</u>	<u>1156</u>										
	<u>1201</u>	<u>12.29</u>	<u>3973</u>	<u>6.50</u>	<u>0.08</u>	<u>55.1</u>	<u>165.79</u>	<u>82.00</u>	<u>100.0</u>	<u>500.0</u>	<u>Slightly Turbid</u>
	<u>1231</u>	<u>12.14</u>	<u>3939</u>	<u>6.55</u>	<u>0.03</u>	<u>23.3</u>	<u>17.38</u>	<u>82.55</u>	<u>100.0</u>	<u>3000.0</u>	<u>Clear</u>
	<u>1236</u>	<u>14.18</u>	<u>3953</u>	<u>6.51</u>	<u>0.06</u>	<u>27.0</u>	<u>14.45</u>	<u>82.53</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1241</u>	<u>14.39</u>	<u>3951</u>	<u>6.51</u>	<u>0.07</u>	<u>26.9</u>	<u>11.91</u>	<u>82.54</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
<u>1246</u>	<u>14.24</u>	<u>3949</u>	<u>6.51</u>	<u>0.07</u>	<u>25.6</u>	<u>11.12</u>	<u>82.55</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>	

Well Stabilized? YES NO

Total Volume Purged: 5000.0 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH		Turbidity (NTU)			Appearance or Comment Clarity, Color, Odor, Ect.
<u>5 Oct 21</u>	<u>1246</u>	<u>14.24</u>	<u>3949</u>	<u>6.51</u>	<u>0.07</u>	<u>11.12</u>			<u>Clear</u>

Comments:



# Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: OTP Coyote

Event: Fall 2021

Sample ID: Blue 16

Sampling Personal: [Signature]

Weather Conditions: Temp: 65 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

### WELL INFORMATION

Well Locked?	<u>YES</u>	NO
Well Labeled?	<u>YES</u>	NO
Casing Strait?	<u>YES</u>	NO
Grout Seal Intact?	<u>YES</u>	<u>NO</u> Not Visible
Repairs Necessary?		
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>80.60</u>	ft
Total Depth of Well:	<u>—</u>	ft
Well Volume:	<u>—</u>	liters
Depth to Top of Pump:	<u>—</u>	ft
Water Level After Sample:	<u>80.63</u>	ft
Measurement Method:	<u>Electric Water Level Indicator</u>	

### SAMPLING INFORMATION

Purging Method:	<u>Bladder</u>	Control Settings:
Sampling Method:	<u>Bladder</u>	Purge: <u>5</u> Sec.
Dedicated Equipment?	<u>YES</u> <u>NO</u>	Recover: <u>55</u> Sec.
Duplicate Sample?	<u>YES</u> <u>NO</u>	PSI: <u>60</u>
Duplicate Sample ID:	<u>—</u>	
Bottle List:		
<u>1 Liter Raw</u>		
<u>500mL Nitric</u>		

### FIELD READINGS

Stabilization Parameters (3 Consecutive)		Temp. (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate mL/Min	mL Removed	Appearance or Comment
Purge Date	Time		±5%	±0.1	±10%	±10	<5.0				Clarity, Color, Odor, Ect.
	<u>1017</u>	<u>Start of Well Purge</u>									
	<u>1022</u>	<u>13.22</u>	<u>2813</u>	<u>6.60</u>	<u>0.52</u>	<u>61.3</u>	<u>121.18</u>	<u>80.65</u>	<u>100.0</u>	<u>500.0</u>	<u>Slightly Turbid</u>
	<u>1052</u>	<u>12.86</u>	<u>2836</u>	<u>6.56</u>	<u>0.18</u>	<u>52.7</u>	<u>70.05</u>	<u>80.62</u>	<u>100.0</u>	<u>3000.0</u>	<u>Clear</u>
	<u>1122</u>	<u>13.31</u>	<u>2845</u>	<u>6.56</u>	<u>0.15</u>	<u>59.5</u>	<u>45.18</u>	<u>80.63</u>	<u>100.0</u>	<u>3000.0</u>	<u>Clear</u>
	<u>1127</u>	<u>13.32</u>	<u>2853</u>	<u>6.56</u>	<u>0.15</u>	<u>64.8</u>	<u>39.53</u>	<u>80.63</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1132</u>	<u>13.08</u>	<u>2849</u>	<u>6.56</u>	<u>0.12</u>	<u>60.7</u>	<u>38.07</u>	<u>80.62</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>
	<u>1137</u>	<u>13.50</u>	<u>2847</u>	<u>6.56</u>	<u>0.14</u>	<u>71.1</u>	<u>35.78</u>	<u>80.63</u>	<u>100.0</u>	<u>500.0</u>	<u>Clear</u>

Well Stabilized? YES NO

Total Volume Purged: 8000.0 Liters

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH		Turbidity (NTU)			Appearance or Comment
									Clarity, Color, Odor, Ect.
<u>5 Oct 21</u>	<u>1137</u>	<u>13.50</u>	<u>2847</u>	<u>6.56</u>		<u>35.78</u>			<u>Clear</u>

Comments:



2616 E. Broadway Ave  
Bismarck, ND 58501  
(701) 258-9720

# Chain of Custody Record

<b>Project Name:</b> <b>OTP Coyote - Blue CCR</b>	<b>Event:</b> <b>Fall 2021</b>	<b>Work Order Number:</b> <b>82-2744</b>
<b>Report To:</b> Otter Tail Power <b>Attn:</b> Josh Hollen <b>Address:</b> PO Box 496 Fergus Falls, MN 56538-0496 <b>Phone:</b> <b>Email:</b> <a href="mailto:jhollen@otpc.com">jhollen@otpc.com</a>	<b>CC:</b>	<b>Collected By:</b> 

Lab Number	Sample ID	Date	Time	Sample Type	Sample Type				Temp (°C)	Spec. Cond.	pH	Appearance (clear, partly cloudy, cloudy)	Analysis Required
					1 Liter Raw	500 mL Nitric	500 mL Nitric (filtered)	1 Liter Sulfuric					
W3824	FB Blue	5 Oct 21	NA	GW	X	X			NA	NA	NA	NA	OTP CCR App 3
W3825	Blue 6	5 Oct 21	0958	GW	X	X			11.94	2516	6.54	Clear	
W3826	Blue 7/MS7/MSD7	4 Oct 21	1320	GW	3	3			16.45	2763	6.64	Clear	
W3827	Blue 13	5 Oct 21	0852	GW	X	X			11.02	6148	6.82	Clear	
W3828	Blue 14	5 Oct 21	1426	GW	X	X			15.77	5505	6.75	Clear	
W3829	Blue 15	5 Oct 21	1246	GW	X	X			14.24	3949	6.51	Clear	
W3830	Blue 16	5 Oct 21	1137	GW	X	X			13.50	2847	6.56	Clear	

Comments:

Relinquished By		Sample Condition		Received By	
Name	Date/Time	Location	Temp (°C)	Name	Date/Time
1	6 Oct 21 1915	Log In Walk In #2	4.6 TM562 / TM805		7 Oct 21 0800
2					

## **Appendix B**

### **Groundwater Flow Calculations**

## Coyote Blue Pit Groundwater Velocity Calculation

Sampling Date 5/11/2021

### Upgradient (BLUE 13)

<b>Top of Casing Elevation</b>	2045.27	ft amsl	<i>Groundwater Monitoring System Report (Barr, 2016)</i>
<b>Depth to Water</b>	104.49	ft below TOC	
<b>Water Level Elevation</b>	1940.78	ft amsl	

### Downgradient (BLUE 15)

<b>Top of Casing Elevation</b>	1995.88	ft amsl	<i>Groundwater Monitoring System Report (Barr, 2016)</i>
<b>Depth to Water</b>	81.09	ft below TOC	
<b>Water Level Elevation</b>	1914.79	ft amsl	

<b>horizontal hydraulic conductivity (Kh)</b>	5.20E-05	cm/s	<i>Groundwater Monitoring System Report (Barr, 2016)</i>
	1.47E-01	ft/day	
<b>porosity (n)</b>	0.2		<i>Groundwater Monitoring System Report (Barr, 2016)</i>
<b>horizontal distance</b>	2403.4	ft	
<b>WL elevation difference</b>	25.99	ft	
<b>gradient (i)</b>	0.011	ft/ft	
<b>linear velocity (V)</b>	0.0080	ft/day	
<b>V</b>	<b>2.9</b>	ft/yr	

## Coyote Blue Pit Groundwater Velocity Calculation

Sampling Date 10/5/2021

### Upgradient (BLUE 13)

<b>Top of Casing Elevation</b>	2045.27	ft amsl	<i>Groundwater Monitoring System Report (Barr, 2016)</i>
<b>Depth to Water</b>	105.35	ft below TOC	
<b>Water Level Elevation</b>	1939.92	ft amsl	

### Downgradient (BLUE 15)

<b>Top of Casing Elevation</b>	1995.88	ft amsl	<i>Groundwater Monitoring System Report (Barr, 2016)</i>
<b>Depth to Water</b>	81.08	ft below TOC	
<b>Water Level Elevation</b>	1914.80	ft amsl	

<b>horizontal hydraulic conductivity (Kh)</b>	5.20E-05	cm/s	<i>Groundwater Monitoring System Report (Barr, 2016)</i>
	1.47E-01	ft/day	
<b>porosity (n)</b>	0.2		<i>Groundwater Monitoring System Report (Barr, 2016)</i>
<b>horizontal distance</b>	2403.4	ft	
<b>WL elevation difference</b>	25.12	ft	
<b>gradient (i)</b>	0.010	ft/ft	
<b>linear velocity (V)</b>	0.0077	ft/day	
<b>V</b>	<b>2.8</b>	ft/yr	