Entergy Arkansas, LLC
White Bluff Steam Electric Station
Landfill Cells 1-4

2023 Annual Groundwater Monitoring and Corrective Action Report

Prepared in Compliance with the EPA Final Rule for the Disposal of Coal Combustion Residuals Title 40 CFR Part 257

Prepared for:

PO Box 551
Little Rock, Arkansas 72203

Prepared by:

8550 United Plaza Blvd. Suite 502
Baton Rouge, LA 70809

January 31, 2024

TABLE OF CONTENTS

LIST OF APPENDICES

EXECUTIVE SUMMARY

Entergy Arkansas, LLC (Entergy), operates a coal ash disposal landfill (Landfill) for the disposal of coal combustion residuals (CCR) at the White Bluff Steam Electric Station (Plant) located near Redfield, Arkansas. The Landfill receives CCR generated from the combustion of coal at the Plant. Management of the CCR at the Landfill is performed pursuant to national criteria established in Title 40 of the Code of Federal Regulations (40 CFR), Part 257 (CCR Rule), effective April 19, 2015, and subsequent revisions to the CCR Rule.

The Plant conducted two semi-annual detection monitoring events in 2023 for the Landfill CCR unit monitoring well network per 40 CFR § 257.94. The statistical analyses completed for the second semi-annual 2022 and first semi-annual 2023 sampling event analytical data identified potential statistically significant increases (SSIs); therefore, alternate source demonstrations (ASDs) were performed for both semi-annual detection monitoring events and are attached to this report. Each of the ASDs performed were successful which resulted in the Landfill continuing to operate under the detection monitoring program. The Landfill CCR unit operated under the detection monitoring program (40 CFR § 257.94) during the duration of 2023.

1. INTRODUCTION

Entergy Arkansas, LLC (Entergy), operates the Landfill for the disposal of CCRs at the Plant located near Redfield, Arkansas (Lat: 34.421658 / Long: -92.139455). The Landfill receives CCR generated from the combustion of coal at the Plant. The CCR Landfill is managed in accordance with the national criteria established by the CCR Rule. Entergy installed a groundwater monitoring system at the Landfill that is subject to the groundwater monitoring and corrective action requirements provided under §257.90 through §257.98 of the CCR rule. In accordance with §257.90(e) of the CCR rule, Entergy must prepare an annual report that provides information regarding the groundwater monitoring and corrective action program at the Landfill.

2. GROUNDWATER MONITORING SYSTEM

The Landfill's groundwater monitoring system consists of 23 monitoring wells as shown on Figure 1 included in Appendix A. Pursuant to §257.91(f) of the CCR rule, a qualified Arkansas-registered professional engineer has certified the groundwater monitoring system, which was designed and constructed to meet the requirements of §257.91.

3. INSTALLED OR DECOMISSIONED WELLS DURING 2023

Entergy did not install any new wells or decommission any existing wells in the certified groundwater monitoring system during 2023.

4. GROUNDWATER MONITORING DATA

In accordance with §257.90(e)(3), all monitoring data obtained under §257.90 through §257.98 during 2023 are provided in Appendix B. Data include:

- Summary of the number of groundwater samples that were collected for analysis for each background and downgradient well;
- Dates the samples were collected; and
- Whether the sample was collected as part of detection or assessment monitoring.

5. STATUS SUMMARY OF THE 2023 GROUNDWATER MONITORING PROGRAM

Groundwater monitoring was performed in accordance with the detection monitoring requirements of §257.94. A summary of activities related to groundwater detection monitoring performed during 2023 is provided in the list below:

- In accordance with §257.94(b), semiannual detection monitoring was performed during the first half (June) and second half (November) of 2023 for analysis of Appendix III parameters (boron, calcium, chloride, fluoride, pH, sulfate and total dissolved solids (TDS)).

- Statistical evaluation of the semiannual detection monitoring data was performed in accordance with the statistical method certified by a qualified Arkansas-registered professional engineer. The certified statistical method has been posted to Entergy's CCR Rule Compliance Data and Information website.

- In 2023, Entergy completed a successful alternate source demonstration (ASD) per §257.94(e)(2) in response to potential statistically significant increases (SSIs) identified during the statistical evaluation of the data generated from the second half 2022 semi-annual detection monitoring event. As required by §257.94(e)(2), a copy of the ASD is included in Appendix C. Based on the successful evaluation conducted and results presented in the ASD, Entergy continued with detection monitoring in accordance with §257.94.

- The first half 2023 semi-annual detection monitoring sampling was performed during June 2023. Based on statistical evaluation of the data potential SSIs were identified for boron, calcium, chloride, fluoride, and total dissolved solids (TDS).

- Entergy completed a successful ASD per §257.94(e)(2) for the potential SSIs identified during the first half 2023 semi-annual detection monitoring event. As required by §257.94(e)(2), a copy of the ASD is included in Appendix C. Entergy continued with detection monitoring in accordance with §257.94.

- The second half 2023 semi-annual detection monitoring sampling was performed during November 2023. Statistical evaluation of the data will be performed during 2024 to determine if any SSIs are identified in accordance with §257.93(h).

- No problems were encountered during 2023 regarding the detection monitoring and corrective action system. Therefore, no actions were required to modify the system.

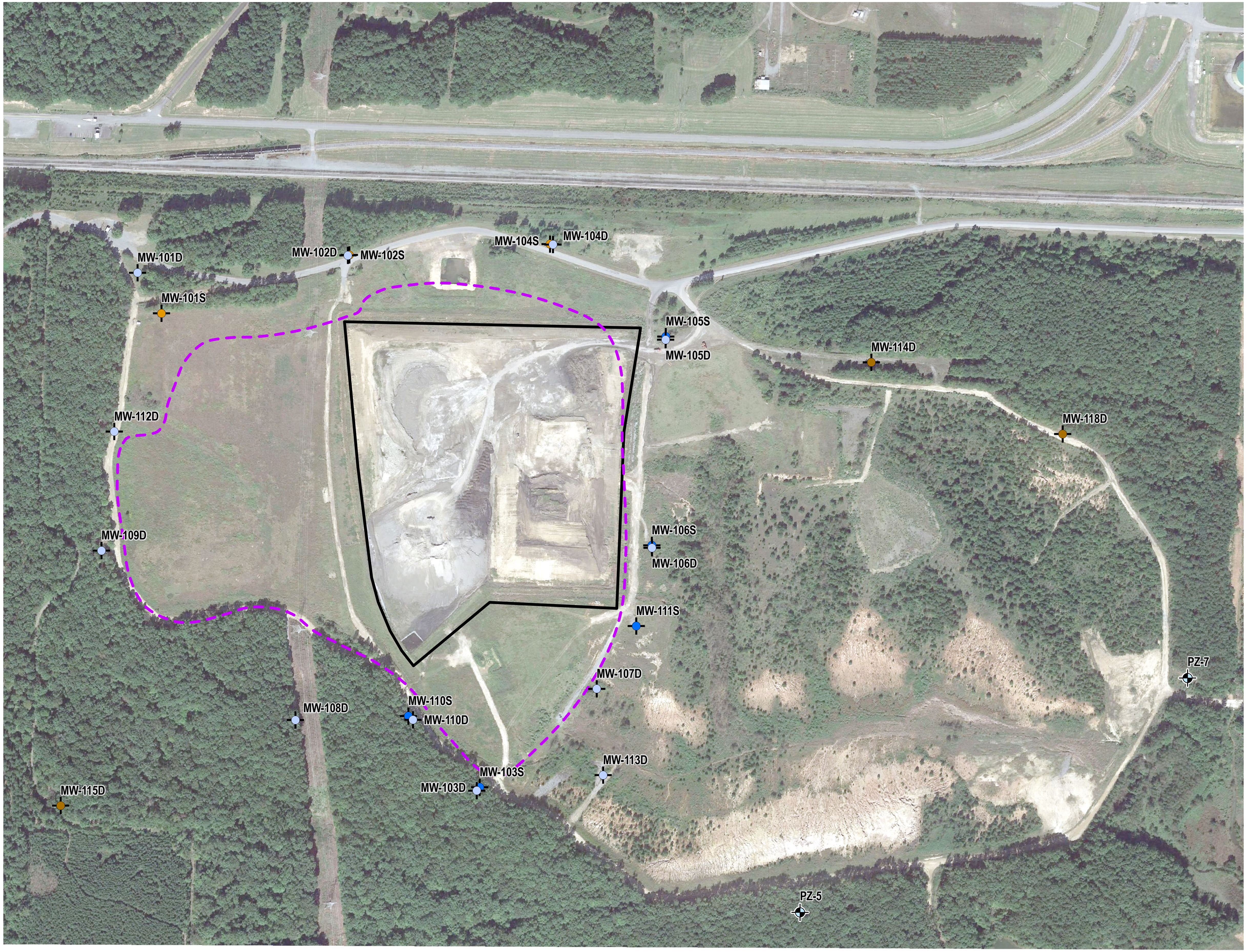
- The Landfill CCR unit remained in detection monitoring for the duration of 2023.

6. PROJECTED ACTIVITIES FOR 2024

Planned activities for the program during 2024 are listed below:

- Statistical evaluation of the second-half 2023 and first-half 2024 detection monitoring sampling data will be performed during 2024 to determine if any SSIs are identified.
- Semi-annual detection monitoring is planned for June and December 2024.

APPENDIX A
SITE MAP



LEGEND

- ◆ STRATUM I BACKROUND WELL
- ◆ STRATUM I MONITORING WELL
- ◆ STRATUM III BACKROUND WELL
- ◆ STRATUM III MONITORING WELL
- ⊕ STRATUM III PIEZOMETER
- ▭ APPROX. EXTENT OF CLOSED CADL
- ▭ APPROX. EXTENT OF ACTIVE CADL

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 2018.
2. COAL ASH DISPOSAL LANDFILL (CADL)

N

0 400 800 Feet

1 " = 400 '
1:4,800

PROJECT:

ENTERGY WHITE BLUFF PLANT
1100 WHITE BLUFF ROAD
REDFIELD, ARKANSAS

TITLE:

CADL EXTENT AND CCR GROUNDWATER MONITORING LOCATIONS

DRAWN BY:	S. MAJOR	PROJ. NO.:	341458
CHECKED BY:	S. SELLWOOD		
APPROVED BY:	J. HOUSE		**FIGURE 1**
DATE:	OCTOBER 2020		

TRC

Two United Plaza
8550 United Plaza Blvd., Suite 502
Baton Rouge, LA
Phone: 225.216.7483

FILE NO.: 341458-002.mxd

TRC - GIS

Coordinate System: NAD 1983 StatePlane Arkansas South FIPS 0302 Feet (Foot US)
Map Rotation: 0

Plot Date: 10/7/2020, 15:35:24 PM by SMAJOR -- LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\Entergy\MadisonLegacyProjects\Arkansas\2018_302967\341458-002.mxd

APPENDIX B
GROUNDWATER MONITORING DATA

Sampling Schedule, Entergy White Bluff CADL Network			
	Detection Monitoring Sampling Dates and Wells Sampled		
Well ID	6/6-6/8/2023	11/14-11/17/2023	Number of Samples Collected
MW-101S	X	X	2
MW-102S	X	X	2
MW-103S	X	[1]	1
MW-104S	X	X	2
MW-105S	X	X	2
MW-106S	X	X	2
MW-110S	X	X	2
MW-111S	X	X	2
MW-101D	X	X	2
MW-102D	X	X	2
MW-103D	X	X	2
MW-104D	X	X	2
MW-105D	X	X	2
MW-106D	X	X	2
MW-107D	X	X	2
MW-108D	X	X	2
MW-109D	X	X	2
MW-110D	X	X	2
MW-112D	X	X	2
MW-113D	X	X	2
MW-114D	X	X	2
MW-115D	X	X	2
MW-118D	X	X	2

Notes: All samples collected through 2023 were part of the detection monitoring program. No samples collected through 2023 were part of an assessment monitoring program.

[1] MW-103S was not sampled in November 2023 due to high turbidity.

Field pH Data Collected during 2023, Entergy White Bluff CADL network		
Well ID	Date Collected	pH (su)
MW-101S	06/08/2023	4.67
	11/17/2023	6.04
MW-102S	06/08/2023	4.28
	11/16/2023	6.02
MW-103S	06/07/2023	4.56
	11/15/2023	5.04
MW-104S	06/07/2023	5.00
	11/14/2023	5.50
MW-105S	06/07/2023	5.71
	11/16/2023	6.02
MW-106S	06/07/2023	4.02
	11/17/2023	4.00
MW-110S	06/07/2023	4.16
	11/15/2023	4.80
MW-111S	06/07/2023	3.98
	11/16/2023	3.86
MW-101D	06/08/2023	1.55
	11/17/2023	7.06
MW-102D	06/08/2023	3.68
	11/17/2023	7.47
MW-103D	06/07/2023	5.13
	11/15/2023	7.90
MW-104D	06/07/2023	6.19
	11/14/2023	7.61
MW-105D	06/07/2023	5.11
	11/14/2023	7.71

Field pH Data Collected during 2023, Entergy White Bluff CADL network		
Well ID	Date Collected	pH (su)
MW-106D	06/07/2023	6.75
	11/17/2023	9.99
MW-107D	06/06/2023	1.75
	11/16/2023	8.01
MW-108D	06/07/2023	5.01
	11/16/2023	7.74
MW-109D	06/08/2023	3.84
	11/16/2023	7.80
MW-110D	06/06/2023	6.92
	11/16/203	8.21
MW-112D	06/06/2023	5.65
	11/17/2023	7.57
MW-113D	06/08/2023	6.40
	11/15/203	7.30
MW-114D	06/08/2023	7.11
	11/15/2023	7.82
MW-115D	06/08/2023	7.26
	11/16/2023	7.86
MW-118D	06/06/2023	5.40
	11/17/2023	7.18

ANALYTICAL REPORT

August 28, 2023

Revised Report

GBMc & Associates - Bryant, AR

Sample Delivery Group:	L1624861
Samples Received:	06/10/2023
Project Number:	1145-21-080
Description:	Entergy - White Bluff
Site:	WHITE BLUFF
Report To:	Jonathan Brown 219 Brown Lane Little Rock, AR 72022

Entire Report Reviewed By: Brittnie Boyd

Brittnie L Boyd
Project Manager

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

TABLE OF CONTENTS

SAMPLE SUMMARY

RP-1 L1624861-01 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/05/23 16:08	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	10	06/23/23 16:37	06/23/23 16:37	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	100	06/23/23 16:51	06/23/23 16:51	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/20/23 23:36	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 18:41	LD	Mt. Juliet, TN

RP-2 L1624861-02 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/05/23 12:00	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/23/23 17:04	06/23/23 17:04	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/20/23 23:38	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 18:44	LD	Mt. Juliet, TN

RP-3 L1624861-03 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/06/23 14:14	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	10	06/23/23 18:38	06/23/23 18:38	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	5	06/23/23 17:58	06/23/23 17:58	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/20/23 23:41	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 18:48	LD	Mt. Juliet, TN

RP-4 L1624861-04 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/06/23 15:22	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/23/23 18:52	06/23/23 18:52	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/20/23 23:44	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 18:51	LD	Mt. Juliet, TN

RP-5 L1624861-05 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/06/23 09:20	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/23/23 19:05	06/23/23 19:05	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/20/23 23:52	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 19:04	LD	Mt. Juliet, TN

RP-6 L1624861-06 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/05/23 14:00	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/23/23 19:18	06/23/23 19:18	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	10	06/23/23 19:32	06/23/23 19:32	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/20/23 23:55	ZSA	Mt. Juliet, TN

SAMPLE SUMMARY

RP-6 L1624861-06 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/05/23 14:00	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 18:28	LD	Mt. Juliet, TN

RP-7 L1624861-07 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/06/23 10:27	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/23/23 19:45	06/23/23 19:45	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/20/23 23:58	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 19:07	LD	Mt. Juliet, TN

RP-8 L1624861-08 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/06/23 11:31	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/23/23 19:59	06/23/23 19:59	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/21/23 00:01	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 19:10	LD	Mt. Juliet, TN

RP-9 L1624861-09 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/06/23 13:00	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/23/23 20:14	06/23/23 20:14	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/21/23 00:04	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 19:14	LD	Mt. Juliet, TN

RP-10 L1624861-10 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/06/23 16:47	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/23/23 20:28	06/23/23 20:28	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	5	06/23/23 20:42	06/23/23 20:42	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/21/23 00:07	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 19:17	LD	Mt. Juliet, TN

FIELD BLANK L1624861-11 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/05/23 12:05	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/23/23 21:22	06/23/23 21:22	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/21/23 00:10	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 19:20	LD	Mt. Juliet, TN

SAMPLE SUMMARY

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

DUPLICATE RP-2 L1624861-12 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/05/23 12:01	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/23/23 21:36	06/23/23 21:36	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/21/23 00:13	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 19:23	LD	Mt. Juliet, TN

MW-101S L1624861-13 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/08/23 14:11	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075111	1	06/12/23 18:48	06/13/23 02:36	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/23/23 21:49	06/23/23 21:49	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/21/23 00:15	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 19:27	LD	Mt. Juliet, TN

MW-102S L1624861-14 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/08/23 15:47	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075111	1	06/12/23 18:48	06/13/23 02:36	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/23/23 22:03	06/23/23 22:03	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/21/23 00:18	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 19:30	LD	Mt. Juliet, TN

MW-103S L1624861-15 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/07/23 11:44	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/23/23 22:16	06/23/23 22:16	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/21/23 00:27	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 19:33	LD	Mt. Juliet, TN

MW-104S L1624861-16 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/07/23 14:50	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/23/23 22:31	06/23/23 22:31	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/21/23 00:30	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 19:44	LD	Mt. Juliet, TN

MW-105S L1624861-17 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/07/23 15:52	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/23/23 22:44	06/23/23 22:44	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/21/23 00:32	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 19:47	LD	Mt. Juliet, TN

MW-106S L1624861-18 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/07/23 09:15	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/23/23 22:57	06/23/23 22:57	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	5	06/23/23 23:11	06/23/23 23:11	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/21/23 00:35	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 19:50	LD	Mt. Juliet, TN

MW-110S L1624861-19 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/07/23 13:42	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/24/23 00:18	06/24/23 00:18	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/21/23 00:38	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 19:53	LD	Mt. Juliet, TN

MW-111S L1624861-20 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/07/23 10:44	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	1	06/23/23 23:24	06/23/23 23:24	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083289	5	06/24/23 00:04	06/24/23 00:04	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075641	1	06/13/23 11:44	06/20/23 23:24	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075651	1	06/13/23 11:52	06/13/23 19:57	LD	Mt. Juliet, TN

MW-101D L1624861-21 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/08/23 18:43	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075111	1	06/12/23 18:48	06/13/23 02:36	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 11:41	06/24/23 11:41	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 00:46	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 17:39	LD	Mt. Juliet, TN

MW-102D L1624861-22 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/08/23 17:36	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075111	1	06/12/23 18:48	06/13/23 02:36	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 12:35	06/24/23 12:35	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 00:49	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 17:42	LD	Mt. Juliet, TN

MW-103D L1624861-23 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/07/23 12:11	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 12:48	06/24/23 12:48	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 00:51	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 17:45	LD	Mt. Juliet, TN

MW-104D L1624861-24 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/07/23 16:05	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075832	1	06/12/23 10:09	06/12/23 12:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 13:02	06/24/23 13:02	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 00:54	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 17:49	LD	Mt. Juliet, TN

MW-105D L1624861-25 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/06/23 12:30	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075855	1	06/12/23 10:27	06/12/23 12:46	AS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 13:42	06/24/23 13:42	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 01:02	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 18:00	LD	Mt. Juliet, TN

MW-106D L1624861-26 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/07/23 10:20	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075855	1	06/12/23 10:27	06/12/23 12:46	AS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 13:56	06/24/23 13:56	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 01:05	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 18:03	LD	Mt. Juliet, TN

MW-107D L1624861-27 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/06/23 10:20	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075855	1	06/12/23 10:27	06/12/23 12:46	AS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 14:09	06/24/23 14:09	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 01:08	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 18:06	LD	Mt. Juliet, TN

MW-108D L1624861-28 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/07/23 13:45	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075855	1	06/12/23 10:27	06/12/23 12:46	AS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 14:22	06/24/23 14:22	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 01:10	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 18:10	LD	Mt. Juliet, TN

MW-109D L1624861-29 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/08/23 10:30	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075111	1	06/12/23 18:48	06/13/23 02:36	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 14:36	06/24/23 14:36	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 01:13	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 18:13	LD	Mt. Juliet, TN

SAMPLE SUMMARY

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

MW-110D L1624861-30 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/06/23 15:50	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075855	1	06/12/23 10:27	06/12/23 12:46	AS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 14:49	06/24/23 14:49	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 01:16	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 18:16	LD	Mt. Juliet, TN

MW-112D L1624861-31 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/06/23 17:30	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075855	1	06/12/23 10:27	06/12/23 12:46	AS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 15:03	06/24/23 15:03	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 01:19	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 17:26	LD	Mt. Juliet, TN

MW-113D L1624861-32 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/08/23 09:15	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075111	1	06/12/23 18:48	06/13/23 02:36	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 15:16	06/24/23 15:16	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	10	06/24/23 15:30	06/24/23 15:30	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 01:22	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 18:19	LD	Mt. Juliet, TN

MW-114D L1624861-33 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/08/23 12:55	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075111	1	06/12/23 18:48	06/13/23 02:36	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 15:43	06/24/23 15:43	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 01:24	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 18:23	LD	Mt. Juliet, TN

MW-115D L1624861-34 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/08/23 11:40	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075111	1	06/12/23 18:48	06/13/23 02:36	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 16:23	06/24/23 16:23	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 01:27	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 18:26	LD	Mt. Juliet, TN

MW-118D L1624861-35 GW

Collected by	Collected date/time	Received date/time
Will Glenn	06/06/23 14:10	06/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075855	1	06/12/23 10:27	06/12/23 12:46	AS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 16:37	06/24/23 16:37	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 01:35	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 18:29	LD	Mt. Juliet, TN

Collected by	Collected date/time	Received date/time
Will Glenn	06/07/23 09:25	06/10/23 09:00

FIELD BLANK 1 L1624861-36 GW

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075855	1	06/12/23 10:27	06/12/23 12:46	AS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 17:04	06/24/23 17:04	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 01:38	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 18:40	LD	Mt. Juliet, TN

Collected by	Collected date/time	Received date/time
Will Glenn	06/07/23 09:16	06/10/23 09:00

DUPLICATE 1 MW-106S L1624861-37 GW

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075855	1	06/12/23 10:27	06/12/23 12:46	AS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 17:17	06/24/23 17:17	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	10	06/24/23 17:30	06/24/23 17:30	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 01:41	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 18:44	LD	Mt. Juliet, TN

Collected by	Collected date/time	Received date/time
Will Glenn	06/06/23 17:31	06/10/23 09:00

DUPLICATE 3 MW-112D L1624861-38 GW

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075855	1	06/12/23 10:27	06/12/23 12:46	AS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 17:44	06/24/23 17:44	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 01:44	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 18:47	LD	Mt. Juliet, TN

Collected by	Collected date/time	Received date/time
Will Glenn	06/06/23 15:50	06/10/23 09:00

DUPLICATE 2 MW-110D L1624861-39 GW

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2075855	1	06/12/23 10:27	06/12/23 12:46	AS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2083802	1	06/24/23 17:57	06/24/23 17:57	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2075642	1	06/13/23 11:47	06/29/23 00:35	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2075653	1	06/13/23 11:49	06/13/23 18:50	LD	Mt. Juliet, TN

CASE NARRATIVE

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

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 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.

Brittnie Boyd

Brittnie L Boyd
Project Manager

Report Revision History

Level II Report - Version 1: 06/29/23 15:47
Level II Report - Version 2: 08/21/23 12:09

Project Narrative

EDD
Updated sample ID

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	4020		50.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	420		10.0	10	06/23/2023 16:37	WG2083289
Fluoride	2.02		1.50	10	06/23/2023 16:37	WG2083289
Sulfate	2240		500	100	06/23/2023 16:51	WG2083289

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	06/20/2023 23:36	WG2075641

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	330		1.00	1	06/13/2023 18:41	WG2075651

RP-2

SAMPLE RESULTS - 02

Collected date/time: 06/05/23 12:00

L1624861

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	291		10.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	19.5		1.00	1	06/23/2023 17:04	WG2083289
Fluoride	ND		0.150	1	06/23/2023 17:04	WG2083289
Sulfate	110		5.00	1	06/23/2023 17:04	WG2083289

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	ND		0.200	1	06/20/2023 23:38	WG2075641

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Calcium	16.6		1.00	1	06/13/2023 18:44	WG2075651

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1820		50.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	174		5.00	5	06/23/2023 17:58	WG2083289
Fluoride	0.948		0.750	5	06/23/2023 17:58	WG2083289
Sulfate	1280		50.0	10	06/23/2023 18:38	WG2083289

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	06/20/2023 23:41	WG2075641

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	203		1.00	1	06/13/2023 18:48	WG2075651

RP-4

Collected date/time: 06/06/23 15:22

SAMPLE RESULTS - 04

L1624861

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

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	404		10.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	31.5		1.00	1	06/23/2023 18:52	WG2083289
Fluoride	0.369		0.150	1	06/23/2023 18:52	WG2083289
Sulfate	108		5.00	1	06/23/2023 18:52	WG2083289

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	06/20/2023 23:44	WG2075641

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	56.1		1.00	1	06/13/2023 18:51	WG2075651

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	498		10.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	40.7		1.00	1	06/23/2023 19:05	WG2083289
Fluoride	0.331		0.150	1	06/23/2023 19:05	WG2083289
Sulfate	244	E	5.00	1	06/23/2023 19:05	WG2083289

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	06/20/2023 23:52	WG2075641

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	42.6		1.00	1	06/13/2023 19:04	WG2075651

SAMPLE RESULTS - 06

L1624861

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1820		25.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	33.2		1.00	1	06/23/2023 19:18	WG2083289
Fluoride	0.855		0.150	1	06/23/2023 19:18	WG2083289
Sulfate	1230		50.0	10	06/23/2023 19:32	WG2083289

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.580		0.200	1	06/20/2023 23:55	WG2075641

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	262	V	1.00	1	06/13/2023 18:28	WG2075651

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	440		10.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	6.61		1.00	1	06/23/2023 19:45	WG2083289
Fluoride	0.419		0.150	1	06/23/2023 19:45	WG2083289
Sulfate	216	E	5.00	1	06/23/2023 19:45	WG2083289

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	06/20/2023 23:58	WG2075641

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	36.4		1.00	1	06/13/2023 19:07	WG2075651

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	329		10.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	21.8		1.00	1	06/23/2023 19:59	WG2083289
Fluoride	0.284		0.150	1	06/23/2023 19:59	WG2083289
Sulfate	160		5.00	1	06/23/2023 19:59	WG2083289

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	06/21/2023 00:01	WG2075641

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	37.4		1.00	1	06/13/2023 19:10	WG2075651

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	224		10.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	2.56	B	1.00	1	06/23/2023 20:14	WG2083289
Fluoride	0.156		0.150	1	06/23/2023 20:14	WG2083289
Sulfate	26.5		5.00	1	06/23/2023 20:14	WG2083289

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	06/21/2023 00:04	WG2075641

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	19.0		1.00	1	06/13/2023 19:14	WG2075651

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	844		13.3	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	58.9		1.00	1	06/23/2023 20:28	WG2083289
Fluoride	0.545		0.150	1	06/23/2023 20:28	WG2083289
Sulfate	488		25.0	5	06/23/2023 20:42	WG2083289

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.372		0.200	1	06/21/2023 00:07	WG2075641

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	58.3		1.00	1	06/13/2023 19:17	WG2075651

FIELD BLANK

Collected date/time: 06/05/23 12:05

SAMPLE RESULTS - 11

L1624861

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

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	ND		10.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	ND		1.00	1	06/23/2023 21:22	WG2083289
Fluoride	ND		0.150	1	06/23/2023 21:22	WG2083289
Sulfate	ND		5.00	1	06/23/2023 21:22	WG2083289

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	ND		0.200	1	06/21/2023 00:10	WG2075641

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Calcium	ND		1.00	1	06/13/2023 19:20	WG2075651

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	298		10.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	19.1		1.00	1	06/23/2023 21:36	WG2083289
Fluoride	ND		0.150	1	06/23/2023 21:36	WG2083289
Sulfate	107		5.00	1	06/23/2023 21:36	WG2083289

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	06/21/2023 00:13	WG2075641

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	16.3		1.00	1	06/13/2023 19:23	WG2075651

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	208		10.0	1	06/13/2023 02:36	WG2075111

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	7.50		1.00	1	06/23/2023 21:49	WG2083289
Fluoride	ND		0.150	1	06/23/2023 21:49	WG2083289
Sulfate	49.1		5.00	1	06/23/2023 21:49	WG2083289

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	06/21/2023 00:15	WG2075641

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	15.4		1.00	1	06/13/2023 19:27	WG2075651

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	198		10.0	1	06/13/2023 02:36	WG2075111

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	7.54		1.00	1	06/23/2023 22:03	WG2083289
Fluoride	ND		0.150	1	06/23/2023 22:03	WG2083289
Sulfate	23.1		5.00	1	06/23/2023 22:03	WG2083289

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	06/21/2023 00:18	WG2075641

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	12.5		1.00	1	06/13/2023 19:30	WG2075651

SAMPLE RESULTS - 15

L1624861

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	117		10.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	4.07	B	1.00	1	06/23/2023 22:16	WG2083289
Fluoride	ND		0.150	1	06/23/2023 22:16	WG2083289
Sulfate	37.0		5.00	1	06/23/2023 22:16	WG2083289

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	ND		0.200	1	06/21/2023 00:27	WG2075641

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Calcium	4.57		1.00	1	06/13/2023 19:33	WG2075651

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	233		10.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	4.58	B	1.00	1	06/23/2023 22:31	WG2083289
Fluoride	ND		0.150	1	06/23/2023 22:31	WG2083289
Sulfate	73.9		5.00	1	06/23/2023 22:31	WG2083289

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.782		0.200	1	06/21/2023 00:30	WG2075641

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	16.3		1.00	1	06/13/2023 19:44	WG2075651

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	173		10.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	4.07	B	1.00	1	06/23/2023 22:44	WG2083289
Fluoride	ND		0.150	1	06/23/2023 22:44	WG2083289
Sulfate	21.5		5.00	1	06/23/2023 22:44	WG2083289

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	ND		0.200	1	06/21/2023 00:32	WG2075641

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Calcium	13.7		1.00	1	06/13/2023 19:47	WG2075651

MW-106S
Collected date/time: 06/07/23 09:15

SAMPLE RESULTS - 18

L1624861

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

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	1200		20.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	13.3		1.00	1	06/23/2023 22:57	WG2083289
Fluoride	0.728		0.150	1	06/23/2023 22:57	WG2083289
Sulfate	808		25.0	5	06/23/2023 23:11	WG2083289

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	7.40		0.200	1	06/21/2023 00:35	WG2075641

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Calcium	46.8		1.00	1	06/13/2023 19:50	WG2075651

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	441		10.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	5.78		1.00	1	06/24/2023 00:18	WG2083289
Fluoride	0.228		0.150	1	06/24/2023 00:18	WG2083289
Sulfate	233	E	5.00	1	06/24/2023 00:18	WG2083289

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	2.24		0.200	1	06/21/2023 00:38	WG2075641

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	5.85		1.00	1	06/13/2023 19:53	WG2075651

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1270		20.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	11.5		1.00	1	06/23/2023 23:24	WG2083289
Fluoride	0.850		0.150	1	06/23/2023 23:24	WG2083289
Sulfate	854		25.0	5	06/24/2023 00:04	WG2083289

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	5.98		0.200	1	06/20/2023 23:24	WG2075641

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	118		1.00	1	06/13/2023 19:57	WG2075651

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	349		10.0	1	06/13/2023 02:36	WG2075111

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	5.99		1.00	1	06/24/2023 11:41	WG2083802
Fluoride	ND	P1	0.150	1	06/24/2023 11:41	WG2083802
Sulfate	74.0		5.00	1	06/24/2023 11:41	WG2083802

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	06/29/2023 00:46	WG2075642

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	48.0		1.00	1	06/13/2023 17:39	WG2075653

MW-102D

Collected date/time: 06/08/23 17:36

SAMPLE RESULTS - 22

L1624861

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

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	487		10.0	1	06/13/2023 02:36	WG2075111

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	8.28		1.00	1	06/24/2023 12:35	WG2083802
Fluoride	ND		0.150	1	06/24/2023 12:35	WG2083802
Sulfate	29.1		5.00	1	06/24/2023 12:35	WG2083802

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	0.277		0.200	1	06/29/2023 00:49	WG2075642

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Calcium	66.9		1.00	1	06/13/2023 17:42	WG2075653

MW-103D

Collected date/time: 06/07/23 12:11

SAMPLE RESULTS - 23

L1624861

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

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	422		10.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	7.29		1.00	1	06/24/2023 12:48	WG2083802
Fluoride	0.166		0.150	1	06/24/2023 12:48	WG2083802
Sulfate	71.6		5.00	1	06/24/2023 12:48	WG2083802

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.286		0.200	1	06/29/2023 00:51	WG2075642

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	54.3		1.00	1	06/13/2023 17:45	WG2075653

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	321		10.0	1	06/12/2023 12:22	WG2075832

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	9.30		1.00	1	06/24/2023 13:02	WG2083802
Fluoride	ND		0.150	1	06/24/2023 13:02	WG2083802
Sulfate	20.1		5.00	1	06/24/2023 13:02	WG2083802

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.245		0.200	1	06/29/2023 00:54	WG2075642

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	55.4		1.00	1	06/13/2023 17:49	WG2075653

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	331		10.0	1	06/12/2023 12:46	WG2075855

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	8.28		1.00	1	06/24/2023 13:42	WG2083802
Fluoride	ND		0.150	1	06/24/2023 13:42	WG2083802
Sulfate	26.3		5.00	1	06/24/2023 13:42	WG2083802

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.284		0.200	1	06/29/2023 01:02	WG2075642

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	54.4		1.00	1	06/13/2023 18:00	WG2075653

MW-106D

Collected date/time: 06/07/23 10:20

SAMPLE RESULTS - 26

L1624861

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	210		10.0	1	06/12/2023 12:46	WG2075855

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	5.01		1.00	1	06/24/2023 13:56	WG2083802
Fluoride	ND		0.150	1	06/24/2023 13:56	WG2083802
Sulfate	10.3		5.00	1	06/24/2023 13:56	WG2083802

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.277		0.200	1	06/29/2023 01:05	WG2075642

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	42.9		1.00	1	06/13/2023 18:03	WG2075653

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	470		10.0	1	06/12/2023 12:46	WG2075855

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	20.0		1.00	1	06/24/2023 14:09	WG2083802
Fluoride	ND		0.150	1	06/24/2023 14:09	WG2083802
Sulfate	137		5.00	1	06/24/2023 14:09	WG2083802

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.329		0.200	1	06/29/2023 01:08	WG2075642

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	82.8		1.00	1	06/13/2023 18:06	WG2075653

SAMPLE RESULTS - 28

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	469		10.0	1	06/12/2023 12:46	WG2075855

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	12.7		1.00	1	06/24/2023 14:22	WG2083802
Fluoride	ND		0.150	1	06/24/2023 14:22	WG2083802
Sulfate	43.2		5.00	1	06/24/2023 14:22	WG2083802

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.352		0.200	1	06/29/2023 01:10	WG2075642

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	68.0		1.00	1	06/13/2023 18:10	WG2075653

MW-109D

Collected date/time: 06/08/23 10:30

SAMPLE RESULTS - 29

L1624861

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	372		10.0	1	06/13/2023 02:36	WG2075111

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	7.47		1.00	1	06/24/2023 14:36	WG2083802
Fluoride	ND		0.150	1	06/24/2023 14:36	WG2083802
Sulfate	49.9		5.00	1	06/24/2023 14:36	WG2083802

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	0.321		0.200	1	06/29/2023 01:13	WG2075642

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Calcium	47.4		1.00	1	06/13/2023 18:13	WG2075653

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

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	346		10.0	1	06/12/2023 12:46	WG2075855

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	6.63		1.00	1	06/24/2023 14:49	WG2083802
Fluoride	ND		0.150	1	06/24/2023 14:49	WG2083802
Sulfate	40.3		5.00	1	06/24/2023 14:49	WG2083802

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.322		0.200	1	06/29/2023 01:16	WG2075642

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	44.7		1.00	1	06/13/2023 18:16	WG2075653

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	308		10.0	1	06/12/2023 12:46	WG2075855

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	6.05		1.00	1	06/24/2023 15:03	WG2083802
Fluoride	ND		0.150	1	06/24/2023 15:03	WG2083802
Sulfate	ND		5.00	1	06/24/2023 15:03	WG2083802

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.287		0.200	1	06/29/2023 01:19	WG2075642

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	39.5		1.00	1	06/13/2023 17:26	WG2075653

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1160		20.0	1	06/13/2023 02:36	WG2075111

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	14.1		1.00	1	06/24/2023 15:16	WG2083802
Fluoride	ND		0.150	1	06/24/2023 15:16	WG2083802
Sulfate	653		50.0	10	06/24/2023 15:30	WG2083802

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.503		0.200	1	06/29/2023 01:22	WG2075642

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	184		1.00	1	06/13/2023 18:19	WG2075653

MW-114D

Collected date/time: 06/08/23 12:55

SAMPLE RESULTS - 33

L1624861

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	326		10.0	1	06/13/2023 02:36	WG2075111

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	7.42		1.00	1	06/24/2023 15:43	WG2083802
Fluoride	ND		0.150	1	06/24/2023 15:43	WG2083802
Sulfate	29.6		5.00	1	06/24/2023 15:43	WG2083802

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	0.275		0.200	1	06/29/2023 01:24	WG2075642

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Calcium	51.7		1.00	1	06/13/2023 18:23	WG2075653

MW-115D

Collected date/time: 06/08/23 11:40

SAMPLE RESULTS - 34

L1624861

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

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	342		10.0	1	06/13/2023 02:36	WG2075111

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	4.63	B	1.00	1	06/24/2023 16:23	WG2083802
Fluoride	ND		0.150	1	06/24/2023 16:23	WG2083802
Sulfate	ND		5.00	1	06/24/2023 16:23	WG2083802

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.346		0.200	1	06/29/2023 01:27	WG2075642

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	43.5		1.00	1	06/13/2023 18:26	WG2075653

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	566		10.0	1	06/12/2023 12:46	WG2075855

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	8.27		1.00	1	06/24/2023 16:37	WG2083802
Fluoride	ND		0.150	1	06/24/2023 16:37	WG2083802
Sulfate	162		5.00	1	06/24/2023 16:37	WG2083802

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.276		0.200	1	06/29/2023 01:35	WG2075642

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	90.6		1.00	1	06/13/2023 18:29	WG2075653

FIELD BLANK 1

Collected date/time: 06/07/23 09:25

SAMPLE RESULTS - 36

L1624861

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	ND		10.0	1	06/12/2023 12:46	WG2075855

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	ND		1.00	1	06/24/2023 17:04	WG2083802
Fluoride	ND		0.150	1	06/24/2023 17:04	WG2083802
Sulfate	ND		5.00	1	06/24/2023 17:04	WG2083802

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	ND		0.200	1	06/29/2023 01:38	WG2075642

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Calcium	ND		1.00	1	06/13/2023 18:40	WG2075653

DUPLICATE 1 MW-106S

Collected date/time: 06/07/23 09:16

SAMPLE RESULTS - 37

L1624861

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	1180		20.0	1	06/12/2023 12:46	WG2075855

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	13.0		1.00	1	06/24/2023 17:17	WG2083802
Fluoride	0.801		0.150	1	06/24/2023 17:17	WG2083802
Sulfate	788		50.0	10	06/24/2023 17:30	WG2083802

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	7.69		0.200	1	06/29/2023 01:41	WG2075642

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Calcium	45.0		1.00	1	06/13/2023 18:44	WG2075653

DUPLICATE 3 MW-112D

Collected date/time: 06/06/23 17:31

SAMPLE RESULTS - 38

L1624861

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

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	258		10.0	1	06/12/2023 12:46	WG2075855

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	6.23		1.00	1	06/24/2023 17:44	WG2083802
Fluoride	ND		0.150	1	06/24/2023 17:44	WG2083802
Sulfate	ND		5.00	1	06/24/2023 17:44	WG2083802

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.311		0.200	1	06/29/2023 01:44	WG2075642

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	39.9		1.00	1	06/13/2023 18:47	WG2075653

DUPLICATE 2 MW-110D

Collected date/time: 06/06/23 15:50

SAMPLE RESULTS - 39

L1624861

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	346		10.0	1	06/12/2023 12:46	WG2075855

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	6.68		1.00	1	06/24/2023 17:57	WG2083802
Fluoride	ND		0.150	1	06/24/2023 17:57	WG2083802
Sulfate	39.0		5.00	1	06/24/2023 17:57	WG2083802

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.321		0.200	1	06/29/2023 00:35	WG2075642

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Calcium	45.6		1.00	1	06/13/2023 18:50	WG2075653

QUALITY CONTROL SUMMARY

L1624861-13,14,21,22,29,32,33,34

Method Blank (MB)

(MB) R3937323-1 06/13/23 02:36

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1624192-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1624192-10 06/13/23 02:36 • (DUP) R3937323-3 06/13/23 02:36

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	1400	1450	1	4.07		5

L1624861-32 Original Sample (OS) • Duplicate (DUP)

(OS) L1624861-32 06/13/23 02:36 • (DUP) R3937323-4 06/13/23 02:36

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	1160	1190	1	2.72		5

Laboratory Control Sample (LCS)

(LCS) R3937323-2 06/13/23 02:36

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8570	97.4	77.3-123	

Method Blank (MB)

(MB) R3936421-1 06/12/23 12:22

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U	J	10.0	10.0

L1624861-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1624861-02 06/12/23 12:22 • (DUP) R3936421-5 06/12/23 12:22

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	291	296	1	1.70		5

L1624861-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1624861-09 06/12/23 12:22 • (DUP) R3936421-6 06/12/23 12:22

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	224	220	1	1.80		5

Laboratory Control Sample (LCS)

(LCS) R3936421-2 06/12/23 12:22

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8320	94.5	77.3-123	

Method Blank (MB)

(MB) R3936434-1 06/12/23 12:46

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1623688-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1623688-02 06/12/23 12:46 • (DUP) R3936434-3 06/12/23 12:46

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	134	138	1	2.94		5

L1623901-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1623901-01 06/12/23 12:46 • (DUP) R3936434-4 06/12/23 12:46

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	261	278	1	6.31	J3	5

Laboratory Control Sample (LCS)

(LCS) R3936434-2 06/12/23 12:46

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	7780	88.4	77.3-123	

WG2083289

Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY

L1624861-01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20

Method Blank (MB)

(MB) R3941971-1 06/23/23 10:40

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	0.465	J	0.379	1.00
Fluoride	U		0.0640	0.150
Sulfate	0.648	J	0.594	5.00

L1624861-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1624861-02 06/23/23 17:04 • (DUP) R3941971-3 06/23/23 17:18

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	19.5	19.7	1	1.14		15
Fluoride	ND	ND	1	8.32		15
Sulfate	110	110	1	0.667		15

L1624861-19 Original Sample (OS) • Duplicate (DUP)

(OS) L1624861-19 06/24/23 00:18 • (DUP) R3941971-6 06/24/23 00:31

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	5.78	5.79	1	0.0363		15
Fluoride	0.228	0.224	1	1.77		15
Sulfate	233	234	1	0.534	E	15

Laboratory Control Sample (LCS)

(LCS) R3941971-2 06/23/23 10:53

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	38.2	95.5	80.0-120	
Fluoride	8.00	7.81	97.6	80.0-120	
Sulfate	40.0	37.5	93.6	80.0-120	

L1624861-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1624861-02 06/23/23 17:04 • (MS) R3941971-4 06/23/23 17:31 • (MSD) R3941971-5 06/23/23 17:44

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50.0	19.5	68.9	68.6	98.8	98.2	1	80.0-120			0.437	15
Fluoride	5.00	ND	4.81	4.80	94.2	94.1	1	80.0-120			0.135	15
Sulfate	50.0	110	160	159	99.2	97.0	1	80.0-120			0.681	15

L1624861-19 Original Sample (OS) • Matrix Spike (MS)

(OS) L1624861-19 06/24/23 00:18 • (MS) R3941971-7 06/24/23 00:45

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	5.78	55.9	100	1	80.0-120	
Fluoride	5.00	0.228	5.13	98.0	1	80.0-120	
Sulfate	50.0	233	274	83.0	1	80.0-120	E

Method Blank (MB)

(MB) R3941976-1 06/24/23 10:35

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	0.466	J	0.379	1.00
Fluoride	U		0.0640	0.150
Sulfate	0.654	J	0.594	5.00

L1624861-21 Original Sample (OS) • Duplicate (DUP)

(OS) L1624861-21 06/24/23 11:41 • (DUP) R3941976-3 06/24/23 11:55

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	5.99	6.01	1	0.265		15
Fluoride	ND	ND	1	26.6	P1	15
Sulfate	74.0	75.5	1	1.97		15

L1624868-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1624868-01 06/24/23 18:11 • (DUP) R3941976-6 06/24/23 18:24

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	11.3	11.0	1	2.80		15
Sulfate	6.33	6.05	1	4.55		15

Laboratory Control Sample (LCS)

(LCS) R3941976-2 06/24/23 10:49

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	38.9	97.4	80.0-120	
Fluoride	8.00	7.99	99.9	80.0-120	
Sulfate	40.0	38.3	95.7	80.0-120	

L1624861-21 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1624861-21 06/24/23 11:41 • (MS) R3941976-4 06/24/23 12:08 • (MSD) R3941976-5 06/24/23 12:22

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50.0	5.99	55.1	55.7	98.3	99.4	1	80.0-120			1.04	15
Fluoride	5.00	ND	4.79	4.93	93.8	96.6	1	80.0-120			2.87	15

QUALITY CONTROL SUMMARY

L1624861-21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39

L1624861-21 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1624861-21 06/24/23 11:41 • (MS) R3941976-4 06/24/23 12:08 • (MSD) R3941976-5 06/24/23 12:22

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Sulfate	50.0	74.0	123	125	98.4	102	1	80.0-120			1.62	15

L1624868-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1624868-01 06/24/23 18:11 • (MS) R3941976-7 06/24/23 19:05

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	11.3	61.3	100	1	80.0-120	
Sulfate	50.0	6.33	56.7	101	1	80.0-120	

Method Blank (MB)

(MB) R3939297-1 06/20/23 23:19

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron	U		0.0200	0.200

Laboratory Control Sample (LCS)

(LCS) R3939297-2 06/20/23 23:21

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Boron	1.00	0.998	99.8	80.0-120	

L1624861-20 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1624861-20 06/20/23 23:24 • (MS) R3939297-4 06/20/23 23:30 • (MSD) R3939297-5 06/20/23 23:32

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron	1.00	5.98	6.89	6.89	90.3	90.8	1	75.0-125			0.0711	20

Method Blank (MB)

(MB) R3942700-1 06/29/23 00:30

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron	U		0.0200	0.200

Laboratory Control Sample (LCS)

(LCS) R3942700-2 06/29/23 00:32

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Boron	1.00	0.987	98.7	80.0-120	

L1624861-39 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1624861-39 06/29/23 00:35 • (MS) R3942700-4 06/29/23 00:41 • (MSD) R3942700-5 06/29/23 00:43

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron	1.00	0.321	1.33	1.33	101	101	1	75.0-125			0.104	20

Method Blank (MB)

(MB) R3936335-1 06/13/23 18:22

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Calcium	U		0.0936	1.00

Laboratory Control Sample (LCS)

(LCS) R3936335-2 06/13/23 18:25

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Calcium	5.00	4.87	97.3	80.0-120	

L1624861-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1624861-06 06/13/23 18:28 • (MS) R3936335-4 06/13/23 18:35 • (MSD) R3936335-5 06/13/23 18:38

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Calcium	5.00	262	267	265	89.4	57.1	1	75.0-125		V	0.607	20

Method Blank (MB)

(MB) R3936323-1 06/13/23 17:19

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Calcium	U		0.0936	1.00

Laboratory Control Sample (LCS)

(LCS) R3936323-2 06/13/23 17:22

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Calcium	5.00	4.65	93.0	80.0-120	

L1624861-31 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1624861-31 06/13/23 17:26 • (MS) R3936323-4 06/13/23 17:32 • (MSD) R3936323-5 06/13/23 17:35

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Calcium	5.00	39.5	44.2	44.3	93.5	96.7	1	75.0-125			0.358	20

GLOSSARY OF TERMS

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

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

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
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
B	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
V	The sample concentration is too high to evaluate accurate spike recoveries.

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	LAO00356
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.

Company Name/Address:
GBMc & Associates - Bryant, AR

219 Brown Lane
Little Rock, AR 72022

Billing Information:

Accounts Payable
219 Brown Ln.
Bryant, AR 72022

Pres Chk

Analysis / Container / Preservative

PH 10BDH4321 TRC 21M141
CR6-20221V

Chain of Custody Page ___ of ___

Pace®
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at:
https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to:
Will Glenn

Email To:
Will.Glenn@AllianceTG.com;Jonathan.Brown@

Project Description:
Entergy - White Bluff

City/State Collected:

Please Circle:
PT MT CT ET

Phone: **501-847-7077**

Client Project #
1145-21-080

Lab Project #
GBMCBAR-ENTERGYWB

SDG # L1624861
D207

Collected by (print):
Will Glenn

Site/Facility ID #
WHITE BLUFF

P.O. #

Acctnum: **GBMCBAR**
Template: **T231252**
Prelogin: **P1003296**
PM: **829 - Brittnie L Boyd**
PB: BW 5/31
Shipped Via: **FedEX Ground**

Collected by (signature):
Will Gl

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	BICP 250mlHDPE-HNO3	CAG 250mlHDPE-HNO3	Cl, F, SO4 125mlHDPE-NoPres	TDS 1L-HDPE NoPres	Remarks	Sample # (lab only)
RP-1	Grab	GW		6-5-23	1608	3	X	X	X	X	3.71	-01
RP-2		GW			1206						3.81	-02
RP-3		GW		6-6-23	1414						3.53	-03
RP-4		GW			1522						5.82	-04
RP-5		GW			920						3.64	-05
RP-6		GW		6-5-23	1400						4.51	-06
RP-7		GW		6-6-23	1027						3.64	-07
RP-8		GW			1131						5.5	-08
RP-9		GW			1300						6.16	-09
RP-10		GW			1647						3.69	-10

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_________

Remarks:

pH _______ Temp _______

Flow _______ Other _______

Samples returned via:
__ UPS ☒ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: ✓NP __Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: ✓Y __N
Preservation Correct/Checked: ✓Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature)
Will Gl

Date:
6-9-23

Time:
1100

Received by: (Signature)

Trip Blank Received: Yes [✓ No]
HCL / MeoH
TBR

Relinquished by : (Signature)

Date:

Time:

Received by: (Signature)

Temp: °C

Bottles Received:
117

If preservation required by Login: Date/Time

Relinquished by : (Signature)

Date:

Time:

Received for lab by: (Signature)
⑨

Date:
6/10/23

Time:
900

Hold:

Condition:
NCF [✓ OK]

Company Name/Address:
GBMc & Associates - Bryant, AR

219 Brown Lane
Little Rock, AR 72022

Billing Information:
Accounts Payable
219 Brown Ln.
Bryant, AR 72022

Pres Chk ✓

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace® PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to: **Will Glenn**

Email To: **Will.Glenn@AllianceTG.com;Jonathan.Brown@**

Project Description: **Entergy - White Bluff**

City/State Collected:

Please Circle: PT MT CT ET

Phone: **501-847-7077**

Client Project # **1145-21-080**

Lab Project # **GBMCBAR-ENTERGYWB**

SDG # L1624861

Table #

Collected by (print): Will Glenn

Site/Facility ID # **WHITE BLUFF**

P.O. #

Acctnum: **GBMCBAR**

Template: **T231252**

Prelogin: **P1003296**

PM: **829 - Brittnie L Boyd**

PB: BW 5/31

Shipped Via: **FedEX Ground**

Collected by (signature): Will Gl

Immediately Packed on Ice N ___ Y ✗

Quote #

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	BICP 250mlHDPE-HNO3	CAG 250mlHDPE-HNO3	Cl, F, SO4 125mlHDPE-NoPres	TDS 1L-HDPE NoPres	Remarks	Sample # (lab only)
FIELD BLANK	Grab	GW		6-5-23	1205	3	X	X	X	X		-11
DUPLICATE RP-2		GW			1201							-12
MW-101S		GW		6-8-23	1411						4.67	-13
MW-102S		GW		6-8-23	1547						4.28	-14
MW-103S		GW		6-7-23	1144						4.56	-15
MW-104S		GW			1450						5.0	-16
MW-105S		GW			1552						5.71	-17
MW-106S		GW			915						4.02	-18
MW-110S		GW			1342						4.16	-19
MW-111S		GW			1044	3					3.98	-20

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS ✗ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: ✓ NP __Y __N
COC Signed/Accurate: ✓ Y __N
Bottles arrive intact: ✓ Y __N
Correct bottles used: ✓ Y __N
Sufficient volume sent: ✓ Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: ✓ Y __N
RAD Screen <0.5 mR/hr: ✓ Y __N

Relinquished by : (Signature) Will Gl	Date: 6-9-23	Time: 1100	Received by: (Signature)	Trip Blank Received: Yes / [✓ No] HCL / MeoH TBR	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: 117	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) Kaycee ⑨	Date: 6/10/23 Time: 900	Hold: Condition: NCF / [✓ OK]

Company Name/Address:

GBMc & Associates - Bryant, AR

219 Brown Lane
Little Rock, AR 72022

Billing Information:

Accounts Payable
219 Brown Ln.
Bryant, AR 72022

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace® PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to: **Will Glenn**

Email To: **Will.Glenn@AllianceTG.com;Jonathan.Brown@**

Project Description: **Entergy - White Bluff**

City/State Collected:

Please Circle: PT MT CT ET

Phone: **501-847-7077**

Client Project # **1145-21-080**

Lab Project # **GBMCBAR-ENTERGYWB**

SDG # L1624861

Table #

Acctnum: **GBMCBAR**

Template: **T231252**

Prelogin: **P1003296**

PM: **829 - Brittnie L Boyd**

PB: BW 5/31

Shipped Via: **FedEX Ground**

Collected by (print): Will Glenn

Site/Facility ID # **WHITE BLUFF**

P.O. #

Collected by (signature): Will

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y X

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	BICP 250mlHDPE-HNO3	CAG 250mlHDPE-HNO3	Cl, F, SO4 125mlHDPE-NoPres	TDS 1L-HDPE NoPres							Remarks	Sample # (lab only)
MW-101D	Grab	GW		6-8-23	1843	3	X	X	X	X							1.55	-21
MW-102D	|	GW		⊥	1736	|	|	|	|	|							3.68	-22
MW-103D	|	GW		6-7-23	1811	|	|	|	|	|							5.13	-23
MW-104D	|	GW		⊥	1605	|	|	|	|	|							6.19	-24
MW-105D	|	GW		6-6-23	1230	|	|	|	|	|							5.11	-25
MW-106D	|	GW		6-7-23	1020	|	|	|	|	|							6.75	-26
MW-107D	|	GW		6-6-23	1020	|	|	|	|	|							1.75	-27
MW-108D	|	GW		6-7-23	1345	|	|	|	|	|							5.01	-28
MW-109D	|	GW		6-8-23	1030	|	|	|	|	|							3.84	-29
MW-110D	|	GW		6-6-23	1550	|	|	|	|	|							6.92	-30

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS X FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: ✓NP __Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: ✓Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature) Will
Date: 6-9-23
Time: 1100
Received by: (Signature)
Trip Blank Received: Yes [✓ No]
HCL / MeoH
TBR

Relinquished by : (Signature)
Date:
Time:
Received by: (Signature)
Temp: °C
Bottles Received: 117

If preservation required by Login: Date/Time

Relinquished by : (Signature)
Date:
Time:
Received for lab by: (Signature) Kayau ⑨
Date: 6/10/23
Time: 900

Hold:

Condition: NCF / [✓ OK]

Company Name/Address:
GBMc & Associates - Bryant, AR

219 Brown Lane
Little Rock, AR 72022

Billing Information:

Accounts Payable
219 Brown Ln.
Bryant, AR 72022

Pres Chk: ✓2

Chain of Custody Page ___ of ___

Pace®
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to:
Will Glenn

Email To:
Will.Glenn@AllianceTG.com;Jonathan.Brown@

Project Description:
Entergy - White Bluff

City/State Collected:

Please Circle:
PT MT CT ET

Phone: **501-847-7077**

Client Project #
1145-21-080

Lab Project #
GBMCBAR-ENTERGYWB

Collected by (print):
Will Glenn

Site/Facility ID #
WHITE BLUFF

P.O. #

Collected by (signature):
Will

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y X

SDG # L1624861

Table #

Acctnum: **GBMCBAR**
Template: **T231252**
Prelogin: **P1003296**
PM: **829 - Brittnie L Boyd**
PB: BW 5/31
Shipped Via: **FedEX Ground**

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	BICP 250mlHDPE-HNO3	CAG 250mlHDPE-HNO3	Cl, F, SO4 125mlHDPE-NoPres	TDS 1L-HDPE NoPres	Remarks	Sample # (lab only)
MW-111D	Grab	GW										
MW-112D		GW		6-6-23	1730	3	X	X	X	X	5.65	-31
MW-113D		GW		6-8-23	915						6.4	-32
MW-114D		GW			1255						7.11	-33
MW-115D		GW			1140						7.26	-34
MW-118D		GW		6-6-23	1410						5.4	-35
FIELD BLANK 1		GW		6-7-23	925							-36
DUPLICATE 1 MW-106S		GW			916							-37
~~FIELD BLANK 2~~ Duplicate 3 MW-112D		GW		6-6-23	1731							-38
DUPLICATE 2 MW-110D		GW			1550							-39

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH _______ Temp _______
Flow _______ Other _______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: [✓ NP] __Y __N
COC Signed/Accurate: [✓ Y] __N
Bottles arrive intact: [✓ Y] __N
Correct bottles used: [✓ Y] __N
Sufficient volume sent: [✓ Y] __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: [✓ Y] __N
RAD Screen <0.5 mR/hr: [✓ Y] __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	
Will	6-9-23	1100		Trip Blank Received: Yes / [✓ No] HCL / MeoH TBR
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: 117
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) Kayla ⑨	Date: 6/10/23 Time: 900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / [✓ OK]

L1624861

Tracking Numbers	Temperature
6337 2251 9699	NSA7 5.9+0=5.9
6524 5564 0140	NSA7 0.4+0=0.4
6337 2251 9714	NSA7 5.6+0=5.6
6524 5564 0129	NSA7 4.9+0=4.9
6524 5564 0118	NSA7 4.6+0=4.6
6524 5564 0107	NSA7 4.7+0=4.7
6524 5564 0151	NSA7 5.1+0=5.1
6337 2251 9703	NSA7 5.2+0=5.2

ANALYTICAL REPORT

December 04, 2023

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

Alliance Technical Group - Bryant, AR

Sample Delivery Group:	L1679725
Samples Received:	11/18/2023
Project Number:	1145-21-080
Description:	Entergy - White Bluff
Site:	CADL - CCR
Report To:	Jonathan Brown 219 Brown Lane Little Rock, AR 72022

Entire Report Reviewed By: Brittnie Boyd

Brittnie L Boyd
Project Manager

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

TABLE OF CONTENTS

SAMPLE SUMMARY

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

MW-102S L1679725-01 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/16/23 10:20	11/18/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2176590	1	11/22/23 19:47	11/23/23 00:23	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2176478	1	11/23/23 09:11	11/23/23 09:11	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177093	1	11/24/23 17:25	11/24/23 17:25	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180043	1	12/01/23 21:04	12/01/23 21:04	ASM	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2174869	1	11/29/23 09:48	11/29/23 18:34	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	1	11/29/23 09:47	11/29/23 17:44	LD	Mt. Juliet, TN

MW-104S L1679725-02 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/14/23 16:35	11/18/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2174543	1	11/20/23 11:34	11/20/23 17:11	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2176790	1	11/23/23 12:45	11/23/23 12:45	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177093	1	11/24/23 17:25	11/24/23 17:25	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180043	1	12/01/23 21:16	12/01/23 21:16	ASM	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2174869	1	11/29/23 09:48	11/29/23 18:23	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	1	11/29/23 09:47	11/29/23 18:01	LD	Mt. Juliet, TN

MW-105S L1679725-03 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/14/23 14:00	11/18/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2174543	1	11/20/23 11:34	11/20/23 17:11	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2176478	1	11/23/23 09:20	11/23/23 09:20	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177093	1	11/24/23 17:25	11/24/23 17:25	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180043	1	12/01/23 21:29	12/01/23 21:29	ASM	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2174869	1	11/29/23 09:48	11/29/23 18:37	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	1	11/29/23 09:47	11/29/23 18:04	LD	Mt. Juliet, TN

MW-110S L1679725-04 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/15/23 15:55	11/18/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2175285	1	11/21/23 14:40	11/22/23 00:12	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2176478	1	11/23/23 09:24	11/23/23 09:24	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177093	1	11/24/23 17:25	11/24/23 17:25	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180043	1	12/01/23 21:42	12/01/23 21:42	ASM	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2174869	1	11/29/23 09:48	11/29/23 18:40	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	1	11/29/23 09:47	11/29/23 18:08	LD	Mt. Juliet, TN

MW-111S L1679725-05 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/16/23 16:25	11/18/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2176590	1	11/22/23 19:47	11/23/23 00:23	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2176478	1	11/23/23 09:26	11/23/23 09:26	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177093	1	11/24/23 17:25	11/24/23 17:25	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180043	1	12/01/23 22:07	12/01/23 22:07	ASM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180043	10	12/01/23 22:20	12/01/23 22:20	ASM	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2174869	1	11/29/23 09:48	11/29/23 18:43	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	1	11/29/23 09:47	11/29/23 18:19	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	5	11/29/23 09:47	11/29/23 19:19	LD	Mt. Juliet, TN

SAMPLE SUMMARY

MW-103D L1679725-06 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/15/23 12:20	11/18/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2175518	1	11/22/23 10:07	11/22/23 14:15	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2176478	1	11/23/23 09:30	11/23/23 09:30	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177543	1	11/28/23 09:45	11/28/23 09:45	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180043	1	12/01/23 22:33	12/01/23 22:33	ASM	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2174869	1	11/29/23 09:48	11/29/23 18:52	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	1	11/29/23 09:47	11/29/23 18:22	LD	Mt. Juliet, TN

MW-104D L1679725-07 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/14/23 17:30	11/18/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2174565	1	11/20/23 14:12	11/20/23 21:12	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2176790	1	11/23/23 12:47	11/23/23 12:47	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177543	1	11/28/23 09:45	11/28/23 09:45	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180043	1	12/01/23 23:11	12/01/23 23:11	ASM	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2174869	1	11/29/23 09:48	11/29/23 18:55	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	1	11/29/23 09:47	11/29/23 18:25	LD	Mt. Juliet, TN

MW-105D L1679725-08 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/14/23 15:10	11/18/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2174565	1	11/20/23 14:12	11/20/23 21:12	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2176478	1	11/23/23 09:35	11/23/23 09:35	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177543	1	11/28/23 09:45	11/28/23 09:45	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180043	1	12/01/23 23:24	12/01/23 23:24	ASM	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2174869	1	11/29/23 09:48	11/29/23 18:57	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	1	11/29/23 09:47	11/29/23 18:29	LD	Mt. Juliet, TN

MW-107D L1679725-09 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/16/23 17:50	11/18/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2176590	1	11/22/23 19:47	11/23/23 00:23	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2176478	1	11/23/23 09:39	11/23/23 09:39	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177543	1	11/28/23 09:45	11/28/23 09:45	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180043	1	12/01/23 23:37	12/01/23 23:37	ASM	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2174869	1	11/29/23 09:48	11/29/23 19:00	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	1	11/29/23 09:47	11/29/23 18:32	LD	Mt. Juliet, TN

MW-108D L1679725-10 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/16/23 15:20	11/18/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2176580	1	11/22/23 19:01	11/23/23 13:45	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2176470	1	11/23/23 11:36	11/23/23 11:36	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177543	1	11/28/23 09:45	11/28/23 09:45	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180043	1	12/01/23 23:49	12/01/23 23:49	ASM	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2174869	1	11/29/23 09:48	11/29/23 19:03	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	1	11/29/23 09:47	11/29/23 18:35	LD	Mt. Juliet, TN

SAMPLE SUMMARY

MW-109D L1679725-11 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/16/23 13:00	11/18/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2176580	1	11/22/23 19:01	11/23/23 13:45	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2176845	1	11/27/23 13:29	11/27/23 13:29	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177543	1	11/28/23 09:45	11/28/23 09:45	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180043	1	12/02/23 00:02	12/02/23 00:02	ASM	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2174869	1	11/29/23 09:48	11/29/23 19:06	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	1	11/29/23 09:47	11/29/23 18:39	LD	Mt. Juliet, TN

MW-110D L1679725-12 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/16/23 15:00	11/18/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2176580	1	11/22/23 19:01	11/23/23 13:45	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2176478	1	11/23/23 10:12	11/23/23 10:12	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177543	1	11/28/23 09:45	11/28/23 09:45	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180051	1	12/02/23 01:31	12/02/23 01:31	ASM	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2174869	1	11/29/23 09:48	11/29/23 19:09	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	1	11/29/23 09:47	11/29/23 18:42	LD	Mt. Juliet, TN

MW-113D L1679725-13 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/15/23 13:50	11/18/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2175285	1	11/21/23 14:40	11/22/23 00:12	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2176478	1	11/23/23 10:17	11/23/23 10:17	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177543	1	11/28/23 09:45	11/28/23 09:45	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180051	1	12/02/23 02:22	12/02/23 02:22	ASM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180051	10	12/02/23 02:35	12/02/23 02:35	ASM	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2174869	1	11/29/23 09:48	11/29/23 19:12	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	1	11/29/23 09:47	11/29/23 18:46	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	5	11/29/23 09:47	11/29/23 19:22	LD	Mt. Juliet, TN

MW-114D L1679725-14 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/15/23 10:10	11/18/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2175285	1	11/21/23 14:40	11/22/23 00:12	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2176790	1	11/23/23 12:53	11/23/23 12:53	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177543	1	11/28/23 09:45	11/28/23 09:45	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180051	1	12/02/23 02:48	12/02/23 02:48	ASM	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2174869	1	11/29/23 09:48	11/29/23 19:15	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	1	11/29/23 09:47	11/29/23 18:49	LD	Mt. Juliet, TN

MW-115D L1679725-15 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/16/23 11:35	11/18/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2176580	1	11/22/23 19:01	11/23/23 13:45	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2176478	1	11/23/23 10:21	11/23/23 10:21	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177543	1	11/28/23 09:45	11/28/23 09:45	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180051	1	12/02/23 03:00	12/02/23 03:00	ASM	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2174869	1	11/29/23 09:48	11/29/23 19:18	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	1	11/29/23 09:47	11/29/23 19:02	LD	Mt. Juliet, TN

SAMPLE SUMMARY

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

DUPLICATE 2 L1679725-16 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/15/23 13:50	11/18/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2175515	1	11/22/23 17:42	11/23/23 00:47	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2176790	1	11/23/23 13:02	11/23/23 13:02	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177543	1	11/28/23 09:45	11/28/23 09:45	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180051	1	12/02/23 03:39	12/02/23 03:39	ASM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180051	10	12/02/23 03:51	12/02/23 03:51	ASM	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2174869	1	11/29/23 09:48	11/29/23 19:27	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	1	11/29/23 09:47	11/29/23 19:05	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	5	11/29/23 09:47	11/29/23 19:31	LD	Mt. Juliet, TN

DUPLICATE 3 L1679725-17 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/15/23 15:55	11/18/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2175515	1	11/22/23 17:42	11/23/23 00:47	JAC	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2176478	1	11/23/23 10:25	11/23/23 10:25	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177543	1	11/28/23 09:45	11/28/23 09:45	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180051	1	12/02/23 04:04	12/02/23 04:04	ASM	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2174869	1	11/29/23 09:48	11/29/23 19:30	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2174901	1	11/29/23 09:47	11/29/23 19:09	LD	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 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.

Brittnie Boyd

Brittnie L Boyd
Project Manager

MW-102S
Collected date/time: 11/16/23 10:20

SAMPLE RESULTS - 01

L1679725

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	204		10.0	1	11/23/2023 00:23	WG2176590

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	58.3		20.0	1	11/23/2023 09:11	WG2176478

Sample Narrative:

L1679725-01 WG2176478: Endpoint ~~pH~~ 4.5 Headspace

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	6.02	T8	1	11/24/2023 17:25	WG2177093

Sample Narrative:

L1679725-01 WG2177093: 6.02 at 18.8C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	7.75		1.00	1	12/01/2023 21:04	WG2180043
Fluoride	0.663		0.150	1	12/01/2023 21:04	WG2180043
Sulfate	25.2		5.00	1	12/01/2023 21:04	WG2180043

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	11/29/2023 18:34	WG2174869
Lithium	0.0333		0.0150	1	11/29/2023 18:34	WG2174869

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	0.0954		0.00200	1	11/29/2023 17:44	WG2174901
Calcium	14.4		1.00	1	11/29/2023 17:44	WG2174901
Magnesium	3.01		1.00	1	11/29/2023 17:44	WG2174901
Sodium	17.7		2.00	1	11/29/2023 17:44	WG2174901
Strontium	0.294		0.0100	1	11/29/2023 17:44	WG2174901

MW-104S

Collected date/time: 11/14/23 16:35

SAMPLE RESULTS - 02

L1679725

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	253		10.0	1	11/20/2023 17:11	WG2174543

Wet Chemistry by Method 2320 B-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Alkalinity	31.7		20.0	1	11/23/2023 12:45	WG2176790

Sample Narrative:

L1679725-02 WG2176790: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
pH	5.50	T8	1	11/24/2023 17:25	WG2177093

Sample Narrative:

L1679725-02 WG2177093: 5.5 at 18.4C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	4.39		1.00	1	12/01/2023 21:16	WG2180043
Fluoride	0.170		0.150	1	12/01/2023 21:16	WG2180043
Sulfate	65.7		5.00	1	12/01/2023 21:16	WG2180043

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	0.834		0.200	1	11/29/2023 18:23	WG2174869
Lithium	0.0412		0.0150	1	11/29/2023 18:23	WG2174869

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.0329		0.00200	1	11/29/2023 18:01	WG2174901
Calcium	14.4		1.00	1	11/29/2023 18:01	WG2174901
Magnesium	3.86		1.00	1	11/29/2023 18:01	WG2174901
Sodium	23.2		2.00	1	11/29/2023 18:01	WG2174901
Strontium	0.293		0.0100	1	11/29/2023 18:01	WG2174901

MW-105S

Collected date/time: 11/14/23 14:00

SAMPLE RESULTS - 03

L1679725

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

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	207		10.0	1	11/20/2023 17:11	WG2174543

Wet Chemistry by Method 2320 B-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Alkalinity	68.3		20.0	1	11/23/2023 09:20	WG2176478

Sample Narrative:

L1679725-03 WG2176478: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
pH	6.02	T8	1	11/24/2023 17:25	WG2177093

Sample Narrative:

L1679725-03 WG2177093: 6.02 at 18.4C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	4.83		1.00	1	12/01/2023 21:29	WG2180043
Fluoride	0.171		0.150	1	12/01/2023 21:29	WG2180043
Sulfate	28.3		5.00	1	12/01/2023 21:29	WG2180043

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	ND		0.200	1	11/29/2023 18:37	WG2174869
Lithium	0.0444		0.0150	1	11/29/2023 18:37	WG2174869

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.0765		0.00200	1	11/29/2023 18:04	WG2174901
Calcium	16.3		1.00	1	11/29/2023 18:04	WG2174901
Magnesium	3.57		1.00	1	11/29/2023 18:04	WG2174901
Sodium	18.4		2.00	1	11/29/2023 18:04	WG2174901
Strontium	0.349		0.0100	1	11/29/2023 18:04	WG2174901

MW-110S
Collected date/time: 11/15/23 15:55

SAMPLE RESULTS - 04

L1679725

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	355		10.0	1	11/22/2023 00:12	WG2175285

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	ND		20.0	1	11/23/2023 09:24	WG2176478

Sample Narrative:

L1679725-04 WG2176478: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	4.80	T8	1	11/24/2023 17:25	WG2177093

Sample Narrative:

L1679725-04 WG2177093: 4.8 at 18.4C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	4.01		1.00	1	12/01/2023 21:42	WG2180043
Fluoride	0.444		0.150	1	12/01/2023 21:42	WG2180043
Sulfate	150		5.00	1	12/01/2023 21:42	WG2180043

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	1.69		0.200	1	11/29/2023 18:40	WG2174869
Lithium	0.0315		0.0150	1	11/29/2023 18:40	WG2174869

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	0.0392		0.00200	1	11/29/2023 18:08	WG2174901
Calcium	6.03		1.00	1	11/29/2023 18:08	WG2174901
Magnesium	2.22		1.00	1	11/29/2023 18:08	WG2174901
Sodium	61.0		2.00	1	11/29/2023 18:08	WG2174901
Strontium	0.160		0.0100	1	11/29/2023 18:08	WG2174901

MW-111S

Collected date/time: 11/16/23 16:25

SAMPLE RESULTS - 05

L1679725

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1370		20.0	1	11/23/2023 00:23	WG2176590

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	ND		20.0	1	11/23/2023 09:26	WG2176478

Sample Narrative:

L1679725-05 WG2176478: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	3.86	T8	1	11/24/2023 17:25	WG2177093

Sample Narrative:

L1679725-05 WG2177093: 3.86 at 18.3C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	12.1		1.00	1	12/01/2023 22:07	WG2180043
Fluoride	0.869		0.150	1	12/01/2023 22:07	WG2180043
Sulfate	827		50.0	10	12/01/2023 22:20	WG2180043

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	6.67		0.200	1	11/29/2023 18:43	WG2174869
Lithium	0.0520		0.0150	1	11/29/2023 18:43	WG2174869

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	0.0159		0.00200	1	11/29/2023 18:19	WG2174901
Calcium	117		1.00	1	11/29/2023 18:19	WG2174901
Magnesium	35.2		1.00	1	11/29/2023 18:19	WG2174901
Sodium	178		2.00	1	11/29/2023 18:19	WG2174901
Strontium	3.20		0.0500	5	11/29/2023 19:19	WG2174901

MW-103D

Collected date/time: 11/15/23 12:20

SAMPLE RESULTS - 06

L1679725

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	437		10.0	1	11/22/2023 14:15	WG2175518

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	319		20.0	1	11/23/2023 09:30	WG2176478

Sample Narrative:

L1679725-06 WG2176478: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.90	T8	1	11/28/2023 09:45	WG2177543

Sample Narrative:

L1679725-06 WG2177543: 7.9 at 19.8C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	6.75		1.00	1	12/01/2023 22:33	WG2180043
Fluoride	0.203		0.150	1	12/01/2023 22:33	WG2180043
Sulfate	63.7		5.00	1	12/01/2023 22:33	WG2180043

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.274		0.200	1	11/29/2023 18:52	WG2174869
Lithium	0.0520		0.0150	1	11/29/2023 18:52	WG2174869

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	0.0878		0.00200	1	11/29/2023 18:22	WG2174901
Calcium	55.6		1.00	1	11/29/2023 18:22	WG2174901
Magnesium	12.1		1.00	1	11/29/2023 18:22	WG2174901
Sodium	80.6		2.00	1	11/29/2023 18:22	WG2174901
Strontium	1.31		0.0100	1	11/29/2023 18:22	WG2174901

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	333		10.0	1	11/20/2023 21:12	WG2174565

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	271		20.0	1	11/23/2023 12:47	WG2176790

Sample Narrative:

L1679725-07 WG2176790: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.61	T8	1	11/28/2023 09:45	WG2177543

Sample Narrative:

L1679725-07 WG2177543: 7.61 at 19.4C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	9.25		1.00	1	12/01/2023 23:11	WG2180043
Fluoride	0.202		0.150	1	12/01/2023 23:11	WG2180043
Sulfate	17.5		5.00	1	12/01/2023 23:11	WG2180043

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.241		0.200	1	11/29/2023 18:55	WG2174869
Lithium	0.0403		0.0150	1	11/29/2023 18:55	WG2174869

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	0.0663		0.00200	1	11/29/2023 18:25	WG2174901
Calcium	52.6		1.00	1	11/29/2023 18:25	WG2174901
Magnesium	11.8		1.00	1	11/29/2023 18:25	WG2174901
Sodium	41.2		2.00	1	11/29/2023 18:25	WG2174901
Strontium	1.22		0.0100	1	11/29/2023 18:25	WG2174901

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	332		10.0	1	11/20/2023 21:12	WG2174565

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	272		20.0	1	11/23/2023 09:35	WG2176478

Sample Narrative:

L1679725-08 WG2176478: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.71	T8	1	11/28/2023 09:45	WG2177543

Sample Narrative:

L1679725-08 WG2177543: 7.71 at 19.3C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	8.94		1.00	1	12/01/2023 23:24	WG2180043
Fluoride	0.310		0.150	1	12/01/2023 23:24	WG2180043
Sulfate	27.0		5.00	1	12/01/2023 23:24	WG2180043

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.273		0.200	1	11/29/2023 18:57	WG2174869
Lithium	0.0407		0.0150	1	11/29/2023 18:57	WG2174869

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	0.123		0.00200	1	11/29/2023 18:29	WG2174901
Calcium	53.7		1.00	1	11/29/2023 18:29	WG2174901
Magnesium	11.6		1.00	1	11/29/2023 18:29	WG2174901
Sodium	44.8		2.00	1	11/29/2023 18:29	WG2174901
Strontium	1.27		0.0100	1	11/29/2023 18:29	WG2174901

MW-107D
Collected date/time: 11/16/23 17:50

SAMPLE RESULTS - 09

L1679725

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

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	534		10.0	1	11/23/2023 00:23	WG2176590

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	318		20.0	1	11/23/2023 09:39	WG2176478

Sample Narrative:

L1679725-09 WG2176478: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.01	T8	1	11/28/2023 09:45	WG2177543

Sample Narrative:

L1679725-09 WG2177543: 8.01 at 19.2C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	19.9		1.00	1	12/01/2023 23:37	WG2180043
Fluoride	ND		0.150	1	12/01/2023 23:37	WG2180043
Sulfate	125		5.00	1	12/01/2023 23:37	WG2180043

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.318		0.200	1	11/29/2023 19:00	WG2174869
Lithium	0.0498		0.0150	1	11/29/2023 19:00	WG2174869

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	0.124		0.00200	1	11/29/2023 18:32	WG2174901
Calcium	79.0		1.00	1	11/29/2023 18:32	WG2174901
Magnesium	16.9		1.00	1	11/29/2023 18:32	WG2174901
Sodium	71.7		2.00	1	11/29/2023 18:32	WG2174901
Strontium	1.97		0.0100	1	11/29/2023 18:32	WG2174901

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	464		10.0	1	11/23/2023 13:45	WG2176580

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	400		20.0	1	11/23/2023 11:36	WG2176470

Sample Narrative:

L1679725-10 WG2176470: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.74	T8	1	11/28/2023 09:45	WG2177543

Sample Narrative:

L1679725-10 WG2177543: 7.74 at 19.2C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	12.6		1.00	1	12/01/2023 23:49	WG2180043
Fluoride	ND		0.150	1	12/01/2023 23:49	WG2180043
Sulfate	38.6		5.00	1	12/01/2023 23:49	WG2180043

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.344		0.200	1	11/29/2023 19:03	WG2174869
Lithium	0.0454		0.0150	1	11/29/2023 19:03	WG2174869

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	0.0744		0.00200	1	11/29/2023 18:35	WG2174901
Calcium	64.2		1.00	1	11/29/2023 18:35	WG2174901
Magnesium	14.1		1.00	1	11/29/2023 18:35	WG2174901
Sodium	88.0		2.00	1	11/29/2023 18:35	WG2174901
Strontium	1.57		0.0100	1	11/29/2023 18:35	WG2174901

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

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	357		10.0	1	11/23/2023 13:45	WG2176580

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	277		20.0	1	11/27/2023 13:29	WG2176845

Sample Narrative:

L1679725-11 WG2176845: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.80	T8	1	11/28/2023 09:45	WG2177543

Sample Narrative:

L1679725-11 WG2177543: 7.8 at 19.2C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	6.02		1.00	1	12/02/2023 00:02	WG2180043
Fluoride	0.188	P1	0.150	1	12/02/2023 00:02	WG2180043
Sulfate	43.6		5.00	1	12/02/2023 00:02	WG2180043

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.312		0.200	1	11/29/2023 19:06	WG2174869
Lithium	0.0416		0.0150	1	11/29/2023 19:06	WG2174869

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	0.0749		0.00200	1	11/29/2023 18:39	WG2174901
Calcium	47.6		1.00	1	11/29/2023 18:39	WG2174901
Magnesium	10.3		1.00	1	11/29/2023 18:39	WG2174901
Sodium	64.6		2.00	1	11/29/2023 18:39	WG2174901
Strontium	1.14		0.0100	1	11/29/2023 18:39	WG2174901

MW-110D

Collected date/time: 11/16/23 15:00

SAMPLE RESULTS - 12

L1679725

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

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	333		10.0	1	11/23/2023 13:45	WG2176580

Wet Chemistry by Method 2320 B-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Alkalinity	261		20.0	1	11/23/2023 10:12	WG2176478

Sample Narrative:

L1679725-12 WG2176478: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
pH	8.21	T8	1	11/28/2023 09:45	WG2177543

Sample Narrative:

L1679725-12 WG2177543: 8.21 at 19.2C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	6.23		1.00	1	12/02/2023 01:31	WG2180051
Fluoride	ND		0.150	1	12/02/2023 01:31	WG2180051
Sulfate	38.8	J6	5.00	1	12/02/2023 01:31	WG2180051

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	0.312		0.200	1	11/29/2023 19:09	WG2174869
Lithium	0.0398		0.0150	1	11/29/2023 19:09	WG2174869

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.0621		0.00200	1	11/29/2023 18:42	WG2174901
Calcium	42.7		1.00	1	11/29/2023 18:42	WG2174901
Magnesium	9.56		1.00	1	11/29/2023 18:42	WG2174901
Sodium	61.1		2.00	1	11/29/2023 18:42	WG2174901
Strontium	1.10		0.0100	1	11/29/2023 18:42	WG2174901

MW-113D

Collected date/time: 11/15/23 13:50

SAMPLE RESULTS - 13

L1679725

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	1150		20.0	1	11/22/2023 00:12	WG2175285

Wet Chemistry by Method 2320 B-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Alkalinity	246		20.0	1	11/23/2023 10:17	WG2176478

Sample Narrative:

L1679725-13 WG2176478: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
pH	7.30	T8	1	11/28/2023 09:45	WG2177543

Sample Narrative:

L1679725-13 WG2177543: 7.3 at 19.1C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	14.7		1.00	1	12/02/2023 02:22	WG2180051
Fluoride	ND		0.150	1	12/02/2023 02:22	WG2180051
Sulfate	590		50.0	10	12/02/2023 02:35	WG2180051

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	0.492		0.200	1	11/29/2023 19:12	WG2174869
Lithium	0.191		0.0150	1	11/29/2023 19:12	WG2174869

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.0147		0.00200	1	11/29/2023 18:46	WG2174901
Calcium	189		1.00	1	11/29/2023 18:46	WG2174901
Magnesium	50.9		1.00	1	11/29/2023 18:46	WG2174901
Sodium	75.8		2.00	1	11/29/2023 18:46	WG2174901
Strontium	4.39		0.0500	5	11/29/2023 19:22	WG2174901

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	315		10.0	1	11/22/2023 00:12	WG2175285

Wet Chemistry by Method 2320 B-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Alkalinity	262		20.0	1	11/23/2023 12:53	WG2176790

Sample Narrative:

L1679725-14 WG2176790: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
pH	7.82	T8	1	11/28/2023 09:45	WG2177543

Sample Narrative:

L1679725-14 WG2177543: 7.82 at 18.9C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	7.25		1.00	1	12/02/2023 02:48	WG2180051
Fluoride	ND		0.150	1	12/02/2023 02:48	WG2180051
Sulfate	25.1		5.00	1	12/02/2023 02:48	WG2180051

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	0.278		0.200	1	11/29/2023 19:15	WG2174869
Lithium	0.0380		0.0150	1	11/29/2023 19:15	WG2174869

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.123		0.00200	1	11/29/2023 18:49	WG2174901
Calcium	50.4		1.00	1	11/29/2023 18:49	WG2174901
Magnesium	10.9		1.00	1	11/29/2023 18:49	WG2174901
Sodium	42.2		2.00	1	11/29/2023 18:49	WG2174901
Strontium	1.16		0.0100	1	11/29/2023 18:49	WG2174901

MW-115D
Collected date/time: 11/16/23 11:35

SAMPLE RESULTS - 15

L1679725

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

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	325		10.0	1	11/23/2023 13:45	WG2176580

Wet Chemistry by Method 2320 B-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Alkalinity	310		20.0	1	11/23/2023 10:21	WG2176478

Sample Narrative:

L1679725-15 WG2176478: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
pH	7.86	T8	1	11/28/2023 09:45	WG2177543

Sample Narrative:

L1679725-15 WG2177543: 7.86 at 18.9C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	4.25	B	1.00	1	12/02/2023 03:00	WG2180051
Fluoride	ND		0.150	1	12/02/2023 03:00	WG2180051
Sulfate	ND		5.00	1	12/02/2023 03:00	WG2180051

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	0.335		0.200	1	11/29/2023 19:18	WG2174869
Lithium	0.0430		0.0150	1	11/29/2023 19:18	WG2174869

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.0716		0.00200	1	11/29/2023 19:02	WG2174901
Calcium	40.8		1.00	1	11/29/2023 19:02	WG2174901
Magnesium	9.13		1.00	1	11/29/2023 19:02	WG2174901
Sodium	63.3		2.00	1	11/29/2023 19:02	WG2174901
Strontium	0.961		0.0100	1	11/29/2023 19:02	WG2174901

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1220		20.0	1	11/23/2023 00:47	WG2175515

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	247		20.0	1	11/23/2023 13:02	WG2176790

Sample Narrative:

L1679725-16 WG2176790: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.34	T8	1	11/28/2023 09:45	WG2177543

Sample Narrative:

L1679725-16 WG2177543: 7.34 at 18.9C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	13.9		1.00	1	12/02/2023 03:39	WG2180051
Fluoride	ND		0.150	1	12/02/2023 03:39	WG2180051
Sulfate	607		50.0	10	12/02/2023 03:51	WG2180051

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.502		0.200	1	11/29/2023 19:27	WG2174869
Lithium	0.192		0.0150	1	11/29/2023 19:27	WG2174869

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	0.0155		0.00200	1	11/29/2023 19:05	WG2174901
Calcium	191		1.00	1	11/29/2023 19:05	WG2174901
Magnesium	50.9		1.00	1	11/29/2023 19:05	WG2174901
Sodium	75.9		2.00	1	11/29/2023 19:05	WG2174901
Strontium	4.58		0.0500	5	11/29/2023 19:31	WG2174901

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	347		10.0	1	11/23/2023 00:47	WG2175515

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	ND		20.0	1	11/23/2023 10:25	WG2176478

Sample Narrative:

L1679725-17 WG2176478: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	5.01	T8	1	11/28/2023 09:45	WG2177543

Sample Narrative:

L1679725-17 WG2177543: 5.01 at 19.1C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	7.25		1.00	1	12/02/2023 04:04	WG2180051
Fluoride	1.14		0.150	1	12/02/2023 04:04	WG2180051
Sulfate	144		5.00	1	12/02/2023 04:04	WG2180051

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	1.59		0.200	1	11/29/2023 19:30	WG2174869
Lithium	0.0303		0.0150	1	11/29/2023 19:30	WG2174869

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	0.0368		0.00200	1	11/29/2023 19:09	WG2174901
Calcium	5.69		1.00	1	11/29/2023 19:09	WG2174901
Magnesium	2.14		1.00	1	11/29/2023 19:09	WG2174901
Sodium	60.3		2.00	1	11/29/2023 19:09	WG2174901
Strontium	0.151		0.0100	1	11/29/2023 19:09	WG2174901

Method Blank (MB)

(MB) R4003151-1 11/20/23 17:11

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Dissolved Solids	U		10.0	10.0

L1678349-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1678349-05 11/20/23 17:11 • (DUP) R4003151-3 11/20/23 17:11

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	457	480	1	4.91		5

L1678349-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1678349-06 11/20/23 17:11 • (DUP) R4003151-4 11/20/23 17:11

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	554	555	1	0.180		5

Laboratory Control Sample (LCS)

(LCS) R4003151-2 11/20/23 17:11

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Dissolved Solids	8800	8630	98.1	85.0-115	

Method Blank (MB)

(MB) R4003150-1 11/20/23 21:12

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U	J	10.0	10.0

L1679725-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1679725-07 11/20/23 21:12 • (DUP) R4003150-3 11/20/23 21:12

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	333	329	1	1.21		5

L1679725-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1679725-08 11/20/23 21:12 • (DUP) R4003150-4 11/20/23 21:12

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	332	338	1	1.79		5

Laboratory Control Sample (LCS)

(LCS) R4003150-2 11/20/23 21:12

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8420	95.7	85.0-115	

Method Blank (MB)

(MB) R4004586-1 11/22/23 00:12

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1678402-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1678402-01 11/22/23 00:12 • (DUP) R4004586-3 11/22/23 00:12

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	375	369	1	1.61		5

L1678497-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1678497-07 11/22/23 00:12 • (DUP) R4004586-4 11/22/23 00:12

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	564	561	1	0.533		5

Laboratory Control Sample (LCS)

(LCS) R4004586-2 11/22/23 00:12

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8360	95.0	85.0-115	

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

Method Blank (MB)

(MB) R4004330-1 11/23/23 00:47

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U	J	10.0	10.0

L1678289-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1678289-01 11/23/23 00:47 • (DUP) R4004330-3 11/23/23 00:47

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	259	244	1	5.96	J3	5

L1678612-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1678612-03 11/23/23 00:47 • (DUP) R4004330-4 11/23/23 00:47

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	798	822	1	2.96		5

Laboratory Control Sample (LCS)

(LCS) R4004330-2 11/23/23 00:47

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8750	99.4	85.0-115	

Method Blank (MB)

(MB) R4004046-1 11/22/23 14:15

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U	J	10.0	10.0

L1678247-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1678247-02 11/22/23 14:15 • (DUP) R4004046-3 11/22/23 14:15

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	339	345	1	1.75		5

L1678402-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1678402-02 11/22/23 14:15 • (DUP) R4004046-4 11/22/23 14:15

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	767	787	1	2.58		5

Laboratory Control Sample (LCS)

(LCS) R4004046-2 11/22/23 14:15

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8610	97.8	85.0-115	

Method Blank (MB)

(MB) R4005374-1 11/23/23 13:45

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1679410-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1679410-06 11/23/23 13:45 • (DUP) R4005374-3 11/23/23 13:45

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	495	507	1	2.40		5

L1679410-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1679410-07 11/23/23 13:45 • (DUP) R4005374-4 11/23/23 13:45

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	550	583	1	5.83	J3	5

Laboratory Control Sample (LCS)

(LCS) R4005374-2 11/23/23 13:45

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	9550	109	85.0-115	

Method Blank (MB)

(MB) R4004323-1 11/23/23 00:23

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1679410-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1679410-05 11/23/23 00:23 • (DUP) R4004323-3 11/23/23 00:23

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	418	436	1	4.22		5

L1679713-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1679713-06 11/23/23 00:23 • (DUP) R4004323-4 11/23/23 00:23

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	1460	1620	1	10.7	J3	5

Laboratory Control Sample (LCS)

(LCS) R4004323-2 11/23/23 00:23

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8070	91.7	85.0-115	

Method Blank (MB)

(MB) R4003792-2 11/23/23 09:02

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Alkalinity	U		8.45	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L1677421-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1677421-03 11/23/23 09:12 • (DUP) R4003792-3 11/23/23 09:17

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	ND	ND	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

L1679658-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1679658-01 11/23/23 11:16 • (DUP) R4003792-4 11/23/23 11:22

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	315	316	1	0.244		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R4003792-1 11/23/23 08:55

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Alkalinity	100	104	104	90.0-110	

Sample Narrative:

LCS: Endpoint pH 4.5

Method Blank (MB)

(MB) R4003790-2 11/23/23 09:01

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Alkalinity	U		8.45	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L1679725-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1679725-01 11/23/23 09:11 • (DUP) R4003790-4 11/23/23 09:16

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	58.3	57.6	1	1.28		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

L1679741-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1679741-07 11/23/23 10:50 • (DUP) R4003790-6 11/23/23 10:54

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	ND	ND	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R4003790-1 11/23/23 08:54

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Alkalinity	100	104	104	90.0-110	

Sample Narrative:

LCS: Endpoint pH 4.5

Method Blank (MB)

(MB) R4003791-2 11/23/23 11:32

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Alkalinity	U		8.45	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L1679475-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1679475-03 11/23/23 11:40 • (DUP) R4003791-3 11/23/23 11:45

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	121	122	1	0.773		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

L1679741-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1679741-05 11/23/23 13:35 • (DUP) R4003791-4 11/23/23 13:39

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	ND	ND	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R4003791-1 11/23/23 11:25

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Alkalinity	100	103	103	90.0-110	

Sample Narrative:

LCS: Endpoint pH 4.5

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

Method Blank (MB)

(MB) R4004737-2 11/27/23 12:43

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Alkalinity	U		8.45	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L1679347-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1679347-01 11/27/23 13:10 • (DUP) R4004737-3 11/27/23 13:15

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Alkalinity	450	455	1	1.10		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

L1680141-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1680141-06 11/27/23 14:59 • (DUP) R4004737-4 11/27/23 15:05

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Alkalinity	259	262	1	1.21		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R4004737-1 11/27/23 12:38

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/l	mg/l	%	%	
Alkalinity	100	98.4	98.4	90.0-110	

Sample Narrative:

LCS: Endpoint pH 4.5

L1679713-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1679713-01 11/24/23 17:25 • (DUP) R4004022-2 11/24/23 17:25

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.32	7.31	1	0.137		1

Sample Narrative:

OS: 7.32 at 18.3C
DUP: 7.31 at 18.4C

L1681356-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1681356-01 11/24/23 17:25 • (DUP) R4004022-3 11/24/23 17:25

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.58	7.61	1	0.395		1

Sample Narrative:

OS: 7.58 at 18.5C
DUP: 7.61 at 18.6C

Laboratory Control Sample (LCS)

(LCS) R4004022-1 11/24/23 17:25

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10.01 at 19.2C

L1679320-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1679320-01 11/28/23 09:45 • (DUP) R4005014-2 11/28/23 09:45

Analyte	Original Result su	DUP Result su	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
pH	7.08	7.05	1	0.425		1

Sample Narrative:

OS: 7.08 at 19.8C

DUP: 7.05 at 19.8C

L1679741-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1679741-04 11/28/23 09:45 • (DUP) R4005014-3 11/28/23 09:45

Analyte	Original Result su	DUP Result su	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
pH	6.36	6.38	1	0.314		1

Sample Narrative:

OS: 6.36 at 19C

DUP: 6.38 at 19C

Laboratory Control Sample (LCS)

(LCS) R4005014-1 11/28/23 09:45

Analyte	Spike Amount su	LCS Result su	LCS Rec. %	Rec. Limits %	LCS Qualifier
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10.02 at 20.6C

Method Blank (MB)

(MB) R4007420-1 12/01/23 09:28

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00
Fluoride	U		0.0640	0.150
Sulfate	U		0.594	5.00

L1679713-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1679713-10 12/01/23 19:09 • (DUP) R4007420-3 12/01/23 19:22

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	43.2	42.9	1	0.788		15
Fluoride	0.262	0.370	1	34.3	P1	15
Sulfate	97.8	98.4	1	0.637		15

L1679725-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1679725-11 12/02/23 00:02 • (DUP) R4007420-6 12/02/23 00:15

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	6.02	5.99	1	0.605		15
Fluoride	0.188	ND	1	68.1	P1	15
Sulfate	43.6	43.6	1	0.118		15

Laboratory Control Sample (LCS)

(LCS) R4007420-2 12/01/23 09:40

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.9	99.8	80.0-120	
Fluoride	8.00	8.39	105	80.0-120	
Sulfate	40.0	39.4	98.6	80.0-120	

L1679713-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1679713-10 12/01/23 19:09 • (MS) R4007420-4 12/01/23 19:34 • (MSD) R4007420-5 12/01/23 19:47

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	40.0	43.2	76.7	76.3	83.8	82.6	1	80.0-120			0.612	15
Fluoride	8.00	0.262	8.94	8.80	108	107	1	80.0-120			1.64	15
Sulfate	40.0	97.8	121	120	58.0	55.2	1	80.0-120	J6	J6	0.922	15

L1679725-11 Original Sample (OS) • Matrix Spike (MS)

(OS) L1679725-11 12/02/23 00:02 • (MS) R4007420-7 12/02/23 00:27

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	40.0	6.02	46.3	101	1	80.0-120	
Fluoride	8.00	0.188	8.59	105	1	80.0-120	
Sulfate	40.0	43.6	76.1	81.5	1	80.0-120	

WG2180051

Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY

L1679725-12,13,14,15,16,17

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

Method Blank (MB)

(MB) R4007447-1 12/02/23 01:06

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	0.560	J	0.379	1.00
Fluoride	U		0.0640	0.150
Sulfate	U		0.594	5.00

L1679725-12 Original Sample (OS) • Duplicate (DUP)

(OS) L1679725-12 12/02/23 01:31 • (DUP) R4007447-3 12/02/23 01:44

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	6.23	6.34	1	1.68		15
Fluoride	ND	ND	1	0.000		15
Sulfate	38.8	38.5	1	0.708		15

L1679741-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1679741-09 12/02/23 08:44 • (DUP) R4007447-6 12/02/23 08:57

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	3.31	3.13	1	5.60		15
Fluoride	ND	ND	1	30.1	P1	15
Sulfate	18.8	18.7	1	0.213		15

Laboratory Control Sample (LCS)

(LCS) R4007447-2 12/02/23 01:18

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	40.3	101	80.0-120	
Fluoride	8.00	8.37	105	80.0-120	
Sulfate	40.0	39.9	99.7	80.0-120	

L1679725-12 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1679725-12 12/02/23 01:31 • (MS) R4007447-4 12/02/23 01:57 • (MSD) R4007447-5 12/02/23 02:09

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	40.0	6.23	46.4	46.5	100	101	1	80.0-120			0.365	15
Fluoride	8.00	ND	8.41	8.51	105	106	1	80.0-120			1.19	15
Sulfate	40.0	38.8	72.8	69.5	85.0	76.7	1	80.0-120		J6	4.67	15

L1679741-09 Original Sample (OS) • Matrix Spike (MS)

(OS) L1679741-09 12/02/23 08:44 • (MS) R4007447-7 12/02/23 09:10

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	40.0	3.31	43.0	99.4	1	80.0-120	
Fluoride	8.00	ND	8.45	105	1	80.0-120	
Sulfate	40.0	18.8	56.2	93.5	1	80.0-120	

Method Blank (MB)

(MB) R4006130-1 11/29/23 18:18

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron	U		0.0200	0.200
Lithium	U		0.00485	0.0150

Laboratory Control Sample (LCS)

(LCS) R4006130-2 11/29/23 18:20

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Boron	1.00	0.964	96.4	80.0-120	
Lithium	1.00	1.00	100	80.0-120	

L1679725-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1679725-02 11/29/23 18:23 • (MS) R4006130-4 11/29/23 18:29 • (MSD) R4006130-5 11/29/23 18:32

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron	1.00	0.834	1.78	1.80	94.8	96.4	1	75.0-125			0.883	20
Lithium	1.00	0.0412	1.02	1.04	98.2	100	1	75.0-125			1.83	20

Method Blank (MB)

(MB) R4006115-1 11/29/23 17:37

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.000381	0.00200
Calcium	U		0.0936	1.00
Magnesium	U		0.0735	1.00
Sodium	U		0.376	2.00
Strontium	U		0.000590	0.0100

Laboratory Control Sample (LCS)

(LCS) R4006115-2 11/29/23 17:41

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	0.0500	0.0462	92.4	80.0-120	
Calcium	5.00	4.78	95.6	80.0-120	
Magnesium	5.00	4.76	95.2	80.0-120	
Sodium	5.00	5.00	100	80.0-120	
Strontium	0.0500	0.0460	92.0	80.0-120	

L1679725-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1679725-01 11/29/23 17:44 • (MS) R4006115-4 11/29/23 17:51 • (MSD) R4006115-5 11/29/23 17:54

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	0.0500	0.0954	0.140	0.140	89.4	88.8	1	75.0-125			0.206	20
Calcium	5.00	14.4	18.7	18.8	87.4	88.8	1	75.0-125			0.367	20
Magnesium	5.00	3.01	7.81	7.91	95.9	97.8	1	75.0-125			1.24	20
Sodium	5.00	17.7	22.0	22.4	86.1	93.9	1	75.0-125			1.76	20
Strontium	0.0500	0.294	0.337	0.339	85.8	89.8	1	75.0-125			0.584	20

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

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
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
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8	Sample(s) received past/too close to holding time expiration.

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	LAO00356
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.

Company Name/Address:

~~GBMc & Associates~~ - Bryant, AR
Alliance
219 Brown Lane
Little Rock, AR 72022

Billing Information:

Accounts Payable
219 Brown Ln.
Bryant, AR 72022

Pres Chk: N

Chain of Custody Page ___ of ___

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

L1649725

SDG #: **F077**

Acctnum: **GBMCBAR**
Template: **T198831**
Prelogin: **P1032739**
PM: **829 - Brittnie L Boyd**
PB: 10/25 TS
Shipped Via: **FedEX Ground**

Report to: **Jonathan Brown**

Email To: **Jonathan.Brown@AllianceTG.com;Jhouse@trcc**

Project Description: **Entergy - White Bluff**

City/State Collected:

Please Circle: PT MT CT ET

Phone: **501-847-7077**

Client Project #: **1145-21-080**

Lab Project #: **GBMCBAR-ENTERGYWB**

Collected by (print): JLC/KRS

Site/Facility ID #: **CADL - CCR**

P.O. #:

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y ___

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	B, Ca 250mlHDPE-HNO3	Cl, F, SO4, PH 250mlHDPE-NoPres	TDS 1L-HDPE NoPres								Remarks	Sample # (lab only)
MW-101S		GW																
MW-102S	G	GW		11/16/23	1020	5	-	-	-								5.35	-01
MW-103S		~~GW~~																
MW-104S	G	GW		11/14/23	1635	5	-	-	-								5.06	-02
MW-105S	G	GW		11/14/23	1400	5	-	-	-								5.49	-03
MW-106S		GW																
MW-110S	G	GW		11/15/23	1555	5	-	-	-								4.35	-04
MW-111S	G	GW		11/16/25	1625	5	-	-	-								3.87	-05
MW-101D		GW																
MW-102D		GW																

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier __________

Tracking # 7123 3304 0419

Sample Receipt Checklist
COC Seal Present/Intact: ✓NP __Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: ✓Y __N
Preservation Correct/Checked: ✓Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature) Jth	Date: 11/17/23	Time: 1200	Received by: (Signature)	Trip Blank Received: Yes / [✓ No] HCL / MeoH TBR	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp DPA8 °C 1.1+0=1.1	Bottles Received: 90
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) 17	Date: 11-18-23	Time: 900

If preservation required by Login: Date/Time

Hold:

Condition: [✓ NCF] / OK

~~GBMc & Associates~~ - Bryant, AR
Alliance
219 Brown Lane
Little Rock, AR 72022

Billing Information:
Accounts Payable
219 Brown Ln.
Bryant, AR 72022

Pres Chk: NZ

Report to: **Jonathan Brown**

Email To: **Jonathan.Brown@AllianceTG.com;Jhouse@trcc**

Project Description: **Entergy - White Bluff**

City/State Collected:

Please Circle: PT MT CT ET

Phone: **501-847-7077**

Client Project # **1145-21-080**

Lab Project # **GBMCBAR-ENTERGYWB**

Collected by (print): JLC/KRS

Site/Facility ID # **CADL - CCR**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1670723

Table #

Acctnum: **GBMCBAR**
Template: **T198831**
Prelogin: **P1032739**
PM: **829 - Brittnie L Boyd**
PB: 10/25 TS
Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	B, Ca 250mlHDPE-HNO3	Cl, F, SO4, PH 250mlHDPE-NoPres	TDS 1L-HDPE NoPres	Remarks	Sample # (lab only)
MW-103D	G	GW		11/15/23	1220	5	/	/	/	7.30	-06
MW-104D	G	GW		11/14/23	1730	5	/	/	/	6.95	-07
MW-105D	G	GW		11/14/23	1510	5	/	/	/	7.27	-08
MW-106D		GW									
MW-107D	G	GW		11/16/23	1750	5	/	/	/	7.13	-09
MW-108D		GW		11/16/23	1520	5	/	/	/	7.12	-10
MW-109D		GW		11/16/23	1300	5	/	/	/	7.28	-11
MW-110D		GW		11/15/23	1500	5	/	/	/	7.81	-12
MW-112D		GW									
MW-113D	G	GW		11/15/23	1350	5	/	/	/	6.84	-13

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking # 7123 3304 0419

Sample Receipt Checklist
COC Seal Present/Intact: ✓NP __Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: ✓Y __N
Preservation Correct/Checked: ✓Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature)	Date: 11/17/23	Time: [illegible]	Received by: (Signature)	Trip Blank Received: Yes / [✓ No] HCL / MeoH TBR	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp DPA8 °C 1.1+0=1.1	Bottles Received: 90
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) Eri Davis 17	Date: 11-18-23	Time: 900

If preservation required by Login: Date/Time

Hold:

Condition: [✓ NCF] / OK

GBMc & Associates - Bryant, AR

219 Brown Lane
Little Rock, AR 72022

Billing Information:
Accounts Payable
219 Brown Ln.
Bryant, AR 72022

Pres Chk: CZ

Chain of Custody Page ___ of ___

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1679725

Table #

Acctnum: **GBMCBAR**
Template: **T198831**
Prelogin: **P1032739**
PM: **829 - Brittnie L Boyd**
PB:
Shipped Via: **FedEX Ground**

Report to: **Jonathan Brown**

Email To: **Jonathan.Brown@AllianceTG.com;Jhouse@trcc**

Project Description: **Entergy - White Bluff**

City/State Collected:

Please Circle: PT MT CT ET

Phone: **501-847-7077**

Client Project # **1145-21-080**

Lab Project # **GBMCBAR-ENTERGYWB**

Collected by (print): JLC/KRS

Site/Facility ID # **CADL - CCR**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	B, Ca 250mlHDPE-HNO3	Cl, F, SO4, PH 250mlHDPE-NoPres	TDS 1L-HDPE NoPres								Remarks	Sample # (lab only)
MW-114D	G	GW		11/15/23	1010	5	✓	✓	✓								7.10	-14
MW-115D	G	GW		11/16/23	1135	5	✓	✓	✓								7.14	-15
MW-118D		GW																
FIELD BLANK 1		GW																
DUPLICATE 1		GW																
FIELD BLANK 2		GW																
DUPLICATE 2 MW113D	G	GW		11/15/23	1350	5	✓	✓	✓								6.84	-16
FIELD BLANK 3		GW																
DUPLICATE 3 MW110S	G	GW		11/15/23	1555	5	✓	✓	✓								4.35	-17
		GW																

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking # 7123 3304 0419

Sample Receipt Checklist
COC Seal Present/Intact: ✓ NP __Y __N
COC Signed/Accurate: ✓ Y __N
Bottles arrive intact: ✓ Y __N
Correct bottles used: ✓ Y __N
Sufficient volume sent: ✓ Y __N
If Applicable
VOA Zero Headspace: ✓ Y __N
Preservation Correct/Checked: ✓ Y __N
RAD Screen <0.5 mR/hr: ✓ Y __N

Relinquished by : (Signature)	Date: 11/17/23	Time: 1200	Received by: (Signature)	Trip Blank Received: Yes / [✓ No] HCL / MeoH TBR
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: DPA8C 1.1+0=1.1 Bottles Received: 90
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) 17	Date: 11-18-23 Time: 900

If preservation required by Login: Date/Time

Hold:

Condition: [✓ NCF] / OK

11/18 NCF-L1679725 GBMCBAR

R5

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

Members

Nicolle Faulk (responsible) BB Brittnie Boyd

Due on *24 November 2023 5:00 PM* for target *Done*

- ☑ Login Clarification needed
- ☐ Chain of custody is incomplete
- ☐ Please specify Metals requested
- ☐ Please specify TCLP requested
- ☑ Received additional samples not listed on COC
- ☐ Sample IDs on containers do not match IDs on COC
- ☐ Client did not "X" analysis
- ☐ Chain of Custody is missing
- ☐ If no COC: Received by:____________________
- ☐ If no COC: Date/Time:____________________
- ☐ If no COC: Temp./Cont.Rec./pH:_______________
- ☐ If no COC: Carrier:_______________
- ☐ If no COC: Tracking #:_______________
- ☐ Client informed by call
- ☑ Client informed by Email
- ☐ Client informed by Voicemail
- ☑ Date/Time:____11/20 0950_______________
- ☑ PM initials:______BB____________
- ☑ Client Contact:______Jonathan Brown__________

Comments

Nicolle Faulk *18 November 2023 6:31 PM*

Received MW-108S 11/16/23 1415 not listed on COC. Same p/t# as other containers. Added as -18

Brittnie Boyd *20 November 2023 9:50 AM*

Please place sample on HOLD.

Nicolle Faulk *21 November 2023 7:39 AM*

done

ANALYTICAL REPORT

December 14, 2023

Alliance Technical Group - Bryant, AR

Sample Delivery Group:	L1680471
Samples Received:	11/21/2023
Project Number:	1145-21-080
Description:	Entergy - White Bluff
Site:	CADL-CCR
Report To:	Jonathan Brown 219 Brown Lane Little Rock, AR 72022

Entire Report Reviewed By: Brittnie Boyd

Brittnie L Boyd
Project Manager

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

TABLE OF CONTENTS

SAMPLE SUMMARY

MW-101S L1680471-01 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/17/23 12:15	11/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2177009	1	11/24/23 13:29	11/24/23 19:03	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2177910	1	11/27/23 15:21	11/27/23 15:21	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177546	1	11/27/23 14:49	11/27/23 14:49	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180080	1	11/30/23 23:50	11/30/23 23:50	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2176334	1	11/30/23 11:16	11/30/23 16:59	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2179561	1	11/30/23 11:44	11/30/23 15:54	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2179561	1	11/30/23 11:44	12/01/23 14:16	JPD	Mt. Juliet, TN

MW-106S L1680471-02 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/17/23 16:05	11/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2177009	1	11/24/23 13:29	11/24/23 19:03	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2177910	1	11/27/23 15:24	11/27/23 15:24	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177546	1	11/27/23 14:49	11/27/23 14:49	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180080	1	12/01/23 00:28	12/01/23 00:28	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180080	10	12/01/23 00:41	12/01/23 00:41	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2176334	1	11/30/23 11:16	11/30/23 17:02	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2179561	1	11/30/23 11:44	11/30/23 15:58	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2179561	1	11/30/23 11:44	12/01/23 14:20	JPD	Mt. Juliet, TN

MW-101D L1680471-03 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/17/23 13:20	11/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2177009	1	11/24/23 13:29	11/24/23 19:03	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2177910	1	11/27/23 15:47	11/27/23 15:47	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177546	1	11/27/23 14:49	11/27/23 14:49	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180080	1	12/01/23 00:54	12/01/23 00:54	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2176334	1	11/30/23 11:16	11/30/23 17:05	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2179561	1	11/30/23 11:44	11/30/23 16:01	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2179561	1	11/30/23 11:44	12/01/23 14:23	JPD	Mt. Juliet, TN

MW-102D L1680471-04 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/17/23 11:10	11/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2177009	1	11/24/23 13:29	11/24/23 19:03	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2177910	1	11/27/23 15:55	11/27/23 15:55	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177546	1	11/27/23 14:49	11/27/23 14:49	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180080	1	12/01/23 01:07	12/01/23 01:07	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2176334	1	11/30/23 11:16	11/30/23 17:07	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2179561	1	11/30/23 11:44	11/30/23 16:05	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2179561	1	11/30/23 11:44	12/01/23 14:27	JPD	Mt. Juliet, TN

MW-118D L1680471-05 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/17/23 09:30	11/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2177009	1	11/24/23 13:29	11/24/23 19:03	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2177912	1	11/28/23 09:55	11/28/23 09:55	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2177546	1	11/27/23 14:49	11/27/23 14:49	ARD	Mt. Juliet, TN

SAMPLE SUMMARY

MW-118D L1680471-05 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/17/23 09:30	11/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG2180080	1	12/01/23 01:32	12/01/23 01:32	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2176334	1	11/30/23 11:16	11/30/23 17:10	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2179561	1	11/30/23 11:44	11/30/23 16:08	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2179561	5	11/30/23 11:44	12/01/23 14:30	JPD	Mt. Juliet, TN

FIELD BLANK 1 L1680471-06 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/17/23 15:15	11/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2177009	1	11/24/23 13:29	11/24/23 19:03	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2177912	1	11/28/23 10:00	11/28/23 10:00	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2178460	1	11/28/23 12:30	11/28/23 12:30	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180080	1	12/01/23 02:23	12/01/23 02:23	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2176334	1	11/30/23 11:16	11/30/23 17:18	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2179561	1	11/30/23 11:44	11/30/23 16:18	SJM	Mt. Juliet, TN

FIELD BLANK 2 L1680471-07 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/17/23 15:15	11/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2177009	1	11/24/23 13:29	11/24/23 19:03	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2177912	1	11/28/23 10:08	11/28/23 10:08	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2178460	1	11/28/23 12:30	11/28/23 12:30	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180082	1	12/04/23 14:30	12/04/23 14:30	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2176334	1	11/30/23 11:16	11/30/23 17:21	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2179561	1	11/30/23 11:44	11/30/23 16:22	SJM	Mt. Juliet, TN

FIELD BLANK 3 L1680471-08 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/17/23 15:15	11/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2177009	1	11/24/23 13:29	11/24/23 19:03	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2177912	1	11/28/23 10:12	11/28/23 10:12	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2178460	1	11/28/23 12:30	11/28/23 12:30	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2180082	1	12/04/23 15:25	12/04/23 15:25	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2176334	1	11/30/23 11:16	11/30/23 17:24	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2179561	1	11/30/23 11:44	11/30/23 16:25	SJM	Mt. Juliet, TN

MW-112D L1680471-09 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/17/23 14:35	11/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2177009	1	11/24/23 13:29	11/24/23 19:03	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2177912	1	11/28/23 10:43	11/28/23 10:43	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2178460	1	11/28/23 12:30	11/28/23 12:30	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2183484	10	12/06/23 00:59	12/06/23 00:59	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2183941	10	12/07/23 00:26	12/07/23 00:26	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2176334	1	11/30/23 11:16	11/30/23 17:27	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2179561	1	11/30/23 11:44	11/30/23 16:29	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2179561	1	11/30/23 11:44	12/01/23 14:33	JPD	Mt. Juliet, TN

SAMPLE SUMMARY

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

FIELD BLANK L1680471-10 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/17/23 15:15	11/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2177009	1	11/24/23 13:29	11/24/23 19:03	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2177912	1	11/28/23 10:48	11/28/23 10:48	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2178460	1	11/28/23 12:30	11/28/23 12:30	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2183484	1	12/06/23 01:27	12/06/23 01:27	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2183941	1	12/07/23 00:58	12/07/23 00:58	GEB	Mt. Juliet, TN
Mercury by Method 7470A	WG2176224	1	11/27/23 19:33	11/28/23 22:44	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2176334	1	11/30/23 11:16	11/30/23 15:52	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2176349	1	11/29/23 14:33	11/30/23 14:45	JPD	Mt. Juliet, TN

MW-106D L1680471-11 GW

Collected by	Collected date/time	Received date/time
JLC/KRS	11/17/23 17:10	11/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2177009	1	11/24/23 13:29	11/24/23 19:03	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG2177912	1	11/28/23 10:51	11/28/23 10:51	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2178460	1	11/28/23 12:30	11/28/23 12:30	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2183484	10	12/06/23 01:54	12/06/23 01:54	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2183941	10	12/07/23 01:29	12/07/23 01:29	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG2176334	1	11/30/23 11:16	11/30/23 17:30	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2179561	1	11/30/23 11:44	11/30/23 16:32	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2179561	5	11/30/23 11:44	12/01/23 14:37	JPD	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 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.

Brittnie Boyd

Brittnie L Boyd
Project Manager

MW-101S

Collected date/time: 11/17/23 12:15

SAMPLE RESULTS - 01

L1680471

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	194		10.0	1	11/24/2023 19:03	WG2177009

Wet Chemistry by Method 2320 B-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Alkalinity	50.5		20.0	1	11/27/2023 15:21	WG2177910

Sample Narrative:

L1680471-01 WG2177910: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
pH	6.04	T8	1	11/27/2023 14:49	WG2177546

Sample Narrative:

L1680471-01 WG2177546: 6.04 at 19.2C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	7.38		1.00	1	11/30/2023 23:50	WG2180080
Fluoride	ND		0.150	1	11/30/2023 23:50	WG2180080
Sulfate	47.7	J6	5.00	1	11/30/2023 23:50	WG2180080

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	ND		0.200	1	11/30/2023 16:59	WG2176334
Lithium	0.0398		0.0150	1	11/30/2023 16:59	WG2176334

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.0536		0.00200	1	12/01/2023 14:16	WG2179561
Calcium	15.0		1.00	1	11/30/2023 15:54	WG2179561
Magnesium	3.90		1.00	1	11/30/2023 15:54	WG2179561
Sodium	25.8		2.00	1	11/30/2023 15:54	WG2179561
Strontium	0.351		0.0100	1	12/01/2023 14:16	WG2179561

MW-106S

Collected date/time: 11/17/23 16:05

SAMPLE RESULTS - 02

L1680471

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

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	1040		20.0	1	11/24/2023 19:03	WG2177009

Wet Chemistry by Method 2320 B-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Alkalinity	ND		20.0	1	11/27/2023 15:24	WG2177910

Sample Narrative:

L1680471-02 WG2177910: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
pH	4.00	T8	1	11/27/2023 14:49	WG2177546

Sample Narrative:

L1680471-02 WG2177546: 4 at 19.3C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	12.6		1.00	1	12/01/2023 00:28	WG2180080
Fluoride	0.695		0.150	1	12/01/2023 00:28	WG2180080
Sulfate	698		50.0	10	12/01/2023 00:41	WG2180080

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	6.91		0.200	1	11/30/2023 17:02	WG2176334
Lithium	0.0251		0.0150	1	11/30/2023 17:02	WG2176334

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.0206		0.00200	1	12/01/2023 14:20	WG2179561
Calcium	40.5		1.00	1	11/30/2023 15:58	WG2179561
Magnesium	23.0		1.00	1	11/30/2023 15:58	WG2179561
Sodium	219		2.00	1	11/30/2023 15:58	WG2179561
Strontium	1.39		0.0100	1	12/01/2023 14:20	WG2179561

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	297		10.0	1	11/24/2023 19:03	WG2177009

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	218		20.0	1	11/27/2023 15:47	WG2177910

Sample Narrative:

L1680471-03 WG2177910: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.06	T8	1	11/27/2023 14:49	WG2177546

Sample Narrative:

L1680471-03 WG2177546: 7.06 at 19.2C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	5.85		1.00	1	12/01/2023 00:54	WG2180080
Fluoride	ND		0.150	1	12/01/2023 00:54	WG2180080
Sulfate	80.1		5.00	1	12/01/2023 00:54	WG2180080

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	11/30/2023 17:05	WG2176334
Lithium	0.0493		0.0150	1	11/30/2023 17:05	WG2176334

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	0.0866		0.00200	1	12/01/2023 14:23	WG2179561
Calcium	56.9		1.00	1	11/30/2023 16:01	WG2179561
Magnesium	11.6		1.00	1	11/30/2023 16:01	WG2179561
Sodium	44.1		2.00	1	11/30/2023 16:01	WG2179561
Strontium	1.32		0.0100	1	12/01/2023 14:23	WG2179561

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

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	445		10.0	1	11/24/2023 19:03	WG2177009

Wet Chemistry by Method 2320 B-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Alkalinity	329		20.0	1	11/27/2023 15:55	WG2177910

Sample Narrative:

L1680471-04 WG2177910: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
pH	7.47	T8	1	11/27/2023 14:49	WG2177546

Sample Narrative:

L1680471-04 WG2177546: 7.47 at 19.3C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	8.22		1.00	1	12/01/2023 01:07	WG2180080
Fluoride	ND		0.150	1	12/01/2023 01:07	WG2180080
Sulfate	25.7		5.00	1	12/01/2023 01:07	WG2180080

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	0.275		0.200	1	11/30/2023 17:07	WG2176334
Lithium	0.0437		0.0150	1	11/30/2023 17:07	WG2176334

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.134		0.00200	1	12/01/2023 14:27	WG2179561
Calcium	67.2		1.00	1	11/30/2023 16:05	WG2179561
Magnesium	14.0		1.00	1	11/30/2023 16:05	WG2179561
Sodium	47.1		2.00	1	11/30/2023 16:05	WG2179561
Strontium	1.54		0.0100	1	12/01/2023 14:27	WG2179561

MW-118D
Collected date/time: 11/17/23 09:30

SAMPLE RESULTS - 05

L1680471

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	504		10.0	1	11/24/2023 19:03	WG2177009

Wet Chemistry by Method 2320 B-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Alkalinity	306		20.0	1	11/28/2023 09:55	WG2177912

Sample Narrative:

L1680471-05 WG2177912: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
pH	7.18	T8	1	11/27/2023 14:49	WG2177546

Sample Narrative:

L1680471-05 WG2177546: 7.18 at 19.2C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	8.23		1.00	1	12/01/2023 01:32	WG2180080
Fluoride	ND		0.150	1	12/01/2023 01:32	WG2180080
Sulfate	151		5.00	1	12/01/2023 01:32	WG2180080

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	0.291		0.200	1	11/30/2023 17:10	WG2176334
Lithium	0.107		0.0150	1	11/30/2023 17:10	WG2176334

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.0383		0.0100	5	12/01/2023 14:30	WG2179561
Calcium	91.0		1.00	1	11/30/2023 16:08	WG2179561
Magnesium	21.4		1.00	1	11/30/2023 16:08	WG2179561
Sodium	51.2		2.00	1	11/30/2023 16:08	WG2179561
Strontium	2.09		0.0500	5	12/01/2023 14:30	WG2179561

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	ND		10.0	1	11/24/2023 19:03	WG2177009

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	ND		20.0	1	11/28/2023 10:00	WG2177912

Sample Narrative:

L1680471-06 WG2177912: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	4.19	T8	1	11/28/2023 12:30	WG2178460

Sample Narrative:

L1680471-06 WG2178460: 4.19 at 18C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	ND		1.00	1	12/01/2023 02:23	WG2180080
Fluoride	ND		0.150	1	12/01/2023 02:23	WG2180080
Sulfate	ND		5.00	1	12/01/2023 02:23	WG2180080

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	11/30/2023 17:18	WG2176334
Lithium	ND		0.0150	1	11/30/2023 17:18	WG2176334

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	ND		0.00200	1	11/30/2023 16:18	WG2179561
Calcium	ND		1.00	1	11/30/2023 16:18	WG2179561
Magnesium	ND		1.00	1	11/30/2023 16:18	WG2179561
Sodium	ND		2.00	1	11/30/2023 16:18	WG2179561
Strontium	ND		0.0100	1	11/30/2023 16:18	WG2179561

FIELD BLANK 2

Collected date/time: 11/17/23 15:15

SAMPLE RESULTS - 07

L1680471

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

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	ND		10.0	1	11/24/2023 19:03	WG2177009

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	ND		20.0	1	11/28/2023 10:08	WG2177912

Sample Narrative:

L1680471-07 WG2177912: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	5.40	T8	1	11/28/2023 12:30	WG2178460

Sample Narrative:

L1680471-07 WG2178460: 5.4 at 18.2C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	ND	P1	1.00	1	12/04/2023 14:30	WG2180082
Fluoride	ND		0.150	1	12/04/2023 14:30	WG2180082
Sulfate	ND		5.00	1	12/04/2023 14:30	WG2180082

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	11/30/2023 17:21	WG2176334
Lithium	ND		0.0150	1	11/30/2023 17:21	WG2176334

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	ND		0.00200	1	11/30/2023 16:22	WG2179561
Calcium	ND		1.00	1	11/30/2023 16:22	WG2179561
Magnesium	ND		1.00	1	11/30/2023 16:22	WG2179561
Sodium	ND		2.00	1	11/30/2023 16:22	WG2179561
Strontium	ND		0.0100	1	11/30/2023 16:22	WG2179561

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	ND		10.0	1	11/24/2023 19:03	WG2177009

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	ND		20.0	1	11/28/2023 10:12	WG2177912

Sample Narrative:

L1680471-08 WG2177912: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	5.48	T8	1	11/28/2023 12:30	WG2178460

Sample Narrative:

L1680471-08 WG2178460: 5.48 at 18.5C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	ND		1.00	1	12/04/2023 15:25	WG2180082
Fluoride	ND		0.150	1	12/04/2023 15:25	WG2180082
Sulfate	ND		5.00	1	12/04/2023 15:25	WG2180082

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	11/30/2023 17:24	WG2176334
Lithium	ND		0.0150	1	11/30/2023 17:24	WG2176334

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	ND		0.00200	1	11/30/2023 16:25	WG2179561
Calcium	ND		1.00	1	11/30/2023 16:25	WG2179561
Magnesium	ND		1.00	1	11/30/2023 16:25	WG2179561
Sodium	ND		2.00	1	11/30/2023 16:25	WG2179561
Strontium	ND		0.0100	1	11/30/2023 16:25	WG2179561

MW-112D

Collected date/time: 11/17/23 14:35

SAMPLE RESULTS - 09

L1680471

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

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	295		10.0	1	11/24/2023 19:03	WG2177009

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	276		20.0	1	11/28/2023 10:43	WG2177912

Sample Narrative:

L1680471-09 WG2177912: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.57	T8	1	11/28/2023 12:30	WG2178460

Sample Narrative:

L1680471-09 WG2178460: 7.57 at 18.2C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	ND		10.0	10	12/06/2023 00:59	WG2183484
Fluoride	ND		1.50	10	12/07/2023 00:26	WG2183941
Sulfate	ND		50.0	10	12/07/2023 00:26	WG2183941

Sample Narrative:

L1680471-09 WG2183484: Dilution due to matrix.

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	0.286		0.200	1	11/30/2023 17:27	WG2176334
Lithium	0.0373		0.0150	1	11/30/2023 17:27	WG2176334

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	0.0871		0.00200	1	12/01/2023 14:33	WG2179561
Calcium	41.1		1.00	1	11/30/2023 16:29	WG2179561
Magnesium	8.57		1.00	1	11/30/2023 16:29	WG2179561
Sodium	50.5		2.00	1	11/30/2023 16:29	WG2179561
Strontium	0.985		0.0100	1	12/01/2023 14:33	WG2179561

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	ND		10.0	1	11/24/2023 19:03	WG2177009

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	ND		20.0	1	11/28/2023 10:48	WG2177912

Sample Narrative:

L1680471-10 WG2177912: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	5.58	T8	1	11/28/2023 12:30	WG2178460

Sample Narrative:

L1680471-10 WG2178460: 5.58 at 18.4C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	ND		1.00	1	12/06/2023 01:27	WG2183484
Fluoride	ND		0.150	1	12/07/2023 00:58	WG2183941
Sulfate	ND		5.00	1	12/07/2023 00:58	WG2183941

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.000200	1	11/28/2023 22:44	WG2176224

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	11/30/2023 15:52	WG2176334
Lithium	ND		0.0150	1	11/30/2023 15:52	WG2176334

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	ND		0.00200	1	11/30/2023 14:45	WG2176349
Calcium	ND		1.00	1	11/30/2023 14:45	WG2176349
Magnesium	ND		1.00	1	11/30/2023 14:45	WG2176349
Sodium	ND	J4	2.00	1	11/30/2023 14:45	WG2176349
Strontium	ND	J4	0.0100	1	11/30/2023 14:45	WG2176349

Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	185		10.0	1	11/24/2023 19:03	WG2177009

Wet Chemistry by Method 2320 B-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Alkalinity	185		20.0	1	11/28/2023 10:51	WG2177912

Sample Narrative:

L1680471-11 WG2177912: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	su			date / time	
pH	9.99	T8	1	11/28/2023 12:30	WG2178460

Sample Narrative:

L1680471-11 WG2178460: 9.99 at 18.4C

Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Chloride	ND		10.0	10	12/06/2023 01:54	WG2183484
Fluoride	ND		1.50	10	12/07/2023 01:29	WG2183941
Sulfate	ND		50.0	10	12/07/2023 01:29	WG2183941

Sample Narrative:

L1680471-11 WG2183484: Dilution due to matrix.

Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Boron	0.249		0.200	1	11/30/2023 17:30	WG2176334
Lithium	0.206		0.0150	1	11/30/2023 17:30	WG2176334

Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.142		0.0100	5	12/01/2023 14:37	WG2179561
Calcium	37.1		1.00	1	11/30/2023 16:32	WG2179561
Magnesium	3.92		1.00	1	11/30/2023 16:32	WG2179561
Sodium	49.4		2.00	1	11/30/2023 16:32	WG2179561
Strontium	3.06		0.0500	5	12/01/2023 14:37	WG2179561

Method Blank (MB)

(MB) R4005316-1 11/24/23 19:03

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1679203-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1679203-01 11/24/23 19:03 • (DUP) R4005316-3 11/24/23 19:03

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	124	125	1	0.803		5

L1679529-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1679529-01 11/24/23 19:03 • (DUP) R4005316-4 11/24/23 19:03

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	419	438	1	4.43		5

Laboratory Control Sample (LCS)

(LCS) R4005316-2 11/24/23 19:03

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8540	97.0	85.0-115	

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

Method Blank (MB)

(MB) R4005035-2 11/27/23 13:53

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Alkalinity	U		8.45	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L1680243-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1680243-01 11/27/23 14:10 • (DUP) R4005035-3 11/27/23 14:14

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	273	275	1	0.760		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

L1680471-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1680471-03 11/27/23 15:47 • (DUP) R4005035-4 11/27/23 15:51

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	218	220	1	1.08		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R4005035-1 11/27/23 13:49

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Alkalinity	100	104	104	90.0-110	

Sample Narrative:

LCS: Endpoint pH 4.5

QUALITY CONTROL SUMMARY

L1680471-05,06,07,08,09,10,11

Method Blank (MB)

(MB) R4005182-2 11/28/23 08:47

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Alkalinity	U		8.45	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L1679713-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1679713-02 11/28/23 09:31 • (DUP) R4005182-4 11/28/23 09:37

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	195	195	1	0.0281		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

L1680793-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1680793-01 11/28/23 11:36 • (DUP) R4005182-6 11/28/23 11:42

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	328	325	1	1.17		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R4005182-1 11/28/23 08:43

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Alkalinity	100	105	105	90.0-110	

Sample Narrative:

LCS: Endpoint pH 4.5

L1679741-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1679741-05 11/27/23 14:49 • (DUP) R4004680-2 11/27/23 14:49

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	3.95	3.92	1	0.762		1

Sample Narrative:

OS: 3.95 at 19.6C

DUP: 3.92 at 19.4C

L1680471-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1680471-05 11/27/23 14:49 • (DUP) R4004680-3 11/27/23 14:49

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.18	7.20	1	0.278		1

Sample Narrative:

OS: 7.18 at 19.2C

DUP: 7.2 at 19.2C

Laboratory Control Sample (LCS)

(LCS) R4004680-1 11/27/23 14:49

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10.02 at 20C

L1680471-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1680471-06 11/28/23 12:30 • (DUP) R4005166-2 11/28/23 12:30

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	4.19	4.16	1	0.719		1

Sample Narrative:

OS: 4.19 at 18C

DUP: 4.16 at 18.2C

L1681378-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1681378-01 11/28/23 12:30 • (DUP) R4005166-3 11/28/23 12:30

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	6.80	6.83	1	0.440		1

Sample Narrative:

OS: 6.8 at 18.7C

DUP: 6.83 at 18.8C

Laboratory Control Sample (LCS)

(LCS) R4005166-1 11/28/23 12:30

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10.03 at 18.8C

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

Method Blank (MB)

(MB) R4006895-1 11/30/23 09:53

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00
Fluoride	U		0.0640	0.150
Sulfate	U		0.594	5.00

L1680300-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1680300-01 11/30/23 19:10 • (DUP) R4006895-3 11/30/23 19:23

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	23.2	23.3	1	0.311		15
Fluoride	0.255	0.229	1	10.9		15
Sulfate	78.7	79.0	1	0.363		15

L1680471-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1680471-01 11/30/23 23:50 • (DUP) R4006895-6 12/01/23 00:03

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	7.38	7.16	1	3.08		15
Fluoride	ND	ND	1	0.000		15
Sulfate	47.7	46.9	1	1.67		15

Laboratory Control Sample (LCS)

(LCS) R4006895-2 11/30/23 10:06

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.3	98.3	80.0-120	
Fluoride	8.00	8.23	103	80.0-120	
Sulfate	40.0	38.8	96.9	80.0-120	

L1680300-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1680300-01 11/30/23 19:10 • (MS) R4006895-4 11/30/23 19:36 • (MSD) R4006895-5 11/30/23 19:48

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Chloride	40.0	23.2	58.9	59.0	89.2	89.5	1	80.0-120			0.170	15
Fluoride	8.00	0.255	9.15	8.58	111	104	1	80.0-120			6.49	15
Sulfate	40.0	78.7	104	104	62.8	63.1	1	80.0-120	J6	J6	0.133	15

L1680471-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1680471-01 11/30/23 23:50 • (MS) R4006895-7 12/01/23 00:16

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/l	mg/l	mg/l	%		%	
Chloride	40.0	7.38	45.6	95.6	1	80.0-120	
Fluoride	8.00	ND	8.19	102	1	80.0-120	
Sulfate	40.0	47.7	78.7	77.4	1	80.0-120	J6

QUALITY CONTROL SUMMARY

Method Blank (MB)

(MB) R4008278-1 12/04/23 11:53

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00
Fluoride	U		0.0640	0.150
Sulfate	U		0.594	5.00

L1680471-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1680471-07 12/04/23 14:30 • (DUP) R4008278-3 12/04/23 14:44

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	ND	ND	1	200	P1	15
Fluoride	ND	ND	1	0.000		15
Sulfate	ND	ND	1	0.000		15

L1680861-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1680861-02 12/04/23 20:41 • (DUP) R4008278-6 12/04/23 20:54

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	3.01	3.04	1	0.787		15
Fluoride	ND	ND	1	0.000		15
Sulfate	ND	ND	1	0.000		15

Laboratory Control Sample (LCS)

(LCS) R4008278-2 12/04/23 12:06

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.2	98.0	80.0-120	
Fluoride	8.00	8.01	100	80.0-120	
Sulfate	40.0	39.0	97.4	80.0-120	

L1680471-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1680471-07 12/04/23 14:30 • (MS) R4008278-4 12/04/23 14:57 • (MSD) R4008278-5 12/04/23 15:11

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	40.0	ND	39.7	40.1	98.2	99.2	1	80.0-120			0.971	15
Fluoride	8.00	ND	8.01	8.22	100	103	1	80.0-120			2.70	15
Sulfate	40.0	ND	39.6	39.9	99.0	99.7	1	80.0-120			0.689	15

L1680861-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1680861-02 12/04/23 20:41 • (MS) R4008278-7 12/04/23 21:08

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	40.0	3.01	43.1	100	1	80.0-120	
Fluoride	8.00	ND	8.27	103	1	80.0-120	
Sulfate	40.0	ND	40.3	101	1	80.0-120	

WG2183484

Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY

L1680471-09,10,11

Method Blank (MB)

(MB) R4009317-1 12/06/23 00:32

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00

L1683282-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1683282-01 12/06/23 02:21 • (DUP) R4009317-3 12/06/23 02:35

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	2.32	2.31	1	0.324		15

L1683795-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1683795-02 12/06/23 07:32 • (DUP) R4009317-6 12/06/23 07:45

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	59.2	59.1	1	0.260		15

Laboratory Control Sample (LCS)

(LCS) R4009317-2 12/06/23 00:45

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.7	99.2	80.0-120	

L1683282-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1683282-01 12/06/23 02:21 • (MS) R4009317-4 12/06/23 03:16 • (MSD) R4009317-5 12/06/23 03:30

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	40.0	2.32	42.2	42.3	99.8	99.9	1	80.0-120			0.129	15

L1683795-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1683795-02 12/06/23 07:32 • (MS) R4009317-7 12/06/23 07:59

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	40.0	59.2	87.5	70.6	1	80.0-120	J6

WG2183941

Wet Chemistry by Method 9056A

QUALITY CONTROL SUMMARY

L1680471-09,10,11

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

Method Blank (MB)

(MB) R4010095-1 12/06/23 15:02

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Fluoride	U		0.0640	0.150
Sulfate	0.632	J	0.594	5.00

L1680203-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1680203-03 12/06/23 18:36 • (DUP) R4010095-3 12/06/23 18:52

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Fluoride	0.215	0.248	1	14.2		15
Sulfate	16.3	16.8	1	2.82		15

L1680380-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1680380-03 12/06/23 23:22 • (DUP) R4010095-6 12/06/23 23:38

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Fluoride	ND	ND	1	8.61		15
Sulfate	82.3	82.2	1	0.00620		15

Laboratory Control Sample (LCS)

(LCS) R4010095-2 12/06/23 15:18

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluoride	8.00	8.39	105	80.0-120	
Sulfate	40.0	40.9	102	80.0-120	

L1680203-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1680203-03 12/06/23 18:36 • (MS) R4010095-4 12/06/23 19:08 • (MSD) R4010095-5 12/06/23 19:23

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Fluoride	8.00	0.215	8.40	8.42	102	103	1	80.0-120			0.306	15
Sulfate	40.0	16.3	54.1	54.1	94.5	94.5	1	80.0-120			0.0259	15

L1680380-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1680380-03 12/06/23 23:22 • (MS) R4010095-7 12/06/23 23:54

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Fluoride	8.00	ND	8.13	99.9	1	80.0-120	
Sulfate	40.0	82.3	106	59.3	1	80.0-120	J6

QUALITY CONTROL SUMMARY

Method Blank (MB)

(MB) R4005530-1 11/28/23 20:31

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.000100	0.000200

Laboratory Control Sample (LCS)

(LCS) R4005530-2 11/28/23 20:34

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.00300	0.00289	96.4	80.0-120	

L1680508-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1680508-03 11/28/23 20:36 • (MS) R4005530-3 11/28/23 21:48 • (MSD) R4005530-4 11/28/23 21:51

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.00300	ND	0.00263	0.00270	87.6	89.9	1	75.0-125			2.69	20

QUALITY CONTROL SUMMARY

L1680471-01,02,03,04,05,06,07,08,09,10,11

Method Blank (MB)

(MB) R4006703-1 11/30/23 15:46

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron	U		0.0200	0.200
Lithium	U		0.00485	0.0150

Laboratory Control Sample (LCS)

(LCS) R4006703-2 11/30/23 15:49

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Boron	1.00	0.991	99.1	80.0-120	
Lithium	1.00	1.00	100	80.0-120	

L1680471-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1680471-10 11/30/23 15:52 • (MS) R4006703-4 11/30/23 15:57 • (MSD) R4006703-5 11/30/23 15:59

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron	1.00	ND	0.983	0.964	98.3	96.4	1	75.0-125			2.00	20
Lithium	1.00	ND	1.01	0.994	101	99.4	1	75.0-125			1.21	20

WG2176349

Metals (ICPMS) by Method 6020

Method Blank (MB)

(MB) R4006905-1 11/30/23 12:43

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.000381	0.00200
Calcium	U		0.0936	1.00
Magnesium	U		0.0735	1.00
Sodium	U		0.376	2.00
Strontium	0.000917	J	0.000590	0.0100

Laboratory Control Sample (LCS)

(LCS) R4006905-2 11/30/23 12:47

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	0.0500	0.0486	97.2	80.0-120	
Calcium	5.00	5.50	110	80.0-120	
Magnesium	5.00	5.31	106	80.0-120	
Sodium	5.00	6.08	122	80.0-120	J4
Strontium	0.0500	0.0676	135	80.0-120	J4

L1680274-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1680274-09 11/30/23 12:50 • (MS) R4006905-4 11/30/23 13:01 • (MSD) R4006905-5 11/30/23 13:04

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	0.0500	0.0177	0.0683	0.0663	101	97.1	1	75.0-125			3.06	20
Calcium	5.00	129	133	131	76.0	51.6	1	75.0-125		V	0.924	20
Magnesium	5.00	56.4	61.5	59.5	102	61.7	1	75.0-125		V	3.31	20
Sodium	5.00	201	208	202	151	35.3	1	75.0-125	V	V	2.82	20
Strontium	0.0500	1.92	1.98	1.96	130	82.0	1	75.0-125	V		1.21	20

Method Blank (MB)

(MB) R4006825-1 11/30/23 15:00

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.000381	0.00200
Calcium	U		0.0936	1.00
Magnesium	U		0.0735	1.00
Sodium	U		0.376	2.00
Strontium	U		0.000590	0.0100

Laboratory Control Sample (LCS)

(LCS) R4006825-2 11/30/23 15:04

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	0.0500	0.0499	99.7	80.0-120	
Calcium	5.00	5.15	103	80.0-120	
Magnesium	5.00	5.11	102	80.0-120	
Sodium	5.00	5.13	103	80.0-120	
Strontium	0.0500	0.0498	99.7	80.0-120	

L1679636-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1679636-11 11/30/23 15:07 • (MS) R4006825-4 11/30/23 15:14 • (MSD) R4006825-5 11/30/23 15:17

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	0.0500	0.234	0.286	0.285	103	102	1	75.0-125			0.153	20
Calcium	5.00	104	110	109	121	105	1	75.0-125			0.697	20
Magnesium	5.00	38.2	42.0	43.1	75.9	97.2	1	75.0-125			2.51	20
Sodium	5.00	12.5	17.5	17.6	101	102	1	75.0-125			0.0767	20
Strontium	0.0500	0.439	0.495	0.488	113	98.4	1	75.0-125			1.43	20

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

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
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.
J4	The associated batch QC was outside the established quality control range for accuracy.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

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	LAO00356
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.

Company Name/Address: ~~GBMc & Associates~~ - Bryant, AR Alliance 219 Brown Lane Little Rock, AR 72022	Billing Information: Accounts Payable 219 Brown Ln. Bryant, AR 72022	Pres Chk	
Report to: Jonathan Brown	Email To: Jonathan.Brown@AllianceTG.com;Jhouse@trcc		
Project Description: Entergy - White Bluff	City/State Collected:	Please Circle: PT MT CT ET	
Phone: **501-847-7077**	Client Project # **1145-21-080**	Lab Project # **GBMCBAR-ENTERGYWB**	
Collected by (print): JLC/KRS	Site/Facility ID # **CADL - CCR**	P.O. #	
Collected by (signature): Immediately Packed on Ice N____ Y____	***Rush?*** (Lab MUST Be Notified) ___ Same Day ___ Five Day ___ Next Day ___ 5 Day (Rad Only) ___ Two Day ___ 10 Day (Rad Only) ___ Three Day	Quote # Date Results Needed	

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # 1680471

Table #

Acctnum: **GBMCBAR**
Template: **T198831**
Prelogin: **P1032739**
PM: **829 - Brittnie L Boyd**
PB:
Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	B, Ca 250mlHDPE-HNO3	Cl, F, SO4, PH 250mlHDPE-NoPres	TDS 1l-HDPE NoPres	COC2 (Ions) See Attachment							~~Remarks~~ p.H	Sample # (lab only)
MW-101S	G	GW		11.17.23	1215	5	-	-	-	-							5.41	-01
MW-102S		GW																
MW-103S		GW																
MW-104S		GW																
MW-105S		GW																
MW-106S	G	GW		11.17.23	1605	5	-	-	-	-							3.72	-02
MW-110S		GW																
MW-111S		GW																
MW-101D	G	GW		11.17.23	1320	5	-	-	-	-							6.42	-03
MW-102D	G	GW		11.17.23	1110	5	-	-	-	-							6.93	-04

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks: Please refer to included email list for all additional analyses

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: ✓Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature) Sarah Colbert	Date: 11.20.23	Time: 1417	Received by: (Signature)	Trip Blank Received: Yes [✓ No] HCL / MeoH TBR	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: 59	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) Caleb Tapp	Date: 11/21/23 Time: 09:00	Hold: Condition: NCF / [✓ OK]

Company Name/Address: **GBMc & Associates - Bryant, AR** 219 Brown Lane Little Rock, AR 72022	Billing Information: Accounts Payable 219 Brown Ln. Bryant, AR 72022	Pres Chk	Chain of Custody Page ___ of ___
Report to: **Jonathan Brown**	Email To: Jonathan.Brown@AllianceTG.com;Jhouse@trcc		
Project Description: **Entergy - White Bluff**	City/State Collected:	Please Circle: PT MT CT ET	
Phone: **501-847-7077**	Client Project # **1145-21-080**	Lab Project # **GBMCBAR-ENTERGYWB**	
Collected by (print): JLL / KRS	Site/Facility ID # **CADL - CCR**	P.O. #	
Collected by (signature): Immediately Packed on Ice N ___ Y ___	*Rush?* (Lab MUST Be Notified) ___ Same Day ___ Five Day ___ Next Day ___ 5 Day (Rad Only) ___ Two Day ___ 10 Day (Rad Only) ___ Three Day	Quote # Date Results Needed	

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # 1680471

Table #

Acctnum: **GBMCBAR**

Template: **T198831**

Prelogin: **P1032739**

PM: **829 - Brittnie L Boyd**

PB: 10/25 TS

Shipped Via: **FedEX Ground**

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	B, Ca 250mlHDPE-HNO3	Cl, F, SO4, PH 250mlHDPE-NoPres	TDS 1L-HDPE NoPres	COC 2 (Ions) see attachment							Remarks pH	Sample # (lab only)
MW-114D		GW																
MW-115D		GW																
MW-118D		GW		11.17.23	0930	5	–	–	–	–							6.55	-05
FIELD BLANK 1		GW		11.17.23	1515	5	–	–	–	–								-06
DUPLICATE 1		GW																
FIELD BLANK 2		GW		11.17.23	1515	5	–	–	–	–								-07
DUPLICATE 2		GW																
FIELD BLANK 3		GW		11.17.23	1515	5	–	–	–	–								-08
DUPLICATE 3		GW																
MW-112D	G	GW		11.17.23	1435	5	–	–	–	–							6.92	-09

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature) Jacob Colbert	Date: 11-20.23	Time: 1417	Received by: (Signature)	Trip Blank Received: Yes / [✓ No] HCL / MeoH TBR	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: 59	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) Caleb Tarp	Date: 11/21/23 Time: 09:00	Hold:	Condition: NCF / [✓ OK]

Company Name/Address:
GBMc & Associates - Bryant, AR

219 Brown Lane
Little Rock, AR 72022

Billing Information:
Accounts Payable
219 Brown Ln.
Bryant, AR 72022

Pres Chk

Chain of Custody Page ___ of ___

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to: Jonathan Brown

Email To: Jonathan.Brown@AllianceTG.com;Jhouse@trcc

Project Description: Entergy - White Bluff

City/State Collected:

Please Circle: PT MT CT ET

Phone: 501-847-7077

Client Project # 1145-21-080

Lab Project # GBMCBAR-ENTERGYWB

SDG # 1680471

Table #

Acctnum: GBMCBAR
Template: T198822
Prelogin: P1032735
PM: 829 - Brittnie L Boyd
PB: 10/25 TS
Shipped Via: FedEX Ground

Collected by (print): JLC/KRS

Site/Facility ID # RECYCLE PONDS

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y ___

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	B, Ca 250mlHDPE-HNO3	Cl, F, SO4, PH 250mlHDPE-NoPres	TDS 1L-HDPE NoPres	Fluoride 125 mL HDPE - NoPres	Metals 250 mlHDPE - HNO3	RA-226/228 1L-HDPE-Add HNO3	RA-226/228 1L-HDPE-Add HNO3	COC 2 (Ions) See Attachment			Remarks pH.	Sample # (lab only)
DUPLICATE		GW																
FIELD BLANK	G	GW		11.17.23	1515	9				-	-	-	-	-				-10
MW-106D	G	GW		11.17.23	1710	5	-	-	-								9.18	-11
		GW																
		GW																
		GW																

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_________

Remarks:

pH _______ Temp _______

Flow _______ Other _______

Samples returned via:
__ UPS __ FedEx __ Courier __________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature) Jacob Colbert
Date: 11-20-23
Time: 1417
Received by: (Signature)

Trip Blank Received: Yes [✓ No]
HCL / MeoH
TBR

Relinquished by : (Signature)
Date:
Time:
Received by: (Signature)

Temp: °C
Bottles Received: 59

If preservation required by Login: Date/Time

Relinquished by : (Signature)
Date:
Time:
Received for lab by: (Signature) Caleb Tapp

Date: 11/21/23
Time: 09:00

Hold:

Condition: NCF / [✓ OK]

Jonathan Brown

From: Jonathan Brown
Sent: Friday, October 20, 2023 2:51 PM
To: Brittnie Boyd
Cc: Mark W. Beasley; House, Jason
Subject: White Bluff Bottle Request

L1680471

Brittnie,

Please send the following bottles for Entergy White Bluff. We also need an extra bottle set or two and plenty of field blank water. Thank you.

White Bluff			
Recycle Ponds	**COC 1**	**COC 2**	**App IV**
RP-1	x	x	x
RP-2	x	x	x
RP-3	x	x	x
RP-4	x	x	x
RP-5	x	x	x
RP-6	x	x	x
RP-7	x	x	x
RP-8	x	x	x
RP-9	x	x	x
RP-10	x	x	x
Field Blank	x	x	x
Duplicate	x	x	x
CADL - CCR	**COC 1**	**COC 2**	
MW-101S	x	x	
MW-102S	x	x	
MW-103S	x	x	
MW-104S	x	x	
MW-105S	x	x	
MW-106S	x	x	
MW-110S	x	x	
MW-111S	x	x	
MW-101D	x	x	
MW-102D	x	x	
MW-103D	x	x	
MW-104D	x	x	
MW-105D	x	x	
MW-106D	x	x	
MW-107D	x	x	

L1680471

MW-108D	x	x
MW-109D	x	x
MW-110D	x	x
MW-111D	x	x
MW-112D	x	x
MW-113D	x	x
MW-114D	x	x
MW-115D	x	x
MW-118D	x	x
Field Blank 1	x	x
Duplicate 1	x	x
Field Blank 2	x	x
Duplicate 2	x	x

COC 1 - Appendix III	Boron, Calcium, Chloride, Fluoride, Sulfate, TDS, pH
COC 2 - Ions*	Calcium, Magnesium, Sodium, Sulfate, Chloride, Boron, Strontium, Lithium, Fluoride, Barium, Alkalinity
Appendix IV	Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Fluoride, Lead, Lithium, Mercury, Molybdenum, Selenium, Thallium, Radium 226/228

GBMc & ASSOCIATES NOW Alliance

Jonathan Brown
Managing Consultant
Office: 501-847-7077 | **Mobile:** 501-920-5894
Address: 219 Brown Lane, Bryant AR, 72022
www.alliancetg.com

L1680471

Tracking Numbers	[redacted]	Tempature
7123 3304 0441	[redacted]	DPA8 4.4 +0 = 4.4
7123 3304 0371	[redacted]	DPA8 5.0 +0 = 5.0
7123 3304 0452	[redacted]	DPA8 3.6 +0 = 3.6
	[redacted]	
	[redacted]	
	[redacted]	
	[redacted]	
	[redacted]	
	[redacted]	
	[redacted]	
	[redacted]	
	[redacted]	
	[redacted]	
	[redacted]	
	[redacted]	
	[redacted]	
	[redacted]	
	[redacted]	
	[redacted]	

APPENDIX C

ALTERNATE SOURCE DEMONSTRATIONS

Alternate Source Demonstration

2nd Half 2022 Sampling Event

Entergy White Bluff Plant
Coal Ash Disposal Landfill
Redfield, Jefferson County, Arkansas

July 2023

Prepared For
Entergy Arkansas, LLC
White Bluff Plant
1100 White Bluff Road
Redfield, Arkansas 72132

Jason S. House
Senior Project Manager

Executive Summary

Entergy Arkansas, LLC (Entergy) performed the most recent semiannual detection monitoring sampling (2nd Half 2022) in December 2022 for Cells 1 through 4 of the coal ash disposal landfill (CADL) pursuant to the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, 40 CFR Part 257 (CCR Rule). Cells 1 through 4 of the CADL constitute the coal combustion residuals (CCR) Unit per the CCR Rule. Per 40 CFR 257.94, the samples were analyzed for the Appendix III detection monitoring parameters. Upon receipt of the laboratory analytical results, statistical analysis was performed.

In accordance with the statistical analyses, the following 20 statistically significant increases (SSI) above background concentrations were identified in five monitoring wells in Stratum I and three monitoring wells in Stratum III, based on either increasing trends at 98% confidence levels using Sen's Slope test and/or intrawell prediction limits statistical analyses:

- Calcium and total dissolved solids (TDS) (MW-102S);
- TDS (MW-103S);
- Calcium, fluoride, sulfate and TDS (MW-106S);
- Boron (MW-110S);
- Boron, calcium, fluoride, sulfate, pH and TDS (MW-111S);
- Boron, calcium, and TDS (MW-112D);
- Calcium and TDS (MW-114D); and
- TDS (MW-118D).

The information provided in this report serves as Entergy's alternate source demonstration (ASD) prepared in accordance with 40 CFR 257.94(e)(2) and successfully demonstrates that the SSIs are not due to a release from the CCR Unit to groundwater, but are due to the following:

- Natural groundwater geochemistry conditions such as pH, electrical conductivity (EC), oxidation-reduction potential (ORP) and the naturally occurrence of sulfide minerals;
- Natural variation in groundwater quality;
- Releases from historic fill or portions of the CADL closed before the effective date of the CCR Rule (October 19, 2015); and/or
- Surface water that has come into contact with on-site CCR and has migrated into the subsurface.

Therefore, based on the information provided in this ASD report, Entergy will continue to conduct semiannual detection monitoring for Appendix III constituents in accordance with 40 CFR 257.94 at the certified groundwater monitoring well system (Certified Monitoring Well Network) for the CCR Unit and will continue to implement improvements to stormwater management practices at the CADL.

Table of Contents

List of Figures

Section 1
Introduction

1.1 Background

Entergy Arkansas, LLC (Entergy) operates the Entergy White Bluff Plant (Plant), a coal-fired power plant, to generate electricity. The Plant is located at 1100 White Bluff Road in Redfield, Jefferson County, Arkansas as shown on Figure 1. Coal combustion residuals (CCR) are produced as part of the electrical generation operations. The Plant has been generating and disposing of CCR in a portion of the on-site coal ash disposal landfill (CADL) since it began operations in 1981. The CADL is a Class 3N non-commercial industrial landfill and operates under Arkansas Division of Environmental Quality (ADEQ) Solid Waste Permit No. 0199-S3N-R3.

The ADEQ-permitted CADL consists of approximately 153-acres at the Plant and encompasses the following three areas:

- Approximately 50-acre portion of the CADL historically used for CCR disposal from 1981 until prior to the effective date of the CCR Rule (October 19, 2015). CCR was placed into ravines. This area was closed in accordance with the Plant's original solid waste permit (TRC, 2018a);
- Cells 1 through 4, which are the current cells used for CCR disposal and were constructed on top of, and adjacent to, the above-noted closed CCR disposal areas prior to the effective date of the CCR Rule. Cells 1 through 4 encompass approximately 30 acres and were constructed as follows:
    - Cells 1, 2, and 3 were constructed with an 18-inch thick compacted clay bottom liner;
    - Cell 4 was constructed with a two-foot thick compacted clay bottom liner and a leachate collection system; and
- Approximately 100-acre portion of the CADL that is currently undeveloped and may be used for CCR and/or non-CCR disposal.

In addition to the current 153-acre permitted landfill, there is an approximately 25 acre area to the immediate west of Cells 1 through 4 where during the initial period of operation of the Plant, ash was placed pursuant to the permits issued at that time. This historic fill area is covered with soil and vegetated.

Cells 1 through 4 accept CCR for disposal in accordance with the federal *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule* (CCR Rule), effective October 19, 2015, and subsequent Final Rules promulgated by the United States

Environmental Protection Agency (USEPA). Cells 1 through 4 comprise the CCR management unit (CCR Unit) per the CCR Rule and are the focus of this ASD. The approximate limits of Cells 1 through 4, the closed disposal areas, and the undeveloped, future disposal areas within the ADEQ-permitted footprint of the CADL are shown in Figure 2.

Historical CCR management by Entergy has consisted of the following activities:

- Beneficial use in local construction projects;
- Beneficial use as roadbed material at the CADL; and
- Placement into the CADL.

1.1.1 Groundwater Monitoring and Statistical Analysis

In accordance with 40 CFR 257.90 through 257.94, Entergy installed a groundwater monitoring system for Cells 1 through 4 and has collected samples from the Certified Monitoring Well Network for laboratory analysis for CCR constituents and performed statistical analysis of the collected samples. Entergy installed a Certified Monitoring Well Network for the CCR Unit in accordance with 40 CFR 257.90 and 257.91. The Certified Monitoring Well Network consists of 23 wells installed into two stratigraphic units as follows:

- Eight wells are installed into an upper silty and clayey sand unit (Stratum I), which are designated as "S" monitoring wells; and
- Fifteen wells are installed into a lower silty and clayey sand and clay unit (Stratum III), which are designated as "D" monitoring wells.

Pursuant to 40 CFR 257.91(f), Entergy obtained certification by a qualified Arkansas-registered professional engineer (P.E.) stating that the Certified Monitoring Well Network has been designed and constructed to meet the requirements of 40 CFR 257.91 (see Groundwater Monitoring System Certification, TRC, February 26, 2018) of the CCR Rule (TRC 2018b).

As discussed above, Stratum I and Stratum III are currently being monitored pursuant to the CCR Rule. A groundwater sampling and analysis program including selection of statistical procedures to evaluate groundwater data was prepared per the CCR Rule (see Groundwater Sampling and Analysis Plan (FTN, 2017b)). Eight quarterly background CCR detection monitoring events were performed from October 2015 through June 2017 in accordance with 40 CFR 257.93(d) and 257.94(b). The eight quarterly detection monitoring background samples were analyzed for Appendix III to Part 257 – Constituents for Detection Monitoring and for Appendix IV to Part 257 – Constituents for Assessment Monitoring.

Following completion of quarterly background detection monitoring in June 2017, Entergy implemented semiannual detection monitoring per 40 CFR 257.94(b) for the CCR Unit. The first semiannual detection monitoring event was performed in August 2017 (2nd Half 2017). Subsequent detection monitoring events, with associated verification sampling when appropriate, have been performed on a semiannual basis since August 2017. Entergy performed the most recent semiannual detection monitoring event (2nd Half 2022) in December 2022. Per the CCR Rule, the semiannual detection monitoring event samples were analyzed for Appendix III constituents.

After completion of each semiannual detection monitoring event, the Appendix III laboratory analytical data were statistically evaluated to identify potential SSIs for Appendix III constituents above background levels. In accordance with 40 CFR 257.93(f)(6), Entergy obtained certification by a qualified Arkansas-registered P.E. stating that the selected statistical method is appropriate for evaluating the groundwater monitoring data for the CCR Unit (see Statistical Methods Certification, TRC, October 16, 2017).

Pursuant to 40 CFR 257.93(h), statistical analysis and re-analysis of the laboratory analytical data were performed to identify potential SSIs for the 2nd Half 2022 semiannual detection monitoring event. A total of 20 SSIs were identified for six Appendix III constituents: boron, calcium, fluoride, sulfate, pH, and TDS. SSIs were identified in five Stratum I and three Stratum III monitoring wells.

1.2 Purpose

Pursuant to 40 CFR 257.94(e)(2), Entergy may demonstrate that a source other than the CCR Unit caused the SSIs identified or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The purpose of this report is to provide written documentation of the successful ASD for the SSIs identified for the 2nd Half 2022 semiannual detection monitoring event, pursuant to 40 CFR 257.94(e)(2) of the CCR Rule.

Section 2
Hydrogeology and Geochemistry

2.1 Site Hydrogeology

Historical subsurface investigations have identified the following three stratigraphic horizons of the Jackson Group (Kresse, et. al., 2014) and their associated hydrogeology for the CCR Unit and the CADL:

- **Stratum 1. Interbedded Clay, Silt, and Sand.**
  Stratum 1 ranges from approximately 10 to 54-feet thick and consists of interbedded silty sand (SM), clayey sand (SC), silts (ML and MH), and clay (CL and CH). Occasional deposits of carbonaceous material are present throughout Stratum 1. Based on the results of in-situ slug tests, hydraulic conductivity values range from 4.0 x 10^{-5} to 4.0 x 10^{-4} cm/sec;
- **Stratum 2. Clay.**
  Stratum 2 ranges from approximately 14 to 49-feet thick and consists of a very stiff clay (CH) with occasional silt and/or very fine-grained sand laminations. Occasional deposits of carbonaceous mater are present throughout Stratum 2. Based on the results of in-situ slug tests, hydraulic conductivity values range from 4.7 x 10^{-6} to 1.4 x 10^{-8} cm/sec;
- **Stratum 3. Clayey and Silty Sand.**
  Stratum 3 ranges from approximately 5 to 19-feet thick and consists primarily of clayey sand (SC) and/or silty sand (SM). A poorly graded, fine-grained sand (SM) was identified in one piezometer. The upper limits of Stratum 3 were encountered at elevations of 263 to 289-feet NGVD (depths ranging from 19 to 97-feet bgs). Based on results of in-situ slug tests, hydraulic conductivity was determined to be spatially variable and ranged from 4.2 x 10^{-7} to 2.5 x 10^{-4} cm/sec; and
- **Underlying Clay.**
  A clay unit underlies Stratum 3 and is described as a very dark grey clay that is highly laminated with light grey silt and very fined-grained sand. Based on results of an in-situ slug test, the vertical hydraulic conductivity was 3.7 x 10^{-8} cm/sec.

It was concluded that Stratum 1 was not laterally continuous across the approximately 153-acre landfill. The estimated calculated seepage velocities in Stratums 1 and 3 were as follows:

- Stratum 1: 2 to 20 feet/year; and
- Stratum 3: <1 to 10 feet/year.

While Stratum I and Stratum III have been monitored per the CCR Rule since October 2015, it is unclear whether Stratum I and Stratum III are aquifers that are capable of providing sustainable well yields consistent with USEPA aquifer use criteria (*e.g.*, 0.1 gallons per minute). This uncertainty is based on the following evidence:

- Stratum I is present to the west of the CADL and only present within the western portion of the ADEQ-permitted boundaries of the CADL, approximately corresponding to the boundaries of the closed portions of the CADL. The CCR Unit and Stratum I are not continuous to the east across the entire footprint of the CADL;
- In-situ hydraulic conductivities are low to very low for both Stratum I and Stratum III, indicating that sustainable well yields may not be obtainable from Stratum I and Stratum III at volumes that meet the minimum USEPA well use criteria (*e.g.*, 0.1 gallons per minute); and
- During the quarterly and semiannual detection monitoring events performed from October 2015 through December 2021, which have been performed using the low-flow purge and sample methodology, the sampling teams have consistently documented that turbidity values are often greater than 10 Nephelometric Turbidity Units (NTU). Furthermore, wells have been pumped dry during sampling for both Stratum I and Stratum III, indicating that neither sustainable well yields nor useable drinking water are associated with Stratum I and Stratum III.

To evaluate this uncertainty, Entergy began performing hydrogeologic investigations during 2019 and 2020, continuing through 2021 to evaluate both the stratigraphy and hydrogeology beneath the CCR Unit and to identify the aquifer(s) making up the uppermost aquifer system at the CCR Unit and CADL and the appropriateness of the current Certified Monitioring Well Network.

2.2 General Groundwater Quality

Regionally, groundwater quality in the Jackson Group consists of a sodium- and calcium-sulfate water type, with generally poor water quality (FTN 2014, Kresse et. al 2014). Reported water quality concentrations for select secondary drinking water contaminants compared to USEPA secondary maximum contaminant levels (MCLs) are provided in the table below.

Jackson Group Groundwater Water Quality

Constituent	Concentration Range		USEPA Secondary MCL
	Low	High	
Iron (mg/L)	0.05	19	0.3
pH (s.u.)	2.9	8.0	6.5 - 8.5
Sulfate (mg/L)	0.6	3,080	250
TDS (mg/L)	11	5,330	500

As noted in the table above, the natural range of groundwater quality within the Jackson Group, which includes both Stratum I and Stratum III, exceeds the secondary drinking water MCLs established by the USEPA for drinking water or, in the case of pH, is less than its secondary MCL. Finally, the results of historical groundwater monitoring at the Plant conducted from 1991 through 1996 showed that normal indicator parameters were masked by naturally elevated concentrations of the monitored constituents (FTN 2014, TRC 2018a).

2.3 Groundwater Geochemistry

Understanding the geochemistry of groundwater is essential to examining the groundwater monitoring data, explaining the relationships between the characteristics, and analyzing natural as well as anthropogenic impacts on groundwater systems. Source apart, geochemical processes play an important role in controlling the chemical composition of groundwater, including carbonate equilibrium, oxidation-reduction reactions and adsorption-desorption processes. Based the site geological conditions, several groundwater parameters are discussed as follows, including boron, fluoride, sulfate, calcium, TDS and pH.

2.3.1 Boron in Groundwater

Boron in normally considered as a minor constituent in groundwater as it is generally present in low concentrations (Palmucci & Rusi, 2014). Source apart, the primary origin of boron in groundwater is the process of sorption and desorption to the mineral surfaces including rocks and soils (Ravenscroft & McArthur, 2004). The regulatory guideline values of boron in drinking water are given at 0.5 mg/L by WHO and 0.9 mg/L by USEPA in human consumption for long-term exposure (WHO, 2008; USEPA, 2008). Boron is often cited as contamination tracer and usually occurs as a non-ionized form as H_3BO_3 in soils at $pH<8.5$, but above this pH, it exists as an anion, $B(OH)_4^-$ (Upadhyaya et al., 2014).

The factors that may influence the boron concentration in groundwater include weathering, human activity, evaporative concentration, ion-exchange, electrical conductivity (EC), and pH. Ravenscroft & McArthur (2004) studied the mechanism of regional boron enrichment groundwater and the results indicated that the main process caused high boron enriched in groundwater was the flushing by fresh groundwater other than geolofical setting, climate or age. The desorption of Boron from mineral surfaces could be affected by pH, ionic strength, salinity and HCO_3/CO_3. Decreasing of pH will increase the dissolution of boron from the mineral surfaces. Boron adsorption favors high pH and boron desorption favors low pH on rocks, soils and organic matters (Hollis et al., 1988; Keren & Communar, 2009; Tabelin et al., 2014).

A few more research studies confirmed that the presence of boron in groundwater depends on the EC (salinity), such that it increases with increasing EC. Halim et al. (2010) reported that the increasing of Cl^- concentration contributes to increase in EC value since a strong linear correlation ($R^2 = 0.88$) between EC and Cl^- was observed. Palmucci & Rusi (2014) observed a clear correlation between the high concentrations of boron and the chloride-sodium facies, which are characterized by high saline content, negative redox potential, and low value of the SO_4^{2-}/Cl^- ratio. Rodriguez-Espinosa et al. (2020) found that the Boron concentration in groundwater was related to the SO_4^{2-} and age affect.

Regarding to the Boron concentration level on the sites, the main source of Boron is more natural than anthropogenic. Therefore, the detected increasing of Boron concentration is likely due to the geochemistry condition changes, such as pH, ion exchanges, EC and salinity.

2.3.2 Fluoride in Groundwater

The common natural source of fluoride in groundwater is the dissolution of natural fluoride-bearing mineral, such as fluorspar, fluorapatite, amphiboles, hornblende, tremolite and biotite (Luo et al., 2018). The natural concentration of fluoride in groundwater depends on the geological, chemical and physical characteristics of the aquifer, the porosity and acidity of the soil and rocks, the surrounding temperature, the action of other chemical elements, depth of the aquifer and intensity of weathering (Brindha & Elango, 2011). Due to the concentration range of this site, geochemical process is the main factor controlling fluoride in groundwater.

Ion exchange, evaporation, adsorption-desorption, ion competition, mixing, salinization and anthropogenic pollution are geochemical processes that can take place and cause the occurrence of fluoride in groundwater (Luo et al., 2018). Main factors that might cause the increase of fluoride concentration in groundwater include alkaline pH, high concentration of sodium and bicarbonate, and low concentration of calcium.

Alkaline pH can increase the fluoride dissolution from mineral surfaces into groundwater. Saxena & Ahmed (2001) observed that alkaline conditions with pH ranging between 7.6 and 8.6 are favorable for dissolution of fluorite mineral from the host rocks.

Sodium bicarbonate type waters are typical of high fluoride waters. Many research studies have demonstrated positive correlations between fluoride and both bicarbonate and sodium as well as an inverse relation between fluoride and calcium. (Mondal et al., 2014; Guo et al., 2012; Chen et al., 2020). The chemical reactions for the dissolution of fluoride in the presence of high bicarbonate and sodium, and low calcium content is described as follows (Kimambo et al., 2019):

$$\mathrm{Na^+ + \ + HCO_3^- - \rightarrow NaHCO_3}$$

$$\mathrm{CaF_2 + \ + 2NaHCO_3 \ \rightarrow CaCO_3 + 2Na^+ + 2F^- + \ H_2O + CO_2}$$

Luo et al. (2018) reported that cation exchange can increase the fluoride concentration when increasing the Na/Ca molar ratio via ion complexation, and salt effect can further increase the fluoride dissolution from mineral surfaces.

In addition, evaporation is another potential reason to increase the fluoride concentration in shallow groundwater. Evaporation could directly remove water from shallow aquifers and elevate the fluoride concentration. Evaporation could increase ion concentrations, leading to the precipitation of some major minerals, reducing the calcium concentration, and favoring the dissolution of fluoride. Anthropogenic sources may also increase the fluoride in groundwater, such as pesticide and fertilizer use, and industrial waste discharge.

2.3.3 Sulfate in Groundwater

Sulfate is ubiquitous in groundwater, with both natural and anthropogenic sources. There are many potential sources of sulfate including mineral dissolution, atmospheric deposition, and other anthropogenic sources (mining, fertilizer, synthetic detergents, industrial wastewater etc.) (Miao et al., 2012). As water moves through soil and rock formations that contain sulfate minerals, some of the sulfate dissolves into the groundwater. Minerals that contain sulfate include magnesium sulfate (Epsom salt), sodium sulfate (Glauber's salt), and calcium sulfate (gypsum). Gypsum is an important contributor to the high levels of sulphate in many aquifers of the world. Higher levels of sulfate in groundwater are common in the western part of the United States (MDH, 2008).

Sulfate is mobile in soil and inputs to soil will impact groundwater eventually. Many research studies indicated that atmospheric deposition, dissolution of gypsum, oxidation of sulfide mineral and anthropogenic inputs will contribute to sulfate. Based on the geological condition of the site, atmospheric deposition and anthropogenic activities could be the main factors (Einsiedl & Mayer, 2005; Pu et al., 2012).

2.3.4 Calcium in Groundwater

Calcium is one of the most important ionic constituents in groundwater (Razowska-jaworek, 2014). Water-rock interaction occurs when water meets rocks or minerals, limestone, marble, calcite, dolomite, gypsum, fluorite and apatite. Natural dissolution of carbonate rocks and minerals is the primary source of calcium in groundwater (Jiang et al., 2009). Calcium is an important determinant of water hardness (Ca^{2+}), while magnesium is the other hardness determinant. The most common shallow groundwater type is Ca-HCO_3 dominated and Ca(Mg)-HCO_3 dominated.

A literature review indicates the major factors that may influence the calcium concentration in groundwater include rock weathering, pH, electrical conductivity and anthropogenic activities (mining, concrete material dissolution, fertilizer etc.) (Hájek et al., 2021; Schot & Wassen, 1993; Shi et al., 2018). Based on the geological condition of the site, pH, electrical conductivity and anthropogenic activities could be the potential reasons for the calcium SSI.

2.3.5 TDS in Groundwater

Total dissolved solids represent the combined total of inorganic and organic substances contained in the groundwater, and it can be a general indicator of water quality. These solids are primarily minerals, salts, and organic matters, which may originate from sources such as weathering of minerals, urban runoff, sewage, effluent discharges, agricultural, decaying organisms, and other human activities (de-icing roads, water softer use). Common salts that contribute to TDS are sodium, chloride, calcium, magnesium, potassium, sulfates, and bicarbonates (Olumuyiwa I. Ojo, 2012).

TDS levels in groundwater is usually higher than surface water due to the longer contact time with the underlying rocks and sediments. Since many minerals are water soluble, high concentrations can accumulate over time through the constantly reoccurring process of precipitation and evaporation.

TDS is related to other water quality parameters like hardness, which may occur if the high TDS content is due to the presence of carbonates. A few research studies simulated the relationship between TDS and other groundwater parameters such as EC and salinity, using different models. Due to the complicated geological conditions, the observation was not consistent at different study sites (Atekwana et al., 2004; Banadkooki et al., 2020; Poursaeid et al., 2020).

2.3.6 pH in Groundwater

Groundwater pH is an important aspect to consider in the monitoring and management of CCR landfill sites, as changes in pH can affect the quality of groundwater and the potential for release of contaminants. The potential reasons for pH changes in groundwater are as following:

- Changes in water flow patterns. Changes in the flow patterns of groundwater can cause the mixing of different water sources with varying pH levels, resulting in an overall increase in the pH of the groundwater at the site.
- Drainage from adjacent areas. Groundwater from adjacent areas with higher pH levels may be flowing into the landfill site and raising the overall pH of the groundwater at the site.
- Changes in geochemistry condition. Geochemistry can play a role in affecting the pH of groundwater at a landfill site, such as mineral dissolution, pH buffering capacity, redox

reactions, and groundwater-rock interactions (Edmunds & Smedley, 1996; Wilkin & DiGiulio, 2010).

1) Mineral dissolution. Minerals present in the surrounding soil can dissolve and release basic or acidic compounds into the groundwater, affecting the pH, e.g., the dissolution of calcium carbonate can increase the pH of the groundwater by releasing carbonate ions, the dissolution and oxidation of pyrite can decrease the pH of groundwater by releasing hydrogen ions.
2) pH buffering capacity. The presence of minerals with a high buffering capacity in the surrounding soil can help to regulate the pH of the groundwater, preventing drastic changes in response to other factors. For example, the presence of minerals like calcite and dolomite can buffer the groundwater pH, helping to maintain a relatively stable pH even in the presence of acidic compounds.
3) Redox reactions. The oxidation-reduction reactions that occur in the surrounding soil can impact the pH of the groundwater. The oxidation of iron-sulfide minerals can result in the release of sulfuric acid, which can lower the pH of groundwater. The oxidation of reduced sulfur species to sulfate, which can increase the pH of groundwater (Jacks, 2017).
4) Groundwater-rock interactions. The interaction between groundwater and the rocks and minerals in the surrounding soil can affect the pH of the groundwater. For example, groundwater can dissolve or release basic or acidic compounds from the minerals in the rock, affecting the pH.

Section 3

Alternate Source Demonstration

Pursuant to 40 CFR 257.94(e)(2), Entergy may demonstrate that a source other than the CCR Unit caused the SSI or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. As discussed previously, the 2nd Half 2022 semiannual detection monitoring event was performed in December 2022. Statistical analysis of the 2nd Half 2022 semiannual detection monitoring data was performed pursuant to 40 CFR 257.93(f) and (g) and in accordance with the Statistical Methods Certification (TRC 2017b) and the Statistical Analysis Plan (FTN 2017a). Based on either increasing trends at 98% confidence levels using Sen's Slope test and/or intrawell prediction limits statistical analyses, the following 20 SSIs were identified and summarized in Table 1:

- Calcium and TDS (MW-102S);
- TDS (MW-103S);
- Calcium, fluoride, sulfate and TDS (MW-106S);
- Boron (MW-110S);
- Boron, calcium, fluoride, sulfate, pH and TDS (MW-111S);
- Boron, calcium, and TDS (MW-112D);
- Calcium and TDS (MW-114D); and
- TDS (MW-118D).

Other Appendix III constituent concentrations were within their trends at 98% confidence levels using Sen's slope test and/or intrawell prediction limits in the CCR Rule groundwater monitoring system wells.

A discussion for each of the individual SSIs identified for the Stratum I and III wells and associated evidence demonstrating that the 20 SSIs were not caused by a release from the CCR Unit is provided in the subsections below.

Table 1 SSIs – December 2022 Semiannual Detection Monitoring Event

Stratum	Well	Analyte	Value (mg/L)	Intrawell Prediction Limit (mg/L)	SI by Sen's Slope test
I	MW-102S	Calcium	16.2	13.8	N
		TDS	3,860	219	N
	MW-103S	TDS	980	444	N
	MW-106S	Calcium	31.6	23.8	Y
		TDS	979	827	Y
		Fluoride	0.803	0.625	Y
		Sulfate	643	604	Y
	MW-110S	Boron	2.03	1.586	Y
	MW-111S	Boron	6.26	4.495	Y
		Calcium	112	36.8	Y
		TDS	1,270	541	Y
		Fluoride	1.2	0.283	Y
		pH	3.71	3.9-6	N
		Sulfate	879	398	Y
III	MW-112D	Boron	0.278	0.252	N
		Calcium	39.3	23.8	Y
		TDS	302	205	Y
	MW-114D	Calcium	52.1	50.8	N
		TDS	331	322	N
	MW-118D	TDS	557	545	N

3.1 Calcium at MW-102S

The calcium SSI identified at MW-102S is a result of goundwater geochemistry conditions changes and potential infiltration of surface water. The following evidence supports this determination:

- Calcium was detected in MW-102S at a concentration of 16.2 mg/L in the December 2022 sample, which exceeded the intrawell prediction limit of 13.8 mg/L. Compared to the value of 10.3 mg/L in the June 2022 sample, the calcium concentration increased by 57%. Background concentrations of calcium have varied from 7.61 to 12.6 mg/L at upgradient monitoring well MW-101S. The calcium concentration of 16.2 mg/L detected in MW-102S during the 2nd Half 2022 semiannual detection monitoring event exceeded this range. The calcium exceedance could be caused the changes of groundwater geochemistry conditions, especially with the high TDS detected in MW-102S, and potential infiltration of surface water.

3.2 TDS at MW-102S

The TDS SSI identified at MW-102S is a result of analytical error and groundwater geochemistry conditions change. The following evidence supports this determination:

- TDS was detected in MW-102S at a concentration of 3,860 mg/L in the December 2022 sample, which exceeded the intrawell prediction limit of 219 mg/L. Compared to the value of 183 mg/L in the June 2022 sample, the TDS concentration increased approximately 20 times. MW-102S is one of the Stratum I background monitoring wells. No significant increasing trend was observed by the Mann-Kendal statistic model. No significant increase of other ions' concentrations was observed. The TDS exceedance in MW-102S could be most likely analytical error. The monitoring data in next sampling event will be used to confirm this hypothesis.
- TDS exceedance in MW-102S could also be the result of enhanced mineral/soil dissolution due to groundwater geochemistry conditions change.

3.3 TDS at MW-103S

The TDS SSI identified at MW-103S is a result of the groundwater geochemistry conditions, analytical error, the potential impact of CCR disposed at the CADL prior to October 19, 2015 and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-103S. The following evidence supports this determination:

- TDS was detected in MW-111S at a concentration of 980 mg/L in the December 2022 sample, which exceeded the intrawell prediction limit of 444 mg/L. Compared to the value of 122 mg/L in the June 2022 sample, the TDS concentration increased approximately 7 times. No significant increasing trend was observed by the Mann-Kendal statistic model. The TDS exceedance in MW-103S could be analytical error, or a result of groundwater geochemistry conditions change which favors minerals dissolution. As discussed in Section 2.2, the Jackson Group groundwater is sodium- and calcium-sulfate water type. Sodium could be another main contribution to the TDS exceedance with the increasing of sulfate. The acidic groundwater could be one of the potential reasons.

- Based on review of potentiometric surface mapping, locations of closed portions of the CADL, and the CCR Unit relative to MW-103S, MW-103S may monitor groundwater associated with the pre-CCR Rule closed portions of the CADL rather than the CCR Unit. Therefore, concentrations measured in MW-103S may be more reflective of pre-CCR Rule disposal rather than of the Unit.
- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-103S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-103S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-103S, it appears likely that surface water infiltration may have impacted the MW-103S monitoring results.

3.4 Calcium at MW-106S

The calcium SSI identified at MW-106S is a result of the acidic geochemistry condition in groundwater, potential impact of CCR disposed at the CADL prior to October 19, 2015, and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-106S. The following evidence supports this determination:

- Calcium was detected in MW-106S at a concentration of 31.6 mg/L in the December 2022 sample. Compared to the value of 30 mg/L in the June 2022 sample, the calcium concentration was consistent. The Mann-Kendal statistic of 134 exceeded the critical value of 68 indicating a significant increasing trend at the 98% confidence level. As discussed in Section 2.3, pH and EC could affect calcium concentrations in groundwater. A low pH value of 3.83 was detected in the December 2022 sample and the historical data review shows pH in MW-106S stays in a steady range of 3.6 – 4.5, which indicates the groundwater in this area is acidic and it was related to pre-CCR Rule disposal source or natural geochemistry conditions. The acidic groundwater condition favors the dissolution of calcium from soil and mineral surfaces to water phase. The significant increasing trend of calcium from 16 mg/L in 2015 to 40 mg/L in 2021 could be a result of the acidic geochemistry condition. The increasing cation and anion concentrations will also lead to the increasing EC, which will affect other metals dissolution.
- The concentrations of calcium in MW-101S, which is a background well, have varied from 14 to 98.5 mg/L during the overall time period of CCR detection monitoring. The calcium

concentration of 98.5 mg/L for MW-101S is greater than the calcium concentration of 31.6 mg/L measured at MW-106S during the 2nd Half 2022 semiannual detection monitoring event. Therefore, the calcium concentration measured at MW-106S is within the range of natural variation in background groundwater quality.

- Based on review of potentiometric surface mapping, locations of closed portions of the CADL underlying the CCR Unit, and the CCR Unit relative to MW-106S, it appears that MW-106S may monitor groundwater associated with the underlying pre-CCR Rule closed portions of the CADL rather than the CCR Unit; therefore, concentrations measured in MW-106S are likely more reflective of pre-CCR Rule disposal rather than of the CCR Unit.
- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-106S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-106S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-106S, it appears likely that surface water infiltration may have impacted the MW-106S monitoring results.

3.5 Fluoride at MW-106S

The fluoride SSI identified at MW-106S is a result of groundwater geochemistry conditions, potential impact of CCR disposed at the CADL prior to October 19, 2015, and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-106S. The following evidence supports this determination:

- Fluoride was detected in MW-106S at a concentration of 0.803 mg/L in the December 2022 sample. Compared to the value of 0.661 mg/L in the June 2022 sample, the calcium concentration increased by 21%. The Mann-Kendal statistic of 110 exceeded the critical value of 68 indicating a significant increasing trend at the 98% confidence level. This concentration exceeded the intrawell prediction limit of 0.625 mg/L and the maximum fluoride concentrations of 0.1 to 0.135 mg/L measured in the three Stratum I background monitoring wells (MW-101S, MW-102S, and MW-104S). However, it should be noted that the measured fluoride concentrations are less than the federal primary drinking water maximum contaminant level (MCL) standard of 4.0 mg/L.

- The fluoride concentration in MW-106S stayed in a narrow range of 0.6-0.68 mg/L in the past two years. pH of the groundwater is not an impact of the exceedance since fluoride dissolution favors alkaline pH. As discussed in Section 2.3, fluoride has positive correlation with both bicarbonate and sodium, and an inverse relation with calcium. With the increasing trend of calcium in the groundwater, ion exchange process with high sodium and bicarbonate can result in the increasing of fluoride in groundwater.

- Based on review of potentiometric surface mapping, locations of closed portions of the CADL underlying the CCR Unit, and the CCR Unit relative to MW-106S, it appears that MW-106S may monitor groundwater associated with the underlying pre-CCR Rule closed portions of the CADL rather than the CCR Unit; therefore, concentrations measured in MW-106S may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.
- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-106S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-106S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-106S, it appears likely that surface water infiltration may have impacted the MW-106S monitoring results.

3.6 Sulfate at MW-106S

The sulfate SSI identified at MW-106S is a result of natural geochemistry condition in soil and groundwater, potential impact of CCR disposed at the CADL prior to October 19, 2015, and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-106S. The following evidence supports this determination:

- Sulfate was detected in MW-106S at a concentration of 643 mg/L in the December 2022 sample, which exceeded the intrawell prediction limit of 604 mg/L. Compared to the value of 633 mg/L in the June 2022 sample, the sulfate concentration was consistent. The elevated sulfate concentrion in the past three years could be caused by the acidic geochemistry condition discussed above or an anthropogenic source since sulfate is mobile in soils and can get into groundwater via surface water infiltration. Another potential reseaon is the natural occurrence of sulfide minerals in the soil, such as pyrite. The oxidation of sulfide minerals will slowly release sulfate and hydrogen ion into groundwater, which will lead to the increasing of sulfate and decreasing of pH.
- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-106S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-106S area via surface water

swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-106S, it appears likely that surface water infiltration may have impacted the MW-106S monitoring results.

- Based on review of potentiometric surface mapping and locations of closed portions of the CADL, and the CCR Unit relative to MW-106S, MW-106S may monitor groundwater associated with the pre-CCR Rule closed portions of the CADL rather than the CCR unit; therefore, concentrations measured in MW-106S may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.

3.7 TDS at MW-106S

The TDS SSI identified at MW-106S is a result of the acidic groundwater geochemistry condition, sodium sulfate source, potential impact of CCR disposed at the CADL prior to October 19, 2015, and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-106S. The following evidence supports this determination:

- TDS was detected in MW-106S at a concentration of 979 mg/L in the December 2022 sample, which exceeded the intrawell prediction limit of 827 mg/L. Compared to the value of 920 mg/L in the June 2022 sample and 1090 mg/L in the November 2021 sample, the TDS was stable. As discussed in Section 2.2, the Jackson Group groundwater is sodium- and calcium-sulfate water type. Sodium could be another main contribution to the TDS exceedance with calcium and sulfate. High sodium concentration can also cause the fluoride exceedance. The acidic groundwater could be one of the potential reasons. An alternate source containing sodium sulfate should also be considered, which can be mineral dissolution, surface water flux or atmospheric deposition.
- Based on review of potentiometric surface mapping, locations of closed portions of the CADL, and the CCR Unit relative to MW-106S, MW-106S may monitor groundwater associated with the pre-CCR Rule closed portions of the CADL rather than the CCR Unit. Therefore, concentrations measured in MW-106S may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.
- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-106S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-106S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-106S, it appears likely that surface water infiltration may be impacting the MW-106S monitoring results.

3.8 Boron at MW-110S

The Boron SSI identified at MW-110S is a result of the acidic groundwater geochemistry condition and potential impact of CCR disposed at the CADL prior to October 19, 2015. The following evidence supports this determination:

- Boron was detected in MW-110S at a concentration of 2.03 mg/L in the December 2022 sample, which exceeded the intrawell prediction limit of 1.586 mg/L. Compared to the value of 2.03 mg/L in the June 2022 sample, the boron concentration was consistent. The Mann-Kendal statistic of 136 exceeded the critical value of 68 indicating a significant increasing trend at the 98% confidence level. As discussed in Section 2.3, the main factors that may influence boron concentration in groundwater are pH and EC. Decreasing of pH will increase the dissolution of boron from the mineral surfaces. Boron in groundwater will increase with the increasing of EC. The historical data review shows the relatively low salts concentrations in MW-110S area, which indicates EC is not the factor causing the boron increasing trend. A low pH value of 4.11 was detected in the December 2022 sample. The acidic groundwater condition favors the boron dissolution from soil and mineral surface. Based on the consistent boron levels in groundwater, the significant increasing trend of boron is more likely relative to the acidic geochemistry condition other than a contamination source.

- Based on review of potentiometric surface mapping, locations of historic fill, locations of closed portions of the CADL underlying the CCR Unit, and the CCR Unit relative to MW-110S, it appears that MW-110S may monitor groundwater associated with the underlying pre-CCR Rule closed portions of the CADL rather than the CCR Unit; therefore, concentrations measured in MW-110S may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.

3.9 Boron at MW-111S

The boron SSI identified at MW-111S is a result of natural groundwater geochemistry conditions with low pH and high EC, potential impact of CCR disposed at the CADL prior to October 19, 2015, and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-111S. The following evidence supports this determination:

- Boron was detected in MW-111S at a concentration of 6.26 mg/L in the December 2022 sample, which exceeded the intrawell prediction limit of 4.495 mg/L. Compared to the value of 5.39 mg/L in the June 2022 sample, the boron concentration increased by 16%. The Mann-Kendal statistic of 128 exceeded the critical value of 68 indicating a significant increasing trend at the 98% confidence level. As discussed in Section 2.3, the main factors that may influence boron concentration in groundwater are pH and EC. Decreasing of pH will increase the dissolution of boron from the mineral surfaces. Boron in groundwater will increase with the increasing of EC. A low pH value of 3.71 was detected in the December 2022 sample and the pH of groundwater in the area of MW-111S stayed in a steady range of 3.6 to 4.5 in the past five years. The acidic groundwater condition favors the boron dissolution from soil and mineral surface. The increasing sulfate and TDS in MW-111S demonstrates that the groundwater in this area has relatively high EC, which will cause the increasing of boron concentration in groundwater. Based on the consistent boron levels, the significant increasing trend of boron is more likely relative to the geochemistry conditions with low pH and high EC other than a contamination source.

- Based on review of potentiometric surface mapping and locations of closed portions of the CADL, and the CCR Unit relative to MW-111S, MW-111S may monitor groundwater associated with the pre-CCR Rule closed portions of the CADL rather than the CCR Unit. Therefore, concentrations measured in MW-111S may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.
- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-111S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-111S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-111S, it appears likely that surface water infiltration may be impacting the MW-111S monitoring results.

3.10 Calcium at MW-111S

The calcium SSI identified at MW-111S is a result of natural groundwater geochemistry conditions with low pH and high EC, potential impact of CCR disposed at the CADL prior to October 19, 2015, and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-111S. The following evidence supports this determination:

- Calcium was detected in MW-111S at a concentration of 112 mg/L in the December 2022 sample, which exceeded the intrawell prediction limit of 36.8 mg/L. Compared to the value of 115 mg/L in the June 2022 sample, the calcium concentration was consistent. Normality analysis of the calcium data set at MW-111S was non-normal requiring trend analysis of the data set to determine a potential significance increase. The Mann-Kendal statistic of 149 exceeded the critical value of 68 indicating a significant increasing trend at the 98% confidence level. As discussed in Section 2.3, pH and EC could affect calcium concentrations in groundwater. A low pH value of 3.71 was detected in the December 2022 sample and the pH of groundwater in the area of MW-111S stayed in a steady range of 3.6 to 4.5 in the past five years. The acidic condition favors the dissolution of calcium from soil and mineral surfaces to water phase. The relatively high EC in groundwater discussed above can also increase the calcium concentration. The significant increasing trend of calcium could be a result of the natural geochemistry conditions with low pH and high EC.

- Background concentrations of calcium have varied from 14 to 98.5 mg/L at upgradient monitoring well MW-101S. The calcium concentration of 112 mg/L at MW-111S during the 2nd Half 2022 semiannual detection monitoring event is beyond but close to the top background concnetration. Therefore, the calcium exceedance is still in the range of natural variation in background groundwater quality.
- Based on review of potentiometric surface mapping, locations of closed portions of the CADL, and the CCR Unit relative to MW-111S, MW-111S may monitor groundwater associated with the underlying pre-CCR Rule closed portions of the CADL rather than the CCR Unit. Therefore, concentrations measured in MW-111S may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.
- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-111S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-111S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy’s NPDES permit. Based on the close proximity of this surface water to MW-111S, it appears likely that surface water infiltration may have impacted the MW-111S monitoring results.

3.11 Fluoride at MW-111S

The fluoride SSI identified at MW-111S is a result of natural groundwater geochemistry conditions, potential impact of CCR disposed at the CADL prior to October 19, 2015 and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-111S. The following evidence supports this determination:

- Fluoride was detected in MW-111S at a concentration of 1.2 mg/L in the December 2022 sample, which exceeded the intrawell prediction limit of 0.283 mg/L and the maximum fluoride concentrations of 0.1 to 0.135 mg/L measured in the three Stratum I background monitoring wells (MW-101S, MW-102S, and MW-104S). Compared to the value of 0.748 mg/L in the June 2022 sample, the fluoride concentration increased by 60%. The Mann-Kendal statistic of 145 exceeded the critical value of 68 indicating a significant increasing trend at the 98% confidence level. However, it should be noted that the measured fluoride concentrations are less than the federal primary drinking water MCL of 4.0 mg/L. pH of the groundwater is not an impact of the exceedance since fluoride dissoluction favors alkaline pH. As discussed in Section 2.3, fluoride has positive correlation with both bicarbonate and sodium, and an inverse relation with calcium. With the increasing trend of calcium in the groundwater, ion exchange process with high sodium and bicarbonate can result in the increasing of fluoride in groundwater. The fluoride increasing trend could also be a result of continouse dissoved salts from the soils and minerals associated with the increased TDS.

- Based on review of potentiometric surface mapping, locations of closed portions of the CADL, and the CCR Unit relative to MW-111S, MW-111S may monitor groundwater associated with the pre-CCR Rule closed portions of the CADL rather than the CCR Unit. Therefore, concentrations measured in MW-111S may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.
- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-111S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-111S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-111S, it appears likely that surface water infiltration may have impacted the MW-111S monitoring results.

3.12 Sulfate at MW-111S

The sulfate SSI identified at MW-111S is a result of natural groundwater geochemistry condition of low pH and potential oxidation of sulfide minerals, potential impact of CCR disposed at the CADL prior to October 19, 2015, and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-111S. The following evidence supports this determination:

- Sulfate was detected in MW-111S at a concentration of 879 mg/L in the December 2022 sample, which exceeded the intrawell prediction limit of 398 mg/L. Compared to the value of 804 mg/L in the June 2022 sample, the sulfate concentration increased by 9%. The Mann-Kendal statistic of 137 exceeded the critical value of 68 indicating a significant increasing trend at the 98% confidence level. The sulfate increasing was consistent with the TDS increasing, which indicated that more salts were dissoved into groundwater. It could be caused by the acidic geochemistry condition discussed above or an anthropogenic source since sulfate is soluble in soils and can get into groundwater via surface water infiltration. Another potential reseaon is the naturally occurrence of sulfide minerals in the soil, such as pyrite. The oxidation of sulfide minerals will slowly release sulfate and hydrogen ion into groundwater, which will lead to the increasing of sulfate and decreasing of pH. To further investigate this hypothesis, the analysis of ORP is recommended for MW-111S in the next sampling event.
- Based on review of potentiometric surface mapping and locations of closed portions of the CADL, and the CCR Unit relative to MW-111S, MW-111S may monitor groundwater associated with the pre-CCR Rule closed portions of the CADL rather than the CCR Unit;

therefore, concentrations measured in MW-111S may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.

- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-111S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-111S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-111S, it appears likely that surface water infiltration may have impacted the MW-111S monitoring results.

3.13 pH at MW-111S

The pH SSI identified at MW-111S is a result of natural groundwater geochemistry condition, potential oxidation of sulfide minerals, potential impact of CCR disposed at the CADL prior to October 19, 2015, and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-111S. The following evidence supports this determination:

- pH was detected in MW-111S at a value of 3.71 in the December 2022 sample, which exceeded the intrawell prediction limit of 3.9 to 6. No significant increasing trend was observed by the Mann-Kendal statistic model. The acidic groundwater condition and elevated sulfate concentration indicated that there might be rich sulfide mineral such as pyrite in the surrounding soils. The oxidation of sulfide minerals will slowly release sulfate and hydrogen ion into groundwater, which will lead to the increasing of sulfate and decreasing of pH.
- Based on review of potentiometric surface mapping and locations of closed portions of the CADL, and the CCR Unit relative to MW-111S, MW-111S may monitor groundwater associated with the pre-CCR Rule closed portions of the CADL rather than the CCR Unit; therefore, concentrations measured in MW-111S may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.
- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-111S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-111S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-111S, it appears likely that surface water infiltration may have impacted the MW-111S monitoring results.

3.14 TDS at MW-111S

The TDS SSI identified at MW-111S is a result of the acidic groundwater geochemistry conditions with natural occurrence of sulfide minerals, sodium sulfate source, the potential impact of CCR disposed at the CADL prior to October 19, 2015 and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-111S. The following evidence supports this determination:

- TDS was detected in MW-111S at a concentration of 1,270 mg/L in the December 2022 sample, which exceeded the intrawell prediction limit of 541 mg/L. Compared to the value of 1,230 mg/L in the June 2022 sample, the TDS concentration was consistent. The Mann-Kendal statistic of 150 exceeded the critical value of 68 indicating a significant increasing trend at the 98% confidence level. As discussed in Section 2.2, the Jackson Group groundwater is sodium- and calcium-sulfate water type. Sodium could be another main contribution to the TDS exceedance with the increasing of calcium and sulfate. High sodium concentration can also cause the fluoride exceedance. The acidic groundwater could be one of the potential reasons. An alternate source containing sodium sulfate should also be considered, which can be mineral dissolution, surface water flux or atmospheric deposition.
- Based on review of potentiometric surface mapping, locations of closed portions of the CADL, and the CCR Unit relative to MW-111S, MW-111S may monitor groundwater associated with the pre-CCR Rule closed portions of the CADL rather than the CCR Unit. Therefore, concentrations measured in MW-111S may be more reflective of pre-CCR Rule disposal rather than of the Unit.
- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-111S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-111S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-111S, it appears likely that surface water infiltration may have impacted the MW-111S monitoring results.

3.15 Boron at MW-112D

The boron SSI identified at MW-112D is a result of natural variation in groundwater quality and potential impact of CCR disposed at the CADL prior to October 19, 2015. The following evidence supports this determination:

- Boron was detected in MW-112D at a concentration of 0.278 mg/L in the December 2022 sample, which was consistent with 0.278 mg/L in the June 2022 sample. This concentration exceeds the intrawell prediction limit of 0.252 mg/L. Boron concentrations measured at MW-118D (background well for Stratum III) have ranged from 0.274 to 0.355 mg/L. Therefore, the boron exceedance at MW-112D is within the range of variation in background groundwater quality and is not a potential environmental concern.

- Based on review of potentiometric surface mapping, locations of closed portions of the CADL, and the CCR Unit relative to MW-112D, MW-112D is located immediately adjacent (approximately 25 feet) to historic fill, but approximately 950 feet from the CCR Unit. Therefore, the concentrations of boron measured in MW-112D may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.
- Groundwater flow velocities are estimated to be approximately <1 ft/year to 10 ft/year (TRC 2018a). Since, MW-112D is located approximately 950 feet from the CCR unit, any release from the CCR Unit would be detected in Stratum III at MW-112D within approximately 95 years, which is significantly longer than the CCR Unit has been in operation. Therefore, the concentration of boron at MW-112D likely represents either potential pre-CCR Rule migration from historic fill or background groundwater quality for Stratum III.

3.16 Calcium at MW-112D

The calcium SSI identified at MW-112D is a result of natural variation in groundwater quality and potential impact of CCR disposed at the CADL prior to October 19, 2015. The following evidence supports this determination:

- Calcium was detected in MW-112D at a concentration of 39.3 mg/L in the December 2022 sample, which was consistent with 37 mg/L in the June 2022 sample. This concentration exceeds the intrawell prediction limit of 23.8 mg/L. The Mann-Kendal statistic of 137 exceeded the critical value of 68 indicating a significant increasing trend at the 98% confidence level. A pH value of 7.15 was detected at in the December 2022 sample and the historical data review shows MW-112D area has a netural pH condition in groundwater. The relatively low TDS indicated that EC in groundwater is not a factor to the calcium exceedance. Calcium concentrations measured at MW-118D (background well for Stratum III) have ranged from 68.4 to 83.2 mg/L. Therefore, the calcium exceedance at MW-112D is within the range of variation in background groundwater quality and is not a potential environmental concern.
- Based on review of potentiometric surface mapping, locations of historic fill, locations of closed portions of the CADL, and the CCR Unit relative to MW-112D, MW-112D is located immediately adjacent (approximately 25 feet) to historic fill, but approximately 950 feet from the CCR Unit. Therefore, the concentrations of calcium measured in MW-112D may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.
- As discussed previously, groundwater flow velocities are estimated to be approximately <1 ft/year to 10 ft/year (TRC 2018a). Since, MW-112D is located approximately 950 feet from the

CCR Unit, any release from the CCR Unit would be detected in Stratum III at MW-112D within approximately 95 years, which is significantly longer than the CCR Unit has been in operation. Therefore, the concentration of calcium at MW-112D likely represents either potential pre-CCR Rule migration from historic fill or background groundwater quality for Stratum III.

3.17 TDS at MW-112D

The TDS SSI identified at MW-112D is a result of natural variation in groundwater quality and potential impact of CCR disposed at the CADL prior to October 19, 2015. The following evidence supports this determination:

- TDS was detected in MW-112D at a concentration of 302 mg/L in the December 2022 sample, which exceeded the intrawell prediction limit of 205 mg/L. Compared to the value of 270 mg/L in the June 2022 sample, the TDS concentration decreased by 12%. TDS concentrations measured at MW-118D (background well for Stratum III) have ranged from 415 to 484 mg/L. A review of groundwater parameters in Stratum III indicates that sulfate is a great contributor to TDS and the sulfte concentration at MW-112D is very low (less than 5 mg/L). Therefore, the TDS exceedance at MW-112D is within the range of variation in background groundwater quality and is not a potential environmental concern.
- Based on review of potentiometric surface mapping, locations of historic fill, locations of closed portions of the CADL, and the CCR Unit relative to MW-112D, MW-112D is located immediately adjacent (approximately 25 feet) to historic fill, but approximately 950 feet from the CCR Unit. Therefore, the concentrations of TDS measured in MW-112D may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.
- As discussed previously, groundwater flow velocities are estimated to be approximately <1 ft/year to 10 ft/year (TRC 2018a). Since, MW-112D is located approximately 950 feet from the CCR unit, any release from the CCR Unit would be detected in Stratum III at MW-112D within approximately 95 years, which is significantly longer than the CCR Unit has been in operation. Therefore, the concentration of TDS at MW-112D likely represents either potential pre-CCR Rule migration from the historic fill or background groundwater quality for Stratum III.

3.18 Calcium at MW-114D

The calcium SSI identified at MW-114D is a result of natural variation in groundwater quality. The following evidence supports this determination:

- Calcium was detected in MW-114D at a concentration of 52.1 mg/L in the December 2022 sample, which was consistent with 53.1 mg/L in the June 2022 sample. This concentration exceeds the intrawell prediction limit of 50.8 mg/L. A pH value of 7.8 was detected at in the

December 2022 sample and the historical data review shows MW-114D area has a netural pH condition in groundwater. Calcium concentrations measured at MW-118D (background well for Stratum III) have ranged from 68.4 to 103 mg/L. Therefore, the calcium exceedance at MW-114D is within the range of variation in background groundwater quality and is not a potential environmental concern.

- Based on review of potentiometric surface mapping, locations of closed portions of the CADL, and the CCR Unit relative to MW-114D, MW-114D is located 950 feet from the CCR Unit. Therefore, the concentrations of calcium measured in MW-114D may be more reflective of background natural water quality rather than of the CCR Unit.
- As discussed previously, groundwater flow velocities in Stratum III are estimated to be approximately <1 ft/year to 10 ft/year (TRC 2018a). Since, MW-114D is located approximately 950 feet from the CCR Unit, any release from the pre-CCR Rule closed portions of the CADL or the CCR Unit would be detected in Stratum III at MW-114D within approximately 95 years, which is significantly longer than either the CADL or the CCR Unit has been in operation. Therefore, the concentration of calcium at MW-114D likely represents background natural groundwater quality for Stratum III.

3.19 TDS at MW-114D

The TDS SSI identified at MW-114D is a result of natural variation in groundwater quality. The following evidence supports this determination:

- TDS was detected in MW-114D at a concentration of 331 mg/L in the December 2022 sample, which exceeded the intrawell prediction limit of 322 mg/L. Compared to the value of 319 mg/L in the June 2022 sample, the TDS concentration was consistent. TDS concentrations measured at MW-118D (background well for Stratum III) have ranged from 415 to 642 mg/L. Therefore, the TDS exceedance at MW-114D is within the range of variation in background groundwater quality and is not a potential environmental concern.
- Based on review of potentiometric surface mapping, locations of closed portions of the CADL, and the CCR Unit relative to MW-114D, MW-114D is located 950 feet from the CCR Unit. Therefore, the concentrations of TDS measured in MW-114D may be more reflective of background natural water quality rather than of the CCR Unit.
- As discussed previously, groundwater flow velocities in Stratum III are estimated to be approximately <1 ft/year to 10 ft/year (TRC 2018a). Since, MW-114D is located approximately 950 feet from the CCR Unit, any release from the pre-CCR Rule closed portions of the CADL or the CCR Unit would be detected in Stratum III at MW-114D within approximately 95 years, which is significantly longer than either the CADL or the CCR Unit has been in operation. Therefore, the concentration of calcium at MW-114D likely represents background natural groundwater quality for Stratum III.

3.20 TDS at MW-118D

The TDS SSI identified at MW-118D is a result of natural variation in groundwater quality. The following evidence supports this determination:

- TDS was detected in MW-118D at a concentration of 557 mg/L in the December 2022 sample, which exceeded the intrawell prediction limit of 545 mg/L. Compared to the value of 585 mg/L in the June 2022 sample, the TDS concentration decreased by 5%. MW-118D is one of the Stratum III background monitoring wells. The TDS exceedance at MW-118D is within the range of variation in background groundwater quality and is not a potential environmental concern.
- Based on review of potentiometric surface mapping, locations of closed portions of the CADL, and the CCR Unit relative to MW-118D, MW-118D is located 1800 feet from the CCR Unit. Therefore, the concentrations of TDS measured in MW-118D may be more reflective of background natural water quality rather than of the CCR Unit.
- As discussed previously, groundwater flow velocities in Stratum III are estimated to be approximately <1 ft/year to 10 ft/year (TRC 2018a). Since, MW-118D is located approximately 1800 feet from the CCR Unit, any release from the pre-CCR Rule closed portions of the CADL or the CCR Unit would be detected in Stratum III at MW-118D within approximately 180 years, which is significantly longer than either the CADL or the CCR Unit has been in operation. Therefore, the concentration of calcium at MW-118D likely represents background natural groundwater quality for Stratum III.

Section 4
Conclusions

The information provided in this report serves as the ASD prepared in accordance with 40 CFR 257.94(e)(2) of the CCR Rule. Statistical evaluation identified 20 potential SSIs in five monitoring wells in Startums I and three monitoring wells in Strartums III. This ASD has demonstrated the following lines of reasoning that support alternative sources for the identified SSIs:

- Low pH detected in Startums I indicated the acidic groundwater geochemistry conditions in MW-106S, MW-110S and MW-111S. The 12 SSIs identified in Startums I are related to the naurtal groundwater geochemistry conditions, such as low pH, high electrical conductivity, potential presence of sulfide minerals in soils and relatively high oxidation-reduction potential.
- The 2 SSIs detected in MW-102S and MW-103S could be a result of analytical errors. The monitoring data in next sampling event will be used as confirmation.
- The 6 SSIs identified in Startums III are mostly within the natural variation in groundwater quality compared to MW-118D, which likely represents background natural groundwater quality for Stratum III due to its location to CCR Unit and groundwater flow velocities.
- Releases from historic fill or portions of the CADL closed before the effective date of the CCR Rule (October 19, 2015); and/or
- Surface water that has come into contact with on-site CCR and has migrated into the subsurface.

Therefore, the SSIs determined based on statistical analysis of the 2nd Half 2022 semiannual detection monitoring event performed in December of 2022 are not due to a release from the CCR Unit to Stratums I and III of the Jackson Group.Based on the information provided in this ASD report, Entergy will continue to conduct semiannual detection monitoring in accordance with 40 CFR 257.94 at the Certified Monitoring Well Network for the CCR Unit.

Section 5
Certification

I hereby certify that the alternative source demonstration presented within this document for the Entergy White Bluff Plant Coal Ash Disposal Landfill CCR Unit has been prepared to meet the requirements of Title 40 CFR §257.94(e) 2 of the Federal CCR Rule. This document is accurate and has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of Title 40 CFR §257.94(e) 2.

Name: Michael J. Amstadt P.E.

Expiration Date: 12/31/2023

Company: TRC Environmental Corporation

Date: 7/6/2023

(SEAL)

Section 6
References

Atekwana, E. A., Atekwana, E. A., Rowe, R. S., Werkema, D. D., & Legall, F. D. (2004). The relationship of total dissolved solids measurements to bulk electrical conductivity in an aquifer contaminated with hydrocarbon. Journal of Applied Geophysics, 56(4), 281–294.

Banadkooki, F. B., Ehteram, M., Panahi, F., Sh. Sammen, S., Othman, F. B., & EL-Shafie, A. (2020). Estimation of total dissolved solids (TDS) using new hybrid machine learning models. Journal of Hydrology, 587(February), 124989.

Brindha, K., & Elango, L. (2011). Fluoride in groundwater: Causes, implications and mitigation measures. Fluoride: Properties, Applications and Environmental Management, 113–136.

Chen, Q., Jia, C., Wei, J., Dong, F., Yang, W., Hao, D., Jia, Z., & Ji, Y. (2020). Geochemical process of groundwater fluoride evolution along global coastal plains: Evidence from the comparison in seawater intrusion area and soil salinization area. Chemical Geology, 552(July), 119779.

Einsiedl, F., & Mayer, B. (2005). Sources and Processes Affecting Sulfate in a Karstic Groundwater System of the Franconian Alb, Southern Germany. Environmental Science & Technology, 39(18), 7118–7125.

FTN. 2014. Supplemental Geotechnical and Hydrogeological Investigation Report, Entergy White Bluff Plant Class 3N Landfill. Prepared for Entergy Arkansas, Inc. Little Rock, AR: FTN Associates, Ltd. October 1, 2014.

FTN. 2017a. Statistical Analysis Plan, Entergy White Bluff Plant. Little Rock, AR: FTN Associates, Ltd.

FTN. 2017b. Groundwater Sampling and Analysis Plan, Entergy White Bluff Landfill. Little Rock, AR: FTN Associates, LTD.

Guo, H., Zhang, Y., Xing, L., & Jia, Y. (2012). Spatial variation in arsenic and fluoride concentrations of shallow groundwater from the town of Shahai in the Hetao basin, Inner Mongolia. Applied Geochemistry, 27(11), 2187–2196.

Hájek, M., Jiménez-Alfaro, B., Hájek, O., Brancaleoni, L., Cantonati, M., Carbognani, M., Dedić, A., Díte, D., Gerdol, R., Hájková, P., Horsáková, V., Jansen, F., Kamberović, J., Kapfer, J., Kolari, T. H. M., Lamentowicz, M., Lazarević, P., Mašić, E., Moeslund, J. E., …

Horsák, M. (2021). A European map of groundwater pH and calcium. Earth System Science Data, 13(3), 1089–1105.

Hollis, J. F., Keren, R., & Gal, M. (1988). Boron Release and Sorption by Fly Ash as Affected by pH and Particle Size. Journal of Environmental Quality, 17(2), 181–184.

Jiang, Y., Wu, Y., Groves, C., Yuan, D., & Kambesis, P. (2009). Natural and anthropogenic factors affecting the groundwater quality in the Nandong karst underground river system in Yunan, China. Journal of Contaminant Hydrology, 109(1–4), 49–61.

Keren, R., & Communar, G. (2009). Boron Sorption on Wastewater Dissolved Organic Matter: pH Effect. Soil Science Society of America Journal, 73(6), 2021–2025.

Kimambo, V., Bhattacharya, P., Mtalo, F., Mtamba, J., & Ahmad, A. (2019). Fluoride occurrence in groundwater systems at global scale and status of defluoridation – State of the art. Groundwater for Sustainable Development, 9(August 2018), 100223.

Kresse, T.M., P.D. Hays, K.R. Merriman, J.A. Gillip, D.T. Fugitt, J.L. Spellman, A.M. Nottmeier, D.A. Westerman, J.M. Blackstock, and J.L. Battreal. 2014. Aquifers of Arkansas—Protection, Management, and Hydrologic and Geochemical Characteristics of Groundwater Resources in Arkansas [USGS Scientific Investigations Report 2014–5149]. Prepared in Cooperation with the Arkansas Natural Resources Commission. Reston, VA: US Geological Survey. 334 pp.

Luo, W., Gao, X., & Zhang, X. (2018). Geochemical processes controlling the groundwater chemistry and fluoride contamination in the yuncheng basin, China—an area with complex hydrogeochemical conditions. PLoS ONE, 13(7).

MDH. (2008). Sulfate in well water. In Minnesota Department of Health, Well Management Section, Environmental Health Division.

Miao, Z., Brusseau, M. L., Carroll, K. C., Carreón-Diazconti, C., & Johnson, B. (2012). Sulfate reduction in groundwater: Characterization and applications for remediation. Environmental Geochemistry and Health, 34(4), 539–550.

Mondal, D., Gupta, S., Reddy, D. V., & Nagabhushanam, P. (2014). Geochemical controls on fluoride concentrations in groundwater from alluvial aquifers of the Birbhum district, West Bengal, India. Journal of Geochemical Exploration, 145, 190–206.

Olumuyiwa I. Ojo,. (2012). Groundwater: Characteristics, qualities, pollutions and treatments: An overview. International Journal of Water Resources and Environmental Engineering, 4(6), 162–170.

Palmucci, W., & Rusi, S. (2014). Boron-rich groundwater in Central Eastern Italy: a hydrogeochemical and statistical approach to define origin and distribution. Environmental Earth Sciences, 72(12), 5139–5157.

Poursaeid, M., Mastouri, R., Shabanlou, S., & Najarchi, M. (2020). Estimation of total dissolved solids, electrical conductivity, salinity and groundwater levels using novel learning machines. Environmental Earth Sciences, 79(19), 1–25.

Pu, J., Yuan, D., Zhang, C., & Zhao, H. (2012). Hydrogeochemistry and possible sulfate sources in karst groundwater in Chongqing, China. Environmental Earth Sciences 2012 68:1, 68(1), 159–168.

Ravenscroft, P., & McArthur, J. M. (2004). Mechanism of regional enrichment of groundwater by boron: the examples of Bangladesh and Michigan, USA. Applied Geochemistry, 19(9), 1413–1430.

Razowska-jaworek, L. (2014). Calcium and Magnesium in Groundwater. In Calcium and Magnesium in Groundwater.

Saxena, V., & Ahmed, S. (2001). Dissolution of fluoride in groundwater: a water-rock interaction study. Environmental Geology, 40(9), 1084–1087.

Schot, P. P., & Wassen, M. J. (1993). Calcium concentrations in wetland groundwater in relation to water sources and soil conditions in the recharge area. Journal of Hydrology, 141(1–4), 197–217.

Shi, X., Wang, Y., Jiao, J. J., Zhong, J., Wen, H., & Dong, R. (2018). Assessing major factors affecting shallow groundwater geochemical evolution in a highly urbanized coastal area of Shenzhen City, China. Journal of Geochemical Exploration, 184, 17–27.

Tabelin, C. B., Hashimoto, A., Igarashi, T., & Yoneda, T. (2014). Leaching of boron, arsenic and selenium from sedimentary rocks: II. pH dependence, speciation and mechanisms of release. Science of The Total Environment, 473–474, 244–253.

TRC. 2017. Statistical Methods Certification, White Bluff Steam Electric Generating Station, Redfield, Arkansas. Prepared for Entergy Arkansas Inc. Baton Rouge: TRC Environmental Corporation.

TRC. 2018a. Site Conceptual Model: Entergy White Bluff Plant Coal Ash Disposal Landfill, Redfield, Jefferson County, Arkansas. January 2018.

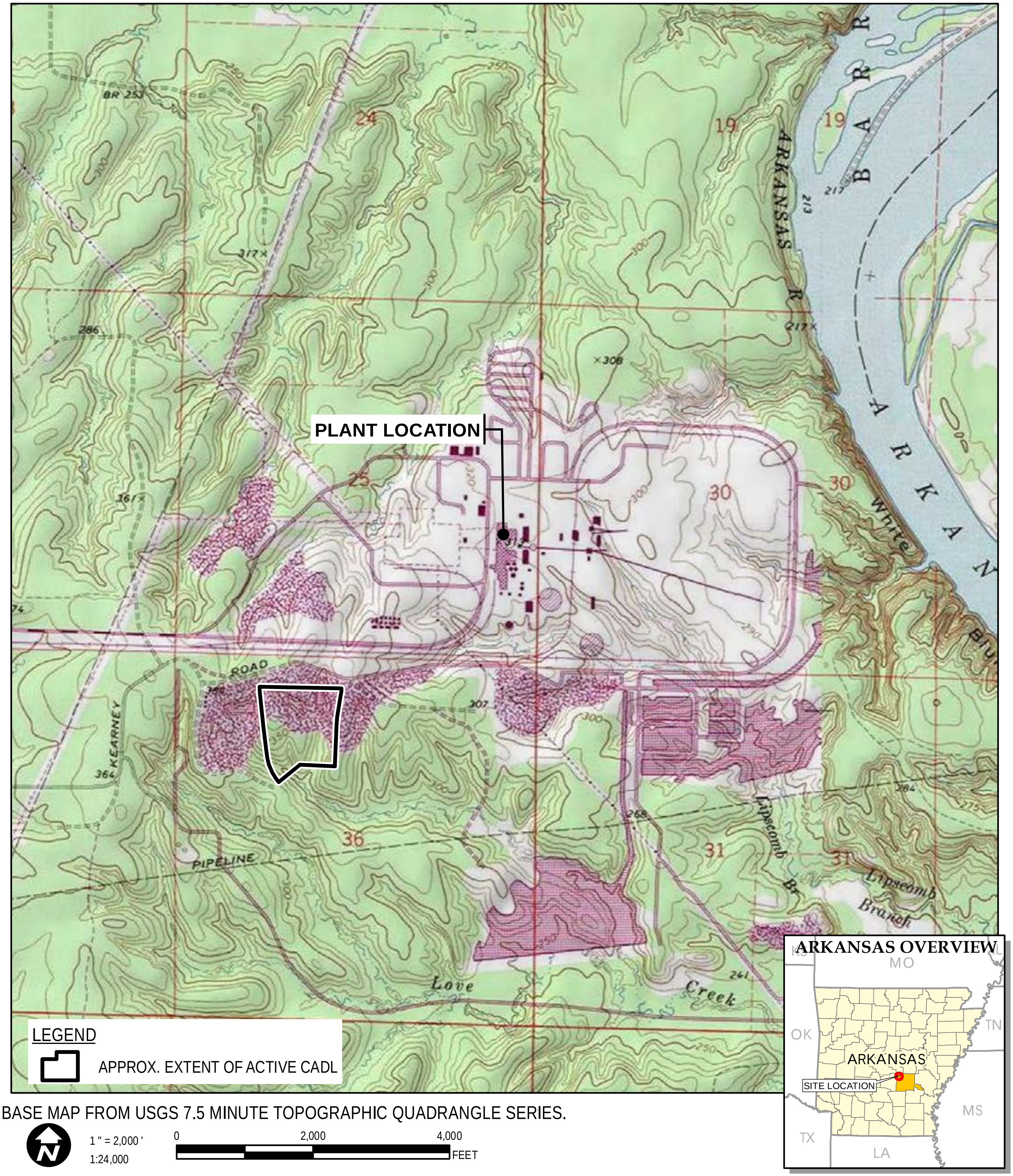
TRC. 2018b. Groundwater Monitoring System Certification, White Bluff Steam Electric Generating Station, Redfield, Arkansas. Prepared for Entergy Arkansas Inc. Baton Rouge: TRC Environmental Corporation.

Upadhyaya, D., Survaiya, M. D., Basha, S., Mandal, S. K., Thorat, R. B., Haldar, S., Goel, S., Dave, H., Baxi, K., Trivedi, R. H., & Mody, K. H. (2014). Occurrence and distribution of selected heavy metals and boron in groundwater of the Gulf of Khambhat region, Gujarat, India. Environmental Science and Pollution Research, 21(5), 3880–3890.

USEPA. (2008). Drinking Water Health Advisory For Boron. Office of Water U.S. Environmental Protection Agency Washington, DC, 822-R-08–0.

United States Environmental Protection Agency. 2017. Secondary Drinking Water Standards: Guidance for Nuisance Chemicals, March 8, 2017.

WHO. (2008). Guidelines for Drinking Water Quality, third ed. World Health Organization, Geneva.



BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

1 " = 2,000 '
1:24,000

0 2,000 4,000 FEET

TRC

Two United Plaza
8550 United Plaza Blvd., Suite 502
Baton Rouge, LA
Phone: 225.216.7483

TRC - GIS

PROJECT:

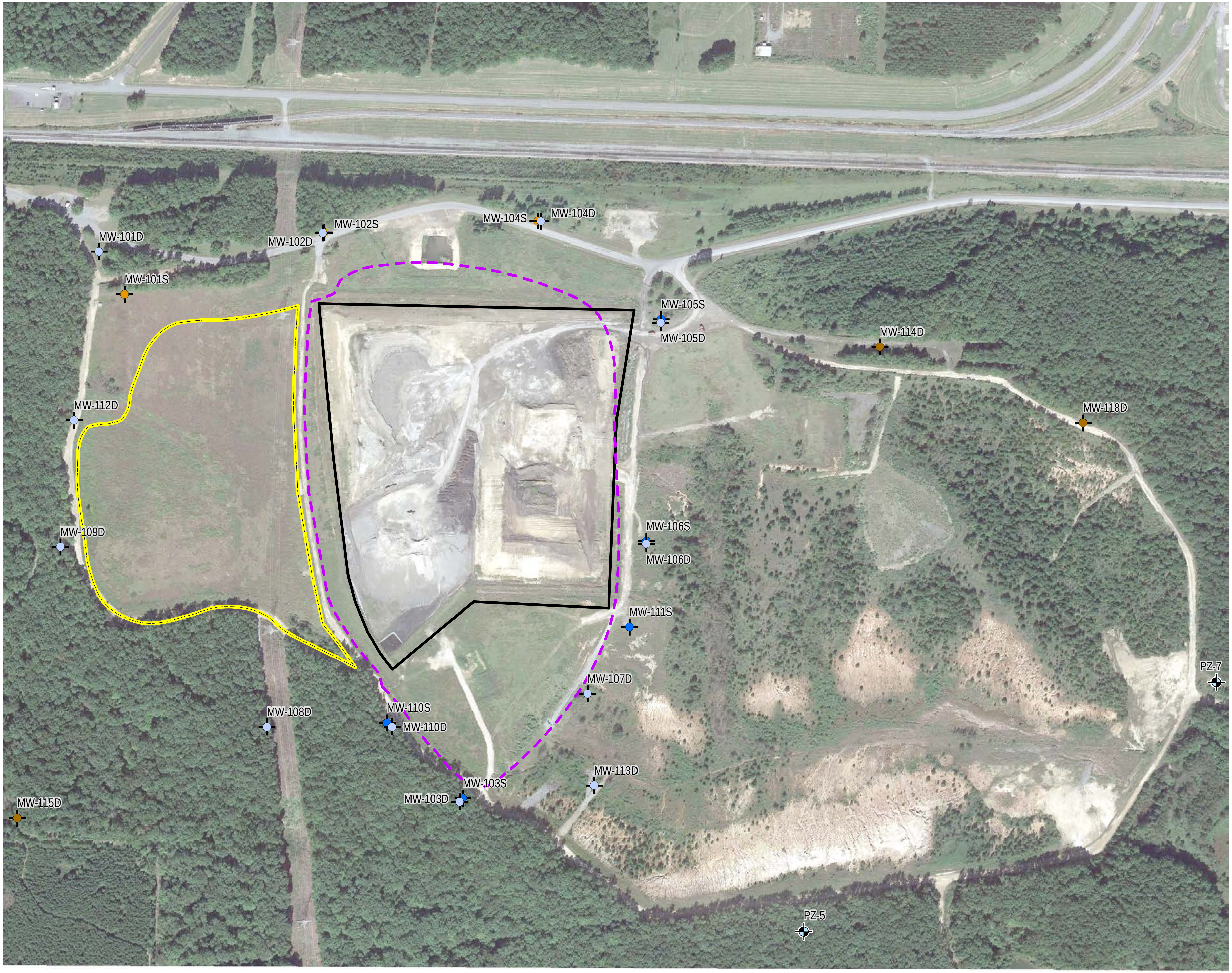
ENTERGY WHITE BLUFF PLANT
1100 WHITE BLUFF ROAD
REDFIELD, ARKANSAS

TITLE:

ENTERGY WHITE BLUFF PLANT LOCATION MAP

DRAWN BY:	S. MAJOR
CHECKED BY:	G. TIEMAN
APPROVED BY:	J. HOUSE
DATE:	JANUARY 2022
PROJ. NO.:	341458
FILE:	341458-001slm_20220105.mxd

FIGURE 1



LEGEND

⊕ STRATUM I BACKROUND WELL

⊕ STRATUM I MONITORING WELL

⊕ STRATUM III BACKROUND WELL

⊕ STRATUM III MONITORING WELL

⊕ STRATUM III PIEZOMETER

▢ APPROX. EXTENT OF ACTIVE CADL

▢ APPROX. EXTENT OF CLOSED CADL

▢ HISTORIC FILL AREA

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 2018.
2. COAL ASH DISPOSAL LANDFILL (CADL)

0 400 800
Feet

1 " = 371 '
1:4,458

PROJECT:

ENTERGY WHITE BLUFF PLANT
1100 WHITE BLUFF ROAD
REDFIELD, ARKANSAS

TITLE:

CADL EXTENT AND CCR GROUNDWATER MONITORING LOCATIONS

DRAWN BY:	S. MAJOR	PROJ. NO.:	341458
CHECKED BY:	S. SELLWOOD		
APPROVED BY:	J. HOUSE		**FIGURE 2**
DATE:	JANUARY 2022		

TRC

Two United Plaza
8550 United Plaza Blvd., Suite 502
Baton Rouge, LA
Phone: 225.216.7483

FILE NO.: 341458-002_01052022.mxd

TRC - GIS

Coordinate System: NAD 1983 StatePlane Arkansas South FIPS 0302 Feet (Foot US)
Map Rotation: 0

Plot Date: 1/5/2022, 15:55:41 PM by DSTITCHER -- LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\Entergy\MadisonLegacyProjects\Arkansas\2018_302967\341458-002_01052022.mxd

Alternate Source Demonstration

1st Half 2023 Sampling Event

Entergy White Bluff Plant
Coal Ash Disposal Landfill
Redfield, Jefferson County, Arkansas

October 2023

Prepared For
Entergy Arkansas, LLC
White Bluff Plant
1100 White Bluff Road
Redfield, Arkansas 72132

Jason S. House
Senior Project Manager

Executive Summary

Entergy Arkansas, LLC (Entergy) performed the most recent semiannual detection monitoring sampling (1st Half 2023) in June 2023 for Cells 1 through 4 of the coal ash disposal landfill (CADL) pursuant to the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, 40 CFR Part 257 (CCR Rule). Cells 1 through 4 of the CADL constitute the coal combustion residuals (CCR) Unit per the CCR Rule. Per 40 CFR 257.94, the samples were analyzed for the Appendix III detection monitoring parameters. Upon receipt of the laboratory analytical results, statistical analysis was performed.

In accordance with the statistical analyses, the following 15 statistically significant increases (SSI) above background concentrations were identified in three monitoring wells in Stratum I and three monitoring wells in Stratum III, based on either increasing trends at 98% confidence levels using Sen's Slope test and/or intrawell prediction limits statistical analyses:

- Calcium, fluoride, sulfate and TDS (MW-106S);
- Boron (MW-110S);
- Boron, calcium, fluoride, sulfate, and TDS (MW-111S);
- Boron, calcium, and TDS (MW-112D);
- TDS (MW-114D); and
- TDS (MW-118D).

The information provided in this report serves as Entergy's alternate source demonstration (ASD) prepared in accordance with 40 CFR 257.94(e)(2) and successfully demonstrates that the SSIs are not due to a release from the CCR Unit to groundwater, but are due to the following:

- Natural groundwater geochemistry conditions such as pH, electrical conductivity (EC), oxidation-reduction potential (ORP) and the naturally occurrence of sulfide minerals;
- Natural variation in groundwater quality;
- Releases from historic fill or portions of the CADL closed before the effective date of the CCR Rule (October 19, 2015); and/or
- Surface water that has come into contact with on-site CCR and has migrated into the subsurface.

Therefore, based on the information provided in this ASD report, Entergy will continue to conduct semiannual detection monitoring for Appendix III constituents in accordance with 40 CFR 257.94 at the certified groundwater monitoring well system (Certified Monitoring Well Network) for the CCR Unit and will continue to implement improvements to stormwater management practices at the CADL.

Table of Contents

List of Figures

Section 1
Introduction

1.1 Background

Entergy Arkansas, LLC (Entergy) operates the Entergy White Bluff Plant (Plant), a coal-fired power plant, to generate electricity. The Plant is located at 1100 White Bluff Road in Redfield, Jefferson County, Arkansas as shown on Figure 1. Coal combustion residuals (CCR) are produced as part of the electrical generation operations. The Plant has been generating and disposing of CCR in a portion of the on-site coal ash disposal landfill (CADL) since it began operations in 1981. The CADL is a Class 3N non-commercial industrial landfill and operates under Arkansas Division of Environmental Quality (ADEQ) Solid Waste Permit No. 0199-S3N-R3.

The ADEQ-permitted CADL consists of approximately 153-acres at the Plant and encompasses the following three areas:

- Approximately 50-acre portion of the CADL historically used for CCR disposal from 1981 until prior to the effective date of the CCR Rule (October 19, 2015). CCR was placed into ravines. This area was closed in accordance with the Plant's original solid waste permit (TRC, 2018a);
- Cells 1 through 4, which are the current cells used for CCR disposal and were constructed on top of, and adjacent to, the above-noted closed CCR disposal areas prior to the effective date of the CCR Rule. Cells 1 through 4 encompass approximately 30 acres and were constructed as follows:
  - Cells 1, 2, and 3 were constructed with an 18-inch thick compacted clay bottom liner;
  - Cell 4 was constructed with a two-foot thick compacted clay bottom liner and a leachate collection system; and
- Approximately 100-acre portion of the CADL that is currently undeveloped and may be used for CCR and/or non-CCR disposal.

In addition to the current 153-acre permitted landfill, there is an approximately 25 acre area to the immediate west of Cells 1 through 4 where during the initial period of operation of the Plant, ash was placed pursuant to the permits issued at that time. This historic fill area is covered with soil and vegetated.

Cells 1 through 4 accept CCR for disposal in accordance with the federal *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule* (CCR Rule), effective October 19, 2015, and subsequent Final Rules promulgated by the United States

Environmental Protection Agency (USEPA). Cells 1 through 4 comprise the CCR management unit (CCR Unit) per the CCR Rule and are the focus of this ASD. The approximate limits of Cells 1 through 4, the closed disposal areas, and the undeveloped, future disposal areas within the ADEQ-permitted footprint of the CADL are shown in Figure 2.

Historical CCR management by Entergy has consisted of the following activities:

- Beneficial use in local construction projects;
- Beneficial use as roadbed material at the CADL; and
- Placement into the CADL.

1.1.1 Groundwater Monitoring and Statistical Analysis

In accordance with 40 CFR 257.90 through 257.94, Entergy installed a groundwater monitoring system for Cells 1 through 4 and has collected samples from the Certified Monitoring Well Network for laboratory analysis for CCR constituents and performed statistical analysis of the collected samples. Entergy installed a Certified Monitoring Well Network for the CCR Unit in accordance with 40 CFR 257.90 and 257.91. The Certified Monitoring Well Network consists of 23 wells installed into two stratigraphic units as follows:

- Eight wells are installed into an upper silty and clayey sand unit (Stratum I), which are designated as "S" monitoring wells; and
- Fifteen wells are installed into a lower silty and clayey sand and clay unit (Stratum III), which are designated as "D" monitoring wells.

Pursuant to 40 CFR 257.91(f), Entergy obtained certification by a qualified Arkansas-registered professional engineer (P.E.) stating that the Certified Monitoring Well Network has been designed and constructed to meet the requirements of 40 CFR 257.91 (see Groundwater Monitoring System Certification, TRC, February 26, 2018) of the CCR Rule (TRC 2018b).

As discussed above, Stratum I and Stratum III are currently being monitored pursuant to the CCR Rule. A groundwater sampling and analysis program including selection of statistical procedures to evaluate groundwater data was prepared per the CCR Rule (see Groundwater Sampling and Analysis Plan (FTN, 2017b)). Eight quarterly background CCR detection monitoring events were performed from October 2015 through June 2017 in accordance with 40 CFR 257.93(d) and 257.94(b). The eight quarterly detection monitoring background samples were analyzed for Appendix III to Part 257 – Constituents for Detection Monitoring and for Appendix IV to Part 257 – Constituents for Assessment Monitoring.

Following completion of quarterly background detection monitoring in June 2017, Entergy implemented semiannual detection monitoring per 40 CFR 257.94(b) for the CCR Unit. The first semiannual detection monitoring event was performed in August 2017 (2nd Half 2017). Subsequent detection monitoring events, with associated verification sampling when appropriate, have been performed on a semiannual basis since August 2017. Entergy performed the most recent semiannual detection monitoring event (1st Half 2023) in June 2023. Per the CCR Rule, the semiannual detection monitoring event samples were analyzed for Appendix III constituents.

After completion of each semiannual detection monitoring event, the Appendix III laboratory analytical data were statistically evaluated to identify potential SSIs for Appendix III constituents above background levels. In accordance with 40 CFR 257.93(f)(6), Entergy obtained certification by a qualified Arkansas-registered P.E. stating that the selected statistical method is appropriate for evaluating the groundwater monitoring data for the CCR Unit (see Statistical Methods Certification, TRC, October 16, 2017).

Pursuant to 40 CFR 257.93(h), statistical analysis and re-analysis of the laboratory analytical data were performed to identify potential SSIs for the 1st Half 2023 semiannual detection monitoring event. A total of 15 SSIs were identified for five Appendix III constituents: boron, calcium, fluoride, sulfate, and TDS. SSIs were identified in three Stratum I and three Stratum III monitoring wells.

1.2 Purpose

Pursuant to 40 CFR 257.94(e)(2), Entergy may demonstrate that a source other than the CCR Unit caused the SSIs identified or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The purpose of this report is to provide written documentation of the successful ASD for the SSIs identified for the 1st Half 2023 semiannual detection monitoring event, pursuant to 40 CFR 257.94(e)(2) of the CCR Rule.

Section 2
Hydrogeology and Geochemistry

2.1 Site Hydrogeology

Historical subsurface investigations have identified the following three stratigraphic horizons of the Jackson Group (Kresse, et. al., 2014) and their associated hydrogeology for the CCR Unit and the CADL:

- **Stratum 1. Interbedded Clay, Silt, and Sand.**
  Stratum 1 ranges from approximately 10 to 54-feet thick and consists of interbedded silty sand (SM), clayey sand (SC), silts (ML and MH), and clay (CL and CH). Occasional deposits of carbonaceous material are present throughout Stratum 1. Based on the results of in-situ slug tests, hydraulic conductivity values range from 4.0×10^{-5} to 4.0×10^{-4} cm/sec;
- **Stratum 2. Clay.**
  Stratum 2 ranges from approximately 14 to 49-feet thick and consists of a very stiff clay (CH) with occasional silt and/or very fine-grained sand laminations. Occasional deposits of carbonaceous mater are present throughout Stratum 2. Based on the results of in-situ slug tests, hydraulic conductivity values range from 4.7×10^{-6} to 1.4×10^{-8} cm/sec;
- **Stratum 3. Clayey and Silty Sand.**
  Stratum 3 ranges from approximately 5 to 19-feet thick and consists primarily of clayey sand (SC) and/or silty sand (SM). A poorly graded, fine-grained sand (SM) was identified in one piezometer. The upper limits of Stratum 3 were encountered at elevations of 263 to 289-feet NGVD (depths ranging from 19 to 97-feet bgs). Based on results of in-situ slug tests, hydraulic conductivity was determined to be spatially variable and ranged from 4.2×10^{-7} to 2.5×10^{-4} cm/sec; and
- **Underlying Clay.**
  A clay unit underlies Stratum 3 and is described as a very dark grey clay that is highly laminated with light grey silt and very fined-grained sand. Based on results of an in-situ slug test, the vertical hydraulic conductivity was 3.7×10^{-8} cm/sec.

It was concluded that Stratum 1 was not laterally continuous across the approximately 153-acre landfill. The estimated calculated seepage velocities in Stratums 1 and 3 were as follows:

- Stratum 1: 2 to 20 feet/year; and
- Stratum 3: <1 to 10 feet/year.

While Stratum I and Stratum III have been monitored per the CCR Rule since October 2015, it is unclear whether Stratum I and Stratum III are aquifers that are capable of providing sustainable well yields consistent with USEPA aquifer use criteria (*e.g.*, 0.1 gallons per minute). This uncertainty is based on the following evidence:

- Stratum I is present to the west of the CADL and only present within the western portion of the ADEQ-permitted boundaries of the CADL, approximately corresponding to the boundaries of the closed portions of the CADL. The CCR Unit and Stratum I are not continuous to the east across the entire footprint of the CADL;
- In-situ hydraulic conductivities are low to very low for both Stratum I and Stratum III, indicating that sustainable well yields may not be obtainable from Stratum I and Stratum III at volumes that meet the minimum USEPA well use criteria (*e.g.*, 0.1 gallons per minute); and
- During the quarterly and semiannual detection monitoring events performed from October 2015 through December 2021, which have been performed using the low-flow purge and sample methodology, the sampling teams have consistently documented that turbidity values are often greater than 10 Nephelometric Turbidity Units (NTU). Furthermore, wells have been pumped dry during sampling for both Stratum I and Stratum III, indicating that neither sustainable well yields nor useable drinking water are associated with Stratum I and Stratum III.

To evaluate this uncertainty, Entergy began performing hydrogeologic investigations during 2019 and 2020, continuing through 2021 to evaluate both the stratigraphy and hydrogeology beneath the CCR Unit and to identify the aquifer(s) making up the uppermost aquifer system at the CCR Unit and CADL and the appropriateness of the current Certified Monitioring Well Network.

2.2 General Groundwater Quality

Regionally, groundwater quality in the Jackson Group consists of a sodium- and calcium-sulfate water type, with generally poor water quality (FTN 2014, Kresse et. al 2014). Reported water quality concentrations for select secondary drinking water contaminants compared to USEPA secondary maximum contaminant levels (MCLs) are provided in the table below.

Jackson Group Groundwater Water Quality

	Concentration Range		USEPA
Constituent	**Low**	**High**	**Secondary MCL**
Iron (mg/L)	0.05	19	0.3
pH (s.u.)	2.9	8.0	6.5 - 8.5
Sulfate (mg/L)	0.6	3,080	250
TDS (mg/L)	11	5,330	500

As noted in the table above, the natural range of groundwater quality within the Jackson Group, which includes both Stratum I and Stratum III, exceeds the secondary drinking water MCLs established by the USEPA for drinking water or, in the case of pH, is less than its secondary MCL. Finally, the results of historical groundwater monitoring at the Plant conducted from 1991 through 1996 showed that normal indicator parameters were masked by naturally elevated concentrations of the monitored constituents (FTN 2014, TRC 2018a).

2.3 Groundwater Geochemistry

Understanding the geochemistry of groundwater is essential to examining the groundwater monitoring data, explaining the relationships between the characteristics, and analyzing natural as well as anthropogenic impacts on groundwater systems. Source apart, geochemical processes play an important role in controlling the chemical composition of groundwater, including carbonate equilibrium, oxidation-reduction reactions and adsorption-desorption processes. Based the site geological conditions, several groundwater parameters are discussed as follows, including boron, fluoride, sulfate, calcium, TDS and pH.

2.3.1 Boron in Groundwater

Boron in normally considered as a minor constituent in groundwater as it is generally present in low concentrations (Palmucci & Rusi, 2014). Source apart, the primary origin of boron in groundwater is the process of sorption and desorption to the mineral surfaces including rocks and soils (Ravenscroft & McArthur, 2004). The regulatory guideline values of boron in drinking water are given at 0.5 mg/L by WHO and 0.9 mg/L by USEPA in human consumption for long-term exposure (WHO, 2008; USEPA, 2008). Boron is often cited as contamination tracer and usually occurs as a non-ionized form as H_3BO_3 in soils at pH<8.5, but above this pH, it exists as an anion, $B(OH)_4^-$ (Upadhyaya et al., 2014).

The factors that may influence the boron concentration in groundwater include weathering, human activity, evaporative concentration, ion-exchange, electrical conductivity (EC), and pH. Ravenscroft & McArthur (2004) studied the mechanism of regional boron enrichment groundwater and the results indicated that the main process caused high boron enriched in groundwater was the flushing by fresh groundwater other than geolofical setting, climate or age. The desorption of Boron from mineral surfaces could be affected by pH, ionic strength, salinity and HCO_3/CO_3. Decreasing of pH will increase the dissolution of boron from the mineral surfaces. Boron adsorption favors high pH and boron desorption favors low pH on rocks, soils and organic matters (Hollis et al., 1988; Keren & Communar, 2009; Tabelin et al., 2014).

A few more research studies confirmed that the presence of boron in groundwater depends on the EC (salinity), such that it increases with increasing EC. Halim et al. (2010) reported that the increasing of Cl^- concentration contributes to increase in EC value since a strong linear correlation ($R^2 = 0.88$) between EC and Cl^- was observed. Palmucci & Rusi (2014) observed a clear correlation between the high concentrations of boron and the chloride-sodium facies, which are characterized by high saline content, negative redox potential, and low value of the SO_4^{2-}/Cl^- ratio. Rodriguez-Espinosa et al. (2020) found that the Boron concentration in groundwater was related to the SO_4^{2-} and age affect.

Regarding to the Boron concentration level on the sites, the main source of Boron is more natural than anthropogenic. Therefore, the detected increasing of Boron concentration is likely due to the geochemistry condition changes, such as pH, ion exchanges, EC and salinity.

2.3.2 Fluoride in Groundwater

The common natural source of fluoride in groundwater is the dissolution of natural fluoride-bearing mineral, such as fluorspar, fluorapatite, amphiboles, hornblende, tremolite and biotite (Luo et al., 2018). The natural concentration of fluoride in groundwater depends on the geological, chemical and physical characteristics of the aquifer, the porosity and acidity of the soil and rocks, the surrounding temperature, the action of other chemical elements, depth of the aquifer and intensity of weathering (Brindha & Elango, 2011). Due to the concentration range of this site, geochemical process is the main factor controlling fluoride in groundwater.

Ion exchange, evaporation, adsorption-desorption, ion competition, mixing, salinization and anthropogenic pollution are geochemical processes that can take place and cause the occurrence of fluoride in groundwater (Luo et al., 2018). Main factors that might cause the increase of fluoride concentration in groundwater include alkaline pH, high concentration of sodium and bicarbonate, and low concentration of calcium.

Alkaline pH can increase the fluoride dissolution from mineral surfaces into groundwater. Saxena & Ahmed (2001) observed that alkaline conditions with pH ranging between 7.6 and 8.6 are favorable for dissolution of fluorite mineral from the host rocks.

Sodium bicarbonate type waters are typical of high fluoride waters. Many research studies have demonstrated positive correlations between fluoride and both bicarbonate and sodium as well as an inverse relation between fluoride and calcium. (Mondal et al., 2014; Guo et al., 2012; Chen et al., 2020). The chemical reactions for the dissolution of fluoride in the presence of high bicarbonate and sodium, and low calcium content is described as follows (Kimambo et al., 2019):

$$\mathrm{Na}^+ + \ +\mathrm{HCO}_3^- - \rightarrow \mathrm{NaHCO}_3$$

$$\mathrm{CaF}_2 + \ +2\mathrm{NaHCO}_3 \ \rightarrow \mathrm{CaCO}_3 + 2\mathrm{Na}^+ + 2\mathrm{F}^- + \ \mathrm{H}_2\mathrm{O} + \mathrm{CO}_2$$

Luo et al. (2018) reported that cation exchange can increase the fluoride concentration when increasing the Na/Ca molar ratio via ion complexation, and salt effect can further increase the fluoride dissolution from mineral surfaces.

In addition, evaporation is another potential reason to increase the fluoride concentration in shallow groundwater. Evaporation could directly remove water from shallow aquifers and elevate the fluoride concentration. Evaporation could increase ion concentrations, leading to the precipitation of some major minerals, reducing the calcium concentration, and favoring the dissolution of fluoride. Anthropogenic sources may also increase the fluoride in groundwater, such as pesticide and fertilizer use, and industrial waste discharge.

2.3.3 Sulfate in Groundwater

Sulfate is ubiquitous in groundwater, with both natural and anthropogenic sources. There are many potential sources of sulfate including mineral dissolution, atmospheric deposition, and other anthropogenic sources (mining, fertilizer, synthetic detergents, industrial wastewater etc.) (Miao et al., 2012). As water moves through soil and rock formations that contain sulfate minerals, some of the sulfate dissolves into the groundwater. Minerals that contain sulfate include magnesium sulfate (Epsom salt), sodium sulfate (Glauber's salt), and calcium sulfate (gypsum). Gypsum is an important contributor to the high levels of sulphate in many aquifers of the world. Higher levels of sulfate in groundwater are common in the western part of the United States (MDH, 2008).

Sulfate is mobile in soil and inputs to soil will impact groundwater eventually. Many research studies indicated that atmospheric deposition, dissolution of gypsum, oxidation of sulfide mineral and anthropogenic inputs will contribute to sulfate. Based on the geological condition of the site, atmospheric deposition and anthropogenic activities could be the main factors (Einsiedl & Mayer, 2005; Pu et al., 2012).

2.3.4 Calcium in Groundwater

Calcium is one of the most important ionic constituents in groundwater (Razowska-jaworek, 2014). Water-rock interaction occurs when water meets rocks or minerals, limestone, marble, calcite, dolomite, gypsum, fluorite and apatite. Natural dissolution of carbonate rocks and minerals is the primary source of calcium in groundwater (Jiang et al., 2009). Calcium is an important determinant of water hardness (Ca^{2+}), while magnesium is the other hardness determinant. The most common shallow groundwater type is Ca-HCO_3 dominated and Ca(Mg)-HCO_3 dominated.

A literature review indicates the major factors that may influence the calcium concentration in groundwater include rock weathering, pH, electrical conductivity and anthropogenic activities (mining, concrete material dissolution, fertilizer etc.) (Hájek et al., 2021; Schot & Wassen, 1993; Shi et al., 2018). Based on the geological condition of the site, pH, electrical conductivity and anthropogenic activities could be the potential reasons for the calcium SSI.

2.3.5 TDS in Groundwater

Total dissolved solids represent the combined total of inorganic and organic substances contained in the groundwater, and it can be a general indicator of water quality. These solids are primarily minerals, salts, and organic matters, which may originate from sources such as weathering of minerals, urban runoff, sewage, effluent discharges, agricultural, decaying organisms, and other human activities (de-icing roads, water softer use). Common salts that contribute to TDS are sodium, chloride, calcium, magnesium, potassium, sulfates, and bicarbonates (Olumuyiwa I. Ojo, 2012).

TDS levels in groundwater is usually higher than surface water due to the longer contact time with the underlying rocks and sediments. Since many minerals are water soluble, high concentrations can accumulate over time through the constantly reoccurring process of precipitation and evaporation.

TDS is related to other water quality parameters like hardness, which may occur if the high TDS content is due to the presence of carbonates. A few research studies simulated the relationship between TDS and other groundwater parameters such as EC and salinity, using different models. Due to the complicated geological conditions, the observation was not consistent at different study sites (Atekwana et al., 2004; Banadkooki et al., 2020; Poursaeid et al., 2020).

2.3.6 pH in Groundwater

Groundwater pH is an important aspect to consider in the monitoring and management of CCR landfill sites, as changes in pH can affect the quality of groundwater and the potential for release of contaminants. The potential reasons for pH changes in groundwater are as following:

- Changes in water flow patterns. Changes in the flow patterns of groundwater can cause the mixing of different water sources with varying pH levels, resulting in an overall increase in the pH of the groundwater at the site.
- Drainage from adjacent areas. Groundwater from adjacent areas with higher pH levels may be flowing into the landfill site and raising the overall pH of the groundwater at the site.
- Changes in geochemistry condition. Geochemistry can play a role in affecting the pH of groundwater at a landfill site, such as mineral dissolution, pH buffering capacity, redox

reactions, and groundwater-rock interactions (Edmunds & Smedley, 1996; Wilkin & DiGiulio, 2010).

1) Mineral dissolution. Minerals present in the surrounding soil can dissolve and release basic or acidic compounds into the groundwater, affecting the pH, e.g., the dissolution of calcium carbonate can increase the pH of the groundwater by releasing carbonate ions, the dissolution and oxidation of pyrite can decrease the pH of groundwater by releasing hydrogen ions.
2) pH buffering capacity. The presence of minerals with a high buffering capacity in the surrounding soil can help to regulate the pH of the groundwater, preventing drastic changes in response to other factors. For example, the presence of minerals like calcite and dolomite can buffer the groundwater pH, helping to maintain a relatively stable pH even in the presence of acidic compounds.
3) Redox reactions. The oxidation-reduction reactions that occur in the surrounding soil can impact the pH of the groundwater. The oxidation of iron-sulfide minerals can result in the release of sulfuric acid, which can lower the pH of groundwater. The oxidation of reduced sulfur species to sulfate, which can increase the pH of groundwater (Jacks, 2017).
4) Groundwater-rock interactions. The interaction between groundwater and the rocks and minerals in the surrounding soil can affect the pH of the groundwater. For example, groundwater can dissolve or release basic or acidic compounds from the minerals in the rock, affecting the pH.

Section 3
Alternate Source Demonstration

Pursuant to 40 CFR 257.94(e)(2), Entergy may demonstrate that a source other than the CCR Unit caused the SSI or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. As discussed previously, the 1st Half 2023 semiannual detection monitoring event was performed in June 2023. Statistical analysis of the 1st Half 2023 semiannual detection monitoring data was performed pursuant to 40 CFR 257.93(f) and (g) and in accordance with the Statistical Methods Certification (TRC 2017b) and the Statistical Analysis Plan (FTN 2017a). Based on either increasing trends at 98% confidence levels using Sen's Slope test and/or intrawell prediction limits statistical analyses, the following 15 SSIs were identified and summarized in Table 1:

- Calcium, fluoride, sulfate and TDS (MW-106S);
- Boron (MW-110S);
- Boron, calcium, fluoride, sulfate, and TDS (MW-111S);
- Boron, calcium, and TDS (MW-112D);
- TDS (MW-114D); and
- TDS (MW-118D).

Other Appendix III constituent concentrations were within their trends at 98% confidence levels using Sen's slope test and/or intrawell prediction limits in the CCR Rule groundwater monitoring system wells.

A discussion for each of the individual SSIs identified for the Stratum I and III wells and associated evidence demonstrating that the 15 SSIs were not caused by a release from the CCR Unit is provided in the subsections below.

Table 1 SSIs – June 2023 Semiannual Detection Monitoring Event

Stratum	Well	Analyte	Value (mg/L)	Intrawell Prediction Limit (mg/L)	SI by Sen's Slope test
I	MW-106S	Calcium	46.8	23.8	Y
		Fluoride	0.728	0.625	Y
		Sulfate	808	603.5	Y
		TDS	1200	827.1	Y
	MW-110S	Boron	2.24	1.586	Y
	MW-111S	Boron	5.98	4.495	Y
		Calcium	118	36.76	Y
		Fluoride	0.85	0.2834	Y
		Sulfate	854	397.5	Y
		TDS	1,270	540.7	Y
III	MW-112D	Boron	0.287	0.2521	N
		Calcium	39.5	23.8	Y
		TDS	308	204.9	Y
	MW-114D	TDS	326	322	N
	MW-118D	TDS	566	544.5	N

3.1 pH Values Across the Site

During the June 2023 sampling event, notably low pH values were recorded across the site, especially in the Stratum III monitoring wells. Ten pH values were below the intrawell prediction limit range at the monitoring wells of MW-102S (4.28), MW-104S (5.0), MW-101D (1.55), MW-102D (3.68), MW-103D (5.13), MW-107D (1.75), MW-108D (5.01), MW-109D (3.84), MW-110D (6.92) and MW-118D (5.4). At this juncture, it is imperative to consider the possibility that these extreme pH values may be attributed to field dection instrument inaccuracies or potential sampling errors rather than indicative of contamination sources. To draw more definitive conclusions regarding the true state of the site, it is recommended that more than one pH detectors will be employed in the next sampling event and the results will serve to confirm whether the low pH readings are consistent and replicable, or if they were indeed an anomaly caused by technical issues.

3.2 Calcium at MW-106S

The calcium SSI identified at MW-106S is a result of the acidic geochemistry condition in groundwater, potential impact of CCR disposed at the CADL prior to October 19, 2015, and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-106S. The following evidence supports this determination:

- Calcium was detected in MW-106S at a concentration of 46.8 mg/L in the June 2023 sample. Compared to the value of 31.6 mg/L in the December 2022 sample, the calcium concentration increased approximately 48%. The Mann-Kendal statistic of 153 exceeded the critical value of 73 indicating a significant increasing trend at the 98% confidence level. As discussed in Section 2.3, pH and EC could affect calcium concentrations in groundwater. Low pH values of 3.8-4.0 were detected in the past few years, which indicates the groundwater in this area is acidic and it was related to pre-CCR Rule disposal source or natural geochemistry conditions. The acidic groundwater condition favors the dissolution of calcium from soil and mineral surfaces to water phase. The significant increasing trend of calcium from 16 mg/L in 2015 to 46.8 mg/L in 2023 could be a result of the acidic geochemistry condition. The increasing cation and anion concentrations will also lead to the increasing EC, which will affect other metals dissolution.
- The concentrations of calcium in MW-101S, which is a background well, have varied from 14 to 98.5 mg/L during the overall time period of CCR detection monitoring. The calcium concentration of 98.5 mg/L for MW-101S is greater than the calcium concentration of 46.8 mg/L measured at MW-106S during the 1st Half 2023 semiannual detection monitoring event. Therefore, the calcium concentration measured at MW-106S is within the range of natural variation in background groundwater quality.
- Based on review of potentiometric surface mapping, locations of closed portions of the CADL underlying the CCR Unit, and the CCR Unit relative to MW-106S, it appears that MW-106S

may monitor groundwater associated with the underlying pre-CCR Rule closed portions of the CADL rather than the CCR Unit; therefore, concentrations measured in MW-106S are likely more reflective of pre-CCR Rule disposal rather than of the CCR Unit.

- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-106S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-106S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-106S, it appears likely that surface water infiltration may have impacted the MW-106S monitoring results.

3.3 Fluoride at MW-106S

The fluoride SSI identified at MW-106S is a result of groundwater geochemistry conditions, potential impact of CCR disposed at the CADL prior to October 19, 2015, and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-106S. The following evidence supports this determination:

- Fluoride was detected in MW-106S at a concentration of 0.728 mg/L in the June 2023 sample. Compared to the value of 0.803 mg/L in the December 2022 sample, the calcium concentration decreased by 10%. The Mann-Kendal statistic of 127 exceeded the critical value of 73 indicating a significant increasing trend at the 98% confidence level. This concentration exceeded the intrawell prediction limit of 0.625 mg/L and the maximum fluoride concentrations of 0.1 to 0.135 mg/L measured in the three Stratum I background monitoring wells (MW-101S, MW-102S, and MW-104S). However, it should be noted that the measured fluoride concentrations are less than the federal primary drinking water maximum contaminant level (MCL) standard of 4.0 mg/L.

- The fluoride concentration in MW-106S stayed in a narrow range of 0.6-0.68 mg/L in the past two years. pH of the groundwater is not an impact of the exceedance since fluoride dissolution favors alkaline pH. As discussed in Section 2.3, fluoride has positive correlation with both bicarbonate and sodium, and an inverse relation with calcium. With the increasing trend of calcium in the groundwater, ion exchange process with high sodium and bicarbonate can result in the increasing of fluoride in groundwater.

- Based on review of potentiometric surface mapping, locations of closed portions of the CADL underlying the CCR Unit, and the CCR Unit relative to MW-106S, it appears that MW-106S may monitor groundwater associated with the underlying pre-CCR Rule closed portions of the CADL rather than the CCR Unit; therefore, concentrations measured in MW-106S may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.

- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-106S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-106S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-106S, it appears likely that surface water infiltration may have impacted the MW-106S monitoring results.

3.4 Sulfate at MW-106S

The sulfate SSI identified at MW-106S is a result of natural geochemistry condition in soil and groundwater, potential impact of CCR disposed at the CADL prior to October 19, 2015, and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-106S. The following evidence supports this determination:

- Sulfate was detected in MW-106S at a concentration of 808 mg/L in the June 2023 sample, which exceeded the intrawell prediction limit of 604 mg/L. The Mann-Kendal statistic of 142 exceeded the critical value of 73 indicating a significant increasing trend at the 98% confidence level. The increasing trend of sulfate was consistent with TDS. The elevated sulfate concentrion in the past three years could be caused by the acidic geochemistry condition discussed above or an anthropogenic source since sulfate is mobile in soils and can get into groundwater via surface water infiltration. Another potential reseaon is the natural occurrence of sulfide minerals in the soil, such as pyrite. The oxidation of sulfide minerals will slowly release sulfate and hydrogen ion into groundwater, which will lead to the increasing of sulfate and decreasing of pH.
- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-106S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-106S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-106S, it appears likely that surface water infiltration may have impacted the MW-106S monitoring results.

- Based on review of potentiometric surface mapping and locations of closed portions of the CADL, and the CCR Unit relative to MW-106S, MW-106S may monitor groundwater associated with the pre-CCR Rule closed portions of the CADL rather than the CCR unit; therefore, concentrations measured in MW-106S may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.

3.5 TDS at MW-106S

The TDS SSI identified at MW-106S is a result of the acidic groundwater geochemistry condition, sodium sulfate source, potential impact of CCR disposed at the CADL prior to October 19, 2015, and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-106S. The following evidence supports this determination:

- TDS was detected in MW-106S at a concentration of 1,200 mg/L in the June 2023 sample, which exceeded the intrawell prediction limit of 827 mg/L. The Mann-Kendal statistic of 136 exceeded the critical value of 73 indicating a significant increasing trend at the 98% confidence level. Compared to the value of 979 mg/L in the December 2022 sample, 920 mg/L in the June 2022 sample and 1090 mg/L in the November 2021 sample, the TDS was stable. As discussed in Section 2.2, the Jackson Group groundwater is sodium- and calcium-sulfate water type. Sodium could be another main contribution to the TDS exceedance with calcium and sulfate. High sodium concentration can also cause the fluoride exceedance. The acidic groundwater could be one of the potential reasons. An alternate source containing sodium sulfate should also be considered, which can be mineral dissolution, surface water flux or atmospheric deposition.
- Based on review of potentiometric surface mapping, locations of closed portions of the CADL, and the CCR Unit relative to MW-106S, MW-106S may monitor groundwater associated with the pre-CCR Rule closed portions of the CADL rather than the CCR Unit. Therefore, concentrations measured in MW-106S may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.
- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-106S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-106S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-106S, it appears likely that surface water infiltration may be impacting the MW-106S monitoring results.

3.6 Boron at MW-110S

The Boron SSI identified at MW-110S is a result of the acidic groundwater geochemistry condition and potential impact of CCR disposed at the CADL prior to October 19, 2015. The following evidence supports this determination:

- Boron was detected in MW-110S at a concentration of 2.24 mg/L in the June 2023 sample, which exceeded the intrawell prediction limit of 1.586 mg/L. Compared to the value of 2.03 mg/L in the December 2022 sample, the boron concentration was consistent. The Mann-Kendal statistic of 155 exceeded the critical value of 73 indicating a significant increasing trend at the 98% confidence level. As discussed in Section 2.3, the main factors that may influence boron concentration in groundwater are pH and EC. Decreasing of pH will increase the dissolution of boron from the mineral surfaces. Boron in groundwater will increase with the increasing of EC. The historical data review shows the relatively low salts concentrations in MW-110S area, which indicates EC is not the factor causing the boron increasing trend. A low pH value of 4.16 was detected in the June 2023 sample. The acidic groundwater condition favors the boron dissolution from soil and mineral surface. Based on the consistent boron levels in groundwater, the significant increasing trend of boron is more likely relative to the acidic geochemistry condition other than a contamination source.
- Based on review of potentiometric surface mapping, locations of historic fill, locations of closed portions of the CADL underlying the CCR Unit, and the CCR Unit relative to MW-110S, it appears that MW-110S may monitor groundwater associated with the underlying pre-CCR Rule closed portions of the CADL rather than the CCR Unit; therefore, concentrations measured in MW-110S may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.

3.7 Boron at MW-111S

The boron SSI identified at MW-111S is a result of natural groundwater geochemistry conditions with low pH and high EC, potential impact of CCR disposed at the CADL prior to October 19, 2015, and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-111S. The following evidence supports this determination:

- Boron was detected in MW-111S at a concentration of 5.98 mg/L in the June 2023 sample, which exceeded the intrawell prediction limit of 4.495 mg/L. Compared to the value of 6.26 mg/L in the December 2022 sample, the boron concentration was consistent. The Mann-Kendal statistic of 145 exceeded the critical value of 73 indicating a significant increasing trend at the 98% confidence level. As discussed in Section 2.3, the main factors that may influence boron concentration in groundwater are pH and EC. Decreasing of pH will increase the dissolution of boron from the mineral surfaces. Boron in groundwater will increase with the increasing of EC. A low pH value of 3.98 was detected in the June 2023 sample and the pH of groundwater in the area of MW-111S stayed in a steady range of 3.6 to 4.5 in the past five years. The acidic groundwater condition favors the boron dissolution from soil and mineral surface. The increasing sulfate and TDS in MW-111S demonstrates that the groundwater in this area has relatively high EC, which will cause the increasing of boron concentration in groundwater. Based on the consistent boron levels, the significant increasing trend of boron is more likely relative to the geochemistry conditions with low pH and high EC other than a contamination source.

- Based on review of potentiometric surface mapping and locations of closed portions of the CADL, and the CCR Unit relative to MW-111S, MW-111S may monitor groundwater associated with the pre-CCR Rule closed portions of the CADL rather than the CCR Unit. Therefore, concentrations measured in MW-111S may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.
- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-111S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-111S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-111S, it appears likely that surface water infiltration may be impacting the MW-111S monitoring results.

3.8 Calcium at MW-111S

The calcium SSI identified at MW-111S is a result of natural groundwater geochemistry conditions with low pH and high EC, potential impact of CCR disposed at the CADL prior to October 19, 2015, and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-111S. The following evidence supports this determination:

- Calcium was detected in MW-111S at a concentration of 118 mg/L in the June 2023 sample, which exceeded the intrawell prediction limit of 36.8 mg/L. Compared to the value of 112 mg/L in the December 2022 sample, the calcium concentration was consistent. Normality analysis of the calcium data set at MW-111S was non-normal requiring trend analysis of the data set to determine a potential significance increase. The Mann-Kendal statistic of 162 exceeded the critical value of 73 indicating a significant increasing trend at the 98% confidence level. As discussed in Section 2.3, pH and EC could affect calcium concentrations in groundwater. A low pH value of 3.98 was detected in the June 2023 sample and the pH of groundwater in the area of MW-111S stayed in a steady range of 3.6 to 4.5 in the past five years. The acidic condition favors the dissolution of calcium from soil and mineral surfaces to water phase. The relatively high EC in groundwater discussed above can also increase the calcium concentration. The significant increasing trend of calcium could be a result of the natural geochemistry conditions with low pH and high EC.

- Background concentrations of calcium have varied from 14 to 98.5 mg/L at upgradient monitoring well MW-101S. The calcium concentration of 118 mg/L at MW-111S during the 1st Half 2023 semiannual detection monitoring event is beyond but close to the top background concnetration. Therefore, the calcium exceedance is still in the range of natural variation in background groundwater quality.
- Based on review of potentiometric surface mapping, locations of closed portions of the CADL, and the CCR Unit relative to MW-111S, MW-111S may monitor groundwater associated with the underlying pre-CCR Rule closed portions of the CADL rather than the CCR Unit. Therefore, concentrations measured in MW-111S may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.
- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-111S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-111S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-111S, it appears likely that surface water infiltration may have impacted the MW-111S monitoring results.

3.9 Fluoride at MW-111S

The fluoride SSI identified at MW-111S is a result of natural groundwater geochemistry conditions, potential impact of CCR disposed at the CADL prior to October 19, 2015 and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-111S. The following evidence supports this determination:

- Fluoride was detected in MW-111S at a concentration of 0.85 mg/L in the June 2023 sample, which exceeded the intrawell prediction limit of 0.283 mg/L and the maximum fluoride concentrations of 0.1 to 0.135 mg/L measured in the three Stratum I background monitoring wells (MW-101S, MW-102S, and MW-104S). Compared to the value of 1.2 mg/L in the December 2022 sample, the fluoride concentration decreased by 29%. The Mann-Kendal statistic of 162 exceeded the critical value of 73 indicating a significant increasing trend at the 98% confidence level. However, it should be noted that the measured fluoride concentrations are less than the federal primary drinking water MCL of 4.0 mg/L. pH of the groundwater is not an impact of the exceedance since fluoride dissoluction favors alkaline pH. As discussed in Section 2.3, fluoride has positive correlation with both bicarbonate and sodium, and an inverse relation with calcium. With the increasing trend of calcium in the groundwater, ion exchange process with high sodium and bicarbonate can result in the increasing of fluoride in groundwater. The fluoride increasing trend could also be a result of continouse dissoved salts from the soils and minerals associated with the increased TDS.

- Based on review of potentiometric surface mapping, locations of closed portions of the CADL, and the CCR Unit relative to MW-111S, MW-111S may monitor groundwater associated with the pre-CCR Rule closed portions of the CADL rather than the CCR Unit. Therefore, concentrations measured in MW-111S may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.
- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-111S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-111S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-111S, it appears likely that surface water infiltration may have impacted the MW-111S monitoring results.

3.10 Sulfate at MW-111S

The sulfate SSI identified at MW-111S is a result of natural groundwater geochemistry condition of low pH and potential oxidation of sulfide minerals, potential impact of CCR disposed at the CADL prior to October 19, 2015, and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-111S. The following evidence supports this determination:

- Sulfate was detected in MW-111S at a concentration of 854 mg/L in the June 2023 sample, which exceeded the intrawell prediction limit of 398 mg/L. Compared to the value of 879 mg/L in the December 2022 sample, the sulfate concentration was consistent. The Mann-Kendal statistic of 154 exceeded the critical value of 73 indicating a significant increasing trend at the 98% confidence level. The sulfate increasing was consistent with the TDS increasing, which indicated that more salts were dissoved into groundwater. It could be caused by the acidic geochemistry condition discussed above or an anthropogenic source since sulfate is soluble in soils and can get into groundwater via surface water infiltration. Another potential reseaon is the naturally occurrence of sulfide minerals in the soil, such as pyrite. The oxidation of sulfide minerals will slowly release sulfate and hydrogen ion into groundwater, which will lead to the increasing of sulfate and decreasing of pH. To further investigate this hypothesis, the analysis of ORP is recommended for MW-111S in the next sampling event.
- Based on review of potentiometric surface mapping and locations of closed portions of the CADL, and the CCR Unit relative to MW-111S, MW-111S may monitor groundwater associated with the pre-CCR Rule closed portions of the CADL rather than the CCR Unit;

therefore, concentrations measured in MW-111S may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.

- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-111S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR Unit. This surface water ultimately migrates from the MW-111S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-111S, it appears likely that surface water infiltration may have impacted the MW-111S monitoring results.

3.11 TDS at MW-111S

The TDS SSI identified at MW-111S is a result of the acidic groundwater geochemistry conditions with natural occurrence of sulfide minerals, sodium sulfate source, the potential impact of CCR disposed at the CADL prior to October 19, 2015 and potential infiltration of surface water impacted by on-site CCR into the subsurface in the area of MW-111S. The following evidence supports this determination:

- TDS was detected in MW-111S at a concentration of 1,270 mg/L in the June 2023 sample, which exceeded the intrawell prediction limit of 541 mg/L. Compared to the value of 1,270 mg/L in the December 2022 sample, the TDS concentration was consistent. The Mann-Kendal statistic of 168 exceeded the critical value of 73 indicating a significant increasing trend at the 98% confidence level. As discussed in Section 2.2, the Jackson Group groundwater is sodium- and calcium-sulfate water type. Sodium could be another main contribution to the TDS exceedance with the increasing of calcium and sulfate. High sodium concentration can also cause the fluoride exceedance. The acidic groundwater could be one of the potential reasons. An alternate source containing sodium sulfate should also be considered, which can be mineral dissolution, surface water flux or atmospheric deposition.
- Based on review of potentiometric surface mapping, locations of closed portions of the CADL, and the CCR Unit relative to MW-111S, MW-111S may monitor groundwater associated with the pre-CCR Rule closed portions of the CADL rather than the CCR Unit. Therefore, concentrations measured in MW-111S may be more reflective of pre-CCR Rule disposal rather than of the Unit.
- Surface water that has come into contact with on-site CCR at the CCR Unit has migrated from the perimeter drainage swale for the CCR Unit due to periodic build-up of sediment within the perimeter surface water swale. When this build-up occurs, surface water flows out of the swale and over the adjoining access road and then to the area of MW-111S. This drainage swale carries surface water runoff from closed portions of the CADL as well as from the CCR

Unit. This surface water ultimately migrates from the MW-111S area via surface water swales within the ADEQ-permitted CADL footprint, with ultimate discharge into the site surge pond as per Entergy's NPDES permit. Based on the close proximity of this surface water to MW-111S, it appears likely that surface water infiltration may have impacted the MW-111S monitoring results.

3.12 Boron at MW-112D

The boron SSI identified at MW-112D is a result of natural variation in groundwater quality and potential impact of CCR disposed at the CADL prior to October 19, 2015. The following evidence supports this determination:

- Boron was detected in MW-112D at a concentration of 0.287 mg/L in the June 2023 sample, which was consistent with 0.278 mg/L in the December 2022 sample. This concentration exceeds the intrawell prediction limit of 0.252 mg/L. Boron concentrations measured at MW-118D (background well for Stratum III) have ranged from 0.274 to 0.355 mg/L. Therefore, the boron exceedance at MW-112D is within the range of variation in background groundwater quality and is not a potential environmental concern.
- Based on review of potentiometric surface mapping, locations of closed portions of the CADL, and the CCR Unit relative to MW-112D, MW-112D is located immediately adjacent (approximately 25 feet) to historic fill, but approximately 950 feet from the CCR Unit. Therefore, the concentrations of boron measured in MW-112D may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.
- Groundwater flow velocities are estimated to be approximately <1 ft/year to 10 ft/year (TRC 2018a). Since, MW-112D is located approximately 950 feet from the CCR unit, any release from the CCR Unit would be detected in Stratum III at MW-112D within approximately 95 years, which is significantly longer than the CCR Unit has been in operation. Therefore, the concentration of boron at MW-112D likely represents either potential pre-CCR Rule migration from historic fill or background groundwater quality for Stratum III.

3.13 Calcium at MW-112D

The calcium SSI identified at MW-112D is a result of natural variation in groundwater quality and potential impact of CCR disposed at the CADL prior to October 19, 2015. The following evidence supports this determination:

- Calcium was detected in MW-112D at a concentration of 39.5 mg/L in the June 2023 sample, which was consistent with 39.3 mg/L in the December 2022 sample. This concentration exceeds the intrawell prediction limit of 23.8 mg/L. The Mann-Kendal statistic of 203 exceeded the critical value of 78 indicating a significant increasing trend at the 98% confidence level. The historical data review shows MW-112D area has a netural pH condition in groundwater, and the pH of 5.65 detected in June 2023 sample will be confirmed in the next sampling event. The relatively low TDS indicated that EC in groundwater is not a factor to the calcium exceedance. Calcium concentrations measured at MW-118D (background well for Stratum III) have ranged from 68.4 to 83.2 mg/L. Therefore, the calcium exceedance at MW-112D is within the range of variation in background groundwater quality and is not a potential environmental concern.

- Based on review of potentiometric surface mapping, locations of historic fill, locations of closed portions of the CADL, and the CCR Unit relative to MW-112D, MW-112D is located immediately adjacent (approximately 25 feet) to historic fill, but approximately 950 feet from the CCR Unit. Therefore, the concentrations of calcium measured in MW-112D may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.
- As discussed previously, groundwater flow velocities are estimated to be approximately <1 ft/year to 10 ft/year (TRC 2018a). Since, MW-112D is located approximately 950 feet from the CCR Unit, any release from the CCR Unit would be detected in Stratum III at MW-112D within approximately 95 years, which is significantly longer than the CCR Unit has been in operation. Therefore, the concentration of calcium at MW-112D likely represents either potential pre-CCR Rule migration from historic fill or background groundwater quality for Stratum III.

3.14 TDS at MW-112D

The TDS SSI identified at MW-112D is a result of natural variation in groundwater quality and potential impact of CCR disposed at the CADL prior to October 19, 2015. The following evidence supports this determination:

- TDS was detected in MW-112D at a concentration of 308 mg/L in the June 2023 sample, which exceeded the intrawell prediction limit of 205 mg/L. Compared to the value of 302 mg/L in the December 2022 sample, the TDS concentration was consistent. The Mann-Kendal statistic of 188 exceeded the critical value of 78 indicating a significant increasing trend at the 98% confidence level. TDS concentrations measured at MW-118D (background well for Stratum III) have ranged from 415 to 484 mg/L. A review of groundwater parameters in Stratum III indicates that sulfate is a great contributor to TDS, but the sulfte concentration at MW-112D is very low (less than 5 mg/L). Therefore, the TDS exceedance at MW-112D is within the range of variation in background groundwater quality and is not a potential environmental concern.
- Based on review of potentiometric surface mapping, locations of historic fill, locations of closed portions of the CADL, and the CCR Unit relative to MW-112D, MW-112D is located immediately adjacent (approximately 25 feet) to historic fill, but approximately 950 feet from the CCR Unit. Therefore, the concentrations of TDS measured in MW-112D may be more reflective of pre-CCR Rule disposal rather than of the CCR Unit.

- As discussed previously, groundwater flow velocities are estimated to be approximately <1 ft/year to 10 ft/year (TRC 2018a). Since, MW-112D is located approximately 950 feet from the CCR unit, any release from the CCR Unit would be detected in Stratum III at MW-112D within approximately 95 years, which is significantly longer than the CCR Unit has been in operation. Therefore, the concentration of TDS at MW-112D likely represents either potential pre-CCR Rule migration from the historic fill or background groundwater quality for Stratum III.

3.15 TDS at MW-114D

The TDS SSI identified at MW-114D is a result of natural variation in groundwater quality. The following evidence supports this determination:

- TDS was detected in MW-114D at a concentration of 326 mg/L in the June 2023 sample, which exceeded the intrawell prediction limit of 322 mg/L. Compared to the value of 331 mg/L in the December 2022 sample, the TDS concentration was consistent. TDS concentrations measured at MW-118D (background well for Stratum III) have ranged from 415 to 642 mg/L. Therefore, the TDS exceedance at MW-114D is within the range of variation in background groundwater quality and is not a potential environmental concern.
- Based on review of potentiometric surface mapping, locations of closed portions of the CADL, and the CCR Unit relative to MW-114D, MW-114D is located 950 feet from the CCR Unit. Therefore, the concentrations of TDS measured in MW-114D may be more reflective of background natural water quality rather than of the CCR Unit.
- As discussed previously, groundwater flow velocities in Stratum III are estimated to be approximately <1 ft/year to 10 ft/year (TRC 2018a). Since, MW-114D is located approximately 950 feet from the CCR Unit, any release from the pre-CCR Rule closed portions of the CADL or the CCR Unit would be detected in Stratum III at MW-114D within approximately 95 years, which is significantly longer than either the CADL or the CCR Unit has been in operation. Therefore, the concentration of calcium at MW-114D likely represents background natural groundwater quality for Stratum III.

3.16 TDS at MW-118D

The TDS SSI identified at MW-118D is a result of natural variation in groundwater quality. The following evidence supports this determination:

- TDS was detected in MW-118D at a concentration of 566 mg/L in the June 2023 sample, which exceeded the intrawell prediction limit of 545 mg/L. Compared to the value of 557 mg/L in the December 2022 sample, the TDS concentration was consistent. MW-118D is one of the Stratum III background monitoring wells. The TDS exceedance at MW-118D is within the range of variation in background groundwater quality and is not a potential environmental concern.

- Based on review of potentiometric surface mapping, locations of closed portions of the CADL, and the CCR Unit relative to MW-118D, MW-118D is located 1800 feet from the CCR Unit. Therefore, the concentrations of TDS measured in MW-118D may be more reflective of background natural water quality rather than of the CCR Unit.
- As discussed previously, groundwater flow velocities in Stratum III are estimated to be approximately <1 ft/year to 10 ft/year (TRC 2018a). Since, MW-118D is located approximately 1800 feet from the CCR Unit, any release from the pre-CCR Rule closed portions of the CADL or the CCR Unit would be detected in Stratum III at MW-118D within approximately 180 years, which is significantly longer than either the CADL or the CCR Unit has been in operation. Therefore, the concentration of calcium at MW-118D likely represents background natural groundwater quality for Stratum III.

Section 4
Conclusions

The information provided in this report serves as the ASD prepared in accordance with 40 CFR 257.94(e)(2) of the CCR Rule. Statistical evaluation identified 15 potential SSIs in three monitoring wells in Startums I and three monitoring wells in Strartums III. This ASD has demonstrated the following lines of reasoning that support alternative sources for the identified SSIs:

- Low pH values detected sitewide especially in Startums III could be possibaly due to field dection instrument inaccuracies or potential sampling errors rather than indicative of contamination sources. The monitoring data in next sampling event will be used as confirmation.
- Historical data indicated acidic groundwater geochemistry conditions in MW-106S, MW-110S and MW-111S. The 10 SSIs identified in Startums I are related to the naurtal groundwater geochemistry conditions, such as low pH, high electrical conductivity, potential presence of sulfide minerals in soils and relatively high oxidation-reduction potential.
- The 5 SSIs identified in Startums III are mostly within the natural variation in groundwater quality compared to MW-118D, which likely represents background natural groundwater quality for Stratum III due to its location to CCR Unit and groundwater flow velocities.
- Releases from historic fill or portions of the CADL closed before the effective date of the CCR Rule (October 19, 2015); and/or
- Surface water that has come into contact with on-site CCR and has migrated into the subsurface.

Therefore, the SSIs determined based on statistical analysis of the 1st Half 2023 semiannual detection monitoring event performed in June 2023 are not due to a release from the CCR Unit to Stratums I and III of the Jackson Group. Based on the information provided in this ASD report, Entergy will continue to conduct semiannual detection monitoring in accordance with 40 CFR 257.94 at the Certified Monitoring Well Network for the CCR Unit.

Section 5
Certification

I hereby certify that the alternative source demonstration presented within this document for the Entergy White Bluff Plant Coal Ash Disposal Landfill CCR Unit has been prepared to meet the requirements of Title 40 CFR §257.94(e) 2 of the Federal CCR Rule. This document is accurate and has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of Title 40 CFR §257.94(e) 2.

Name: Michael J. Amstadt P.E. **Expiration Date:** 12/31/2024

Company: TRC Environmental Corporation **Date:** 10/16/2023

(SEAL)

Section 6
References

Atekwana, E. A., Atekwana, E. A., Rowe, R. S., Werkema, D. D., & Legall, F. D. (2004). The relationship of total dissolved solids measurements to bulk electrical conductivity in an aquifer contaminated with hydrocarbon. Journal of Applied Geophysics, 56(4), 281–294.

Banadkooki, F. B., Ehteram, M., Panahi, F., Sh. Sammen, S., Othman, F. B., & EL-Shafie, A. (2020). Estimation of total dissolved solids (TDS) using new hybrid machine learning models. Journal of Hydrology, 587(February), 124989.

Brindha, K., & Elango, L. (2011). Fluoride in groundwater: Causes, implications and mitigation measures. Fluoride: Properties, Applications and Environmental Management, 113–136.

Chen, Q., Jia, C., Wei, J., Dong, F., Yang, W., Hao, D., Jia, Z., & Ji, Y. (2020). Geochemical process of groundwater fluoride evolution along global coastal plains: Evidence from the comparison in seawater intrusion area and soil salinization area. Chemical Geology, 552(July), 119779.

Einsiedl, F., & Mayer, B. (2005). Sources and Processes Affecting Sulfate in a Karstic Groundwater System of the Franconian Alb, Southern Germany. Environmental Science & Technology, 39(18), 7118–7125.

FTN. 2014. Supplemental Geotechnical and Hydrogeological Investigation Report, Entergy White Bluff Plant Class 3N Landfill. Prepared for Entergy Arkansas, Inc. Little Rock, AR: FTN Associates, Ltd. October 1, 2014.

FTN. 2017a. Statistical Analysis Plan, Entergy White Bluff Plant. Little Rock, AR: FTN Associates, Ltd.

FTN. 2017b. Groundwater Sampling and Analysis Plan, Entergy White Bluff Landfill. Little Rock, AR: FTN Associates, LTD.

Guo, H., Zhang, Y., Xing, L., & Jia, Y. (2012). Spatial variation in arsenic and fluoride concentrations of shallow groundwater from the town of Shahai in the Hetao basin, Inner Mongolia. Applied Geochemistry, 27(11), 2187–2196.

Hájek, M., Jiménez-Alfaro, B., Hájek, O., Brancaleoni, L., Cantonati, M., Carbognani, M., Dedić, A., Díte, D., Gerdol, R., Hájková, P., Horsáková, V., Jansen, F., Kamberović, J., Kapfer, J., Kolari, T. H. M., Lamentowicz, M., Lazarević, P., Mašić, E., Moeslund, J. E., …

Horsák, M. (2021). A European map of groundwater pH and calcium. Earth System Science Data, 13(3), 1089–1105.

Hollis, J. F., Keren, R., & Gal, M. (1988). Boron Release and Sorption by Fly Ash as Affected by pH and Particle Size. Journal of Environmental Quality, 17(2), 181–184.

Jiang, Y., Wu, Y., Groves, C., Yuan, D., & Kambesis, P. (2009). Natural and anthropogenic factors affecting the groundwater quality in the Nandong karst underground river system in Yunan, China. Journal of Contaminant Hydrology, 109(1–4), 49–61.

Keren, R., & Communar, G. (2009). Boron Sorption on Wastewater Dissolved Organic Matter: pH Effect. Soil Science Society of America Journal, 73(6), 2021–2025.

Kimambo, V., Bhattacharya, P., Mtalo, F., Mtamba, J., & Ahmad, A. (2019). Fluoride occurrence in groundwater systems at global scale and status of defluoridation – State of the art. Groundwater for Sustainable Development, 9(August 2018), 100223.

Kresse, T.M., P.D. Hays, K.R. Merriman, J.A. Gillip, D.T. Fugitt, J.L. Spellman, A.M. Nottmeier, D.A. Westerman, J.M. Blackstock, and J.L. Battreal. 2014. Aquifers of Arkansas—Protection, Management, and Hydrologic and Geochemical Characteristics of Groundwater Resources in Arkansas [USGS Scientific Investigations Report 2014–5149]. Prepared in Cooperation with the Arkansas Natural Resources Commission. Reston, VA: US Geological Survey. 334 pp.

Luo, W., Gao, X., & Zhang, X. (2018). Geochemical processes controlling the groundwater chemistry and fluoride contamination in the yuncheng basin, China—an area with complex hydrogeochemical conditions. PLoS ONE, 13(7).

MDH. (2008). Sulfate in well water. In Minnesota Department of Health, Well Management Section, Environmental Health Division.

Miao, Z., Brusseau, M. L., Carroll, K. C., Carreón-Diazconti, C., & Johnson, B. (2012). Sulfate reduction in groundwater: Characterization and applications for remediation. Environmental Geochemistry and Health, 34(4), 539–550.

Mondal, D., Gupta, S., Reddy, D. V., & Nagabhushanam, P. (2014). Geochemical controls on fluoride concentrations in groundwater from alluvial aquifers of the Birbhum district, West Bengal, India. Journal of Geochemical Exploration, 145, 190–206.

Olumuyiwa I. Ojo,. (2012). Groundwater: Characteristics, qualities, pollutions and treatments: An overview. International Journal of Water Resources and Environmental Engineering, 4(6), 162–170.

Palmucci, W., & Rusi, S. (2014). Boron-rich groundwater in Central Eastern Italy: a hydrogeochemical and statistical approach to define origin and distribution. Environmental Earth Sciences, 72(12), 5139–5157.

Poursaeid, M., Mastouri, R., Shabanlou, S., & Najarchi, M. (2020). Estimation of total dissolved solids, electrical conductivity, salinity and groundwater levels using novel learning machines. Environmental Earth Sciences, 79(19), 1–25.

Pu, J., Yuan, D., Zhang, C., & Zhao, H. (2012). Hydrogeochemistry and possible sulfate sources in karst groundwater in Chongqing, China. Environmental Earth Sciences 2012 68:1, 68(1), 159–168.

Ravenscroft, P., & McArthur, J. M. (2004). Mechanism of regional enrichment of groundwater by boron: the examples of Bangladesh and Michigan, USA. Applied Geochemistry, 19(9), 1413–1430.

Razowska-jaworek, L. (2014). Calcium and Magnesium in Groundwater. In Calcium and Magnesium in Groundwater.

Saxena, V., & Ahmed, S. (2001). Dissolution of fluoride in groundwater: a water-rock interaction study. Environmental Geology, 40(9), 1084–1087.

Schot, P. P., & Wassen, M. J. (1993). Calcium concentrations in wetland groundwater in relation to water sources and soil conditions in the recharge area. Journal of Hydrology, 141(1–4), 197–217.

Shi, X., Wang, Y., Jiao, J. J., Zhong, J., Wen, H., & Dong, R. (2018). Assessing major factors affecting shallow groundwater geochemical evolution in a highly urbanized coastal area of Shenzhen City, China. Journal of Geochemical Exploration, 184, 17–27.

Tabelin, C. B., Hashimoto, A., Igarashi, T., & Yoneda, T. (2014). Leaching of boron, arsenic and selenium from sedimentary rocks: II. pH dependence, speciation and mechanisms of release. Science of The Total Environment, 473–474, 244–253.

TRC. 2017. Statistical Methods Certification, White Bluff Steam Electric Generating Station, Redfield, Arkansas. Prepared for Entergy Arkansas Inc. Baton Rouge: TRC Environmental Corporation.

TRC. 2018a. Site Conceptual Model: Entergy White Bluff Plant Coal Ash Disposal Landfill, Redfield, Jefferson County, Arkansas. January 2018.

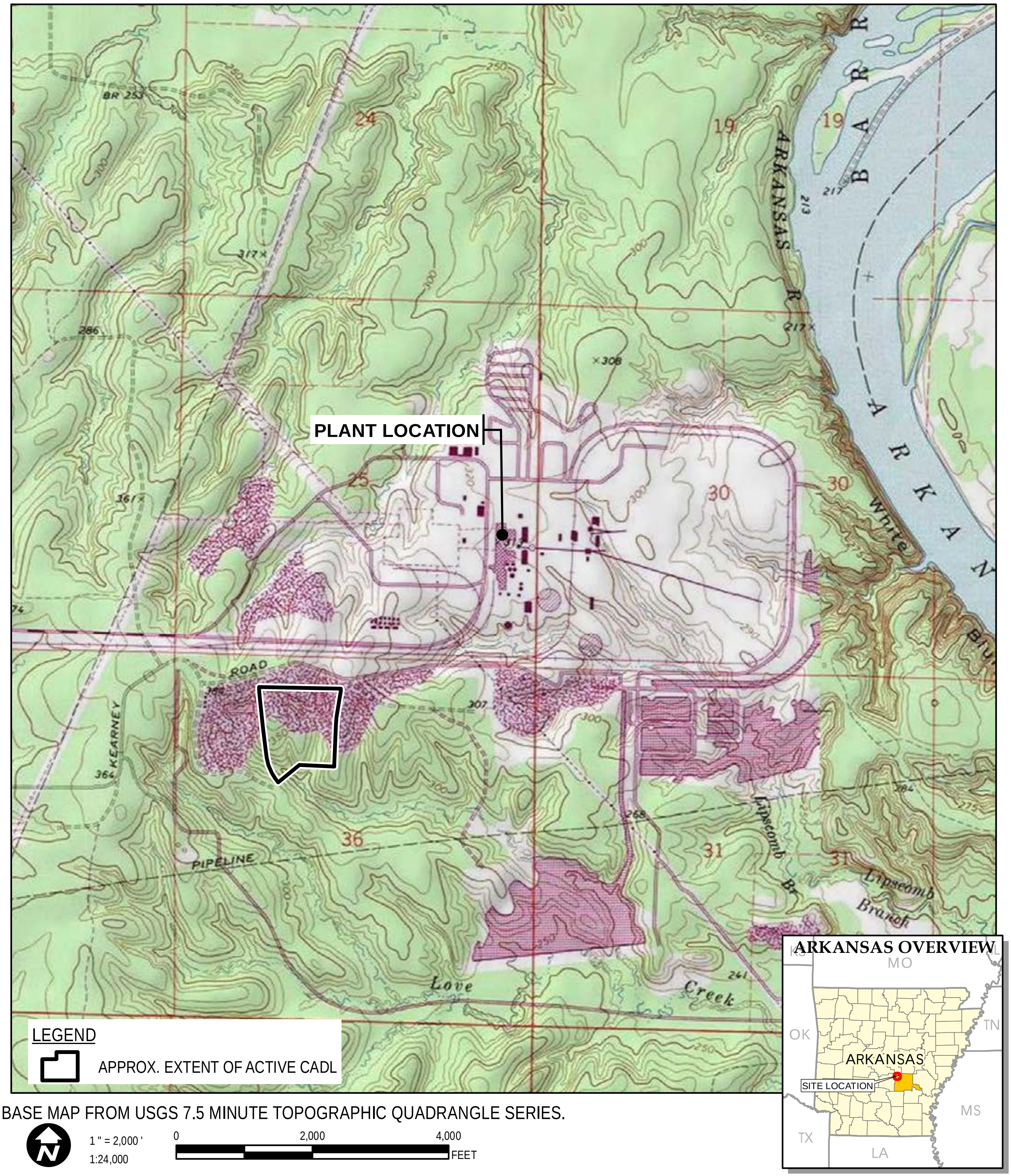
TRC. 2018b. Groundwater Monitoring System Certification, White Bluff Steam Electric Generating Station, Redfield, Arkansas. Prepared for Entergy Arkansas Inc. Baton Rouge: TRC Environmental Corporation.

Upadhyaya, D., Survaiya, M. D., Basha, S., Mandal, S. K., Thorat, R. B., Haldar, S., Goel, S., Dave, H., Baxi, K., Trivedi, R. H., & Mody, K. H. (2014). Occurrence and distribution of selected heavy metals and boron in groundwater of the Gulf of Khambhat region, Gujarat, India. Environmental Science and Pollution Research, 21(5), 3880–3890.

USEPA. (2008). Drinking Water Health Advisory For Boron. Office of Water U.S. Environmental Protection Agency Washington, DC, 822-R-08–0.

United States Environmental Protection Agency. 2017. Secondary Drinking Water Standards: Guidance for Nuisance Chemicals, March 8, 2017.

WHO. (2008). Guidelines for Drinking Water Quality, third ed. World Health Organization, Geneva.



BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

Two United Plaza
8550 United Plaza Blvd., Suite 502
Baton Rouge, LA
Phone: 225.216.7483

TRC - GIS

PROJECT:

ENTERGY WHITE BLUFF PLANT
1100 WHITE BLUFF ROAD
REDFIELD, ARKANSAS

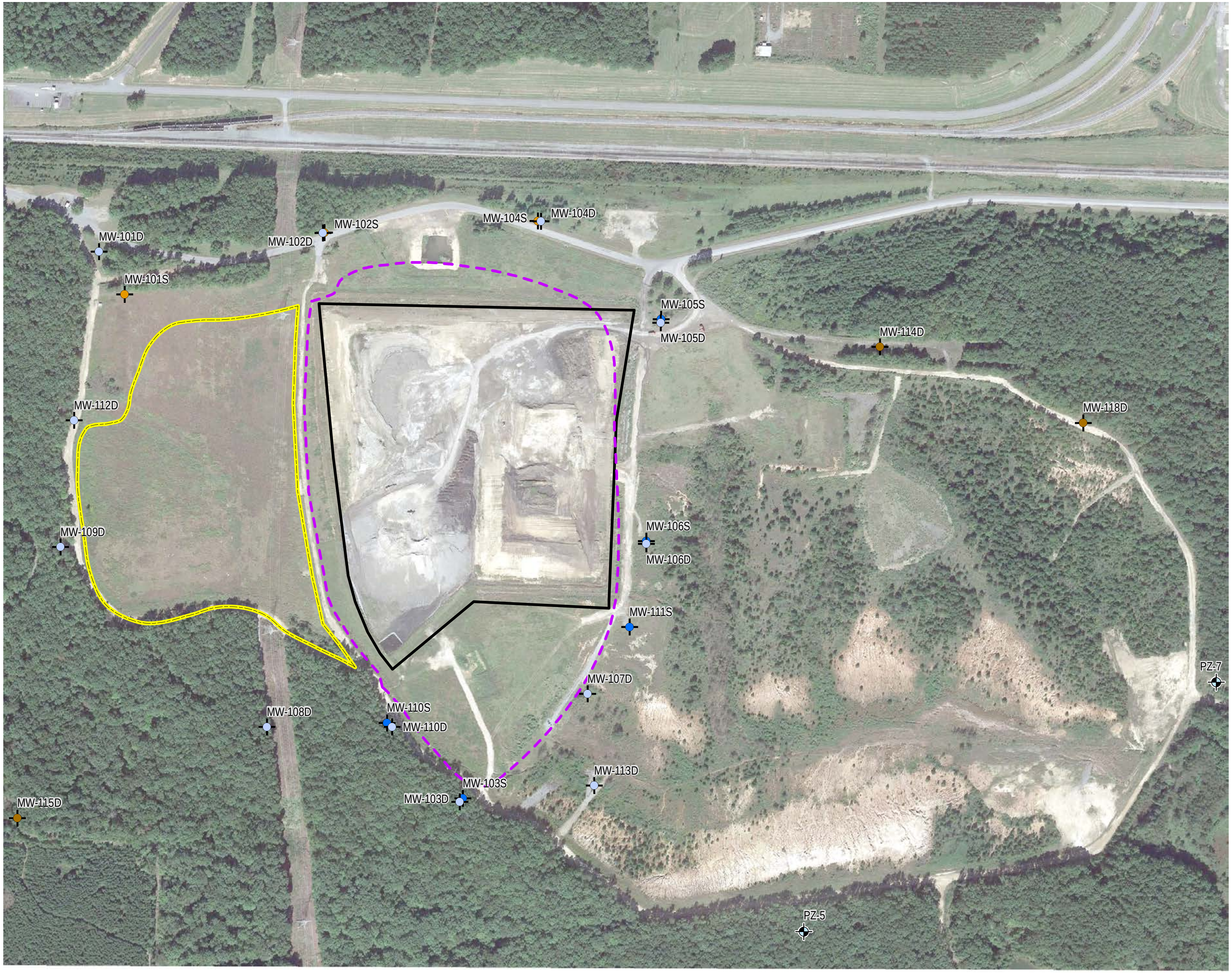
TITLE:

ENTERGY WHITE BLUFF
PLANT LOCATION MAP

DRAWN BY:	S. MAJOR
CHECKED BY:	G. TIEMAN
APPROVED BY:	J. HOUSE
DATE:	JANUARY 2022
PROJ. NO.:	341458
FILE:	341458-001slm_20220105.mxd

FIGURE 1

S:\1-PROJECTS\Entergy\MadisonLegacyProjects\Arkansas\2018_302967\341458-001slm_20220105.mxd -- Saved By: DSTITCHER on 1/5/2022, 15:53:10 PM



LEGEND

- STRATUM I BACKROUND WELL
- STRATUM I MONITORING WELL
- STRATUM III BACKROUND WELL
- STRATUM III MONITORING WELL
- STRATUM III PIEZOMETER
- APPROX. EXTENT OF ACTIVE CADL
- APPROX. EXTENT OF CLOSED CADL
- HISTORIC FILL AREA

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 2018.
2. COAL ASH DISPOSAL LANDFILL (CADL)

1 " = 371 '
1:4,458

PROJECT:

ENTERGY WHITE BLUFF PLANT
1100 WHITE BLUFF ROAD
REDFIELD, ARKANSAS

TITLE:

CADL EXTENT AND CCR GROUNDWATER MONITORING LOCATIONS

DRAWN BY:	S. MAJOR	PROJ. NO.:	341458
CHECKED BY:	S. SELLWOOD		
APPROVED BY:	J. HOUSE	**FIGURE 2**	
DATE:	JANUARY 2022		

TRC

Two United Plaza
8550 United Plaza Blvd., Suite 502
Baton Rouge, LA
Phone: 225.216.7483

FILE NO.: 341458-002_01052022.mxd

TRC - GIS

Plot Date: 1/5/2022, 15:55:41 PM by DSTITCHER -- LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\Entergy\MadisonLegacyProjects\Arkansas\2018_302967\341458-002_0105

Coordinate System: NAD 1983 StatePlane Arkansas South FIPS 0302 Feet (Foot US)
Map Rotation: 0