ftn Associates Ltd.
water resources / environmental consultants

# ENTERGY ARKANSAS, LLC
# WHITE BLUFF PLANT
# LANDFILL CELLS 1 – 4

# 2018 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

## PREPARED IN COMPLIANCE WITH THE EPA FINAL RULE FOR THE DISPOSAL OF COAL COMBUSTION RESIDUALS TITLE 40 CODE OF FEDERAL REGULATIONS PART 257


JANUARY 31, 2019

# ENTERGY ARKANSAS, LLC
# WHITE BLUFF PLANT
# LANDFILL CELLS 1 – 4

# 2018 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

Prepared for

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PO Box 551
Little Rock, AR 72203

Prepared by

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Little Rock, AR 72211

FTN No. R07920-1780-001

January 31, 2019

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# 1.0 INTRODUCTION

Entergy Arkansas, LLC (Entergy), operates a landfill for the disposal of coal combustion residuals (CCRs) at the White Bluff plant located near Redfield, Arkansas. The landfill receives CCRs generated from the combustion of coal at the plant. Management of the CCRs 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), published by the US Environmental Protection Agency (EPA) on April 17, 2015. Entergy has installed a groundwater monitoring system at the CCR 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 White Bluff plant CCR landfill. This document is intended to provide the required information.

# 2.0 GROUNDWATER MONITORING SYSTEM

Entergy'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.

# 3.0 INSTALLED OR DECOMMISSIONED WELLS DURING 2018

Entergy did not install any new wells or decommission any existing wells during 2018.

# 4.0 GROUNDWATER MONITORING DATA

In accordance with §257.90(e)(3), all monitoring data obtained under §§257.90 through 257.98 are provided in Appendix B along with a summary of the number of groundwater

samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was collected as part of detection or assessment monitoring. Monitoring data collected prior to 2018 were provided in the 2017 Annual Groundwater Monitoring and Corrective Action Report, which has been posted to Entergy's CCR Rule Compliance Data and Information website.

## 5.0 STATUS SUMMARY OF THE 2018 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 2018 is provided in the list below:

- In accordance with §257.91(f), the design and construction of the revised groundwater monitoring system was certified by a qualified Arkansas-registered professional engineer. The revised groundwater monitoring system certification has been posted to Entergy's CCR Rule Compliance Data and Information website.
- In accordance with §257.94(b), semiannual detection monitoring was performed during the first and second half of 2018 for analysis of appendix III parameters.
- 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 2018 Entergy completed a successful alternate source demonstration (ASD) per §257.94(e)(2) in response to statistically significant increases (SSIs) identified during the second half 2017 detection monitoring period. The ASD was certified by an Arkansas-registered professional engineer and was placed into the facility's operating record. 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 2018 detection monitoring sampling was performed during March 2018. Based on statistical evaluation of the data, resampling was performed during May 2018 to verify potential statistical exceedances. Resample results confirmed SSIs for boron, calcium, fluoride, and total dissolved solids.

- Entergy completed a successful ASD per §257.94(e)(2) for the SSIs identified during the first half 2018. The ASD was certified by an Arkansas-registered professional engineer and placed in the facility's operating record. 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 2018 detection monitoring sampling was performed during August 2018. Based on statistical evaluation of the data, resampling was performed during September 2018 to verify potential statistical exceedances. Resample results confirmed SSIs for boron, calcium, fluoride, total dissolved solids, and pH.
- No new problems were encountered during 2018 with regard to the detection monitoring and corrective action system. Therefore, no actions were required for modifying the system.
- The facility remained in detection monitoring for the duration of 2018.

## 6.0 PROJECTED ACTIVITIES FOR 2019

Planned activities for the program during 2019 are listed below:

- Semiannual detection monitoring is planned for February and August 2019.
- Entergy is performing an ASD to evaluate the identified SSIs pursuant to §257.94(e) during the second half 2018 monitoring period. Depending on the results of the ASD, Entergy will either continue with detection monitoring or implement assessment monitoring in accordance with §257.95.

# APPENDIX A

**Site Map**

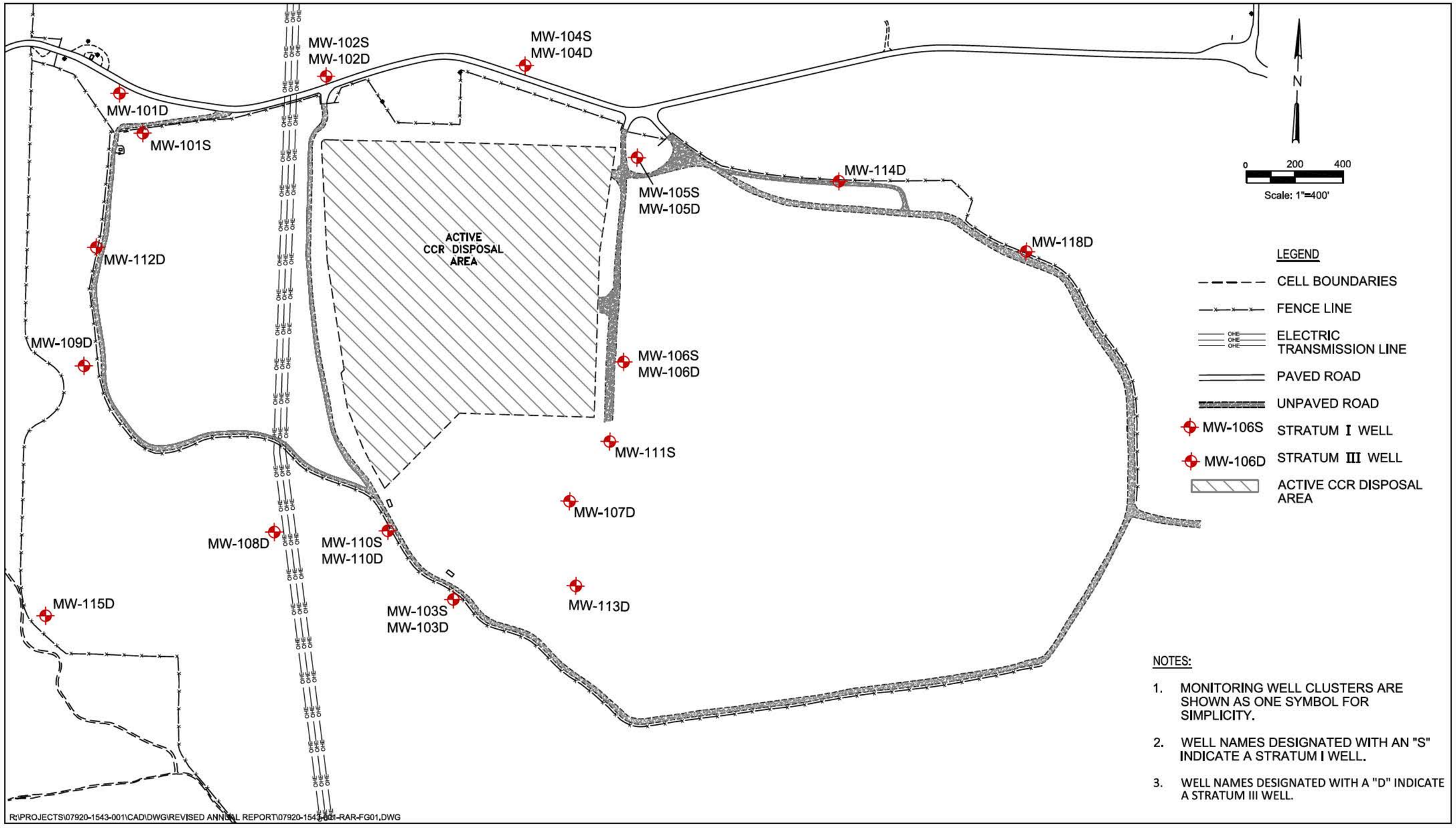



Figure 1. Groundwater monitoring network, Entergy White Bluff EPA CCR landfill.

# APPENDIX B

**Groundwater Monitoring Data**

# Sampling Schedule

Sampling schedule, Entergy White Bluff EPA CCR landfill network

| Well ID | Detection Monitoring Sampling Dates and Wells Sampled | | | | Number of Samples Collected |
|---|---|---|---|---|---|
| | 3/26-28/2018 | 5/30/2018 | 8/13-15/2018 | 9/20/2018 | |
| MW-101S | X | | X | | 2 |
| MW-102S | X | | X | X | 3 |
| MW-103S | X | | X | X | 3 |
| MW-104S | X | X | X | X | 4 |
| MW-105S | X | | X | | 2 |
| MW-106S | X | | X | X | 3 |
| MW-110S | X | | X | | 2 |
| MW-111S | X | X | X | X | 4 |
| MW-101D | X | | X | X | 3 |
| MW-102D | X | | X | | 2 |
| MW-103D | X | | X | | 2 |
| MW-104D | X | | X | | 2 |
| MW-105D | X | X | X | | 3 |
| MW-106D | X | | X | | 2 |
| MW-107D | X | | X | | 2 |
| MW-108D | X | X | X | X | 4 |
| MW-109D | X | X | X | | 3 |
| MW-110D | X | | X | | 2 |
| MW-112D | X | X | X | X | 4 |
| MW-113D | X | | X | X | 3 |
| MW-114D | X | | X | X | 3 |
| MW-115D | X | X | X | X | 4 |
| MW-118D | X | | X | | 2 |

Note: All samples collected during 2018 were part of a detection monitoring program. No samples collected were part of an assessment monitoring program.

**Field pH Data**

Field pH data collected during 2018, Entergy White Bluff EPA CCR landfill network

| Well | Date | pH (su) |
|---|---|---|
| MW-101S | 3/26/2018 | 6.9 |
| | 8/13/2018 | 5.9 |
| MW-102S | 3/26/2018 | 5.7 |
| | 8/13/2018 | 5.4 |
| | 9/20/2018 | 5.6 |
| MW-103S | 3/27/2018 | 5.0 |
| | 8/15/2018 | 4.2 |
| | 9/20/2018 | 4.7 |
| MW-104S | 3/27/2018 | 5.6 |
| | 5/30/2018 | 5.7 |
| | 8/15/2018 | 4.9 |
| | 9/20/2018 | 5.6 |
| MW-105S | 3/28/2018 | 6.0 |
| | 8/14/2018 | 5.4 |
| MW-106S | 3/27/2018 | 4.2 |
| | 8/14/2018 | 3.6 |
| | 9/20/2018 | 4.1 |
| MW-110S | 3/27/2018 | 5.0 |
| | 8/15/2018 | 4.0 |
| MW-111S | 3/27/2018 | 4.1 |
| | 5/30/2018 | 4.2 |
| | 8/14/2018 | 3.6 |
| | 9/20/2018 | 3.9 |
| MW-101D | 3/26/2018 | 6.5 |
| | 8/13/2018 | 6.5 |
| | 9/20/2018 | 4.7 |
| MW-102D | 3/26/2018 | 7.2 |
| | 8/13/2018 | 6.1 |
| MW-103D | 3/26/2018 | 8.3 |
| | 8/14/2018 | 7.3 |
| MW-104D | 3/26/2018 | 7.3 |
| | 8/13/2018 | 6.8 |
| MW-105D | 3/26/2018 | 7.5 |
| | 5/30/2018 | 7.2 |
| | 8/13/2018 | 7.1 |
| MW-106D | 3/26/2018 | 7.3 |
| | 8/14/2018 | 6.9 |
| MW-107D | 3/26/2018 | 7.3 |
| | 8/13/2018 | 7.1 |
| MW-108D | 3/26/2018 | 7.1 |
| | 5/30/2018 | 7.3 |
| | 8/14/2018 | 6.9 |
| | 9/20/2018 | 7.0 |

Field pH data collected during 2018, Entergy White Bluff EPA CCR landfill network

| Well | Date | pH (su) |
|---|---|---|
| MW-109D | 3/27/2018 | 7.2 |
| | 5/30/2018 | 7.4 |
| | 8/14/2018 | 7.1 |
| MW-110D | 3/26/2018 | 7.4 |
| | 8/14/2018 | 7.2 |
| MW-112D | 3/26/2018 | 7.1 |
| | 5/30/2018 | 7.5 |
| | 8/13/2018 | 6.8 |
| | 9/20/2018 | 7.2 |
| MW-113D | 3/26/2018 | 6.6 |
| | 8/14/2018 | 6.5 |
| | 9/20/2018 | 6.4 |
| MW-114D | 3/26/2018 | 7.4 |
| | 8/14/2018 | 6.5 |
| | 9/20/2018 | 6.3 |
| MW-115D | 3/27/2018 | 7.3 |
| | 5/30/2018 | 7.5 |
| | 8/14/2018 | 6.4 |
| | 9/20/2018 | 7.2 |
| MW-118D | 3/26/2018 | 7.2 |
| | 8/14/2018 | 6.8 |

# Laboratory Analytical Data

# ANALYTICAL REPORT

April 10, 2018

## FTN Associates - Little Rock, AR

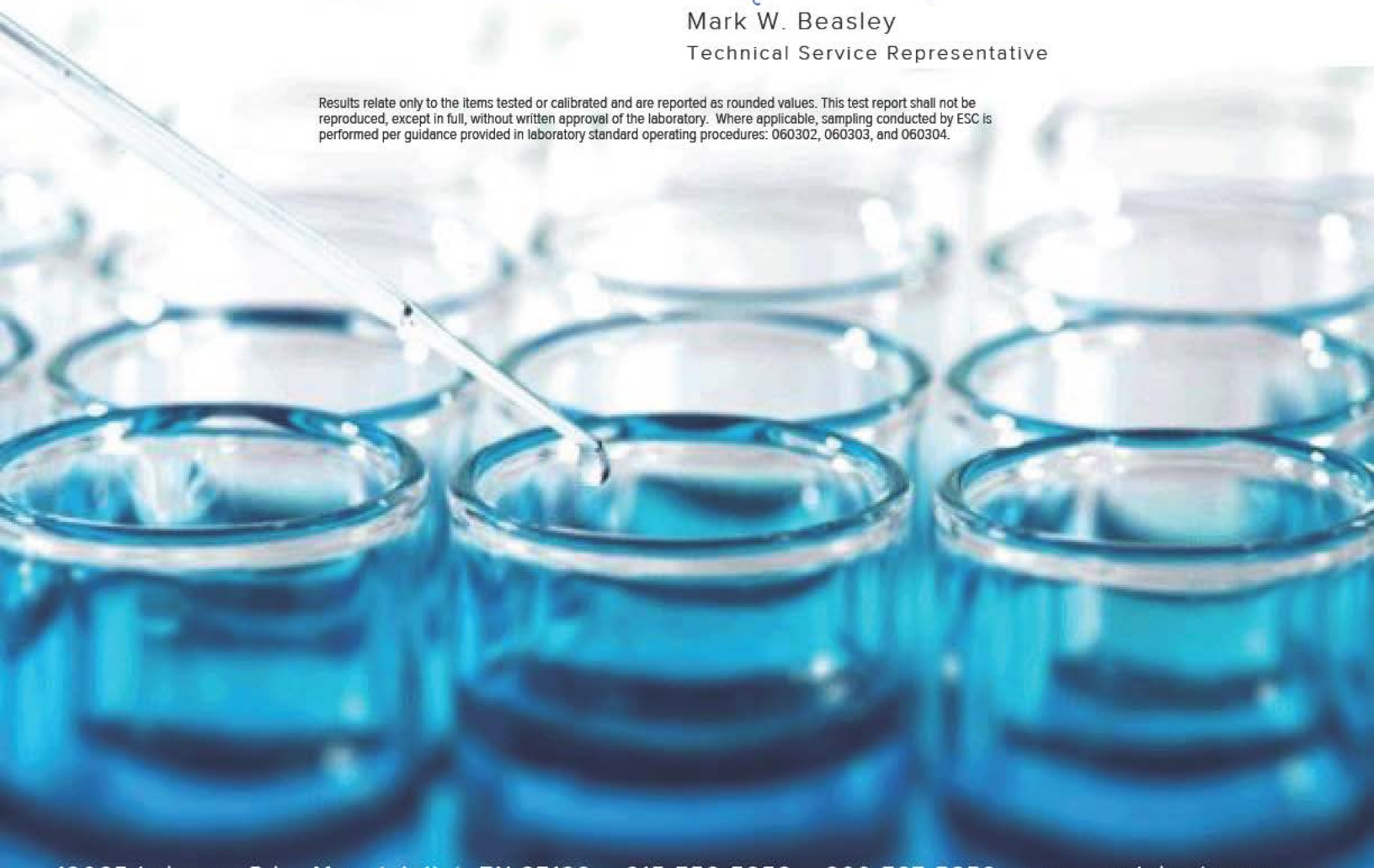
| | |
|---|---|
| Sample Delivery Group: | L981349 |
| Samples Received: | 03/29/2018 |
| Project Number: | 07920-1780-001 |
| Description: | Entergy White Bluff Landfill |

Report To: Dana Derrington
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Entire Report Reviewed By:

Mark W. Beasley
Technical Service Representative





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## MW-101S L981349-01 GW

Collected by: Andrew Pruitt | Collected date/time: 03/26/18 14:35 | Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091214 | 1 | 03/30/18 14:15 | 03/30/18 14:44 | MMF |
| Wet Chemistry by Method 9056A | WG1091173 | 1 | 03/30/18 06:20 | 03/30/18 06:20 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 15:48 | ST |

## MW-101D L981349-02 GW

Collected by: Andrew Pruitt | Collected date/time: 03/26/18 13:45 | Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091214 | 1 | 03/30/18 14:15 | 03/30/18 14:44 | MMF |
| Wet Chemistry by Method 9056A | WG1091173 | 1 | 03/30/18 06:35 | 03/30/18 06:35 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 15:51 | ST |

## MW-102S L981349-03 GW

Collected by: Andrew Pruitt | Collected date/time: 03/26/18 18:40 | Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091218 | 1 | 03/30/18 16:16 | 03/30/18 16:51 | MMF |
| Wet Chemistry by Method 9056A | WG1091173 | 1 | 03/30/18 06 51 | 03/30/18 06 51 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 15:54 | ST |

## MW-102D L981349-04 GW

Collected by: Andrew Pruitt | Collected date/time: 03/26/18 19:00 | Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091218 | 1 | 03/30/18 16:16 | 03/30/18 16:51 | MMF |
| Wet Chemistry by Method 9056A | WG1091173 | 1 | 03/30/18 07:06 | 03/30/18 07:06 | MAJ |
| Wet Chemistry by Method 9056A | WG1091714 | 5 | 03/30/18 22:47 | 03/30/18 22:47 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 16:01 | ST |

## MW-103S L981349-05 GW

Collected by: Andrew Pruitt | Collected date/time: 03/27/18 09:55 | Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091752 | 1 | 03/31/18 15:43 | 03/31/18 16:43 | MMF |
| Wet Chemistry by Method 9056A | WG1091197 | 1 | 04/02/18 17:09 | 04/02/18 17:09 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 16:04 | ST |

## MW-103D L981349-06 GW

Collected by: Andrew Pruitt | Collected date/time: 03/26/18 15:35 | Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091218 | 1 | 03/30/18 16:16 | 03/30/18 16:51 | MMF |
| Wet Chemistry by Method 9056A | WG1091177 | 1 | 03/30/18 04:03 | 03/30/18 04:03 | MAJ |
| Wet Chemistry by Method 9056A | WG1091714 | 5 | 03/30/18 23:01 | 03/30/18 23:01 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 16:07 | ST |

## MW-104S L981349-07 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Andrew Pruitt | 03/27/18 12:55 | 03/29/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091752 | 1 | 03/31/18 15:43 | 03/31/18 16:43 | MMF |
| Wet Chemistry by Method 9056A | WG1091197 | 1 | 04/02/18 18:02 | 04/02/18 18:02 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 16:09 | ST |

## MW-104D L981349-08 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Andrew Pruitt | 03/26/18 18:15 | 03/29/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091218 | 1 | 03/30/18 16:16 | 03/30/18 16:51 | MMF |
| Wet Chemistry by Method 9056A | WG1091177 | 1 | 03/30/18 04:49 | 03/30/18 04:49 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 16:12 | ST |

## MW-105S L981349-09 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Andrew Pruitt | 03/28/18 09:20 | 03/29/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1092053 | 1 | 04/02/18 15:06 | 04/02/18 16:01 | MMF |
| Wet Chemistry by Method 9056A | WG1091173 | 1 | 03/30/18 07:22 | 03/30/18 07:22 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 16:15 | ST |

## MW-105D L981349-10 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Andrew Pruitt | 03/26/18 17:55 | 03/29/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091218 | 1 | 03/30/18 16:16 | 03/30/18 16:51 | MMF |
| Wet Chemistry by Method 9056A | WG1091177 | 1 | 03/30/18 05:35 | 03/30/18 05:35 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 16:17 | ST |

## MW-106S L981349-11 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Andrew Pruitt | 03/27/18 15:20 | 03/29/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091752 | 1 | 03/31/18 15:43 | 03/31/18 16:43 | MMF |
| Wet Chemistry by Method 9056A | WG1091197 | 1 | 04/02/18 18:16 | 04/02/18 18:16 | MAJ |
| Wet Chemistry by Method 9056A | WG1091197 | 5 | 04/02/18 18:29 | 04/02/18 18:29 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 16:20 | ST |

## MW-106D L981349-12 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Andrew Pruitt | 03/26/18 17:30 | 03/29/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091218 | 1 | 03/30/18 16:16 | 03/30/18 16:51 | MMF |
| Wet Chemistry by Method 9056A | WG1091177 | 1 | 03/30/18 05 51 | 03/30/18 05 51 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 16:22 | ST |

## MW-107D L981349-13 GW

Collected by: Andrew Pruitt | Collected date/time: 03/26/18 17:00 | Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091218 | 1 | 03/30/18 16:16 | 03/30/18 16:51 | MMF |
| Wet Chemistry by Method 9056A | WG1091177 | 1 | 03/30/18 06 06 | 03/30/18 06 06 | MAJ |
| Wet Chemistry by Method 9056A | WG1091714 | 5 | 03/30/18 23:14 | 03/30/18 23:14 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 16:25 | ST |

## MW-108D L981349-14 GW

Collected by: Andrew Pruitt | Collected date/time: 03/26/18 14 50 | Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091218 | 1 | 03/30/18 16:16 | 03/30/18 16:51 | MMF |
| Wet Chemistry by Method 9056A | WG1091177 | 1 | 03/30/18 06:21 | 03/30/18 06:21 | MAJ |
| Wet Chemistry by Method 9056A | WG1091714 | 5 | 03/30/18 23:54 | 03/30/18 23:54 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 16:33 | ST |

## MW-109D L981349-15 GW

Collected by: Andrew Pruitt | Collected date/time: 03/27/18 13:30 | Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091752 | 1 | 03/31/18 15:43 | 03/31/18 16:43 | MMF |
| Wet Chemistry by Method 9056A | WG1091197 | 1 | 04/02/18 19:09 | 04/02/18 19:09 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 16:35 | ST |

## MW-110S L981349-16 GW

Collected by: Andrew Pruitt | Collected date/time: 03/27/18 11:18 | Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091752 | 1 | 03/31/18 15:43 | 03/31/18 16:43 | MMF |
| Wet Chemistry by Method 9056A | WG1091197 | 1 | 04/02/18 19:23 | 04/02/18 19:23 | MAJ |
| Wet Chemistry by Method 9056A | WG1092859 | 5 | 04/03/18 15:44 | 04/03/18 15:44 | DR |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 16:38 | ST |

## MW-110D L981349-17 GW

Collected by: Andrew Pruitt | Collected date/time: 03/26/18 15:20 | Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091218 | 1 | 03/30/18 16:16 | 03/30/18 16:51 | MMF |
| Wet Chemistry by Method 9056A | WG1091177 | 1 | 03/30/18 06:37 | 03/30/18 06:37 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 16:41 | ST |

## MW-111S L981349-18 GW

Collected by: Andrew Pruitt | Collected date/time: 03/27/18 16:13 | Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091752 | 1 | 03/31/18 15:43 | 03/31/18 16:43 | MMF |
| Wet Chemistry by Method 9056A | WG1091197 | 1 | 04/02/18 19:36 | 04/02/18 19:36 | MAJ |
| Wet Chemistry by Method 9056A | WG1092859 | 5 | 04/03/18 16:00 | 04/03/18 16:00 | DR |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 16:43 | ST |

## MW-112D L981349-19 GW

Collected by: Andrew Pruitt
Collected date/time: 03/26/18 14 00
Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091218 | 1 | 03/30/18 16:16 | 03/30/18 16:51 | MMF |
| Wet Chemistry by Method 9056A | WG1091177 | 1 | 03/30/18 06 52 | 03/30/18 06 52 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 16:46 | ST |

## MW-113D L981349-20 GW

Collected by: Andrew Pruitt
Collected date/time: 03/26/18 16:20
Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091220 | 1 | 03/30/18 13:37 | 03/30/18 14:12 | MMF |
| Wet Chemistry by Method 9056A | WG1091177 | 1 | 03/30/18 07:08 | 03/30/18 07:08 | MAJ |
| Wet Chemistry by Method 9056A | WG1091177 | 10 | 03/30/18 07:23 | 03/30/18 07:23 | MAJ |
| Metals (ICP) by Method 6010B | WG1091126 | 1 | 03/30/18 10:13 | 03/30/18 15:38 | ST |

## MW-114D L981349-21 GW

Collected by: Andrew Pruitt
Collected date/time: 03/26/18 16:45
Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091220 | 1 | 03/30/18 13:37 | 03/30/18 14:12 | MMF |
| Wet Chemistry by Method 9056A | WG1091177 | 1 | 03/30/18 07:38 | 03/30/18 07:38 | MAJ |
| Metals (ICP) by Method 6010B | WG1091124 | 1 | 03/29/18 16:14 | 03/29/18 22:29 | CCE |

## MW-115D L981349-22 GW

Collected by: Andrew Pruitt
Collected date/time: 03/27/18 14:00
Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091752 | 1 | 03/31/18 15:43 | 03/31/18 16:43 | MMF |
| Wet Chemistry by Method 9056A | WG1091197 | 1 | 04/02/18 19:50 | 04/02/18 19:50 | ADH |
| Metals (ICP) by Method 6010B | WG1091124 | 1 | 03/29/18 16:14 | 03/29/18 22:35 | ST |

## MW-118D L981349-23 GW

Collected by: Andrew Pruitt
Collected date/time: 03/26/18 16:30
Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1091220 | 1 | 03/30/18 13:37 | 03/30/18 14:12 | MMF |
| Wet Chemistry by Method 9056A | WG1091177 | 1 | 03/30/18 07:54 | 03/30/18 07:54 | MAJ |
| Wet Chemistry by Method 9056A | WG1091714 | 5 | 03/31/18 00:08 | 03/31/18 00:08 | MAJ |
| Metals (ICP) by Method 6010B | WG1091124 | 1 | 03/29/18 16:14 | 03/29/18 22:37 | ST |

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

Mark W. Beasley
Technical Service Representative

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Dissolved Solids | 312000 | | 2820 | 10000 | 1 | 03/30/2018 14:44 | WG1091214 |

## Wet Chemistry by Method 9056A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Chloride | 6240 | | 51.9 | 1000 | 1 | 03/30/2018 06:20 | WG1091173 |
| Fluoride | 45.3 | J | 9.90 | 100 | 1 | 03/30/2018 06:20 | WG1091173 |
| Sulfate | 43500 | | 77.4 | 5000 | 1 | 03/30/2018 06:20 | WG1091173 |

## Metals (ICP) by Method 6010B

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Boron | 93.0 | J | 12.6 | 200 | 1 | 03/30/2018 15:48 | WG1091126 |
| Calcium | 46100 | | 46.3 | 1000 | 1 | 03/30/2018 15:48 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Dissolved Solids | 270000 | | 2820 | 10000 | 1 | 03/30/2018 14:44 | WG1091214 |

## Wet Chemistry by Method 9056A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Chloride | 6940 | | 51.9 | 1000 | 1 | 03/30/2018 06:35 | WG1091173 |
| Fluoride | 70.7 | J | 9.90 | 100 | 1 | 03/30/2018 06:35 | WG1091173 |
| Sulfate | 39700 | | 77.4 | 5000 | 1 | 03/30/2018 06:35 | WG1091173 |

## Metals (ICP) by Method 6010B

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Boron | 121 | J | 12.6 | 200 | 1 | 03/30/2018 15:51 | WG1091126 |
| Calcium | 28600 | | 46.3 | 1000 | 1 | 03/30/2018 15:51 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 179000 | | 2820 | 10000 | 1 | 03/30/2018 16:51 | WG1091218 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 7100 | | 51.9 | 1000 | 1 | 03/30/2018 06 51 | WG1091173 |
| Fluoride | 51.4 | J | 9.90 | 100 | 1 | 03/30/2018 06 51 | WG1091173 |
| Sulfate | 18700 | | 77.4 | 5000 | 1 | 03/30/2018 06 51 | WG1091173 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 66 8 | J | 12.6 | 200 | 1 | 03/30/2018 15:54 | WG1091126 |
| Calcium | 8680 | | 46.3 | 1000 | 1 | 03/30/2018 15:54 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 550000 | | 2820 | 10000 | 1 | 03/30/2018 16:51 | WG1091218 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 11100 | | 51.9 | 1000 | 1 | 03/30/2018 07:06 | WG1091173 |
| Fluoride | 472 | J | 9.90 | 100 | 1 | 03/30/2018 07:06 | WG1091173 |
| Sulfate | 114000 | | 387 | 25000 | 5 | 03/30/2018 22:47 | WG1091714 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 320 | | 12.6 | 200 | 1 | 03/30/2018 16:01 | WG1091126 |
| Calcium | 93300 | | 46.3 | 1000 | 1 | 03/30/2018 16:01 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 109000 | | 2820 | 10000 | 1 | 03/31/2018 16:43 | WG1091752 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 3930 | | 51.9 | 1000 | 1 | 04/02/2018 17:09 | WG1091197 |
| Fluoride | 43.9 | J P1 | 9.90 | 100 | 1 | 04/02/2018 17:09 | WG1091197 |
| Sulfate | 33600 | | 77.4 | 5000 | 1 | 04/02/2018 17:09 | WG1091197 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 215 | | 12.6 | 200 | 1 | 03/30/2018 16:04 | WG1091126 |
| Calcium | 755 | J | 46.3 | 1000 | 1 | 03/30/2018 16:04 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 367000 | | 2820 | 10000 | 1 | 03/30/2018 16:51 | WG1091218 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 17500 | | 51.9 | 1000 | 1 | 03/30/2018 04:03 | WG1091177 |
| Fluoride | 232 | | 9.90 | 100 | 1 | 03/30/2018 04:03 | WG1091177 |
| Sulfate | 135000 | | 387 | 25000 | 5 | 03/30/2018 23:01 | WG1091714 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 230 | | 12.6 | 200 | 1 | 03/30/2018 16:07 | WG1091126 |
| Calcium | 42200 | | 46.3 | 1000 | 1 | 03/30/2018 16:07 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 309000 | | 2820 | 10000 | 1 | 03/31/2018 16:43 | WG1091752 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 4040 | | 51.9 | 1000 | 1 | 04/02/2018 18:02 | WG1091197 |
| Fluoride | 124 | | 9.90 | 100 | 1 | 04/02/2018 18:02 | WG1091197 |
| Sulfate | 84100 | | 77.4 | 5000 | 1 | 04/02/2018 18:02 | WG1091197 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 803 | | 12.6 | 200 | 1 | 03/30/2018 16:09 | WG1091126 |
| Calcium | 30600 | | 46.3 | 1000 | 1 | 03/30/2018 16:09 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 304000 | | 2820 | 10000 | 1 | 03/30/2018 16:51 | WG1091218 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 9870 | | 51.9 | 1000 | 1 | 03/30/2018 04:49 | WG1091177 |
| Fluoride | 92.8 | J | 9.90 | 100 | 1 | 03/30/2018 04:49 | WG1091177 |
| Sulfate | 19300 | | 77.4 | 5000 | 1 | 03/30/2018 04:49 | WG1091177 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 276 | | 12.6 | 200 | 1 | 03/30/2018 16:12 | WG1091126 |
| Calcium | 51200 | | 46.3 | 1000 | 1 | 03/30/2018 16:12 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 199000 | | 2820 | 10000 | 1 | 04/02/2018 16:01 | WG1092053 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 3760 | | 51.9 | 1000 | 1 | 03/30/2018 07:22 | WG1091173 |
| Fluoride | 37.2 | J P1 | 9.90 | 100 | 1 | 03/30/2018 07:22 | WG1091173 |
| Sulfate | 26300 | | 77.4 | 5000 | 1 | 03/30/2018 07:22 | WG1091173 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 78.0 | J | 12.6 | 200 | 1 | 03/30/2018 16:15 | WG1091126 |
| Calcium | 19700 | | 46.3 | 1000 | 1 | 03/30/2018 16:15 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 345000 | | 2820 | 10000 | 1 | 03/30/2018 16:51 | WG1091218 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 8410 | | 51.9 | 1000 | 1 | 03/30/2018 05:35 | WG1091177 |
| Fluoride | 98.2 | J | 9.90 | 100 | 1 | 03/30/2018 05:35 | WG1091177 |
| Sulfate | 39800 | | 77.4 | 5000 | 1 | 03/30/2018 05:35 | WG1091177 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 312 | | 12.6 | 200 | 1 | 03/30/2018 16:17 | WG1091126 |
| Calcium | 53900 | | 46.3 | 1000 | 1 | 03/30/2018 16:17 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 688000 | | 2820 | 10000 | 1 | 03/31/2018 16:43 | WG1091752 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 11100 | | 51.9 | 1000 | 1 | 04/02/2018 18:16 | WG1091197 |
| Fluoride | 481 | | 9.90 | 100 | 1 | 04/02/2018 18:16 | WG1091197 |
| Sulfate | 456000 | | 387 | 25000 | 5 | 04/02/2018 18:29 | WG1091197 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 7070 | | 12.6 | 200 | 1 | 03/30/2018 16:20 | WG1091126 |
| Calcium | 21600 | | 46.3 | 1000 | 1 | 03/30/2018 16:20 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 318000 | | 2820 | 10000 | 1 | 03/30/2018 16:51 | WG1091218 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 5620 | | 51.9 | 1000 | 1 | 03/30/2018 05 51 | WG1091177 |
| Fluoride | 101 | | 9.90 | 100 | 1 | 03/30/2018 05 51 | WG1091177 |
| Sulfate | 19000 | | 77.4 | 5000 | 1 | 03/30/2018 05 51 | WG1091177 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 366 | | 12.6 | 200 | 1 | 03/30/2018 16:22 | WG1091126 |
| Calcium | 52700 | | 46.3 | 1000 | 1 | 03/30/2018 16:22 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Dissolved Solids | 536000 | | 2820 | 10000 | 1 | 03/30/2018 16:51 | WG1091218 |

## Wet Chemistry by Method 9056A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Chloride | 20100 | | 51.9 | 1000 | 1 | 03/30/2018 06 06 | WG1091177 |
| Fluoride | 93.0 | J | 9.90 | 100 | 1 | 03/30/2018 06 06 | WG1091177 |
| Sulfate | 151000 | | 387 | 25000 | 5 | 03/30/2018 23:14 | WG1091714 |

## Metals (ICP) by Method 6010B

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Boron | 376 | | 12.6 | 200 | 1 | 03/30/2018 16:25 | WG1091126 |
| Calcium | 85000 | | 46.3 | 1000 | 1 | 03/30/2018 16:25 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Dissolved Solids | 613000 | | 2820 | 10000 | 1 | 03/30/2018 16:51 | WG1091218 |

## Wet Chemistry by Method 9056A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Chloride | 15900 | | 51.9 | 1000 | 1 | 03/30/2018 06:21 | WG1091177 |
| Fluoride | 96.7 | J | 9.90 | 100 | 1 | 03/30/2018 06:21 | WG1091177 |
| Sulfate | 107000 | | 387 | 25000 | 5 | 03/30/2018 23:54 | WG1091714 |

## Metals (ICP) by Method 6010B

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Boron | 380 | | 12.6 | 200 | 1 | 03/30/2018 16:33 | WG1091126 |
| Calcium | 93600 | | 46.3 | 1000 | 1 | 03/30/2018 16:33 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 367000 | | 2820 | 10000 | 1 | 03/31/2018 16:43 | WG1091752 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 9260 | | 51.9 | 1000 | 1 | 04/02/2018 19:09 | WG1091197 |
| Fluoride | 86.7 | J | 9.90 | 100 | 1 | 04/02/2018 19:09 | WG1091197 |
| Sulfate | 68600 | | 77.4 | 5000 | 1 | 04/02/2018 19:09 | WG1091197 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 348 | | 12.6 | 200 | 1 | 03/30/2018 16:35 | WG1091126 |
| Calcium | 49100 | | 46.3 | 1000 | 1 | 03/30/2018 16:35 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 382000 | | 2820 | 10000 | 1 | 03/31/2018 16:43 | WG1091752 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 11700 | | 51.9 | 1000 | 1 | 04/02/2018 19:23 | WG1091197 |
| Fluoride | 245 | | 9.90 | 100 | 1 | 04/02/2018 19:23 | WG1091197 |
| Sulfate | 170000 | | 387 | 25000 | 5 | 04/03/2018 15:44 | WG1092859 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 1130 | | 12.6 | 200 | 1 | 03/30/2018 16:38 | WG1091126 |
| Calcium | 4900 | | 46.3 | 1000 | 1 | 03/30/2018 16:38 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 333000 | | 2820 | 10000 | 1 | 03/30/2018 16:51 | WG1091218 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 6650 | | 51.9 | 1000 | 1 | 03/30/2018 06:37 | WG1091177 |
| Fluoride | 113 | | 9.90 | 100 | 1 | 03/30/2018 06:37 | WG1091177 |
| Sulfate | 31200 | | 77.4 | 5000 | 1 | 03/30/2018 06:37 | WG1091177 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 333 | | 12.6 | 200 | 1 | 03/30/2018 16:41 | WG1091126 |
| Calcium | 42400 | | 46.3 | 1000 | 1 | 03/30/2018 16:41 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 533000 | | 2820 | 10000 | 1 | 03/31/2018 16:43 | WG1091752 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 5040 | | 51.9 | 1000 | 1 | 04/02/2018 19:36 | WG1091197 |
| Fluoride | 284 | | 9.90 | 100 | 1 | 04/02/2018 19:36 | WG1091197 |
| Sulfate | 317000 | | 387 | 25000 | 5 | 04/03/2018 16 00 | WG1092859 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 4110 | | 12.6 | 200 | 1 | 03/30/2018 16:43 | WG1091126 |
| Calcium | 37200 | | 46.3 | 1000 | 1 | 03/30/2018 16:43 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 190000 | | 2820 | 10000 | 1 | 03/30/2018 16:51 | WG1091218 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 4120 | | 51.9 | 1000 | 1 | 03/30/2018 06 52 | WG1091177 |
| Fluoride | 113 | | 9.90 | 100 | 1 | 03/30/2018 06 52 | WG1091177 |
| Sulfate | 675 | J | 77.4 | 5000 | 1 | 03/30/2018 06 52 | WG1091177 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 256 | | 12.6 | 200 | 1 | 03/30/2018 16:46 | WG1091126 |
| Calcium | 24500 | | 46.3 | 1000 | 1 | 03/30/2018 16:46 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 1050000 | | 2820 | 10000 | 1 | 03/30/2018 14:12 | WG1091220 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 13400 | | 51.9 | 1000 | 1 | 03/30/2018 07:08 | WG1091177 |
| Fluoride | U | | 9.90 | 100 | 1 | 03/30/2018 07:08 | WG1091177 |
| Sulfate | 628000 | | 774 | 50000 | 10 | 03/30/2018 07:23 | WG1091177 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 534 | | 12.6 | 200 | 1 | 03/30/2018 15:38 | WG1091126 |
| Calcium | 180000 | V | 46.3 | 1000 | 1 | 03/30/2018 15:38 | WG1091126 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 278000 | | 2820 | 10000 | 1 | 03/30/2018 14:12 | WG1091220 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 7760 | | 51.9 | 1000 | 1 | 03/30/2018 07:38 | WG1091177 |
| Fluoride | 100 | | 9.90 | 100 | 1 | 03/30/2018 07:38 | WG1091177 |
| Sulfate | 12800 | | 77.4 | 5000 | 1 | 03/30/2018 07:38 | WG1091177 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 264 | | 12.6 | 200 | 1 | 03/29/2018 22:29 | WG1091124 |
| Calcium | 42000 | | 46.3 | 1000 | 1 | 03/29/2018 22:29 | WG1091124 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 374000 | | 2820 | 10000 | 1 | 03/31/2018 16:43 | WG1091752 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 5450 | | 51.9 | 1000 | 1 | 04/02/2018 19:50 | WG1091197 |
| Fluoride | 172 | | 9.90 | 100 | 1 | 04/02/2018 19:50 | WG1091197 |
| Sulfate | 1310 | J | 77.4 | 5000 | 1 | 04/02/2018 19:50 | WG1091197 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 346 | | 12.6 | 200 | 1 | 03/29/2018 22:35 | WG1091124 |
| Calcium | 44100 | | 46.3 | 1000 | 1 | 03/29/2018 22:35 | WG1091124 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 456000 | | 2820 | 10000 | 1 | 03/30/2018 14:12 | WG1091220 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 9110 | | 51.9 | 1000 | 1 | 03/30/2018 07:54 | WG1091177 |
| Fluoride | U | J3 J5 | 9.90 | 100 | 1 | 03/30/2018 07:54 | WG1091177 |
| Sulfate | 126000 | | 387 | 25000 | 5 | 03/31/2018 00:08 | WG1091714 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 327 | | 12.6 | 200 | 1 | 03/29/2018 22:37 | WG1091124 |
| Calcium | 79300 | | 46.3 | 1000 | 1 | 03/29/2018 22:37 | WG1091124 |

## Method Blank (MB)

(MB) R3298287-1 03/30/18 14:44

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Dissolved Solids | U | | 2820 | 10000 |

## L981217-01 Original Sample (OS) • Duplicate (DUP)

(OS) L981217-01 03/30/18 14:44 • (DUP) R3298287-4 03/30/18 14:44

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Dissolved Solids | 1050000 | 1040000 | 1 | 0.573 | | 5 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3298287-2 03/30/18 14:44 • (LCSD) R3298287-3 03/30/18 14:44

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Solids | 8800000 | 8590000 | 8570000 | 97.6 | 97.4 | 85 0-115 | | | 0.233 | 5 |

## Method Blank (MB)

(MB) R3298291-1 03/30/18 16:51

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Dissolved Solids | U | | 2820 | 10000 |

## L981349-19 Original Sample (OS) • Duplicate (DUP)

(OS) L981349-19 03/30/18 16:51 • (DUP) R3298291-4 03/30/18 16:51

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Dissolved Solids | 190000 | 194000 | 1 | 2.08 | | 5 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3298291-2 03/30/18 16:51 • (LCSD) R3298291-3 03/30/18 16:51

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Solids | 8800000 | 8640000 | 8590000 | 98 2 | 97.6 | 85 0-115 | | | 0.580 | 5 |

## Method Blank (MB)

(MB) R3298295-1 03/30/18 14:12

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Dissolved Solids | U | | 2820 | 10000 |

## L981208-02 Original Sample (OS) • Duplicate (DUP)

(OS) L981208-02 03/30/18 14:12 • (DUP) R3298295-4 03/30/18 14:12

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Dissolved Solids | 491000 | 498000 | 1 | 1.42 | | 5 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3298295-2 03/30/18 14:12 • (LCSD) R3298295-3 03/30/18 14:12

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Solids | 8800000 | 8480000 | 8580000 | 96.4 | 97.5 | 85 0-115 | | | 1.17 | 5 |

## Method Blank (MB)

(MB) R3299059-1 03/31/18 16:43

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Dissolved Solids | U | | 2820 | 10000 |

## L981643-01 Original Sample (OS) • Duplicate (DUP)

(OS) L981643-01 03/31/18 16:43 • (DUP) R3299059-4 03/31/18 16:43

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Dissolved Solids | 938000 | 962000 | 1 | 2.53 | | 5 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3299059-2 03/31/18 16:43 • (LCSD) R3299059-3 03/31/18 16:43

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Solids | 8800000 | 8490000 | 8560000 | 96 5 | 97.3 | 85 0-115 | | | 0.821 | 5 |

## Method Blank (MB)

(MB) R3298648-1 04/02/18 16:01

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Dissolved Solids | U | | 2820 | 10000 |

## L981200-01 Original Sample (OS) • Duplicate (DUP)

(OS) L981200-01 04/02/18 16:01 • (DUP) R3298648-4 04/02/18 16:01

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Dissolved Solids | 167000 | 176000 | 1 | 5.25 | J3 | 5 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3298648-2 04/02/18 16:01 • (LCSD) R3298648-3 04/02/18 16:01

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Solids | 8800000 | 8630000 | 8640000 | 98.1 | 98 2 | 85 0-115 | | | 0.116 | 5 |

## Method Blank (MB)

(MB) R3297750-1 03/29/18 23:08

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Chloride | 129 | J | 51.9 | 1000 |
| Fluoride | U | | 9.90 | 100 |
| Sulfate | U | | 77.4 | 5000 |

## L981300-01 Original Sample (OS) • Duplicate (DUP)

(OS) L981300-01 03/30/18 03:46 • (DUP) R3297750-4 03/30/18 04:01

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | 186 | 100 | 1 | 59 9 | J P1 | 15 |
| Fluoride | U | 0.000 | 1 | 0.000 | | 15 |
| Sulfate | 212 | 0.000 | 1 | 200 | P1 | 15 |

## L981349-09 Original Sample (OS) • Duplicate (DUP)

(OS) L981349-09 03/30/18 07:22 • (DUP) R3297750-7 03/30/18 07:37

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | 3760 | 3680 | 1 | 2.12 | | 15 |
| Fluoride | 37.2 | 66 6 | 1 | 56 6 | J P1 | 15 |
| Sulfate | 26300 | 26900 | 1 | 2.13 | | 15 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3297750-2 03/29/18 23:24 • (LCSD) R3297750-3 03/29/18 23:39

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 40000 | 39800 | 39900 | 99 6 | 99 7 | 80.0-120 | | | 0.185 | 15 |
| Fluoride | 8000 | 8100 | 8110 | 101 | 101 | 80.0-120 | | | 0.0740 | 15 |
| Sulfate | 40000 | 40500 | 40300 | 101 | 101 | 80.0-120 | | | 0.384 | 15 |

## L981300-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L981300-01 03/30/18 03:46 • (MS) R3297750-5 03/30/18 04:17 • (MSD) R3297750-6 03/30/18 04:32

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fluoride | 5000 | U | 5200 | 5780 | 104 | 116 | 1 | 80.0-120 | | | 10.4 | 15 |
| Sulfate | 50000 | 212 | 47400 | 54900 | 94.4 | 109 | 1 | 80.0-120 | | | 14.6 | 15 |

## L981349-09 Original Sample (OS) • Matrix Spike (MS)

(OS) L981349-09 03/30/18 07:22 • (MS) R3297750-8 03/30/18 07:52

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Chloride | 50000 | 3760 | 58800 | 110 | 1 | 80.0-120 | |
| Fluoride | 5000 | 37.2 | 5350 | 106 | 1 | 80.0-120 | |
| Sulfate | 50000 | 26300 | 74200 | 95 8 | 1 | 80.0-120 | |

## Method Blank (MB)

(MB) R3298642-1 03/30/18 02:15

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Chloride | U | | 51.9 | 1000 |
| Fluoride | U | | 9.90 | 100 |
| Sulfate | U | | 77.4 | 5000 |

## L981349-06 Original Sample (OS) • Duplicate (DUP)

(OS) L981349-06 03/30/18 04:03 • (DUP) R3298642-4 03/30/18 04:18

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | 17500 | 17500 | 1 | 0.352 | | 15 |
| Fluoride | 232 | 270 | 1 | 14.9 | | 15 |

## L981349-23 Original Sample (OS) • Duplicate (DUP)

(OS) L981349-23 03/30/18 07:54 • (DUP) R3298642-6 03/30/18 08:40

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | 9110 | 9020 | 1 | 1.05 | | 15 |
| Fluoride | U | 0.000 | 1 | 0.000 | | 15 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3298642-2 03/30/18 02:30 • (LCSD) R3298642-3 03/30/18 02:45

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 40000 | 39600 | 39400 | 98 9 | 98 5 | 80.0-120 | | | 0.392 | 15 |
| Fluoride | 8000 | 8120 | 8150 | 101 | 102 | 80.0-120 | | | 0.330 | 15 |
| Sulfate | 40000 | 40200 | 40400 | 100 | 101 | 80.0-120 | | | 0.406 | 15 |

## L981349-06 Original Sample (OS) • Matrix Spike (MS)

(OS) L981349-06 03/30/18 04:03 • (MS) R3298642-5 03/30/18 04:33

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Chloride | 50000 | 17500 | 74500 | 114 | 1 | 80.0-120 | |
| Fluoride | 5000 | 232 | 5630 | 108 | 1 | 80.0-120 | |

## L981349-23 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L981349-23 03/30/18 07:54 • (MS) R3298642-7 03/30/18 08:56 • (MSD) R3298642-8 03/30/18 09:11

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 50000 | 9110 | 58600 | 67500 | 98 9 | 117 | 1 | 80.0-120 | | | 14.2 | 15 |
| Fluoride | 5000 | U | 4860 | 6080 | 97.3 | 122 | 1 | 80.0-120 | | J3 J5 | 22 2 | 15 |

## Method Blank (MB)

(MB) R3298585-1 04/02/18 15:53

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Chloride | 72.7 | J | 51.9 | 1000 |
| Fluoride | U | | 9.90 | 100 |
| Sulfate | 92 6 | J | 77.4 | 5000 |

## L981349-05 Original Sample (OS) • Duplicate (DUP)

(OS) L981349-05 04/02/18 17:09 • (DUP) R3298585-4 04/02/18 17:22

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | 3930 | 4020 | 1 | 2.31 | | 15 |
| Fluoride | 43.9 | 56 8 | 1 | 25 6 | J P1 | 15 |
| Sulfate | 33600 | 34000 | 1 | 1.20 | | 15 |

## L981349-22 Original Sample (OS) • Duplicate (DUP)

(OS) L981349-22 04/02/18 19:50 • (DUP) R3298585-7 04/02/18 20:03

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | 5450 | 5400 | 1 | 0.791 | | 15 |
| Fluoride | 172 | 160 | 1 | 6.93 | | 15 |
| Sulfate | 1310 | 1180 | 1 | 9.86 | J | 15 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3298585-2 04/02/18 16:07 • (LCSD) R3298585-3 04/02/18 16:20

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 40000 | 39600 | 39600 | 99.1 | 99.1 | 80.0-120 | | | 0.0396 | 15 |
| Fluoride | 8000 | 8020 | 8020 | 100 | 100 | 80.0-120 | | | 0.0287 | 15 |
| Sulfate | 40000 | 40100 | 40000 | 100 | 100 | 80.0-120 | | | 0.0932 | 15 |

## L981349-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L981349-05 04/02/18 17:09 • (MS) R3298585-5 04/02/18 17:35 • (MSD) R3298585-6 04/02/18 17:49

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 50000 | 3930 | 59800 | 54300 | 112 | 101 | 1 | 80.0-120 | | | 9.65 | 15 |
| Fluoride | 5000 | 43.9 | 5590 | 5380 | 111 | 107 | 1 | 80.0-120 | | | 3 67 | 15 |
| Sulfate | 50000 | 33600 | 80200 | 82200 | 93.1 | 97.1 | 1 | 80.0-120 | | | 2.45 | 15 |

## L981349-22 Original Sample (OS) • Matrix Spike (MS)

(OS) L981349-22 04/02/18 19:50 • (MS) R3298585-8 04/02/18 20:16

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Chloride | 50000 | 5450 | 61900 | 113 | 1 | 80.0-120 | |
| Fluoride | 5000 | 172 | 5510 | 107 | 1 | 80.0-120 | |
| Sulfate | 50000 | 1310 | 51100 | 99 7 | 1 | 80.0-120 | |

## Method Blank (MB)

(MB) R3298019-1 03/30/18 21:04

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Sulfate | U | | 77.4 | 5000 |

## L981395-13 Original Sample (OS) • Duplicate (DUP)

(OS) L981395-13 03/31/18 01:28 • (DUP) R3298019-7 03/31/18 01:42

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Sulfate | 293000 | 291000 | 5 | 0.581 | | 15 |

## L981680-01 Original Sample (OS) • Duplicate (DUP)

(OS) L981680-01 03/31/18 03:16 • (DUP) R3298019-8 03/31/18 03:29

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Sulfate | ND | 498 | 1 | 0.000 | | 15 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3298019-2 03/30/18 21:18 • (LCSD) R3298019-3 03/30/18 21:31

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 40000 | 40600 | 40600 | 101 | 101 | 80.0-120 | | | 0.0404 | 15 |

## L981680-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L981680-01 03/31/18 03:16 • (MS) R3298019-9 03/31/18 03:42

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Sulfate | 50000 | ND | 50900 | 101 | 1 | 80.0-120 | |

## Method Blank (MB)

(MB) R3298827-1 04/03/18 07:11

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Sulfate | U | | 77.4 | 5000 |

## L982420-01 Original Sample (OS) • Duplicate (DUP)

(OS) L982420-01 04/03/18 21:39 • (DUP) R3298827-7 04/03/18 21:54

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Sulfate | 15100 | 15400 | 1 | 1.98 | | 15 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3298827-2 04/03/18 07:26 • (LCSD) R3298827-3 04/03/18 07:42

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 40000 | 38400 | 38400 | 96.1 | 96 0 | 80.0-120 | | | 0.0601 | 15 |

## L982420-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L982420-01 04/03/18 21:39 • (MS) R3298827-8 04/03/18 22:10

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Sulfate | 50000 | 15100 | 64200 | 98 2 | 1 | 80.0-120 | |

## Method Blank (MB)

(MB) R3297618-1 03/29/18 21:53

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Boron | U | | 12.6 | 200 |
| Calcium | U | | 46.3 | 1000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3297618-2 03/29/18 21:56 • (LCSD) R3297618-3 03/29/18 21:58

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | 1010 | 1010 | 101 | 101 | 80.0-120 | | | 0.0383 | 20 |
| Calcium | 10000 | 9840 | 9820 | 98.4 | 98 2 | 80.0-120 | | | 0.280 | 20 |

## L981404-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L981404-06 03/29/18 22:01 • (MS) R3297618-5 03/29/18 22:06 • (MSD) R3297618-6 03/29/18 22:08

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | ND | 1010 | 1050 | 101 | 105 | 1 | 75.0-125 | | | 3.42 | 20 |
| Calcium | 10000 | 188000 | 189000 | 193000 | 5.80 | 50.6 | 1 | 75.0-125 | V | V | 2.34 | 20 |

## Method Blank (MB)

(MB) R3297919-1 03/30/18 15:31

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Boron | U | | 12.6 | 200 |
| Calcium | U | | 46.3 | 1000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3297919-2 03/30/18 15:33 • (LCSD) R3297919-3 03/30/18 15:36

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | 1050 | 1040 | 105 | 104 | 80.0-120 | | | 0.641 | 20 |
| Calcium | 10000 | 10400 | 10400 | 104 | 104 | 80.0-120 | | | 0.331 | 20 |

## L981349-20 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L981349-20 03/30/18 15:38 • (MS) R3297919-5 03/30/18 15:43 • (MSD) R3297919-6 03/30/18 15:46

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | 534 | 1580 | 1560 | 104 | 102 | 1 | 75.0-125 | | | 1.27 | 20 |
| Calcium | 10000 | 180000 | 188000 | 187000 | 78.7 | 68 7 | 1 | 75.0-125 | | V | 0.535 | 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.

## 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 mu tiple analytes reported. |
| Dilution | If the sample matrix contains an interfering material, 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 d fferent than 1 is used in this field, the resu t 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 qual ty 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 Qual fier is provided w thin the Glossary and Definitions page and potentially a discussion of possible implications of the Qual fier 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 resu t returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the resu ts 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. |
| 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 qual fiers 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 in tially 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 ident fication 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. |
| J5 | The sample matrix interfered w th the ability to make any accurate determination; spike value is high. |
| 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. |

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* 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 ESC Lab Sciences.



## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | n/a |
| 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] | 90010 | South Carolina | 84004 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1 4] | 2006 |
| Louisiana [1] | LA180010 | Texas | T 104704245-17-14 |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

## Third Party Federal Accreditations

| | | | |
|---|---|---|---|
| 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

## Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.

**FTN Associates - Little Rock, AR**

3 Innwood Circle, Suite 220
Little Rock, AR 72211

Billing Information:
Accounts Payable
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Report to: Dana Derrington

Email To: dld@ftn-assoc.com, hlf@ftn-assoc.com

Project Description: Entergy White Bluff Landfill

City/State Collected: Redfield, AR

Phone: 501-225-7779
Fax:

Client Project # 07920-1780-001

Lab Project # FTNLRAR-ENTERGYWB

Collected by (print): Andrew Pruitt

Site/Facility ID # Entergy White Bluff

P.O. #

Collected by (signature): Andrew Pruitt
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

Pres Chk

| Sample ID | Comp/Grab | Matrix * | Depth | Date | Time | No. of Cntrs | B, Ca 250mlHDPE-HNO3 | Cl, F, SO4, TDS 250mlHDPE-NoPres | Remarks | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-101S | Grab | GW | | 3/26/18 | 1435 | 2 | X | X | | -01 |
| MW-101D | | GW | | 3/26/18 | 1345 | 2 | X | X | | -02 |
| MW-102S | | GW | | 3/26/18 | 1640 | 2 | X | X | | -03 |
| MW-102D | | GW | | 3/26/18 | 1900 | 2 | X | X | | -04 |
| MW-103S | | GW | | 3/27/18 | 0955 | 2 | X | X | | -05 |
| MW-103D | | GW | | 3/26/18 | 1535 | 2 | X | X | | -06 |
| MW-104S | | GW | | 3/27/18 | 1255 | 2 | X | X | | -07 |
| MW-104D | | GW | | 3/26/18 | 1815 | 2 | X | X | | -08 |
| MW-105S | | GW | | 3/28/18 | 0920 | 2 | X | X | | -09 |
| MW-105D | ↓ | GW | | 3/26/18 | 1755 | 2 | X | X | | -10 |

Chain of Custody Page 1 of 3

ESC LAB SCIENCES
a subsidiary of Accelerated

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L981349

C047

Table #

Acctnum: FTNLRAR
Template: T133435
Prelogin: P643034
TSR: 134 - Mark W. Beasley
PB: 3-5-18 Gm

Shipped Via: FedEX Ground

* 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 # 426992112996/3000

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

Trip Blank Received: Yes / No
HCL / MeoH
TBR

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) |
|---|---|---|---|
| Andrew Pruitt | 3/28/18 | 1400 | |
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) |
| | | | |
| Relinquished by: (Signature) | Date: | Time: | Received for lab by: (Signature) |
| | | | Kelly Thurman 84 |

Temp: 2/2 °C Bottles Received: 46
Date: 3/29/18 Time: 0845

If preservation required by Login: Date/Time

Hold:

Condition: NCF OK

**FTN Associates - Little Rock, AR**

3 Innwood Circle, Suite 220
Little Rock, AR 72211

Billing Information:
Accounts Payable
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Pres Chk

Report to: Dana Derrington

Email To: dld@ftn-assoc.com, hlf@ftn-assoc.com

Project Description: Entergy White Bluff Landfill

City/State Collected: Redfield, AR

Phone: 501-225-7779
Fax:

Client Project # 07920-1780-001

Lab Project # FTNLRAR-ENTERGYWB

Collected by (print): Andrew Pruitt

Site/Facility ID # Entergy White Bluff

P.O. #

Collected by (signature): Andrew Pruitt

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, TDS 250mlHDPE-NoPres | Remarks | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-106S | Grab | GW | | 3/27/18 | 1520 | 2 | X | X | | -11 |
| MW-106D | | GW | | 3/26/18 | 1730 | 2 | X | X | | -12 |
| MW-107D | | GW | | 3/26/18 | 1700 | 2 | X | X | | -13 |
| MW-108D | | GW | | 3/26/18 | 1450 | 2 | X | X | | -14 |
| MW-109D | | GW | | 3/27/18 | 1330 | 2 | X | X | | -15 |
| MW-110S | | GW | | 3/27/18 | 1118 | 2 | X | X | | -16 |
| MW-110D | | GW | | 3/26/18 | 1520 | 2 | X | X | | -17 |
| ~~MW-111S~~ MW-111S | | GW | | 3/27/18 | 1613 | 2 | X | X | | -18 |
| MW-112D | | GW | | 3/26/18 | 1400 | 2 | X | X | | -19 |
| MW-113D | ↓ | GW | | 3/26/18 | 1620 | 2 | X | X | | -20 |

Analysis / Container / Preservative

* 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 # 4269 9211 2996 3000

| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) |
|---|---|---|---|
| Andrew Pruitt | 3/28/18 | 1400 | |
| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) |
| | | | |
| Relinquished by : (Signature) | Date: | Time: | Received for lab by: (Signature) |
| | | | |

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 2.1 °C Bottles Received: 46

Date: 3/29/18 Time: 0845

Sample Receipt Checklist

| | | |
|---|---|---|
| COC Seal Present/Intact: | NP | Y / N |
| COC Signed/Accurate: | | ✓ / N |
| Bottles arrive intact: | | ✓ / N |
| Correct bottles used: | | ✓ / N |
| Sufficient volume sent: | | ✓ / N |
| If Applicable | | |
| VOA Zero Headspace: | | Y / N |
| Preservation Correct/Checked: | | ✓ / N |

if preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Chain of Custody Page 2 of 3

ESC LABORATORIES
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12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L981349

Table #

Acctnum: FTNLRAR

Template: T133435

Prelogin: P643034

TSR: 134 - Mark W. Beasley

PB: 3-5-18 Gm

Shipped Via: FedEx Ground

**FTN Associates - Little Rock, AR**

3 Innwood Circle, Suite 220
Little Rock, AR 72211

Billing Information:
Accounts Payable
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Pres Chk

Report to: Dana Derrington

Email To: dld@ftn-assoc.com, hlf@ftn-assoc.com

Project Description: Entergy White Bluff Landfill

City/State Collected: Redfield, AR

Phone: 501-225-7779
Fax:

Client Project # 07920-1780-001

Lab Project # FTNLRAR-ENTERGYWB

Collected by (print): Andrew Pruitt

Site/Facility ID # Entergy White Bluff

P.O. #

Collected by (signature): Andrew Pruitt

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

| Sample ID | Comp/Grab | Matrix * | Depth | Date | Time | No. of Cntrs | B, Ca 250mlHDPE-HNO3 | Cl, F, SO4, TDS 250mlHDPE-NoPres | Remarks | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-114D | Grab | GW | | 3/26/18 | 1645 | 2 | X | X | | -21 |
| MW-115D | ↓ | GW | | 3/27/18 | 1400 | 2 | X | X | | -22 |
| MW-118D | ↓ | GW | | 3/26/18 | 1630 | 2 | X | X | | -23 |
| ~~———~~ | | ~~GW~~ | | | | ~~2~~ | ~~X~~ | ~~X~~ | | |
| ~~———~~ | | ~~GW~~ | | | | ~~2~~ | ~~X~~ | ~~X~~ | | |
| ~~———~~ | | ~~GW~~ | | | | ~~2~~ | ~~X~~ | ~~X~~ | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Chain of Custody Page 3 of 3

ESC LABORATORIES
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12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L981349

Table #

Acctnum: FTNLRAR
Template: T133435
Prelogin: P643034
TSR: 134 - Mark W. Beasley
PB: 3-5-18 GM

Shipped Via: FedEX Ground

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

Remarks:

pH _____ Temp _____
Flow _____ Other _____

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

Samples returned via: __ UPS X FedEx __ Courier __ _____

Tracking # 4269 9211 2996 3000

Trip Blank Received: Yes / No
HCL / MeoH
TBR

| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) |
|---|---|---|---|
| Andrew Pruitt | 3/28/18 | 1400 | |
| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) |
| | | | |
| Relinquished by : (Signature) | Date: | Time: | Received for lab by: (Signature) |
| | | | Kelly Allen 841 |

Temp: 2.1 °C Bottles Received: 46

If preservation required by Login: Date/Time

Date: 3/29/18 Time: 0845

Hold:

Condition: NCF OK

# ANALYTICAL REPORT

April 13, 2018

## FTN Associates - Little Rock, AR

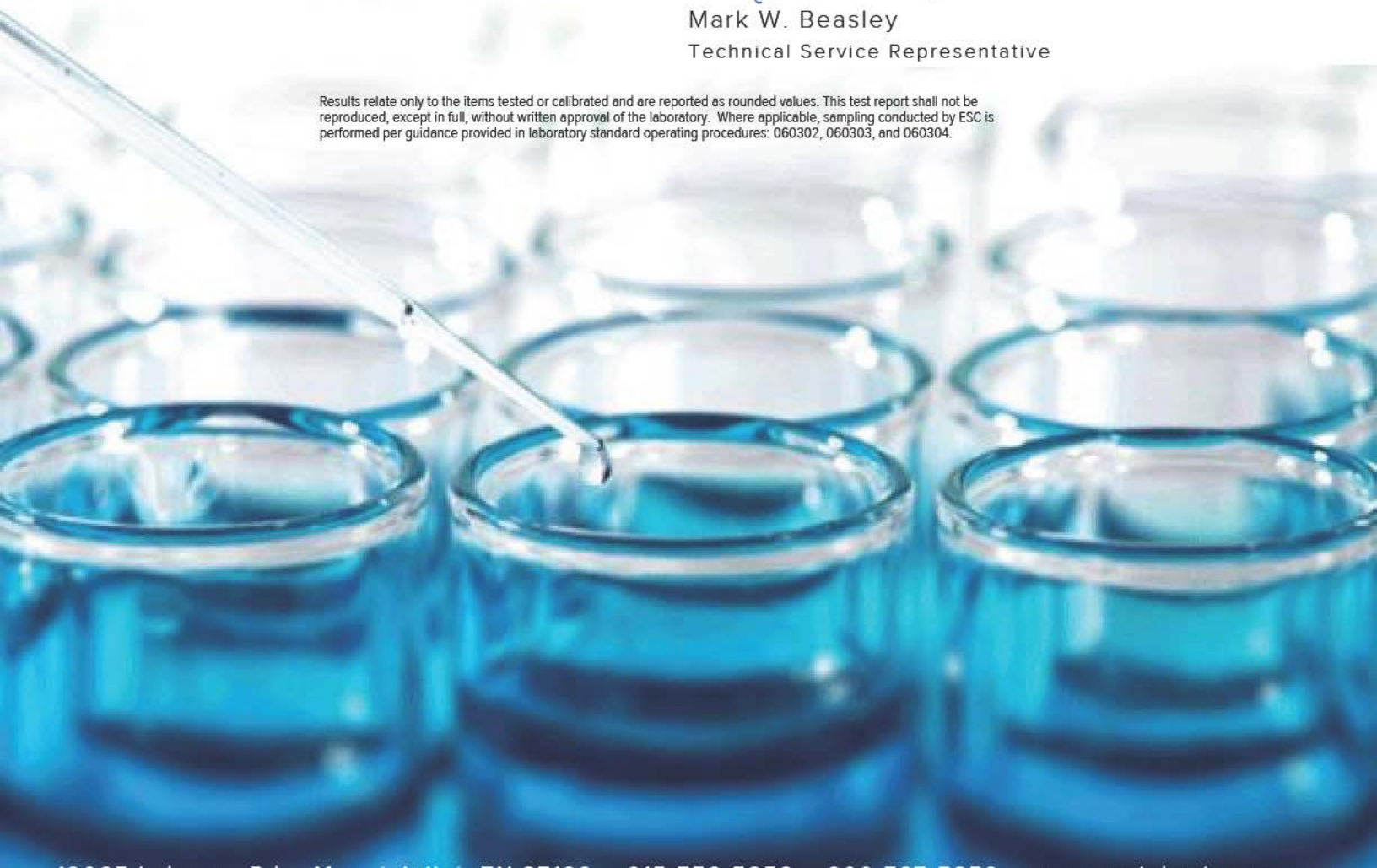
| | |
|---|---|
| Sample Delivery Group: | L984800 |
| Samples Received: | 03/29/2018 |
| Project Number: | 07920-1780-001 |
| Description: | Entergy White Bluff Landfill |

Report To: Dana Derrington
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Entire Report Reviewed By:

Mark W. Beasley
Technical Service Representative





# TABLE OF CONTENTS

## MW-106S L984800-01 GW

Collected by: Andrew Pruitt
Collected date/time: 03/27/18 15:20
Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG1096700 | 1 | 04/11/18 17:14 | 04/12/18 04:49 | TRB |

## MW-108D L984800-02 GW

Collected by: Andrew Pruitt
Collected date/time: 03/26/18 14 50
Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Wet Chemistry by Method 9056A | WG1096737 | 1 | 04/12/18 01:26 | 04/12/18 01:26 | MAJ |

## MW-111S L984800-03 GW

Collected by: Andrew Pruitt
Collected date/time: 03/27/18 16:13
Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1096830 | 1 | 04/11/18 19:17 | 04/11/18 19:42 | EG |
| Wet Chemistry by Method 9056A | WG1096737 | 1 | 04/12/18 01:41 | 04/12/18 01:41 | MAJ |
| Metals (ICP) by Method 6010B | WG1096700 | 1 | 04/11/18 17:14 | 04/12/18 04 52 | TRB |

## MW-112D L984800-04 GW

Collected by: Andrew Pruitt
Collected date/time: 03/26/18 14 00
Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1097008 | 1 | 04/12/18 18:49 | 04/12/18 19:18 | EG |
| Metals (ICP) by Method 6010B | WG1096700 | 1 | 04/11/18 17:14 | 04/12/18 04 56 | TRB |

## MW-115D L984800-05 GW

Collected by: Andrew Pruitt
Collected date/time: 03/27/18 14:00
Received date/time: 03/29/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG1096700 | 1 | 04/11/18 17:14 | 04/12/18 04 59 | TRB |

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

Mark W. Beasley
Technical Service Representative

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Calcium | 20400 | | 46.3 | 1000 | 1 | 04/12/2018 04:49 | WG1096700 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 15400 | | 51.9 | 1000 | 1 | 04/12/2018 01:26 | WG1096737 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 482000 | T8 | 2820 | 10000 | 1 | 04/11/2018 19:42 | WG1096830 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Fluoride | 254 | | 9.90 | 100 | 1 | 04/12/2018 01:41 | WG1096737 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Calcium | 37800 | | 46.3 | 1000 | 1 | 04/12/2018 04 52 | WG1096700 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 152000 | Q | 2820 | 10000 | 1 | 04/12/2018 19:18 | WG1097008 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 239 | | 12.6 | 200 | 1 | 04/12/2018 04 56 | WG1096700 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Calcium | 46900 | | 46.3 | 1000 | 1 | 04/12/2018 04 59 | WG1096700 |

## Method Blank (MB)

(MB) R3301218-1 04/11/18 19:42

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Dissolved Solids | U | | 2820 | 10000 |

## L983430-03 Original Sample (OS) • Duplicate (DUP)

(OS) L983430-03 04/11/18 19:42 • (DUP) R3301218-4 04/11/18 19:42

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Dissolved Solids | 31800000 | 33000000 | 1 | 3 70 | | 5 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3301218-2 04/11/18 19:42 • (LCSD) R3301218-3 04/11/18 19:42

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Solids | 8800000 | 8610000 | 8580000 | 97.8 | 97.5 | 85 0-115 | | | 0.349 | 5 |

## Method Blank (MB)

(MB) R3301695-1 04/12/18 19:18

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Dissolved Solids | U | | 2820 | 10000 |

## L984613-03 Original Sample (OS) • Duplicate (DUP)

(OS) L984613-03 04/12/18 19:18 • (DUP) R3301695-4 04/12/18 19:18

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Dissolved Solids | 876000 | 898000 | 1 | 2.48 | | 5 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3301695-2 04/12/18 19:18 • (LCSD) R3301695-3 04/12/18 19:18

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Solids | 8800000 | 8510000 | 8590000 | 96 7 | 97.6 | 85 0-115 | | | 0.936 | 5 |

## Method Blank (MB)

(MB) R3301138-1 04/11/18 19:20

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Chloride | U | | 51.9 | 1000 |
| Fluoride | U | | 9.90 | 100 |

## L984480-01 Original Sample (OS) • Duplicate (DUP)

(OS) L984480-01 04/11/18 22:20 • (DUP) R3301138-4 04/11/18 22:36

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | 37700 | 37800 | 1 | 0.223 | | 15 |
| Fluoride | 306 | 305 | 1 | 0.327 | | 15 |

## L984800-03 Original Sample (OS) • Duplicate (DUP)

(OS) L984800-03 04/12/18 01:41 • (DUP) R3301138-7 04/12/18 01:56

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | 4570 | 4730 | 1 | 3.40 | | 15 |
| Fluoride | 254 | 238 | 1 | 6.51 | | 15 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3301138-2 04/11/18 19:35 • (LCSD) R3301138-3 04/11/18 19:51

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 40000 | 39400 | 39300 | 98 5 | 98 3 | 80.0-120 | | | 0.177 | 15 |
| Fluoride | 8000 | 8040 | 8000 | 100 | 100 | 80.0-120 | | | 0.450 | 15 |

## L984480-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L984480-01 04/11/18 22:20 • (MS) R3301138-5 04/11/18 22:51 • (MSD) R3301138-6 04/11/18 23:38

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 50000 | 37700 | 86600 | 87200 | 97.9 | 99.1 | 1 | 80.0-120 | | | 0.673 | 15 |
| Fluoride | 5000 | 306 | 5180 | 5340 | 97.5 | 101 | 1 | 80.0-120 | | | 2.94 | 15 |

## L984800-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L984800-03 04/12/18 01:41 • (MS) R3301138-8 04/12/18 02:43

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Chloride | 50000 | 4570 | 55100 | 101 | 1 | 80.0-120 | |
| Fluoride | 5000 | 254 | 5470 | 104 | 1 | 80.0-120 | |

## Method Blank (MB)

(MB) R3301076-1 04/12/18 03:22

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Boron | U | | 12.6 | 200 |
| Calcium | U | | 46.3 | 1000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3301076-2 04/12/18 03:25 • (LCSD) R3301076-3 04/12/18 03:28

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | 978 | 981 | 97.8 | 98.1 | 80.0-120 | | | 0.376 | 20 |
| Calcium | 10000 | 9800 | 9770 | 98 0 | 97.7 | 80.0-120 | | | 0.307 | 20 |

## L984679-19 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L984679-19 04/12/18 03:32 • (MS) R3301076-5 04/12/18 03:38 • (MSD) R3301076-6 04/12/18 03:41

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | 184 | 1170 | 1160 | 98.4 | 97.6 | 1 | 75.0-125 | | | 0.680 | 20 |
| Calcium | 10000 | 130000 | 137000 | 138000 | 69 5 | 77.6 | 1 | 75.0-125 | V | | 0.587 | 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.

## Abbreviations and Definitions

| | |
|---|---|
| MDL | Method Detection Limit. |
| 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 mu tiple analytes reported. |
| Dilution | If the sample matrix contains an interfering material, 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 d fferent than 1 is used in this field, the resu t 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 qual ty 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 Qual fier is provided w thin the Glossary and Definitions page and potentially a discussion of possible implications of the Qual fier 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 resu t returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the resu ts 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. |
| 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 qual fiers 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 in tially 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 |
|---|---|
| Q | Sample was prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values. |
| T8 | Sample(s) received past/too close to holding time expiration. |
| V | The sample concentration is too high to evaluate accurate spike recoveries. |

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* 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 ESC Lab Sciences.



## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | n/a |
| 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] | 90010 | South Carolina | 84004 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1 4] | 2006 |
| Louisiana [1] | LA180010 | Texas | T 104704245-17-14 |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

## Third Party Federal Accreditations

| | | | |
|---|---|---|---|
| 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

## Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.

Chain of Custody Page 2 of 3

ESC LAB SCIENCES
a subsidiary of Accutest
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

**FTN Associates - Little Rock, AR**
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Billing Information:
Accounts Payable
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Pres Chk

Email To: dld@ftn-assoc.com, hlf@ftn-assoc.com

Report to: Dana Derrington

Project Description: Entergy White Bluff Landfill

City/State Collected: Redfield, AR

Phone: 501-225-7779
Fax:

Client Project # 07920-1780-001

Lab Project # FTNLRAR-ENTERGYWB

Collected by (print): Andrew Pruitt

Site/Facility ID # Entergy White Bluff

P.O. #

Collected by (signature): Andrew Pruitt
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

No. of Cntrs

Analysis / Container / Preservative

B, Ca 250mlHDPE-HNO3

Cl, F, SO4, TDS 250mlHDPE-NoPres

| Sample ID | Comp/Grab | Matrix * | Depth | Date | Time | | | | Remarks | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-106S | Grab | GW | | 3/27/18 | 1520 | 2 | X | X | | -11 |
| MW-106D | | GW | | 3/26/18 | 1730 | 2 | X | X | | -12 |
| MW-107D | | GW | | 3/26/18 | 1700 | 2 | X | X | | -13 |
| MW-108D | | GW | | 3/26/18 | 1450 | 2 | X | X | | -14 |
| MW-109D | | GW | | 3/27/18 | 1330 | 2 | X | X | | -15 |
| MW-110S | | GW | | 3/27/18 | 1118 | 2 | X | X | | -16 |
| MW-110D | | GW | | 3/26/18 | 1520 | 2 | X | X | | -17 |
| ~~MW-111S~~ MW-111S | | GW | | 3/27/18 | 163 | 2 | X | X | | -18 |
| MW-112D | | GW | | 3/26/18 | 1400 | 2 | X | X | | -19 |
| MW-113D | ↓ | GW | | 3/26/18 | 1620 | 2 | X | X | | -20 |

L# L981344 N 4/11/18
Table # L984300
Acctnum: FTNLRAR
Template: T133435
Prelogin: P643034
TSR: 134 - Mark W. Beasley
PB: 3-5-18 GM
Shipped Via: FedEX Ground

-01
-02
-03
-04

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

Remarks:

pH ___ Temp ___
Flow ___ Other ___

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

Samples returned via: ___ UPS ✓ FedEx ___ Courier ___

Tracking # 4219 9211 2496 3000

Trip Blank Received: Yes / No
HCL / MeoH
TBR

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) |
|---|---|---|---|
| Andrew Pruitt | 3/28/18 | 1400 | |
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) |
| | | | |
| Relinquished by: (Signature) | Date: | Time: | Received for lab by: (Signature) |
| | | | |

Temp: 2.1 °C Bottles Received: 46
Date: 3/29/18 Time: 0845

If preservation required by Login: Date/Time

Hold: Condition: NCF / OK

Chain of Custody Page 3 of 3

ESC LAB SCIENCES
a subsidiary of Pace Analytical
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

**FTN Associates - Little Rock, AR**
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Billing Information:
**Accounts Payable**
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Report to: **Dana Derrington**

Email To: dld@ftn-assoc.com, hlf@ftn-assoc.com

Project Description: **Entergy White Bluff Landfill**

City/State Collected: Redfield, AR

Phone: **501-225-7779**
Fax:

Client Project # **07920-1780-001**

Lab Project # **FTNLRAR-ENTERGYWB**

Collected by (print): Andrew Pruitt

Site/Facility ID # Entergy White Bluff

P.O. #

Collected by (signature): Andrew Pruitt
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

Free Chk ✓2

| Sample ID | Comp/Grab | Matrix * | Depth | Date | Time | No. of Cntrs | B, Ca 250mlHDPE-HNO3 | Cl, F, SO4, TDS 250mlHDPE-NoPres |
|---|---|---|---|---|---|---|---|---|
| MW-114D | Grab | GW | | 3/26/18 | 1645 | 2 | X | X |
| MW-115D | ↓ | GW | | 3/27/18 | 1400 | 2 | X | X |
| MW-118D | ↓ | GW | | 3/26/18 | 1630 | 2 | X | X |
| | | GW | | | | 2 | X | X |
| | | GW | | | | 2 | X | X |
| | | GW | | | | 2 | X | X |

L# ~~L981349~~
Table # L984800
Acctnum: FTNLRAR
Template: T133435
Prelogin: P643034
TSR: 134 - Mark W. Beasley
PB: 3-5-18 GM
Shipped Via: FedEx Ground

| Remarks | Sample # (lab only) |
|---|---|
| | ~~-21~~ |
| | ~~-22~~ -05 |
| | ~~-23~~ |

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

Remarks:

pH _____ Temp _____
Flow _____ Other _____

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

Samples returned via: UPS FedEx Courier

Tracking # 4269 9211 2996 3000

Trip Blank Received: Yes / No
HCL / MeOH
TBR

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) |
|---|---|---|---|
| Andrew Pruitt | 3/29/18 | 1400 | |
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) |
| Relinquished by: (Signature) | Date: | Time: | Received for lab by: (Signature) |
| | | | 841 |

Temp: 7.2 °C Bottles Received: 46
Date: 3/29/18 Time: 0845

If preservation required by Login: Date/Time

Hold:

Condition: NCF ✓

## Andy Vann

**From:** Mark Beasley
**Sent:** Wednesday, April 11, 2018 2:45 PM
**To:** Login; Sample Storage
**Subject:** L981349 *FTNLRAR* rush relog

Relog the following as R3 due 4/13:

| | |
|---|---|
| L981349-11 | CAICP |
| L984349-14 | CHLORIDE |
| L984349-18 | CAICP, FLUORIDE, TDS |
| L984349-19 | BICP, TDS |
| L984349-22 | CAICP |

Thanks
Mark

---

**From:** Dana Derrington [mailto:dld@ftn-assoc.com]
**Sent:** Wednesday, April 11, 2018 2:39 PM
**To:** Mark Beasley
**Cc:** hlf@ftn-assoc.com
**Subject:** RE: Revised Lab report L981349

Hi Mark,

Can you have the lab re-analyze the following samples? If we can, please put a rush on the analysis so that we have the results by this Friday.

Thanks,
Dana

| Well ID | Analyte | March 2018 Result (mg/L) |
|---|---|---|
| MW-106S | CALCIUM | 21.6 |
| MW-111S | CALCIUM | 37.2 |
| MW-111S | DISSOLVED SOLIDS | 533 |
| MW-111S | FLUORIDE | 0.284 |
| MW-112D | BORON | 0.256 |
| MW-115D | CALCIUM | 44.1 |
| MW-108D | CHLORIDE | 15.9 |
| MW-112D | DISSOLVED SOLIDS | 190 |

**Dana Derrington, PE*, PG***
FTN Associates, Ltd.
Office: (314) 514-7853

# ANALYTICAL REPORT

June 07, 2018

## FTN Associates - Little Rock, AR

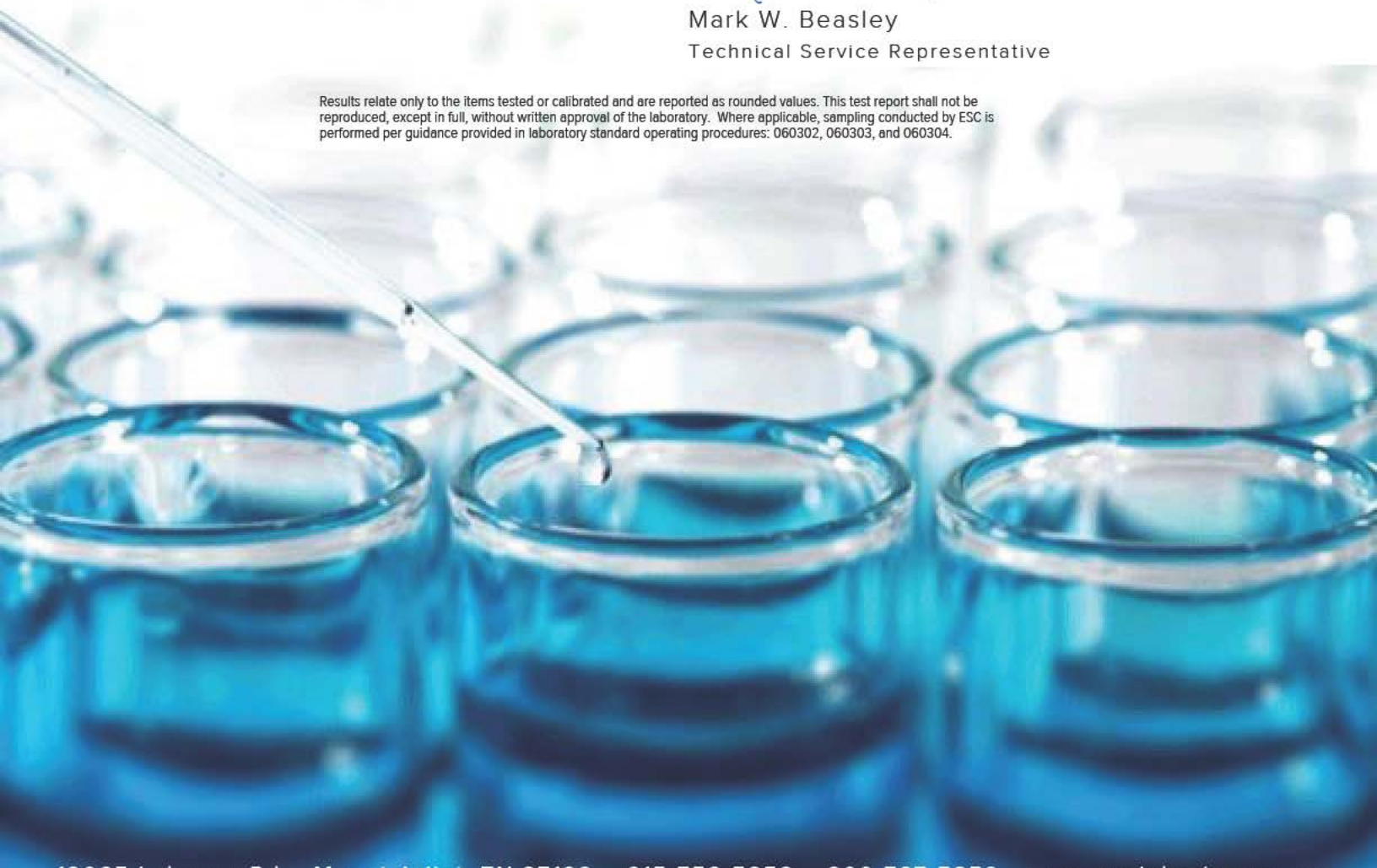
| | |
|---|---|
| Sample Delivery Group: | L998064 |
| Samples Received: | 05/31/2018 |
| Project Number: | P07920-1780-001 |
| Description: | Entergy White Bluff Landfill |

Report To: Dana Derrington
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Entire Report Reviewed By:

Mark W. Beasley
Technical Service Representative





# TABLE OF CONTENTS

## MW-104S L998064-01 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| E izabeth Studebaker | 05/30/18 13:50 | 05/31/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG1118532 | 1 | 06/04/18 17:18 | 06/06/18 16:38 | TRB |

## MW-111S L998064-02 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| E izabeth Studebaker | 05/30/18 15:03 | 05/31/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1120036 | 1 | 06/06/18 13:46 | 06/06/18 14:11 | EG |
| Wet Chemistry by Method 9056A | WG1118415 | 1 | 06/01/18 20:19 | 06/01/18 20:19 | MAJ |
| Metals (ICP) by Method 6010B | WG1118532 | 1 | 06/04/18 17:18 | 06/06/18 16:41 | TRB |

## MW-105D L998064-03 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| E izabeth Studebaker | 05/30/18 11:20 | 05/31/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1120036 | 1 | 06/06/18 13:46 | 06/06/18 14:11 | EG |
| Metals (ICP) by Method 6010B | WG1118532 | 1 | 06/04/18 17:18 | 06/06/18 16:43 | TRB |

## MW-112D L998064-04 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| E izabeth Studebaker | 05/30/18 11:43 | 05/31/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1120036 | 1 | 06/06/18 13:46 | 06/06/18 14:11 | EG |
| Metals (ICP) by Method 6010B | WG1118532 | 1 | 06/04/18 17:18 | 06/06/18 16:46 | TRB |

## MW-115D L998064-05 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| E izabeth Studebaker | 05/30/18 12:07 | 05/31/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG1118532 | 1 | 06/04/18 17:18 | 06/06/18 16:49 | TRB |

## MW-109D L998064-06 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| E izabeth Studebaker | 05/30/18 10:53 | 05/31/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG1118532 | 1 | 06/04/18 17:18 | 06/06/18 16:51 | TRB |

## MW-108D L998064-07 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| E izabeth Studebaker | 05/30/18 10:17 | 05/31/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Wet Chemistry by Method 9056A | WG1118415 | 1 | 06/01/18 21:05 | 06/01/18 21:05 | MAJ |

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

Mark W. Beasley
Technical Service Representative

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Calcium | 28600 | | 46.3 | 1000 | 1 | 06/06/2018 16:38 | WG1118532 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 542000 | | 2820 | 10000 | 1 | 06/06/2018 14:11 | WG1120036 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Fluoride | 320 | | 9.90 | 100 | 1 | 06/01/2018 20:19 | WG1118415 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Calcium | 34000 | | 46.3 | 1000 | 1 | 06/06/2018 16:41 | WG1118532 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 205000 | | 2820 | 10000 | 1 | 06/06/2018 14:11 | WG1120036 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Calcium | 19000 | | 46.3 | 1000 | 1 | 06/06/2018 16:43 | WG1118532 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 202000 | | 2820 | 10000 | 1 | 06/06/2018 14:11 | WG1120036 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 241 | B | 12.6 | 200 | 1 | 06/06/2018 16:46 | WG1118532 |
| Calcium | 24400 | | 46.3 | 1000 | 1 | 06/06/2018 16:46 | WG1118532 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Calcium | 43500 | | 46.3 | 1000 | 1 | 06/06/2018 16:49 | WG1118532 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 307 | | 12.6 | 200 | 1 | 06/06/2018 16:51 | WG1118532 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 11300 | | 51.9 | 1000 | 1 | 06/01/2018 21 05 | WG1118415 |

## Method Blank (MB)

(MB) R3316209-1 06/06/18 14:11

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Dissolved Solids | U | | 2820 | 10000 |

## L998161-02 Original Sample (OS) • Duplicate (DUP)

(OS) L998161-02 06/06/18 14:11 • (DUP) R3316209-4 06/06/18 14:11

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Dissolved Solids | 2950000 | 3050000 | 1 | 3 33 | | 5 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3316209-2 06/06/18 14:11 • (LCSD) R3316209-3 06/06/18 14:11

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Solids | 8800000 | 8530000 | 8500000 | 96 9 | 96 6 | 85 0-115 | | | 0.352 | 5 |



## Method Blank (MB)

(MB) R3314804-1 06/01/18 12:57

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Chloride | 160 | J | 51.9 | 1000 |
| Fluoride | U | | 9.90 | 100 |

## L998064-07 Original Sample (OS) • Duplicate (DUP)

(OS) L998064-07 06/01/18 21:05 • (DUP) R3314804-4 06/01/18 21:21

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | 11300 | 11300 | 1 | 0.0725 | | 15 |
| Fluoride | 73.1 | 97.1 | 1 | 28 2 | J P1 | 15 |

## L998111-02 Original Sample (OS) • Duplicate (DUP)

(OS) L998111-02 06/01/18 23:09 • (DUP) R3314804-7 06/01/18 23:24

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | U | 0.000 | 1 | 0.000 | | 15 |
| Fluoride | U | 0.000 | 1 | 0.000 | | 15 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3314804-2 06/01/18 13:13 • (LCSD) R3314804-3 06/01/18 13:28

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 40000 | 38900 | 39000 | 97.2 | 97.4 | 80.0-120 | | | 0.224 | 15 |
| Fluoride | 8000 | 7780 | 7810 | 97.3 | 97.6 | 80.0-120 | | | 0.307 | 15 |

## L998064-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L998064-07 06/01/18 21:05 • (MS) R3314804-5 06/01/18 21:36 • (MSD) R3314804-6 06/01/18 21:52

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 50000 | 11300 | 61500 | 62100 | 100 | 102 | 1 | 80.0-120 | | | 0.994 | 15 |
| Fluoride | 5000 | 73.1 | 5260 | 5320 | 104 | 105 | 1 | 80.0-120 | | | 1.06 | 15 |

## L998111-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L998111-02 06/01/18 23:09 • (MS) R3314804-8 06/02/18 00:10

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Chloride | 50000 | U | 49800 | 99 6 | 1 | 80.0-120 | |
| Fluoride | 5000 | U | 5320 | 106 | 1 | 80.0-120 | |

## Method Blank (MB)

(MB) R3316035-4 06/07/18 03:32

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Boron | 27.7 | J | 12.6 | 200 |
| Calcium | U | | 46.3 | 1000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3316035-5 06/07/18 03:35 • (LCSD) R3316035-6 06/07/18 03:37

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | 1020 | 1030 | 102 | 103 | 80.0-120 | | | 0.383 | 20 |
| Calcium | 10000 | 9760 | 9810 | 97.6 | 98.1 | 80.0-120 | | | 0.577 | 20 |

## L997916-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L997916-02 06/06/18 15:44 • (MS) R3316035-2 06/06/18 15:49 • (MSD) R3316035-3 06/06/18 15:51

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | 525 | 1550 | 1520 | 103 | 99 8 | 1 | 75.0-125 | | | 1.95 | 20 |
| Calcium | 10000 | 157000 | 167000 | 166000 | 101 | 96.1 | 1 | 75.0-125 | | | 0.294 | 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.

## Abbreviations and Definitions

| | |
|---|---|
| MDL | Method Detection Limit. |
| 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 mu tiple 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 lim t 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 qual ty 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 Qual fier is provided w thin the Glossary and Definitions page and potentially a discussion of possible implications of the Qual fier 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 resu t returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the resu ts 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. |
| 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 qual fiers 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 in tially 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 ident fication of the analyte is acceptable; the reported value is an estimate. |
| P1 | RPD value not applicable for sample concentrations less than 5 times the reporting limit. |

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* 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 ESC Lab Sciences.

## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | n/a |
| 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] | 90010 | South Carolina | 84004 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1 4] | 2006 |
| Louisiana [1] | LA180010 | Texas | T 104704245-17-14 |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

## Third Party Federal Accreditations

| | | | |
|---|---|---|---|
| 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

## Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.

**FTN Associates - Little Rock, AR**

3 Innwood Circle, Suite 220
Little Rock, AR 72211

Billing Information:
Accounts Payable
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Report to: Dana Derrington

Email To: dld@ftn-assoc.com, hlf@ftn-assoc.com, ajp@ftn-assoc.com

Project Description: Entergy White Bluff Landfill

City/State Collected: Redfield, AR

Phone: 501-920-9642
Fax:

Client Project # P07920-1780-001

Lab Project # FTNLRAR-ENTERGYWB

Collected by (print): Elizabeth Studebaker

Collected by (signature): Elizabeth Studebaker

Site/Facility ID #

P.O. #

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

Chain of Custody Page 1 of 1

ESC LAB SCIENCES
a subsidiary of Pace Analytical

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L998 06V

1174

Acctnum: FTNLRAR
Template: T136487
Prelogin: P654594
TSR: 134 - Mark W. Beasley
PB: 5-23-18

Shipped Via: FedEX Ground

| Sample ID | Comp/Grab | Matrix * | Depth | Date | Time | No. of Cntrs | BICP 250mlHDPE-HNO3 | BICP, CAICP 250mlHDPE-HNO3 | CAICP 250mlHDPE-HNO3 | CHLORIDE 125mlHDPE-NoPres | FLUORIDE, TDS 250mlHDPE-NoPres | TDS 250mlHDPE-NoPres | Remarks | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-104S | G | GW | | 05/30/18 | 1350 | 1 | | | X | | | | | -01 |
| MW-111S | G | GW | | 05/30/18 | 1503 | 2 | | | X | | X | | | 02 |
| MW-105D | G | GW | | 05/30/18 | 1120 | 2 | | | X | | | X | | 03 |
| MW-112D | G | GW | | 05/30/18 | 1143 | 2 | | X | | | | X | | 04 |
| ~~MW-115S~~ MW-115D | G | GW | | 05/30/18 | 1207 | 1 | | | X | | | | | 05 |
| MW-109D | G | GW | | 05/30/18 | 1053 | 1 | X | | | | | | | 06 |
| MW-108D | G | GW | | 05/30/18 | 1017 | 1 | | | | X | | | | 07 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

Analysis / Container / Preservative

Pres Chk: 12 12 12

* 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 # 4380 6872 6099

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

| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) |
|---|---|---|---|
| Elizabeth Studebaker | 05/30/18 | 1715 | |
| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) |
| | | | |
| Relinquished by : (Signature) | Date: | Time: | Received for lab by: (Signature) |
| | | | |

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 4.7 °C Bottles Received: 10

Date: 5/31/18 Time: 0815

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Pace Analytical®
National Center for Testing & Innovation

# ANALYTICAL REPORT

August 24, 2018

## FTN Associates - Little Rock, AR

| | |
|---|---|
| Sample Delivery Group: | L1018131 |
| Samples Received: | 08/16/2018 |
| Project Number: | 07920-1780-001 |
| Description: | Entergy White Bluff Landfill |
| Site: | ENTERGY/WHITE BLUFF |
| Report To: | Dana Derrington<br>3 Innwood Circle, Suite 220<br>Little Rock, AR 72211 |

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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## MW-101S L1018131-01 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/13/18 16:05 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1153425 | 1 | 08/17/18 09 56 | 08/17/18 10:41 | MMF |
| Wet Chemistry by Method 9056A | WG1153384 | 1 | 08/17/18 17:41 | 08/17/18 17:41 | ELN |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 15:12 | TRB |

## MW-101D L1018131-02 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/13/18 15:35 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1153427 | 1 | 08/17/18 12:13 | 08/17/18 13:06 | MMF |
| Wet Chemistry by Method 9056A | WG1153384 | 1 | 08/17/18 17:56 | 08/17/18 17:56 | ELN |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 15:23 | TRB |

## MW-102S L1018131-03 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/13/18 16:25 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1153427 | 1 | 08/17/18 12:13 | 08/17/18 13:06 | MMF |
| Wet Chemistry by Method 9056A | WG1153384 | 1 | 08/17/18 18:10 | 08/17/18 18:10 | ELN |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 15:26 | TRB |

## MW-102D L1018131-04 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/13/18 16:45 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1153427 | 1 | 08/17/18 12:13 | 08/17/18 13:06 | MMF |
| Wet Chemistry by Method 9056A | WG1153384 | 1 | 08/17/18 18:25 | 08/17/18 18:25 | ELN |
| Wet Chemistry by Method 9056A | WG1154934 | 5 | 08/20/18 22:35 | 08/20/18 22:35 | ELN |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 15:28 | TRB |

## MW-103S L1018131-05 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/15/18 13:20 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1155473 | 1 | 08/22/18 17 51 | 08/22/18 18:24 | MMF |
| Wet Chemistry by Method 9056A | WG1153384 | 1 | 08/17/18 18:39 | 08/17/18 18:39 | ELN |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 15:37 | TRB |

## MW-103D L1018131-06 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/14/18 17:25 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1153966 | 1 | 08/20/18 11:23 | 08/20/18 12:12 | AJS |
| Wet Chemistry by Method 9056A | WG1153384 | 1 | 08/17/18 18:53 | 08/17/18 18:53 | ELN |
| Wet Chemistry by Method 9056A | WG1153384 | 5 | 08/18/18 10:27 | 08/18/18 10:27 | ELN |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 15:39 | TRB |

## MW-104S L1018131-07 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/15/18 14:45 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1155473 | 1 | 08/22/18 17 51 | 08/22/18 18:24 | MMF |
| Wet Chemistry by Method 9056A | WG1153384 | 1 | 08/17/18 19:37 | 08/17/18 19:37 | ELN |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 15:42 | TRB |

## MW-104D L1018131-08 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/13/18 17:05 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1153427 | 1 | 08/17/18 12:13 | 08/17/18 13:06 | MMF |
| Wet Chemistry by Method 9056A | WG1153384 | 1 | 08/17/18 19:51 | 08/17/18 19:51 | ELN |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 15:45 | TRB |

## MW-105S L1018131-09 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/14/18 15:25 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1153966 | 1 | 08/20/18 11:23 | 08/20/18 12:12 | AJS |
| Wet Chemistry by Method 9056A | WG1153384 | 1 | 08/17/18 20 05 | 08/17/18 20 05 | ELN |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 15:48 | TRB |

## MW-105D L1018131-10 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/13/18 17:40 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1153427 | 1 | 08/17/18 12:13 | 08/17/18 13:06 | MMF |
| Wet Chemistry by Method 9056A | WG1153384 | 1 | 08/17/18 20:20 | 08/17/18 20:20 | ELN |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 15 50 | TRB |

## MW-106S L1018131-11 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/14/18 14:07 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1153966 | 1 | 08/20/18 11:23 | 08/20/18 12:12 | AJS |
| Wet Chemistry by Method 9056A | WG1153384 | 1 | 08/17/18 20:34 | 08/17/18 20:34 | ELN |
| Wet Chemistry by Method 9056A | WG1153384 | 10 | 08/18/18 10:41 | 08/18/18 10:41 | ELN |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 15 53 | TRB |

## MW-106D L1018131-12 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/14/18 11:00 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1153966 | 1 | 08/20/18 11:23 | 08/20/18 12:12 | AJS |
| Wet Chemistry by Method 9056A | WG1153384 | 1 | 08/17/18 20:49 | 08/17/18 20:49 | ELN |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 15 56 | TRB |

## MW-107D L1018131-13 GW

Collected by: Eric N. | Collected date/time: 08/13/18 18:20 | Received date/time: 08/16/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1153427 | 1 | 08/17/18 12:13 | 08/17/18 13:06 | MMF |
| Wet Chemistry by Method 9056A | WG1153384 | 1 | 08/17/18 21:03 | 08/17/18 21:03 | ELN |
| Wet Chemistry by Method 9056A | WG1153384 | 5 | 08/18/18 10 55 | 08/18/18 10 55 | ELN |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 15 59 | TRB |

## MW-108D L1018131-14 GW

Collected by: Eric N. | Collected date/time: 08/14/18 18:20 | Received date/time: 08/16/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1153966 | 1 | 08/20/18 11:23 | 08/20/18 12:12 | AJS |
| Wet Chemistry by Method 9056A | WG1153805 | 1 | 08/18/18 13:51 | 08/18/18 13:51 | MAJ |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 16 01 | TRB |

## MW-109D L1018131-15 GW

Collected by: Eric N. | Collected date/time: 08/14/18 18:55 | Received date/time: 08/16/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1153966 | 1 | 08/20/18 11:23 | 08/20/18 12:12 | AJS |
| Wet Chemistry by Method 9056A | WG1153805 | 1 | 08/18/18 14:35 | 08/18/18 14:35 | MAJ |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 16:10 | TRB |

## MW-110S L1018131-16 GW

Collected by: Eric N. | Collected date/time: 08/15/18 11:35 | Received date/time: 08/16/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1155473 | 1 | 08/22/18 17 51 | 08/22/18 18:24 | MMF |
| Wet Chemistry by Method 9056A | WG1153805 | 1 | 08/18/18 14:49 | 08/18/18 14:49 | MAJ |
| Wet Chemistry by Method 9056A | WG1154968 | 5 | 08/20/18 23:14 | 08/20/18 23:14 | ELN |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 16:12 | TRB |

## MW-110D L1018131-17 GW

Collected by: Eric N. | Collected date/time: 08/14/18 18:00 | Received date/time: 08/16/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1154343 | 1 | 08/20/18 14:45 | 08/21/18 15:16 | MMF |
| Wet Chemistry by Method 9056A | WG1153805 | 1 | 08/18/18 15 03 | 08/18/18 15 03 | MAJ |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 16:15 | TRB |

## MW-111S L1018131-18 GW

Collected by: Eric N. | Collected date/time: 08/14/18 13:06 | Received date/time: 08/16/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1154343 | 1 | 08/20/18 14:45 | 08/21/18 15:16 | MMF |
| Wet Chemistry by Method 9056A | WG1153805 | 1 | 08/18/18 15:47 | 08/18/18 15:47 | MAJ |
| Wet Chemistry by Method 9056A | WG1154968 | 5 | 08/20/18 23:29 | 08/20/18 23:29 | ELN |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 16:18 | TRB |

## MW-112D L1018131-19 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/13/18 15:05 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1153427 | 1 | 08/17/18 12:13 | 08/17/18 13:06 | MMF |
| Wet Chemistry by Method 9056A | WG1153805 | 1 | 08/18/18 16:15 | 08/18/18 16:15 | MAJ |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 16:21 | TRB |

## MW-113D L1018131-20 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/14/18 17 05 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1154343 | 1 | 08/20/18 14:45 | 08/21/18 15:16 | MMF |
| Wet Chemistry by Method 9056A | WG1153805 | 1 | 08/18/18 16:30 | 08/18/18 16:30 | MAJ |
| Wet Chemistry by Method 9056A | WG1154968 | 10 | 08/20/18 23:43 | 08/20/18 23:43 | ELN |
| Metals (ICP) by Method 6010B | WG1153626 | 1 | 08/21/18 13:20 | 08/21/18 16:24 | TRB |

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.

Mark W. Beasley
Project Manager

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 217000 | | 2820 | 10000 | 1 | 08/17/2018 10:41 | WG1153425 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 11100 | | 51.9 | 1000 | 1 | 08/17/2018 17:41 | WG1153384 |
| Fluoride | 100 | | 9.90 | 100 | 1 | 08/17/2018 17:41 | WG1153384 |
| Sulfate | 46900 | | 77.4 | 5000 | 1 | 08/17/2018 17:41 | WG1153384 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 48.7 | J | 12.6 | 200 | 1 | 08/21/2018 15:12 | WG1153626 |
| Calcium | 14100 | | 46.3 | 1000 | 1 | 08/21/2018 15:12 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 337000 | | 2820 | 10000 | 1 | 08/17/2018 13 06 | WG1153427 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 6420 | | 51.9 | 1000 | 1 | 08/17/2018 17:56 | WG1153384 |
| Fluoride | 72.5 | J | 9.90 | 100 | 1 | 08/17/2018 17:56 | WG1153384 |
| Sulfate | 65200 | | 77.4 | 5000 | 1 | 08/17/2018 17:56 | WG1153384 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 99.4 | J | 12.6 | 200 | 1 | 08/21/2018 15:23 | WG1153626 |
| Calcium | 38300 | | 46.3 | 1000 | 1 | 08/21/2018 15:23 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 194000 | | 2820 | 10000 | 1 | 08/17/2018 13 06 | WG1153427 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 7360 | | 51.9 | 1000 | 1 | 08/17/2018 18:10 | WG1153384 |
| Fluoride | 37.0 | J | 9.90 | 100 | 1 | 08/17/2018 18:10 | WG1153384 |
| Sulfate | 18700 | | 77.4 | 5000 | 1 | 08/17/2018 18:10 | WG1153384 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 38.7 | J | 12.6 | 200 | 1 | 08/21/2018 15:26 | WG1153626 |
| Calcium | 9010 | | 46.3 | 1000 | 1 | 08/21/2018 15:26 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 535000 | | 2820 | 10000 | 1 | 08/17/2018 13 06 | WG1153427 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 11000 | | 51.9 | 1000 | 1 | 08/17/2018 18:25 | WG1153384 |
| Fluoride | 34.9 | J | 9.90 | 100 | 1 | 08/17/2018 18:25 | WG1153384 |
| Sulfate | 110000 | | 387 | 25000 | 5 | 08/20/2018 22:35 | WG1154934 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 282 | | 12.6 | 200 | 1 | 08/21/2018 15:28 | WG1153626 |
| Calcium | 87600 | | 46.3 | 1000 | 1 | 08/21/2018 15:28 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 272000 | | 2820 | 10000 | 1 | 08/22/2018 18:24 | WG1155473 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 9710 | | 51.9 | 1000 | 1 | 08/17/2018 18:39 | WG1153384 |
| Fluoride | 153 | | 9.90 | 100 | 1 | 08/17/2018 18:39 | WG1153384 |
| Sulfate | 74400 | | 77.4 | 5000 | 1 | 08/17/2018 18:39 | WG1153384 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 145 | J | 12.6 | 200 | 1 | 08/21/2018 15:37 | WG1153626 |
| Calcium | 4930 | | 46.3 | 1000 | 1 | 08/21/2018 15:37 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 376000 | | 2820 | 10000 | 1 | 08/20/2018 12:12 | WG1153966 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 16500 | | 51.9 | 1000 | 1 | 08/17/2018 18:53 | WG1153384 |
| Fluoride | 188 | | 9.90 | 100 | 1 | 08/17/2018 18:53 | WG1153384 |
| Sulfate | 122000 | | 387 | 25000 | 5 | 08/18/2018 10:27 | WG1153384 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 205 | | 12.6 | 200 | 1 | 08/21/2018 15:39 | WG1153626 |
| Calcium | 41400 | | 46.3 | 1000 | 1 | 08/21/2018 15:39 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 305000 | | 2820 | 10000 | 1 | 08/22/2018 18:24 | WG1155473 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 4080 | | 51.9 | 1000 | 1 | 08/17/2018 19:37 | WG1153384 |
| Fluoride | 33.7 | J | 9.90 | 100 | 1 | 08/17/2018 19:37 | WG1153384 |
| Sulfate | 81500 | | 77.4 | 5000 | 1 | 08/17/2018 19:37 | WG1153384 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 659 | | 12.6 | 200 | 1 | 08/21/2018 15:42 | WG1153626 |
| Calcium | 30200 | | 46.3 | 1000 | 1 | 08/21/2018 15:42 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 304000 | | 2820 | 10000 | 1 | 08/17/2018 13 06 | WG1153427 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 9860 | | 51.9 | 1000 | 1 | 08/17/2018 19:51 | WG1153384 |
| Fluoride | 26 0 | J | 9.90 | 100 | 1 | 08/17/2018 19:51 | WG1153384 |
| Sulfate | 18200 | | 77.4 | 5000 | 1 | 08/17/2018 19:51 | WG1153384 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 244 | | 12.6 | 200 | 1 | 08/21/2018 15:45 | WG1153626 |
| Calcium | 52000 | | 46.3 | 1000 | 1 | 08/21/2018 15:45 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 242000 | | 2820 | 10000 | 1 | 08/20/2018 12:12 | WG1153966 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 5200 | | 51.9 | 1000 | 1 | 08/17/2018 20 05 | WG1153384 |
| Fluoride | 34.9 | J | 9.90 | 100 | 1 | 08/17/2018 20 05 | WG1153384 |
| Sulfate | 29800 | | 77.4 | 5000 | 1 | 08/17/2018 20 05 | WG1153384 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 75.8 | J | 12.6 | 200 | 1 | 08/21/2018 15:48 | WG1153626 |
| Calcium | 17500 | | 46.3 | 1000 | 1 | 08/21/2018 15:48 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Dissolved Solids | 355000 | | 2820 | 10000 | 1 | 08/17/2018 13 06 | WG1153427 |

## Wet Chemistry by Method 9056A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Chloride | 8820 | | 51.9 | 1000 | 1 | 08/17/2018 20:20 | WG1153384 |
| Fluoride | 20.8 | J | 9.90 | 100 | 1 | 08/17/2018 20:20 | WG1153384 |
| Sulfate | 34400 | | 77.4 | 5000 | 1 | 08/17/2018 20:20 | WG1153384 |

## Metals (ICP) by Method 6010B

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Boron | 273 | | 12.6 | 200 | 1 | 08/21/2018 15:50 | WG1153626 |
| Calcium | 54800 | | 46.3 | 1000 | 1 | 08/21/2018 15:50 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 738000 | | 2820 | 10000 | 1 | 08/20/2018 12:12 | WG1153966 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 12600 | | 51.9 | 1000 | 1 | 08/17/2018 20:34 | WG1153384 |
| Fluoride | 541 | | 9.90 | 100 | 1 | 08/17/2018 20:34 | WG1153384 |
| Sulfate | 479000 | | 774 | 50000 | 10 | 08/18/2018 10:41 | WG1153384 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 6520 | | 12.6 | 200 | 1 | 08/21/2018 15:53 | WG1153626 |
| Calcium | 24600 | | 46.3 | 1000 | 1 | 08/21/2018 15:53 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 329000 | | 2820 | 10000 | 1 | 08/20/2018 12:12 | WG1153966 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 5600 | | 51.9 | 1000 | 1 | 08/17/2018 20:49 | WG1153384 |
| Fluoride | 40.5 | J | 9.90 | 100 | 1 | 08/17/2018 20:49 | WG1153384 |
| Sulfate | 19400 | | 77.4 | 5000 | 1 | 08/17/2018 20:49 | WG1153384 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 313 | | 12.6 | 200 | 1 | 08/21/2018 15:56 | WG1153626 |
| Calcium | 51600 | | 46.3 | 1000 | 1 | 08/21/2018 15:56 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 534000 | | 2820 | 10000 | 1 | 08/17/2018 13 06 | WG1153427 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 20200 | | 51.9 | 1000 | 1 | 08/17/2018 21:03 | WG1153384 |
| Fluoride | 30 6 | J | 9.90 | 100 | 1 | 08/17/2018 21:03 | WG1153384 |
| Sulfate | 141000 | | 387 | 25000 | 5 | 08/18/2018 10 55 | WG1153384 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 335 | | 12.6 | 200 | 1 | 08/21/2018 15:59 | WG1153626 |
| Calcium | 81300 | | 46.3 | 1000 | 1 | 08/21/2018 15:59 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 607000 | | 2820 | 10000 | 1 | 08/20/2018 12:12 | WG1153966 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 16100 | | 51.9 | 1000 | 1 | 08/18/2018 13:51 | WG1153805 |
| Fluoride | 569 | J | 9.90 | 100 | 1 | 08/18/2018 13:51 | WG1153805 |
| Sulfate | 92400 | | 77.4 | 5000 | 1 | 08/18/2018 13:51 | WG1153805 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 339 | | 12.6 | 200 | 1 | 08/21/2018 16:01 | WG1153626 |
| Calcium | 87100 | | 46.3 | 1000 | 1 | 08/21/2018 16:01 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 384000 | | 2820 | 10000 | 1 | 08/20/2018 12:12 | WG1153966 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 8840 | | 51.9 | 1000 | 1 | 08/18/2018 14:35 | WG1153805 |
| Fluoride | 71.1 | J | 9.90 | 100 | 1 | 08/18/2018 14:35 | WG1153805 |
| Sulfate | 56900 | | 77.4 | 5000 | 1 | 08/18/2018 14:35 | WG1153805 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 326 | | 12.6 | 200 | 1 | 08/21/2018 16:10 | WG1153626 |
| Calcium | 49700 | | 46.3 | 1000 | 1 | 08/21/2018 16:10 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 311000 | | 2820 | 10000 | 1 | 08/22/2018 18:24 | WG1155473 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 6450 | | 51.9 | 1000 | 1 | 08/18/2018 14:49 | WG1153805 |
| Fluoride | 30.4 | J | 9.90 | 100 | 1 | 08/18/2018 14:49 | WG1153805 |
| Sulfate | 127000 | | 387 | 25000 | 5 | 08/20/2018 23:14 | WG1154968 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 794 | | 12.6 | 200 | 1 | 08/21/2018 16:12 | WG1153626 |
| Calcium | 4480 | | 46.3 | 1000 | 1 | 08/21/2018 16:12 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 322000 | | 2820 | 10000 | 1 | 08/21/2018 15:16 | WG1154343 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 6610 | | 51.9 | 1000 | 1 | 08/18/2018 15:03 | WG1153805 |
| Fluoride | 70.9 | J | 9.90 | 100 | 1 | 08/18/2018 15:03 | WG1153805 |
| Sulfate | 28300 | | 77.4 | 5000 | 1 | 08/18/2018 15:03 | WG1153805 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 300 | | 12.6 | 200 | 1 | 08/21/2018 16:15 | WG1153626 |
| Calcium | 43100 | | 46.3 | 1000 | 1 | 08/21/2018 16:15 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 567000 | | 2820 | 10000 | 1 | 08/21/2018 15:16 | WG1154343 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 5380 | | 51.9 | 1000 | 1 | 08/18/2018 15:47 | WG1153805 |
| Fluoride | 270 | | 9.90 | 100 | 1 | 08/18/2018 15:47 | WG1153805 |
| Sulfate | 326000 | | 387 | 25000 | 5 | 08/20/2018 23:29 | WG1154968 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 4030 | | 12.6 | 200 | 1 | 08/21/2018 16:18 | WG1153626 |
| Calcium | 39300 | | 46.3 | 1000 | 1 | 08/21/2018 16:18 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 203000 | | 2820 | 10000 | 1 | 08/17/2018 13 06 | WG1153427 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 4270 | | 51.9 | 1000 | 1 | 08/18/2018 16:15 | WG1153805 |
| Fluoride | 74 7 | J | 9.90 | 100 | 1 | 08/18/2018 16:15 | WG1153805 |
| Sulfate | U | | 77.4 | 5000 | 1 | 08/18/2018 16:15 | WG1153805 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 256 | | 12.6 | 200 | 1 | 08/21/2018 16:21 | WG1153626 |
| Calcium | 27700 | | 46.3 | 1000 | 1 | 08/21/2018 16:21 | WG1153626 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Dissolved Solids | 1060000 | | 2820 | 10000 | 1 | 08/21/2018 15:16 | WG1154343 |

## Wet Chemistry by Method 9056A

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Chloride | 13300 | | 51.9 | 1000 | 1 | 08/18/2018 16:30 | WG1153805 |
| Fluoride | 226 | J | 9.90 | 100 | 1 | 08/18/2018 16:30 | WG1153805 |
| Sulfate | 607000 | | 774 | 50000 | 10 | 08/20/2018 23:43 | WG1154968 |

## Metals (ICP) by Method 6010B

| Analyte | Result ug/l | Qualifier | MDL ug/l | RDL ug/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Boron | 471 | | 12.6 | 200 | 1 | 08/21/2018 16:24 | WG1153626 |
| Calcium | 172000 | | 46.3 | 1000 | 1 | 08/21/2018 16:24 | WG1153626 |

## Method Blank (MB)

(MB) R3335765-1 08/17/18 10:41

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Dissolved Solids | 4000 | J | 2820 | 10000 |

## L1017877-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1017877-01 08/17/18 10:41 • (DUP) R3335765-4 08/17/18 10:41

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Dissolved Solids | 555000 | 554000 | 1 | 0.180 | | 5 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3335765-2 08/17/18 10:41 • (LCSD) R3335765-3 08/17/18 10:41

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Solids | 8800000 | 8680000 | 8680000 | 98 6 | 98 6 | 85 0-115 | | | 0.000 | 10 |

## Method Blank (MB)

(MB) R3335776-1 08/17/18 13:06

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Dissolved Solids | 3000 | J | 2820 | 10000 |

## L1018131-19 Original Sample (OS) • Duplicate (DUP)

(OS) L1018131-19 08/17/18 13:06 • (DUP) R3335776-4 08/17/18 13:06

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Dissolved Solids | 203000 | 203000 | 1 | 0.000 | | 5 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3335776-2 08/17/18 13:06 • (LCSD) R3335776-3 08/17/18 13:06

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Solids | 8800000 | 8640000 | 8620000 | 98 2 | 98 0 | 85 0-115 | | | 0.232 | 10 |

## Method Blank (MB)

(MB) R3335810-1 08/20/18 12:12

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Dissolved Solids | 3000 | | 2820 | 10000 |

## L1017769-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1017769-01 08/20/18 12:12 • (DUP) R3335810-4 08/20/18 12:12

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Dissolved Solids | 275000 | 286000 | 1 | 3 92 | | 5 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3335810-2 08/20/18 12:12 • (LCSD) R3335810-3 08/20/18 12:12

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Solids | 8800000 | 8620000 | 8710000 | 98 0 | 99 0 | 85 0-115 | | | 1.04 | 10 |

## Method Blank (MB)

(MB) R3336206-1 08/21/18 15:16

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Dissolved Solids | U | | 2820 | 10000 |

## L1018241-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1018241-03 08/21/18 15:16 • (DUP) R3336206-4 08/21/18 15:16

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Dissolved Solids | 712000 | 700000 | 1 | 1.70 | | 5 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3336206-2 08/21/18 15:16 • (LCSD) R3336206-3 08/21/18 15:16

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Solids | 8800000 | 8600000 | 8630000 | 97.7 | 98.1 | 85 0-115 | | | 0.348 | 10 |

## Method Blank (MB)

(MB) R3336252-1 08/22/18 18:24

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Dissolved Solids | U | | 2820 | 10000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3336252-2 08/22/18 18:24 • (LCSD) R3336252-3 08/22/18 18:24

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Solids | 8800000 | 8670000 | 8810000 | 98 5 | 100 | 85 0-115 | | | 1.60 | 10 |

## Method Blank (MB)

(MB) R3334727-1 08/17/18 13:13

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Chloride | U | | 51.9 | 1000 |
| Fluoride | U | | 9.90 | 100 |
| Sulfate | U | | 77.4 | 5000 |

## L1018067-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1018067-01 08/17/18 14:34 • (DUP) R3334727-4 08/17/18 14:48

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | 3150 | 3100 | 1 | 1.60 | | 15 |
| Fluoride | ND | 0.000 | 1 | 0.000 | | 15 |
| Sulfate | 9700 | 9720 | 1 | 0.123 | | 15 |

## L1018071-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1018071-01 08/17/18 16:44 • (DUP) R3334727-7 08/17/18 16:58

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | 2190 | 2130 | 1 | 2.55 | | 15 |
| Fluoride | ND | 28 0 | 1 | 8.18 | J | 15 |
| Sulfate | 14000 | 14200 | 1 | 0.746 | | 15 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3334727-2 08/17/18 13:28 • (LCSD) R3334727-3 08/17/18 13:42

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 40000 | 38300 | 38300 | 95 8 | 95 7 | 80.0-120 | | | 0.189 | 15 |
| Fluoride | 8000 | 7830 | 7830 | 97.9 | 97.9 | 80.0-120 | | | 0.0140 | 15 |
| Sulfate | 40000 | 37300 | 37300 | 93.1 | 93.3 | 80.0-120 | | | 0.139 | 15 |

## L1018067-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1018067-01 08/17/18 14:34 • (MS) R3334727-5 08/17/18 15:03 • (MSD) R3334727-6 08/17/18 15:17

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 50000 | 3150 | 56900 | 54000 | 108 | 102 | 1 | 80.0-120 | | | 5.27 | 15 |
| Fluoride | 5000 | ND | 5130 | 5150 | 103 | 103 | 1 | 80.0-120 | | | 0.397 | 15 |
| Sulfate | 50000 | 9700 | 58000 | 59400 | 96 6 | 99.4 | 1 | 80.0-120 | | | 2.36 | 15 |

## L1018071-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1018071-01 08/17/18 16:44 • (MS) R3334727-8 08/17/18 17:12

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Chloride | 50000 | 2190 | 56200 | 108 | 1 | 80.0-120 | |
| Fluoride | 5000 | ND | 5220 | 104 | 1 | 80.0-120 | |
| Sulfate | 50000 | 14000 | 63000 | 97.8 | 1 | 80.0-120 | |

## Method Blank (MB)

(MB) R3335099-1 08/18/18 08:56

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Chloride | U | | 51.9 | 1000 |
| Fluoride | U | | 9.90 | 100 |
| Sulfate | U | | 77.4 | 5000 |

## L1018131-18 Original Sample (OS) • Duplicate (DUP)

(OS) L1018131-18 08/18/18 15:47 • (DUP) R3335099-6 08/18/18 16:01

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | 5380 | 5410 | 1 | 0.619 | | 15 |
| Fluoride | 270 | 272 | 1 | 0.849 | | 15 |

## L1018241-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1018241-01 08/18/18 17:42 • (DUP) R3335099-8 08/18/18 17:56

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | U | 54.8 | 1 | 200 | J P1 | 15 |
| Fluoride | U | 0.000 | 1 | 0.000 | | 15 |
| Sulfate | U | 0.000 | 1 | 0.000 | | 15 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3335099-2 08/18/18 09:10 • (LCSD) R3335099-3 08/18/18 09:25

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 40000 | 38200 | 38500 | 95.4 | 96 2 | 80.0-120 | | | 0.816 | 15 |
| Fluoride | 8000 | 7770 | 7850 | 97.1 | 98 2 | 80.0-120 | | | 1.11 | 15 |
| Sulfate | 40000 | 39000 | 39400 | 97.4 | 98.4 | 80.0-120 | | | 1.01 | 15 |

## L1018131-14 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1018131-14 08/18/18 13:51 • (MS) R3335099-4 08/18/18 14:06 • (MSD) R3335099-5 08/18/18 14:20

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 50000 | 16100 | 65700 | 65700 | 99.1 | 99.1 | 1 | 80.0-120 | | | 0.00289 | 15 |
| Fluoride | 5000 | 56 9 | 5010 | 5130 | 99 0 | 102 | 1 | 80.0-120 | | | 2.51 | 15 |

## L1018131-14 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1018131-14 08/18/18 13:51 • (MS) R3335099-4 08/18/18 14:06 • (MSD) R3335099-5 08/18/18 14:20

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 50000 | 92400 | 139000 | 140000 | 93.8 | 94.3 | 1 | 80.0-120 | E | E | 0.211 | 15 |

## L1018237-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1018237-01 08/18/18 16:44 • (MS) R3335099-7 08/18/18 16:59

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Chloride | 50000 | 7790 | 59300 | 103 | 1 | 80.0-120 | |
| Fluoride | 5000 | 57.2 | 5310 | 105 | 1 | 80.0-120 | |
| Sulfate | 50000 | 9170 | 61000 | 104 | 1 | 80.0-120 | |

## Method Blank (MB)

(MB) R3335449-1 08/20/18 19:27

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Sulfate | U | | 77.4 | 5000 |

## L1019008-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1019008-03 08/21/18 13:01 • (DUP) R3335449-9 08/21/18 13:19

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Sulfate | 112000 | 112000 | 5 | 0.138 | | 15 |

## L1019008-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1019008-07 08/21/18 14:13 • (DUP) R3335449-10 08/21/18 14:31

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Sulfate | 217000 | 216000 | 5 | 0.302 | | 15 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3335449-2 08/20/18 19:45 • (LCSD) R3335449-3 08/20/18 20:04

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 40000 | 40000 | 39900 | 100 | 99 8 | 80.0-120 | | | 0.109 | 15 |

## Method Blank (MB)

(MB) R3335206-1 08/20/18 19:20

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Sulfate | U | | 77.4 | 5000 |

## L1018061-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1018061-07 08/20/18 21:05 • (DUP) R3335206-4 08/20/18 21:19

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Sulfate | 45500 | 45400 | 1 | 0.149 | | 15 |

## L1019138-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1019138-05 08/21/18 02:07 • (DUP) R3335206-7 08/21/18 02:22

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Sulfate | 81200 | 81200 | 1 | 0.0344 | | 15 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3335206-2 08/20/18 19:35 • (LCSD) R3335206-3 08/20/18 19:49

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 40000 | 39800 | 39900 | 99 5 | 99 6 | 80.0-120 | | | 0.123 | 15 |

## L1018061-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1018061-07 08/20/18 21:05 • (MS) R3335206-5 08/20/18 21:33 • (MSD) R3335206-6 08/20/18 22:17

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 50000 | 45500 | 93400 | 93400 | 95 9 | 95 8 | 1 | 80.0-120 | | | 0.0341 | 15 |

## L1019138-05 Original Sample (OS) • Matrix Spike (MS)

(OS) L1019138-05 08/21/18 02:07 • (MS) R3335206-8 08/21/18 02:38

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Sulfate | 50000 | 81200 | 128000 | 93.4 | 1 | 80.0-120 | E |

## Method Blank (MB)

(MB) R3335498-1 08/21/18 15:04

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Boron | U | | 12.6 | 200 |
| Calcium | U | | 46.3 | 1000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3335498-2 08/21/18 15:07 • (LCSD) R3335498-3 08/21/18 15:09

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | 929 | 956 | 92 9 | 95 6 | 80.0-120 | | | 2.93 | 20 |
| Calcium | 10000 | 9680 | 9890 | 96 8 | 98 9 | 80.0-120 | | | 2.17 | 20 |

## L1018131-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1018131-01 08/21/18 15:12 • (MS) R3335498-5 08/21/18 15:17 • (MSD) R3335498-6 08/21/18 15:20

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | 48.7 | 1010 | 994 | 95 8 | 94.5 | 1 | 75.0-125 | | | 1.32 | 20 |
| Calcium | 10000 | 14100 | 25500 | 25600 | 114 | 115 | 1 | 75.0-125 | | | 0.186 | 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.

## 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 mu tiple 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 lim t 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 qual ty 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 Qual fier is provided w thin the Glossary and Definitions page and potentially a discussion of possible implications of the Qual fier 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 resu t returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the resu ts 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. |
| 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 qual fiers 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 in tially 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 |
|---|---|
| E | The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL). |
| J | The ident fication of the analyte is acceptable; the reported value is an estimate. |
| P1 | RPD value not applicable for sample concentrations less than 5 times the reporting limit. |

# ACCREDITATIONS & LOCATIONS

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* 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 National.



## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | n/a |
| 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] | 90010 | South Carolina | 84004 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1 4] | 2006 |
| Louisiana [1] | LA180010 | Texas | T 104704245-17-14 |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

## Third Party Federal Accreditations

| | | | |
|---|---|---|---|
| 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

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.

**FTN Associates - Little Rock, AR**

3 Innwood Circle, Suite 220
Little Rock, AR 72211

Billing Information:
Accounts Payable
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Pres Chk

Report to: Dana Derrington

Email To: dld@ftn-assoc.com, hlf@ftn-assoc.com, ajp@ftn-assoc.com

Project Description: Entergy White Bluff Landfill

City/State Collected:

Phone: 501-920-9642
Fax:

Client Project # 07920-1780-001

Lab Project # FTNLRAR-ENTERGYWB

Collected by (print): Eric DeCaire

Site/Facility ID #

P.O. #

Collected by (signature): Eric DeCaire

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 | B, Ca 250mlHDPE-HNO3 | Cl, F, SO4, TDS 250mlHDPE-NoPres | | | | | | | | | Remarks | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-101S | | GW | | 8/13/18 | 1605 | 2 | X | X | | | | | | | | | | -01 |
| MW-101D | | GW | | 8/13/18 | 1535 | 2 | X | X | | | | | | | | | | -02 |
| MW-102S | | GW | | 8/13/18 | 1625 | 2 | X | X | | | | | | | | | | -03 |
| MW-102D | | GW | | 8/13/18 | 1645 | 2 | X | X | | | | | | | | | | -04 |
| MW-103S | | GW | | 8/15/18 | 1320 | 2 | X | X | | | | | | | | | | -05 |
| MW-103D | | GW | | 8/14/18 | 1725 | 2 | X | X | | | | | | | | | | -06 |
| MW-104S | | GW | | 8/15/18 | 1445 | 2 | X | X | | | | | | | | | | -07 |
| MW-104D | | GW | | 8/13/18 | 1705 | 2 | X | X | | | | | | | | | | -08 |
| MW-105S | | GW | | 8/14/18 | 1525 | 2 | X | X | | | | | | | | | | -09 |
| MW-105D | | GW | | 8/13/18 | 1740 | 2 | X | X | | | | | | | | | | -10 |

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1018131
B100

Acctnum: FTNLRAR
Template: T139347
Prelogin: P666699
TSR: 134 - Mark W. Beasley
PB: To 8-9-18
Shipped Via: FedEX Standard

* 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 # 4492 6222 5300

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

| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) | Trip Blank Received: Yes / No HCL / MeoH TBR |
|---|---|---|---|---|
| Eric DeCaire | 8/15/18 | 1620 | | |
| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) | Temp: 0.6 °C Bottles Received: 10 20 40 |
| Relinquished by : (Signature) | Date: | Time: | Received for lab by: (Signature) BK Faiss | Date: 8/16/18 Time: 0845 |

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

**FTN Associates - Little Rock, AR**

3 Innwood Circle, Suite 220
Little Rock, AR 72211

Billing Information:
Accounts Payable
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Pres Chk

Report to: Dana Derrington

Email To: dld@ftn-assoc.com, hlf@ftn-assoc.com, ajp@ftn-assoc.com

Project Description: Entergy White Bluff Landfill

City/State Collected:

Phone: 501-920-9642
Fax:

Client Project # 07920-1780-001

Lab Project # FTNLRAR-ENTERGYWB

Collected by (print): Eric Necaise

Site/Facility ID # Entergy/White Bluff

P.O. #

Collected by (signature): Eric Necaise

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

Analysis / Container / Preservative

| Sample ID | Comp/Grab | Matrix * | Depth | Date | Time | No. of Ctrs | B, Ca 250mlHDPE-HNO3 | Cl, F, SO4, TDS 250mlHDPE-NoPres | Remarks | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-106S | Grab | GW | | 8/14/18 | 1407 | 2 | X | X | | -11 |
| MW-106D | | GW | | 8/14/18 | 1100 | 2 | X | X | | -12 |
| MW-107D | | GW | | 8/13/18 | 1820 | 2 | X | X | | -13 |
| MW-108D | | GW | | 8/14/18 | 1820 | 2 | X | X | | -14 |
| MW-109D | | GW | | 8/14/18 | 1855 | 2 | X | X | | -15 |
| MW-110S | | GW | | 8/15/18 | 1135 | 2 | X | X | | -16 |
| MW-110D | | GW | | 8/14/18 | 1800 | 2 | X | X | | -17 |
| MW-111S | | GW | | 8/14/18 | 1306 | 2 | X | X | | -18 |
| MW-112D | | GW | | 8/13/18 | 1505 | 2 | X | X | | -19 |
| MW-113D | | GW | | 8/14/18 | 1705 | 2 | X | X | | -20 |

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1018131

B099

Acctnum: FTNLRAR
Template: T139347
Prelogin: P666699
TSR: 134 - Mark W. Beasley
PB: TB 8-9-18
Shipped Via: FedEX Standard

* 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 # 4492 6222 3296

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

| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) | Trip Blank Received: Yes / No HCL / MeoH TBR |
|---|---|---|---|---|
| Eric Necaise | 8/15/18 | 1620 | | |
| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) | Temp: 4.1 °C Bottles Received: 20 40 |
| Relinquished by : (Signature) | Date: | Time: | Received for lab by: (Signature) Brian Fauss | Date: 8/16/18 Time: 0845 |

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Pace Analytical®
National Center for Testing & Innovation

# ANALYTICAL REPORT

August 23, 2018

## FTN Associates - Little Rock, AR

| | |
|---|---|
| Sample Delivery Group: | L1018237 |
| Samples Received: | 08/16/2018 |
| Project Number: | 07920-1780-001 |
| Description: | Entergy White Bluff Landfill |
| Site: | ENTERGY/WHITE BLUFF |
| Report To: | Dana Derrington<br>3 Innwood Circle, Suite 220<br>Little Rock, AR 72211 |

Entire Report Reviewed By:

Mark W. Beasley
Project Manager



# TABLE OF CONTENTS

## MW-114D L1018237-01 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/14/18 14:10 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1154343 | 1 | 08/20/18 14:45 | 08/21/18 15:16 | MMF |
| Wet Chemistry by Method 9056A | WG1153805 | 1 | 08/18/18 16:44 | 08/18/18 16:44 | MAJ |
| Metals (ICP) by Method 6010B | WG1153790 | 1 | 08/21/18 17:22 | 08/22/18 17:36 | ST |

## MW-115D L1018237-02 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/14/18 18:35 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1154343 | 1 | 08/20/18 14:45 | 08/21/18 15:16 | MMF |
| Wet Chemistry by Method 9056A | WG1153805 | 1 | 08/18/18 17:13 | 08/18/18 17:13 | MAJ |
| Metals (ICP) by Method 6010B | WG1153790 | 1 | 08/21/18 17:22 | 08/22/18 17:39 | ST |

## MW-118D L1018237-03 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/14/18 16:35 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1154343 | 1 | 08/20/18 14:45 | 08/21/18 15:16 | MMF |
| Wet Chemistry by Method 9056A | WG1153805 | 1 | 08/18/18 17:28 | 08/18/18 17:28 | MAJ |
| Wet Chemistry by Method 9056A | WG1154968 | 5 | 08/20/18 23 58 | 08/20/18 23 58 | ELN |
| Metals (ICP) by Method 6010B | WG1153791 | 1 | 08/22/18 08:48 | 08/22/18 15:34 | ST |

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.

Mark W. Beasley
Project Manager

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 282000 | | 2820 | 10000 | 1 | 08/21/2018 15:16 | WG1154343 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 7790 | | 51.9 | 1000 | 1 | 08/18/2018 16:44 | WG1153805 |
| Fluoride | 57.2 | J | 9.90 | 100 | 1 | 08/18/2018 16:44 | WG1153805 |
| Sulfate | 9170 | | 77.4 | 5000 | 1 | 08/18/2018 16:44 | WG1153805 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 231 | | 12.6 | 200 | 1 | 08/22/2018 17:36 | WG1153790 |
| Calcium | 46600 | | 46.3 | 1000 | 1 | 08/22/2018 17:36 | WG1153790 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 368000 | | 2820 | 10000 | 1 | 08/21/2018 15:16 | WG1154343 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 5150 | | 51.9 | 1000 | 1 | 08/18/2018 17:13 | WG1153805 |
| Fluoride | 113 | | 9.90 | 100 | 1 | 08/18/2018 17:13 | WG1153805 |
| Sulfate | 1760 | J | 77.4 | 5000 | 1 | 08/18/2018 17:13 | WG1153805 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 272 | | 12.6 | 200 | 1 | 08/22/2018 17:39 | WG1153790 |
| Calcium | 47900 | | 46.3 | 1000 | 1 | 08/22/2018 17:39 | WG1153790 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 459000 | | 2820 | 10000 | 1 | 08/21/2018 15:16 | WG1154343 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 9110 | | 51.9 | 1000 | 1 | 08/18/2018 17:28 | WG1153805 |
| Fluoride | 296 | J | 9.90 | 100 | 1 | 08/18/2018 17:28 | WG1153805 |
| Sulfate | 109000 | | 387 | 25000 | 5 | 08/20/2018 23:58 | WG1154968 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 337 | | 12.6 | 200 | 1 | 08/22/2018 15:34 | WG1153791 |
| Calcium | 74100 | | 46.3 | 1000 | 1 | 08/22/2018 15:34 | WG1153791 |

## Method Blank (MB)

(MB) R3336206-1 08/21/18 15:16

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Dissolved Solids | U | | 2820 | 10000 |

## L1018241-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1018241-03 08/21/18 15:16 • (DUP) R3336206-4 08/21/18 15:16

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Dissolved Solids | 712000 | 700000 | 1 | 1.70 | | 5 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3336206-2 08/21/18 15:16 • (LCSD) R3336206-3 08/21/18 15:16

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Solids | 8800000 | 8600000 | 8630000 | 97.7 | 98.1 | 85 0-115 | | | 0.348 | 10 |

## Method Blank (MB)

(MB) R3335099-1 08/18/18 08:56

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Chloride | U | | 51.9 | 1000 |
| Fluoride | U | | 9.90 | 100 |
| Sulfate | U | | 77.4 | 5000 |

## L1018131-18 Original Sample (OS) • Duplicate (DUP)

(OS) L1018131-18 08/18/18 15:47 • (DUP) R3335099-6 08/18/18 16:01

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | 5380 | 5410 | 1 | 0.619 | | 15 |
| Fluoride | 270 | 272 | 1 | 0.849 | | 15 |

## L1018241-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1018241-01 08/18/18 17:42 • (DUP) R3335099-8 08/18/18 17:56

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | U | 54.8 | 1 | 200 | J P1 | 15 |
| Fluoride | U | 0.000 | 1 | 0.000 | | 15 |
| Sulfate | U | 0.000 | 1 | 0.000 | | 15 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3335099-2 08/18/18 09:10 • (LCSD) R3335099-3 08/18/18 09:25

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 40000 | 38200 | 38500 | 95.4 | 96 2 | 80.0-120 | | | 0.816 | 15 |
| Fluoride | 8000 | 7770 | 7850 | 97.1 | 98 2 | 80.0-120 | | | 1.11 | 15 |
| Sulfate | 40000 | 39000 | 39400 | 97.4 | 98.4 | 80.0-120 | | | 1.01 | 15 |

## L1018131-14 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1018131-14 08/18/18 13:51 • (MS) R3335099-4 08/18/18 14:06 • (MSD) R3335099-5 08/18/18 14:20

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 50000 | 16100 | 65700 | 65700 | 99.1 | 99.1 | 1 | 80.0-120 | | | 0.00289 | 15 |
| Fluoride | 5000 | 56 9 | 5010 | 5130 | 99 0 | 102 | 1 | 80.0-120 | | | 2.51 | 15 |

## L1018131-14 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1018131-14 08/18/18 13:51 • (MS) R3335099-4 08/18/18 14:06 • (MSD) R3335099-5 08/18/18 14:20

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 50000 | 92400 | 139000 | 140000 | 93.8 | 94.3 | 1 | 80.0-120 | E | E | 0.211 | 15 |

## L1018237-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1018237-01 08/18/18 16:44 • (MS) R3335099-7 08/18/18 16:59

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Chloride | 50000 | 7790 | 59300 | 103 | 1 | 80.0-120 | |
| Fluoride | 5000 | 57.2 | 5310 | 105 | 1 | 80.0-120 | |
| Sulfate | 50000 | 9170 | 61000 | 104 | 1 | 80.0-120 | |

## Method Blank (MB)

(MB) R3335206-1 08/20/18 19:20

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Sulfate | U | | 77.4 | 5000 |

## L1018061-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1018061-07 08/20/18 21:05 • (DUP) R3335206-4 08/20/18 21:19

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Sulfate | 45500 | 45400 | 1 | 0.149 | | 15 |

## L1019138-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1019138-05 08/21/18 02:07 • (DUP) R3335206-7 08/21/18 02:22

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Sulfate | 81200 | 81200 | 1 | 0.0344 | | 15 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3335206-2 08/20/18 19:35 • (LCSD) R3335206-3 08/20/18 19:49

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 40000 | 39800 | 39900 | 99 5 | 99 6 | 80.0-120 | | | 0.123 | 15 |

## L1018061-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1018061-07 08/20/18 21:05 • (MS) R3335206-5 08/20/18 21:33 • (MSD) R3335206-6 08/20/18 22:17

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 50000 | 45500 | 93400 | 93400 | 95 9 | 95 8 | 1 | 80.0-120 | | | 0.0341 | 15 |

## L1019138-05 Original Sample (OS) • Matrix Spike (MS)

(OS) L1019138-05 08/21/18 02:07 • (MS) R3335206-8 08/21/18 02:38

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Sulfate | 50000 | 81200 | 128000 | 93.4 | 1 | 80.0-120 | E |

## Method Blank (MB)

(MB) R3335885-1 08/22/18 16:28

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Boron | U | | 12.6 | 200 |
| Calcium | U | | 46.3 | 1000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3335885-2 08/22/18 16:30 • (LCSD) R3335885-3 08/22/18 16:33

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | 950 | 959 | 95 0 | 95 9 | 80.0-120 | | | 0.977 | 20 |
| Calcium | 10000 | 10100 | 10200 | 101 | 102 | 80.0-120 | | | 1.24 | 20 |

## L1018140-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1018140-02 08/22/18 16:35 • (MS) R3335885-5 08/22/18 16:40 • (MSD) R3335885-6 08/22/18 16:43

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | ND | 1050 | 1060 | 100 | 101 | 1 | 75.0-125 | | | 0.839 | 20 |
| Calcium | 10000 | 4920 | 14700 | 14900 | 98 3 | 100 | 1 | 75.0-125 | | | 1.27 | 20 |

## Method Blank (MB)

(MB) R3335890-1 08/22/18 15:16

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Boron | U | | 12.6 | 200 |
| Calcium | U | | 46.3 | 1000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3335890-2 08/22/18 15:19 • (LCSD) R3335890-3 08/22/18 15:21

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | 962 | 970 | 96 2 | 97.0 | 80.0-120 | | | 0.785 | 20 |
| Calcium | 10000 | 9800 | 9850 | 98 0 | 98 5 | 80.0-120 | | | 0.521 | 20 |

## L1018345-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1018345-05 08/22/18 15:24 • (MS) R3335890-5 08/22/18 15:29 • (MSD) R3335890-6 08/22/18 15:31

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | ND | 1020 | 1020 | 96.1 | 96 3 | 1 | 75.0-125 | | | 0.237 | 20 |
| Calcium | 10000 | ND | 10100 | 10100 | 98.4 | 98 3 | 1 | 75.0-125 | | | 0.0682 | 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.

## Abbreviations and Definitions

| | |
|---|---|
| MDL | Method Detection Limit. |
| 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 mu tiple 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 lim t 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 qual ty 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 Qual fier is provided w thin the Glossary and Definitions page and potentially a discussion of possible implications of the Qual fier 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 resu t returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the resu ts 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. |
| 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 qual fiers 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 in tially 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 |
|---|---|
| E | The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL). |
| J | The ident fication of the analyte is acceptable; the reported value is an estimate. |
| P1 | RPD value not applicable for sample concentrations less than 5 times the reporting limit. |

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* 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 National.

## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | n/a |
| 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] | 90010 | South Carolina | 84004 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1 4] | 2006 |
| Louisiana [1] | LA180010 | Texas | T 104704245-17-14 |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

## Third Party Federal Accreditations

| | | | |
|---|---|---|---|
| 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

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.

**FTN Associates - Little Rock, AR**

3 Innwood Circle, Suite 220
Little Rock, AR 72211

Billing Information:
Accounts Payable
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Report to: Dana Derrington

Email To: dld@ftn-assoc.com, hlf@ftn-assoc.com, ajp@ftn-assoc.com

Project Description: Entergy White Bluff Landfill

City/State Collected:

Phone: 501-920-9642
Fax:

Client Project # 07920-1780-001

Lab Project # FTNLRAR-ENTERGYWB

Collected by (print): Eric Necaise

Site/Facility ID # Entergy / White Bluff

P.O. #

Collected by (signature): Eric Necaise

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 Ctrs | B, Ca 250mlHDPE-HNO3 | Cl, F, SO4, TDS 250mlHDPE-NoPres | | | | | | | | | Remarks | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-114D | Grab | GW | | 8/14/18 | 1410 | 2 | X | X | | | | | | | | | | -01 |
| MW-115D | ↓ | GW | | | 1835 | 2 | X | X | | | | | | | | | | -02 |
| MW-118D | ↓ | GW | | ↓ | 1635 | 2 | X | X | | | | | | | | | | -03 |
| | | GW | | | | 2 | X | X | | | | | | | | | | |
| | | GW | | | | 2 | X | X | | | | | | | | | | |
| | | GW | | | | 2 | X | X | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1618237
A211

Acctnum: FTNLRAR
Template: T139347
Prelogin: P666699
TSR: 134 - Mark W. Beasley
PB: TB 8-9-18
Shipped Via: FedEX Standard

* 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 # 4492 6222 3344

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: X N
Bottles arrive intact: X N
Correct bottles used: X N
Sufficient volume sent: X N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: X N
0.5 mL/HNO3

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) |
|---|---|---|---|
| Eric Necaise | 8/15/18 | 1620 | |
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) |
| Relinquished by: (Signature) | Date: | Time: | Received for lab by: (Signature) |
| | | | Kathryn Cu |

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 1.8 °C Bottles Received: 6

Date: 8/16/18 Time: 0815

If preservation required by Login: Date/Time

Hold:

Conditions NCF / OK

Pace Analytical®
National Center for Testing & Innovation

# ANALYTICAL REPORT

September 14, 2018

## FTN Associates - Little Rock, AR

| | |
|---|---|
| Sample Delivery Group: | L1025215 |
| Samples Received: | 08/16/2018 |
| Project Number: | 07920-1780-001 |
| Description: | Entergy White Bluff Landill |
| Site: | ENTERGY/WHITE BLUFF |
| Report To: | Dana Derrington<br>3 Innwood Circle, Suite 220<br>Little Rock, AR 72211 |

Entire Report Reviewed By:

Mark W. Beasley
Project Manager



# TABLE OF CONTENTS

## MW-115D L1025215-01 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/14/18 18:35 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG1165365 | 1 | 09/13/18 11:25 | 09/13/18 21:07 | ST |

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.

Mark W. Beasley
Project Manager

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Calcium | 45400 | | 46.3 | 1000 | 1 | 09/13/2018 21:07 | WG1165365 |

## Method Blank (MB)

(MB) R3341857-6 09/13/18 21:35

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Calcium | 98.4 | J | 46.3 | 1000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3341857-1 09/13/18 20:02 • (LCSD) R3341857-2 09/13/18 20:04

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Calcium | 10000 | 10000 | 10100 | 100 | 101 | 80.0-120 | | | 0.324 | 20 |

## L1025149-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1025149-11 09/13/18 20:07 • (MS) R3341857-4 09/13/18 20:13 • (MSD) R3341857-5 09/13/18 20:15

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Calcium | 10000 | 346 | 10400 | 10400 | 101 | 101 | 1 | 75.0-125 | | | 0.346 | 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.

## Abbreviations and Definitions

| | |
|---|---|
| MDL | Method Detection Limit. |
| RDL | Reported Detection Limit. |
| Rec. | Recovery. |
| RPD | Relative Percent Difference. |
| SDG | Sample Delivery Group. |
| Analyte | The name of the particular compound or analysis performed. Some Analyses and Methods will have mu tiple 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 lim t 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 qual ty 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 Qual fier is provided w thin the Glossary and Definitions page and potentially a discussion of possible implications of the Qual fier 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 resu t returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the resu ts 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. |
| 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 qual fiers 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 in tially 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 ident fication of the analyte is acceptable; the reported value is an estimate. |

# ACCREDITATIONS & LOCATIONS

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* 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 National.



## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | n/a |
| 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] | 90010 | South Carolina | 84004 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1 4] | 2006 |
| Louisiana [1] | LA180010 | Texas | T 104704245-17-14 |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

## Third Party Federal Accreditations

| | | | |
|---|---|---|---|
| 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

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.

**FTN Associates - Little Rock, AR**

3 Innwood Circle, Suite 220
Little Rock, AR 72211

Billing Information:
Accounts Payable
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Report to: Dana Derrington

Email To: dld@ftn-assoc.com, hlf@ftn-assoc.com, ajp@ftn-assoc.com

Project Description: Entergy White Bluff Landfill

City/State Collected:

Phone: 501-920-9642
Fax:

Client Project # 07920-1780-001

Lab Project # FTNLRAR-ENTERGYWB

Collected by (print): Eric Necaise

Site/Facility ID # Entergy / White Bluff

P.O. #

Collected by (signature): Eric Necaise
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

Analysis / Container / Preservative

Pres Chk: N N

| Sample ID | Comp/Grab | Matrix * | Depth | Date | Time | No. of Cntrs | B, Ca 250mlHDPE-HNO3 | Cl, F, SO4, TDS 250mlHDPE-NoPres |
|---|---|---|---|---|---|---|---|---|
| MW-114D | Grab | GW | | 8/14/18 | 1410 | 2 | X | X |
| MW-115D | ↓ | GW | | ↓ | 1835 | 2 | X | X |
| MW-118D | ↓ | GW | | ↓ | 1635 | 2 | X | X |
| | | GW | | | | 2 | X | X |
| | | GW | | | | 2 | X | X |
| | | GW | | | | 2 | X | X |

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# ~~L018237~~ A211

Acctnum: FTNLRAR
Template: T139347
Prelogin: P666699
TSR: 134 - Mark W. Beasley
PB: TB 8-9-18

Shipped Via: FedEX Standard

| Remarks | Sample # (lab only) |
|---|---|
| L1025215 | -01 |
| | ~~-02~~ |
| | ~~-03~~ |

* 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 # 4492 6222 3344

Sample Receipt Checklist

| | | |
|---|---|---|
| COC Seal Present/Intact: | Y | N |
| COC Signed/Accurate: | Y | N |
| Bottles arrive intact: | Y | N |
| Correct bottles used: | Y | N |
| Sufficient volume sent: | Y | N |
| If Applicable | | |
| VOA Zero Headspace: | Y | N |
| Preservation Correct/Checked: | Y | N |

0.5 mL MeOH

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Trip Blank Received: Yes / No HCl / MeOH TBR |
|---|---|---|---|---|
| Eric Necaise | 8/15/18 | 1420 | | |
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Temp: 1.8 °C Bottles Received: 6 |
| Relinquished by: (Signature) | Date: | Time: | Received for lab by: (Signature) | Date: 8/16/18 Time: 0815 |

If preservation required by Login: Date/Time

Hold:

Conditions: NCF / OK

L1025215

**Jeremy W. Watkins**

**From:** Mark Beasley
**Sent:** Wednesday, September 12, 2018 6:25 PM
**To:** Login; Sample Storage
**Subject:** L1018237 *FTNLRAR* relog

Relog L1018237-02 for CAICP. Log as R5 due 9/19.

Thanks
Mark

---

**From:** Heather Ferguson [mailto:hlf@ftn-assoc.com]
**Sent:** Wednesday, September 12, 2018 3:06 PM
**To:** Mark Beasley
**Subject:** FW: Pace National Report for 07920-1780-001 Entergy White Bluff Landfill L1018237
**Importance:** High

Good afternoon Mark,

Could you ask the lab to verify/re-run calcium at MW-115D from the attached SDG?

Thank you!

Heather

Heather Ferguson
FTN Associates, Ltd.
3 Innwood Circle, Suite 220 • Little Rock, AR 72211
(501) 225-7779 • fax (501) 225-6738
hlf@ftn-assoc.com
http://www.ftn-assoc.com

Pace Analytical®
National Center for Testing & Innovation

# ANALYTICAL REPORT

September 19, 2018

## FTN Associates - Little Rock, AR

| | |
|---|---|
| Sample Delivery Group: | L1025216 |
| Samples Received: | 08/16/2018 |
| Project Number: | 07920-1780-001 |
| Description: | Entergy White Bluff Landfill |
| Site: | ENTERGY/WHITE BLUFF |
| Report To: | Dana Derrington<br>3 Innwood Circle, Suite 220<br>Little Rock, AR 72211 |

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

# TABLE OF CONTENTS

## MW-101S L1025216-01 GW

Collected by: Eric N. | Collected date/time: 08/13/18 16:05 | Received date/time: 08/16/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Wet Chemistry by Method 9056A | WG1165569 | 1 | 09/14/18 17:33 | 09/14/18 17:33 | ELN |

## MW-101D L1025216-02 GW

Collected by: Eric N. | Collected date/time: 08/13/18 15:35 | Received date/time: 08/16/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Wet Chemistry by Method 9056A | WG1165569 | 1 | 09/14/18 18:15 | 09/14/18 18:15 | ELN |

## MW-103S L1025216-03 GW

Collected by: Eric N. | Collected date/time: 08/13/18 13:20 | Received date/time: 08/16/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Wet Chemistry by Method 9056A | WG1165569 | 1 | 09/14/18 18:28 | 09/14/18 18:28 | ELN |

## MW-104S L1025216-04 GW

Collected by: Eric N. | Collected date/time: 08/13/18 14:45 | Received date/time: 08/16/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG1165365 | 1 | 09/13/18 11:25 | 09/13/18 21:10 | ST |

## MW-105D L1025216-05 GW

Collected by: Eric N. | Collected date/time: 08/13/18 17:40 | Received date/time: 08/16/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1165857 | 1 | 09/15/18 12 02 | 09/15/18 13:26 | MMF |
| Metals (ICP) by Method 6010B | WG1165365 | 1 | 09/13/18 11:25 | 09/13/18 21:13 | ST |

## MW-106S L1025216-06 GW

Collected by: Eric N. | Collected date/time: 08/13/18 14:07 | Received date/time: 08/16/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG1165622 | 1 | 09/13/18 13:42 | 09/13/18 17:29 | ST |

## MW-108D L1025216-07 GW

Collected by: Eric N. | Collected date/time: 08/13/18 18:20 | Received date/time: 08/16/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Wet Chemistry by Method 9056A | WG1165569 | 1 | 09/14/18 18:42 | 09/14/18 18:42 | ELN |

## MW-109D L1025216-08 GW

Collected by: Eric N. | Collected date/time: 08/13/18 18:55 | Received date/time: 08/16/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG1165622 | 1 | 09/13/18 13:42 | 09/13/18 17:31 | ST |

## MW-111S L1025216-09 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/14/18 13:06 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1165857 | 1 | 09/15/18 12 02 | 09/15/18 13:26 | MMF |
| Wet Chemistry by Method 9056A | WG1165569 | 1 | 09/14/18 18:56 | 09/14/18 18:56 | ELN |
| Metals (ICP) by Method 6010B | WG1165622 | 1 | 09/13/18 13:42 | 09/13/18 17:34 | ST |

## MW-112D L1025216-10 GW

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Eric N. | 08/13/18 15:05 | 08/16/18 08:45 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Gravimetric Analysis by Method 2540 C-2011 | WG1165857 | 1 | 09/15/18 12 02 | 09/15/18 13:26 | MMF |
| Metals (ICP) by Method 6010B | WG1165622 | 1 | 09/13/18 13:42 | 09/13/18 17:42 | ST |

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.

Mark W. Beasley
Project Manager

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 7060 | | 51.9 | 1000 | 1 | 09/14/2018 17:33 | WG1165569 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Sulfate | 69800 | | 77.4 | 5000 | 1 | 09/14/2018 18:15 | WG1165569 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 5240 | | 51.9 | 1000 | 1 | 09/14/2018 18:28 | WG1165569 |
| Fluoride | 73.0 | J | 9.90 | 100 | 1 | 09/14/2018 18:28 | WG1165569 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Calcium | 28400 | | 46.3 | 1000 | 1 | 09/13/2018 21:10 | WG1165365 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 354000 | T8 | 2820 | 10000 | 1 | 09/15/2018 13:26 | WG1165857 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Calcium | 51600 | | 46.3 | 1000 | 1 | 09/13/2018 21:13 | WG1165365 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Calcium | 25500 | | 46.3 | 1000 | 1 | 09/13/2018 17:29 | WG1165622 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 16400 | | 51.9 | 1000 | 1 | 09/14/2018 18:42 | WG1165569 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 370 | | 12.6 | 200 | 1 | 09/13/2018 17:31 | WG1165622 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 573000 | T8 | 2820 | 10000 | 1 | 09/15/2018 13:26 | WG1165857 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Fluoride | 288 | | 9.90 | 100 | 1 | 09/14/2018 18:56 | WG1165569 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Calcium | 41000 | | 46.3 | 1000 | 1 | 09/13/2018 17:34 | WG1165622 |

## Gravimetric Analysis by Method 2540 C-2011

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Dissolved Solids | 193000 | T8 | 2820 | 10000 | 1 | 09/15/2018 13:26 | WG1165857 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 275 | | 12.6 | 200 | 1 | 09/13/2018 17:42 | WG1165622 |
| Calcium | 29200 | | 46.3 | 1000 | 1 | 09/13/2018 17:42 | WG1165622 |

## Method Blank (MB)

(MB) R3343145-1 09/15/18 13:26

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Dissolved Solids | U | | 2820 | 10000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3343145-2 09/15/18 13:26 • (LCSD) R3343145-3 09/15/18 13:26

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Solids | 8800000 | 8670000 | 8750000 | 98 5 | 99.4 | 85 0-115 | | | 0.918 | 10 |

## Method Blank (MB)

(MB) R3342169-1 09/14/18 10:58

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Chloride | U | | 51.9 | 1000 |
| Fluoride | U | | 9.90 | 100 |
| Sulfate | U | | 77.4 | 5000 |

## L1024980-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1024980-01 09/14/18 16:23 • (DUP) R3342169-4 09/14/18 16:37

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | ND | 537 | 1 | 0.000 | | 15 |
| Fluoride | ND | 0.000 | 1 | 0.000 | | 15 |
| Sulfate | ND | 0.000 | 1 | 0.000 | | 15 |

## L1025245-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1025245-01 09/14/18 19:24 • (DUP) R3342169-7 09/14/18 19:38

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | 28800 | 28900 | 1 | 0.224 | | 15 |
| Fluoride | 585 | 589 | 1 | 0.733 | | 15 |
| Sulfate | 8820 | 8830 | 1 | 0.0793 | | 15 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3342169-2 09/14/18 11:12 • (LCSD) R3342169-3 09/14/18 11:26

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 40000 | 39400 | 39400 | 98 6 | 98.4 | 80.0-120 | | | 0.151 | 15 |
| Fluoride | 8000 | 8110 | 8120 | 101 | 101 | 80.0-120 | | | 0.150 | 15 |
| Sulfate | 40000 | 39700 | 39600 | 99 3 | 99.1 | 80.0-120 | | | 0.221 | 15 |

## L1024980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1024980-01 09/14/18 16:23 • (MS) R3342169-5 09/14/18 16:51 • (MSD) R3342169-6 09/14/18 17:05

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 50000 | ND | 48700 | 48900 | 96 3 | 96 7 | 1 | 80.0-120 | | | 0.446 | 15 |
| Fluoride | 5000 | ND | 4910 | 4950 | 98 2 | 99.1 | 1 | 80.0-120 | | | 0.921 | 15 |
| Sulfate | 50000 | ND | 48800 | 49100 | 97.6 | 98 2 | 1 | 80.0-120 | | | 0.561 | 15 |

## L1025245-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1025245-01 09/14/18 19:24 • (MS) R3342169-8 09/14/18 19:52

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Chloride | 50000 | 28800 | 77900 | 98 2 | 1 | 80.0-120 | |
| Fluoride | 5000 | 585 | 5720 | 103 | 1 | 80.0-120 | |
| Sulfate | 50000 | 8820 | 58500 | 99.4 | 1 | 80.0-120 | |

## Method Blank (MB)

(MB) R3341857-6 09/13/18 21:35

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Calcium | 98.4 | J | 46.3 | 1000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3341857-1 09/13/18 20:02 • (LCSD) R3341857-2 09/13/18 20:04

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Calcium | 10000 | 10000 | 10100 | 100 | 101 | 80.0-120 | | | 0.324 | 20 |

## L1025149-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1025149-11 09/13/18 20:07 • (MS) R3341857-4 09/13/18 20:13 • (MSD) R3341857-5 09/13/18 20:15

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Calcium | 10000 | 346 | 10400 | 10400 | 101 | 101 | 1 | 75.0-125 | | | 0.346 | 20 |

## Method Blank (MB)

(MB) R3341823-1 09/13/18 17:11

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Boron | U | | 12.6 | 200 |
| Calcium | U | | 46.3 | 1000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3341823-2 09/13/18 17:14 • (LCSD) R3341823-3 09/13/18 17:16

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | 1070 | 1050 | 107 | 105 | 80.0-120 | | | 1.66 | 20 |
| Calcium | 10000 | 10300 | 10300 | 103 | 103 | 80.0-120 | | | 0.154 | 20 |

## L1025271-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1025271-01 09/13/18 17:19 • (MS) R3341823-5 09/13/18 17:24 • (MSD) R3341823-6 09/13/18 17:26

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | 262 | 1310 | 1310 | 105 | 105 | 1 | 75.0-125 | | | 0.317 | 20 |
| Calcium | 10000 | 33600 | 43700 | 44000 | 101 | 103 | 1 | 75.0-125 | | | 0.559 | 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.

## 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 mu tiple 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 lim t 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 qual ty 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 Qual fier is provided w thin the Glossary and Definitions page and potentially a discussion of possible implications of the Qual fier 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 resu t returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the resu ts 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. |
| 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 qual fiers 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 in tially 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 ident fication of the analyte is acceptable; the reported value is an estimate. |
| T8 | Sample(s) received past/too close to holding time expiration. |

# ACCREDITATIONS & LOCATIONS

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* 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 National.



## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | n/a |
| 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] | 90010 | South Carolina | 84004 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1 4] | 2006 |
| Louisiana [1] | LA180010 | Texas | T 104704245-17-14 |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

## Third Party Federal Accreditations

| | | | |
|---|---|---|---|
| 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

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.

**FTN Associates - Little Rock, AR**

3 Innwood Circle, Suite 220
Little Rock, AR 72211

Billing Information:
Accounts Payable
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Report to: Dana Derrington

Email To: dld@ftn-assoc.com, hlf@ftn-assoc.com, ajp@ftn-assoc.com

Project Description: Entergy White Bluff Landfill

City/State Collected:

Phone: 501-920-9642
Fax:

Client Project # 07920-1780-001

Lab Project # FTNLRAR-ENTERGYWB

Collected by (print): Eric Necaise

Site/Facility ID #

P.O. #

Collected by (signature): 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

Pres Chk

Analysis / Container / Preservative

| Sample ID | Comp/Grab | Matrix * | Depth | Date | Time | No. of Cntrs | B, Ca 250mlHDPE-HNO3 | Cl, F, SO4, TDS 250mlHDPE-NoPres | Remarks | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-101S | | GW | | 8/13/18 | 1605 | 2 | X | X | L1625216 | -01 ~~-01~~ |
| MW-101D | | GW | | 8/13/18 | 1535 | 2 | X | X | | 02 ~~-02~~ |
| MW-102S | | GW | | 8/13/18 | 1625 | 2 | X | X | | ~~-03~~ |
| MW-102D | | GW | | 8/13/18 | 1645 | 2 | X | X | | ~~-04~~ |
| MW-103S | | GW | | 8/15/18 | 1320 | 2 | X | X | | 03 ~~-05~~ |
| MW-103D | | GW | | 8/14/18 | 1725 | 2 | X | X | | ~~-06~~ |
| MW-104S | | GW | | 8/15/18 | 1445 | 2 | X | X | | 04 ~~-07~~ |
| MW-104D | | GW | | 8/13/18 | 1705 | 2 | X | X | | ~~-08~~ |
| MW-105S | | GW | | 8/14/18 | 1525 | 2 | X | X | | ~~-09~~ |
| MW-105D | | GW | | 8/13/18 | 1740 | 2 | X | X | | 05 ~~-10~~ |

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# ~~L1018131~~
B100

Acctnum: FTNLRAR
Template: T139347
Prelogin: P666699
TSR: 134 - Mark W. Beasley
PB: TB 8-9-18
Shipped Via: FedEX Standard

* 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 # 4492 6222 5300

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

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) |
|---|---|---|---|
| Eric Necaise | 8/15/18 | 1620 | |
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) |
| Relinquished by: (Signature) | Date: | Time: | Received for lab by: (Signature) Brian Faiss |

Trip Blank Received: Yes / (No) HCL / MeoH TBR

Temp: 0.6 °C Bottles Received: 20 40

Date: 8/16/18 Time: 0845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

**FTN Associates - Little Rock, AR**
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Billing Information:
Accounts Payable
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Pres Chk

Report to: Dana Derrington

Email To: dld@ftn-assoc.com, hlf@ftn-assoc.com, ajp@ftn-assoc.com

Project Description: Entergy White Bluff Landfill

City/State Collected:

Phone: 501-920-9642
Fax:

Client Project # 07920-1780-001

Lab Project # FTNLRAR-ENTERGYWB

Collected by (print): Eric Necaise

Site/Facility ID # Entergy/White Bluff

P.O. #

Collected by (signature): Eric Necaise

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

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

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Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# ~~L1018131~~ B099

Acctnum: FTNLRAR
Template: T139347
Prelogin: P666699
TSR: 134 - Mark W. Beasley
PB: 7b 8-9-18
Shipped Via: FedEx Standard

| Sample ID | Comp/Grab | Matrix * | Depth | Date | Time | No. of Ctnrs | B, Ca 250mlHDPE-HNO3 | Cl, F, SO4, TDS 250mlHDPE-NoPres | Remarks | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-106S | Grab | GW | | 8/14/18 | 1407 | 2 | X | X | L1025216 | -06 ~~-11~~ |
| MW-106D | | GW | | 8/14/18 | 1100 | 2 | X | X | | ~~-12~~ |
| MW-107D | | GW | | 8/13/18 | 1820 | 2 | X | X | | ~~-13~~ |
| MW-108D | | GW | | 8/14/18 | 1820 | 2 | X | X | | -07 ~~-14~~ |
| MW-109D | | GW | | 8/14/18 | 1855 | 2 | X | X | | -08 ~~-15~~ |
| MW-110S | | GW | | 8/15/18 | 1135 | 2 | X | X | | ~~-16~~ |
| MW-110D | | GW | | 8/14/18 | 1800 | 2 | X | X | | ~~-17~~ |
| MW-111S | | GW | | 8/14/18 | 1306 | 2 | X | X | | 09 ~~-18~~ |
| MW-112D | | GW | | 8/13/18 | 1505 | 2 | X | X | | 10 ~~-19~~ |
| MW-113D | | GW | | 8/14/18 | 1705 | 2 | X | X | | ~~-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 # 4492 6722 3296

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

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Trip Blank Received: Yes / No HCL / MeoH TBR |
|---|---|---|---|---|
| Eric Necaise | 8/15/18 | 1620 | | |
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Temp: 4.1 °C Bottles Received: 20 40 |
| Relinquished by: (Signature) | Date: | Time: | Received for lab by: (Signature) Pete Faucs | Date: 8/16/18 Time: 0845 |

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

**Jeremy W. Watkins**

L1025216

**From:** Mark Beasley
**Sent:** Wednesday, September 12, 2018 6:30 PM
**To:** Login; Sample Storage
**Subject:** L1018131 *FTNLRAR* relog

Relog the following as R5 due 9/19:

| | |
|---|---|
| L1018131-01 | CHLORIDE |
| L1018131-02 | SULFATE |
| L1018131-05 | CHLORIDE, FLUORIDE |
| L1018131-07 | CAICP |
| L1018131-10 | CAICP, TDS |
| L1018131-11 | CAICP |
| L1018131-14 | CHLORIDE |
| L1018131-15 | BICP |
| L1018131-18 | CAICP, TDS, FLUORIDE |
| L1018131-19 | BICP, CAICP, TDS |

Thanks
Mark

---

**From:** Heather Ferguson [mailto:hlf@ftn-assoc.com]
**Sent:** Wednesday, September 12, 2018 3:04 PM
**To:** Mark Beasley
**Subject:** FW: Pace National Report for 07920-1780-001 Entergy White Bluff Landfill L1018131
**Importance:** High

Hi Mark,

Could you ask the lab to verify/re-run the following samples from the attached SDG when you have a chance?

| | |
|---|---|
| MW-101D | SULFATE |
| MW-101S | CHLORIDE |
| MW-103S | CHLORIDE |
| MW-103S | FLUORIDE |
| MW-104S | CALCIUM |
| MW-105D | CALCIUM |
| MW-105D | DISSOLVED SOLIDS |
| MW-106S | CALCIUM |
| MW-108D | CHLORIDE |
| MW-109D | BORON |
| MW-111S | CALCIUM |
| MW-111S | DISSOLVED SOLIDS |
| MW-111S | FLUORIDE |

L 1025216

| | |
|---|---|
| MW-112D | BORON |
| MW-112D | CALCIUM |
| MW-112D | DISSOLVED SOLIDS |

Thanks so much!
Heather

Heather Ferguson
FTN Associates, Ltd.
3 Innwood Circle, Suite 220 ♦ Little Rock, AR 72211 (501) 225-7779 ♦ fax (501) 225-6738
hlf@ftn-assoc.com http://www.ftn-assoc.com

Pace Analytical®
National Center for Testing & Innovation

# ANALYTICAL REPORT

October 01, 2018

## FTN Associates - Little Rock, AR

| | |
|---|---|
| Sample Delivery Group: | L1028253 |
| Samples Received: | 09/22/2018 |
| Project Number: | |
| Description: | Entergy White Bluff Landfill |
| Site: | ENTERGY WHITE BLUFF |
| Report To: | Dana Derrington<br>3 Innwood Circle, Suite 220<br>Little Rock, AR 72211 |

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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## MW-101D L1028253-01 GW

Collected by: Andrew Pruitt | Collected date/time: 09/20/18 14:00 | Received date/time: 09/22/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Wet Chemistry by Method 9056A | WG1170676 | 1 | 09/25/18 21:35 | 09/25/18 21:35 | ELN |

## MW-112D L1028253-02 GW

Collected by: Andrew Pruitt | Collected date/time: 09/20/18 13:00 | Received date/time: 09/22/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG1170810 | 1 | 09/26/18 11 06 | 09/27/18 02:25 | TRB |

## MW-115D L1028253-03 GW

Collected by: Andrew Pruitt | Collected date/time: 09/20/18 11:30 | Received date/time: 09/22/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Metals (ICPMS) by Method 6020 | WG1170426 | 1 | 09/26/18 13:51 | 09/26/18 17:25 | LD |

## MW-108D L1028253-04 GW

Collected by: Andrew Pruitt | Collected date/time: 09/20/18 13:30 | Received date/time: 09/22/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Wet Chemistry by Method 9056A | WG1170676 | 1 | 09/25/18 22:44 | 09/25/18 22:44 | ELN |

## MW-106S L1028253-05 GW

Collected by: Andrew Pruitt | Collected date/time: 09/20/18 15:52 | Received date/time: 09/22/18 08:45

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Metals (ICPMS) by Method 6020 | WG1170426 | 1 | 09/26/18 13:51 | 09/26/18 17:29 | LD |

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.

Mark W. Beasley
Project Manager

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Sulfate | 19500 | | 77.4 | 5000 | 1 | 09/25/2018 21:35 | WG1170676 |

## Metals (ICP) by Method 6010B

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Boron | 297 | | 12.6 | 200 | 1 | 09/27/2018 02:25 | WG1170810 |

## Metals (ICPMS) by Method 6020

| Analyte | Resu t | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Calcium | 47000 | | 46.0 | 1000 | 1 | 09/26/2018 17:25 | WG1170426 |

## Wet Chemistry by Method 9056A

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Chloride | 15900 | | 51.9 | 1000 | 1 | 09/25/2018 22:44 | WG1170676 |

## Metals (ICPMS) by Method 6020

| Analyte | Result | Qualifier | MDL | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|---|
| | ug/l | | ug/l | ug/l | | date / time | |
| Calcium | 24900 | | 46.0 | 1000 | 1 | 09/26/2018 17:29 | WG1170426 |

## Method Blank (MB)

(MB) R3345158-1 09/25/18 09:47

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Chloride | U | | 51.9 | 1000 |
| Sulfate | U | | 77.4 | 5000 |

## L1027695-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1027695-01 09/25/18 18:06 • (DUP) R3345158-4 09/25/18 18:20

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | 8470 | 8490 | 1 | 0.206 | | 15 |
| Sulfate | 10400 | 10500 | 1 | 0.623 | | 15 |

## L1028253-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1028253-01 09/25/18 21:35 • (DUP) R3345158-7 09/25/18 21:48

| Analyte | Original Resu t ug/l | DUP Result ug/l | Dilution | DUP RPD % | DUP Qua ifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | 7080 | 7160 | 1 | 1.13 | | 15 |
| Sulfate | 19500 | 19600 | 1 | 0.613 | | 15 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3345158-2 09/25/18 10:01 • (LCSD) R3345158-3 09/25/18 10:15

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 40000 | 38100 | 37600 | 95 2 | 94.1 | 80.0-120 | | | 1.16 | 15 |
| Sulfate | 40000 | 38500 | 38100 | 96.4 | 95.1 | 80.0-120 | | | 1.28 | 15 |

## L1027695-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1027695-01 09/25/18 18:06 • (MS) R3345158-5 09/25/18 18:34 • (MSD) R3345158-6 09/25/18 18:48

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 50000 | 8470 | 58200 | 58500 | 99 5 | 100 | 1 | 80.0-120 | | | 0.411 | 15 |
| Sulfate | 50000 | 10400 | 60000 | 60100 | 99 3 | 99 5 | 1 | 80.0-120 | | | 0.177 | 15 |

## L1028253-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1028253-01 09/25/18 21:35 • (MS) R3345158-8 09/25/18 22:30

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Chloride | 50000 | 7080 | 57500 | 101 | 1 | 80.0-120 | |
| Sulfate | 50000 | 19500 | 69500 | 100 | 1 | 80.0-120 | |

## Method Blank (MB)

(MB) R3345506-1 09/27/18 01:38

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Boron | U | | 12.6 | 200 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3345506-2 09/27/18 01:40 • (LCSD) R3345506-3 09/27/18 01:43

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | 1030 | 1030 | 103 | 103 | 80.0-120 | | | 0.0922 | 20 |

## L1028225-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1028225-02 09/27/18 01:46 • (MS) R3345506-5 09/27/18 01:51 • (MSD) R3345506-6 09/27/18 01:53

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1000 | ND | 1130 | 1120 | 105 | 104 | 1 | 75.0-125 | | | 0.888 | 20 |

## Method Blank (MB)

(MB) R3345470-1 09/26/18 16:52

| Analyte | MB Result ug/l | MB Qualifier | MB MDL ug/l | MB RDL ug/l |
|---|---|---|---|---|
| Calcium | U | | 46.0 | 1000 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3345470-2 09/26/18 16:56 • (LCSD) R3345470-3 09/26/18 17:00

| Analyte | Spike Amount ug/l | LCS Resu t ug/l | LCSD Result ug/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Calcium | 5000 | 4970 | 4740 | 99.4 | 94.7 | 80.0-120 | | | 4 78 | 20 |

## L1028306-30 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1028306-30 09/26/18 17:04 • (MS) R3345470-5 09/26/18 17:12 • (MSD) R3345470-6 09/26/18 17:16

| Analyte | Spike Amount ug/l | Original Resu t ug/l | MS Resu t ug/l | MSD Result ug/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qua ifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Calcium | 5000 | 34000 | 39000 | 38500 | 100 | 90.5 | 1 | 75.0-125 | | | 1.27 | 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.

## 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 mu tiple 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 lim t 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 qual ty 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 Qual fier is provided w thin the Glossary and Definitions page and potentially a discussion of possible implications of the Qual fier 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 resu t returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the resu ts 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. |
| 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 qual fiers 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 in tially 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 |
|---|---|

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* 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 National.

## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | n/a |
| 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] | 90010 | South Carolina | 84004 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1 4] | 2006 |
| Louisiana [1] | LA180010 | Texas | T 104704245-17-14 |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

## Third Party Federal Accreditations

| | | | |
|---|---|---|---|
| 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

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.

**FTN Associates - Little Rock, AR**

3 Innwood Circle, Suite 220
Little Rock, AR 72211

Billing Information:
Accounts Payable
3 Innwood Circle, Suite 220
Little Rock, AR 72211

Pres Chk

Report to: Dana Derrington

Email To: dld@ftn-assoc.com, hlf@ftn-assoc.com, ajp@ftn-assoc.com

Project Description: Entergy White Bluff Landfill

City/State Collected: Redfield, AR

Phone: 501-920-9642
Fax:

Client Project #

Lab Project # FTNLRAR-ENTERGYWB

Collected by (print): Andrew Pruitt

Site/Facility ID # Entergy WhiteBluff

P.O. #

Collected by (signature): Andrew Pruitt

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 | 125mlHDPE-NoPres | 250mlHDPE-HNO3 | 250mlHDPE-NoPres | BICP 250mlHDPE-HNO3 | BICP, CAICP 250mlHDPE-HNO3 | CAICP 250mlHDPE-HNO3 | CHLORIDE 125mlHDPE-NoPres | CHLORIDE,FLUORIDE 125mlHDPE-NoPres | FLUORIDE 125mlHDPE-NoPres | SULFATE 125mlHDPE-NoPres | Remarks | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-101D | Grab | GW | | 9/20/18 | 1400 | 1 | | | | | | | | | | X | | 01 |
| MW-112D | | GW | | | 1300 | 3 1 | X | X | X | X | | | | | | | | 02 |
| MW-115D | | GW | | | 1130 | 1 | | | | | | X | | | | | | 03 |
| MW-108D | | GW | | | 1330 | 1 | | | | | | | X | | | | | 04 |
| MW-106S | ↓ | GW | | ↓ | 1552 | 1 | | | | | | X | | | | | | 05 |

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1023253

G070

Acctnum: FTNLRAR
Template: T140634
Prelogin: P672419
TSR: 134 - Mark W. Beasley
PB: 9-13-18

Shipped Via: FedEX Ground

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

Remarks: FIELD SCREEN: <0.5 mR/hr

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking # 449262312497

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

| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) | Trip Blank Received: Yes / No (HCl / MeoH) TBR | If preservation required by Login: Date/Time |
|---|---|---|---|---|---|
| Andrew Pruitt | 9/21/18 | 1700 | | 1 | |
| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) | Temp: 2.8 °C Bottles Received: 5 | |
| Relinquished by : (Signature) | Date: | Time: | Received for lab by: (Signature) | Date: 9-22-18 Time: 0845 | Hold: Condition: NCF / OK |

# APPENDIX C

**Alternate Source Demonstrations**

# Alternate Source Demonstration

Entergy White Bluff Plant
Coal Ash Disposal Landfill
Redfield, Jefferson County, Arkansas

**April 2018**

*Privileged and Confidential*
*Prepared at the Request of Counsel/Attorney-Client Communication/Attorney Work Product*

# Alternate Source Demonstration

## Entergy White Bluff Plant
## Coal Ash Disposal Landfill
## Redfield, Jefferson County, Arkansas

**April 2018**

*Prepared For*
*Entergy Arkansas, Inc.*
*White Bluff Plant*
*1100 White Bluff Road*
*Redfield, Arkansas 72132*


R. Kent Nilsson, P.E.
Senior Engineer

Jason S. House
Project Manager

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# Executive Summary

Entergy Arkansas, LLC (Entergy) operates the Entergy White Bluff Plant (Plant), a coal fired power plant, to generate electricity. The Plant is located near Redfield, Jefferson County, Arkansas, as shown in Figure 1.

Coal combustion residuals (CCR) are produced as part of the electrical generation operations and have historically been managed by Entergy as follows:

- Beneficial use in local construction projects.
- Beneficial use as road bed material at the facility landfill.
- Placement into Entergy's on-site landfill.

Entergy operates a Class 3N non-commercial industrial landfill under Arkansas Department of Environmental Quality (ADEQ) Solid Waste Permit No. 0199-S3N-R3. Entergy also manages CCR at the landfill as provided in the federal Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule (CCR Rule), effective October 17, 2015.

Pursuant to the CCR Rule, Entergy has installed a groundwater monitoring system and has implemented groundwater monitoring at the landfill. The CCR certified groundwater monitoring network consists of 23 wells screened in two hydrogeologic units at the landfill (see Figure 2). These units are referred to as Stratum I (shallow) and III (deep). These units are separated by a low permeability hydrogeologic unit (Stratum II). Stratum I monitoring wells are designed by a "S" after the well number, and Stratum III monitoring wells are designated by a "D" after the well number. Potentiometric maps for Stratum I and Stratum III are shown in Figures 3 and 4, respectively.

Pursuant to the CCR Rule, eight quarterly background groundwater monitoring events were performed from the fourth quarter 2015 through the third quarter 2017. The samples were analyzed for the Appendix III to Part 257 – Constituents for Detection Monitoring and the Appendix IV to Part 257 – Constituents for Assessment Monitoring parameters. Upon completion of the background sampling, the first semiannual detection monitoring event for the Appendix III constituents was performed in August 2017 and verification sampling was performed in November 2017. Statistical analysis of these results relative to the background results was performed pursuant to 40 CFR 257.93(f) and the Statistical Analysis Plan (FTN 2017a). Based on the results of this statistical analysis, the concentrations of Appendix III constituents

were within the intrawell prediction limits for each constituent at each monitoring well, except as follows:

- pH (MW-103S)
- Calcium and TDS (MW-104S)
- Calcium and TDS (MW-105D)
- Calcium (MW-112D)
- Boron (MW-109D)

The pH statistically significant level (SSL) at MW-103S, and the calcium statistically significant increase (SSI) at MW-104S are a result of exceedances of the intrawell predictive limits. The remainder of the SSIs are a result of increasing trends at 98% confidence levels using Sen's Slope test.

Pursuant to 40 CFR257.94(e)(2), Entergy may demonstrate that a source other than the CCR management unit caused the SSIs or that the SSLs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. 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 demonstrates that the SSIs determined based on the first semiannual detection monitoring event performed in 2017 are not due to leakage from the base of the active landfill, but are due to the following:

- The source of the pH SSL in groundwater at MW-103S is natural variation in the groundwater quality. This conclusion is based on the following primary lines of evidence:
  - Similar trends of decreasing pH are observed in monitoring wells in the same area as MW-103S (Figure 5) and the natural pH range of the groundwater in this area is between 2.0 and 8.1 su (FTN 2017b, Kresse et al. 2014); and
  - CCR leachate is alkaline; therefore, pH in groundwater impacted due to leakage from the active landfill would be increasing and not decreasing. The pH of the active CADL leachate is 8.15 su compared to the pH at well MW-103S of 4.3 su.
- The source of the calcium SSI in groundwater at MW-104S is natural variation in the groundwater quality. This conclusion is based on the following primary lines of evidence:
  - MW-104S is a background monitoring well. Other background monitoring wells in the groundwater monitoring system have a range of groundwater calcium concentrations similar to MW-104S (Figure 6); and
  - Concentrations of calcium in the active landfill leachate are less than the concentration in MW-104S.

- The source of the TDS SSI in groundwater at MW-104S is natural variation in the groundwater quality. This conclusion is based on the following primary lines of evidence:
  - MW-104S is an upgradient, Stratum I background monitoring well with TDS concentrations within the background fluctuations measured at MW-101S, another Stratum I background monitoring well (Figure 7); and
  - The TDS concentrations measured in MW-104S are greater than the TDS measured in the leachate sample from the active landfill (Table 2).
- The source of the calcium and TDS SSIs in the groundwater at MW-105D are natural variation in the groundwater quality. This conclusion is based on the following primary lines of evidence:
  - Stratum III background monitoring wells provide the ranges of natural calcium and TDS concentration occurring naturally in groundwater. Time-concentration trends (Figure 8 and 9) show calcium and TDS at MW-105D to be within those background ranges; and
  - Calcium and TDS concentrations in the leachate from the active landfill are less than the measured concentrations in MW-105D.
- The source of the calcium SSI in the groundwater at MW-112D is natural variation in the groundwater quality. This conclusion is based on the following primary line of evidence:
  - Calcium concentrations at MW-112D are among the lowest in Stratum III and are less than all the background monitoring well concentrations (Figure 8). This indicates that there have been no impacts related to calcium from the landfill leachate.
- The source of the boron SSI in the groundwater at MW-109D is not due to leachate migrating from below the active landfill. This conclusion is based on the following primary lines of evidence:
  - The November 2017 boron concentration is a statistical outlier according to Dixon's Outlier Test (see Appendix A); and
  - Deleting the outlier data point makes the time-concentration trend of boron at MW-109D conform to the trends shown in the background monitoring wells (Figure 10); and
  - Sulfate, another constituent in the landfill leachate, is decreasing in concentration at MW-109D, providing evidence that leachate is not migrating from either the closed or active landfill ash cells to MW-109D (Figure 11).

Therefore, based on the information provided in this ASD report, Entergy will continue to conduct detection monitoring as per 40 CFR 257.94 at the CCR certified monitoring well network. Based on the information provided, Entergy is not required to implement an assessment monitoring program pursuant to the CCR Rule during the second semiannual detection monitoring event.

# Section 1
# Introduction

## 1.1 Background

The Entergy White Bluff plant operates an on-site coal ash landfill that is located in Jefferson County at 1100 White Bluff Road in Redfield, Arkansas, as shown in Figure 1. The White Bluff plant has been generating and disposing of coal combustion residuals (CCR) since it began operations in 1981. Historic CCR management has included beneficial re-use as a construction material and disposal into the on-site landfill. Early disposal utilized approximately 20 acres of existing ravines for disposal areas and has been closed and covered in accordance with the original facility permit (TRC 2018).

Entergy operates a Class 3N non-commercial industrial landfill under Arkansas Department of Environmental Quality (ADEQ) Solid Waste Permit No. 0199-S3N-R3. Entergy also manages CCR at the landfill as provided in the federal Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule (CCR Rule), effective October 17, 2015.

Currently, three active disposal cells exist in the active landfill and are regulated under the CCR rule. Limits of active landfill and the closed landfill area are shown in Figure 2. Three of the active disposal cells (Cells 1, 2 and 3) are lined with 18 inches of compacted clay and the fourth (Cell 4) has two feet of compacted clay liner and leachate collection system. The active landfill was built on top of, and adjacent to the unlined, closed, landfill (TRC 2018).

The certified groundwater monitoring network at the landfill consists of 23 wells total, installed in accordance with the CCR Rule into the upper shallow sand unit (Stratum I) and the deeper sand unit (Stratum III). Pursuant to the CCR Rule, Entergy obtained certification by a qualified professional engineer stating that the groundwater monitoring system has been designed and constructed to meet the requirements of 40 CFR 257.91 of the CCR Rule (TRC 2017a). Also, pursuant to CFR 257.93(f)(6) of the CCR Rule, statistical analysis of the monitoring results is performed in accordance with the Statistical Analysis Plan (FTN 2017a) and Entergy obtained certification by a qualified professional engineer stating that the selected statistical method is appropriate for evaluating the groundwater monitoring data for the active CCR landfill (TRC 2017b).

Pursuant to the CCR Rule, eight quarterly background groundwater monitoring events were performed from the fourth quarter 2015 through the third quarter 2017. The samples were analyzed for the Appendix III to Part 257 – Constituents for Detection Monitoring and the Appendix IV to Part 257 – Constituents for Assessment Monitoring. The first semiannual detection monitoring event for the Appendix III constituents as per the CCR Rule was performed in August 2017 and statistical analysis of these results relative to the background results was performed pursuant to the 40 CFR 257.93(f) and the Statistical Analysis Plan. Based on the results of this statistical analysis, the concentrations of Appendix III constituents in Stratum I and Stratum III were within the intrawell prediction limits for each constituent at each monitoring well, except as follows:

- pH (MW-103S)
- Calcium and TDS (MW-104S)
- Calcium and TDS (MW-105D)
- Calcium (MW-112D)
- Boron (MW-109D)

The pH statistically significant level (SSL) at MW-103S, and the calcium statistically significant increase (SSI) at MW-104S are a result of exceedances of the intrawell predictive limits. The remainder of the SSIs are a result of increasing trends at 98% confidence levels using Sen's Slope test.

## 1.2 Purpose

Pursuant to 40 CFR 257.93(h), SSIs were determined for Appendix III constituents (boron, sulfate, pH, calcium, and TDS) at two monitoring wells screened within Stratum I unit at the landfill (wells MW-103S and MW104S) and three in Stratum III (wells MW-105D, MW-109D, and MW-112D). The SSIs were reported in the 2017 Annual Groundwater Monitoring and Corrective Action Report (Entergy, January 31, 2018) which was also placed in the Plant's operating record and posted to Entergy's CCR web page. Pursuant to 40 CFR 257.94(e)(2), Entergy may demonstrate that a source other than the active CCR landfill caused the SSIs and SSL or that the SSIs and SSL resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. As per 40 CFR 257.94(e)(2), Entergy must complete the demonstration within 90 days of determination of the SSIs, or March 13, 2018.

The objective of this report is to provide written documentation of the alternate source demonstration (ASD) for the SSIs and SSL determined in the first semiannual detection monitoring event, as provided for in 40 CFR 257.94(e)(2) of the CCR Rule. Also, Pursuant to 40 CFR 257.94(e)(2), this *ASD* report has been certified by a qualified Arkansas professional engineer verifying the accuracy of the information provided in this report.

## 1.3 Site Hydrogeology

Site investigations have identified three main subsurface strata at the site:

- **Stratum I** is the shallow permeable unit and consists of interbedded silty sand, clayey sand, silt, and clay. Stratum I ranges from 0 feet (ft) to 54 ft in thickness and ranges in elevation from 378 ft. above mean sea level (amsl) to 320 ft amsl. Groundwater in Stratum I is unconfined and sits atop underlying clays of Stratum II. Groundwater flow in Stratum I is to the southeast and is not subject to season changes in direction. Stratum I sands have an estimated hydraulic conductivity ranging from $4 \times 10^{-4}$ centimeters per second (cm/s) to $4 \times 10^{-5}$ cm/s. Groundwater velocities in this stratum range from 2 ft/year to 20 ft/year. A Stratum I potentiometric contour map with water-level measurements from August 28, 2017, is shown in Figure 3 (TRC 2018).
- **Stratum II** is generally composed of very stiff fat clay and ranges from 25 ft to 55 ft in thickness with elevations from 337 ft amsl to 268 ft amsl, and is not monitored under the approved monitoring program (TRC 2018).
- **Stratum III** is heterogeneous in composition with clayey sand and/or silty sand comprising most of the unit, with a stiff to very stiff clay and silt surficial layer. Stratum III ranges in thickness from 5 ft to 20 ft with typical elevations ranging from 287 to 258 ft bgs. Stratum I and III are the two groundwater units monitored at the site. In-situ hydraulic conductivities in Stratum III range from $2.53 \times 10^{-4}$ cm/s to $4.18 \times 10^{-7}$ cm/s, and groundwater flow velocities are estimated at <1 ft/year to 10 ft/year (TRC 2018). A Stratum III potentiometric contour map with water-level measurements from August 28, 2017, is shown in Figure 4 (TRC 2018).

The certified groundwater detection monitoring system at White Bluff consists of 23 monitoring wells; 8 of which are installed in Stratum I and 15 in Stratum III. After well installation background monitoring began in October 2015 per 40 CFR 257.93(d) and 257.94(b), with 8 rounds of background sampling, conducted through June 7, 2017. The first round of detection monitoring after background was conducted in August 2017. Sampling and analysis follows the protocols documented in the Groundwater Sampling and Analysis Plan (FTN 2017c), with statistical analysis completed per the plan described in Statistical Methods Certifications (TRC 2017b).

## 1.4 General Groundwater Quality

The dominant groundwater type in the White Bluff area is sodium- and calcium -sulfate type, with generally poor water quality. Measured sulfate is reported between 0.6 mg/L to 3,080 mg/L, iron from 0.05 mg/L to 19 mg/L, and TDS from 11 mg/L to 5,330 mg/L. pH is reported to range from 2.9 standard units (su) to 8.0 su (FTN 2017b, Kresse et al. 2014). Heavy amounts of silts and clays in Stratums I and III have been documented to affect low-flow sample collection. Voluntary groundwater monitoring at the site, conducted from 1991-1996, showed that normal indicator parameters were masked by naturally elevated concentrations of the constituents (FTN 2014, TRC 2018).

# Section 2
# Alternate Source Demonstration

Collection of the first semiannual detection monitoring event was completed in August 2017. Verification sampling was performed in November 2017. Eight background quarterly detection monitoring events were previously collected per 40 CFR 257.93(d) and 257.94(b). Statistical analysis of the first semiannual detection monitoring data was performed pursuant to 40 CFR 257.93(f) and (g), and in accordance with the Statistical Methods Certifications (TRC 2017b) and the Statistical Analysis Plan (FTN 2017a). Based on intrawell statistical analysis, the following SSIs and SSLs were determined:

- pH (MW-103S)
- Calcium and TDS (MW-104S)
- Calcium and TDS (MW-105D)
- Calcium (MW-112D)
- Boron (MW-109D)

All other Appendix III constituents were within their intrawell prediction limits in all the CCR Rule groundwater monitoring system wells. After identifying these SSIs and SSL, verification sampling was completed in November 2017. This verification sampling confirmed the SSIs and SSL.

## 2.1 pH at MW-103S

The SSL of pH resulted from a low pH (4.3 su) measurement, below the intrawell lower limit of prediction. This SSL is a result of natural variation in groundwater quality, not impacts from active landfill units. The primary lines of evidence for an alternate source of the SSL of pH are as follows:

- **Primary Line of Evidence:**
  - **CCR Leachate Chemistry** – CCR leachate pH is relatively high, as shown in Table 1 summary of samples of leachate (pH=8.15 su) and the seep (11.01 su). The SSL of pH is not associated with impacts from CCR ash due to the alkaline nature of the leachate. MW-103S is located downgradient of the closed landfill with measured leachate pH of 11.01 su, and side gradient of active landfill with measured leachate pH of 8.15 su (Table 1).

- **Natural Variation in Groundwater Quality** – The SSL is within the previously stated range of pHs typically found in Stratum I (2.9 – 8.0 su). Figure 5 shows a decreasing trend in pH observed at two monitoring wells (MW-111S and MW-110S) in the same area as MW-103S.

Natural variation is the source of this SSL because wells in the area are exhibiting the same downward trends in pH, and impacts from active landfill leachate would increase the pH of groundwater due to the alkaline nature of the ash leachate.

## 2.2 Calcium at MW-104S

The SSI of calcium at MW-104S, which is considered a background monitoring well in the monitoring network, is a result of natural variation in the groundwater quality. The primary lines of evidence for this demonstration are as follows:

- **Primary Lines of Evidence:**
  - **Natural Variation in Groundwater Quality** – MW-104S is upgradient of both closed and active landfills. Other background wells, MW-101S for example, show variations in calcium concentrations, in Stratum I, from 13.7 to 98.5 mg/L as shown in Figure 6. Being upgradient of any potential CCR impacts, it can be concluded that fluctuations of up to 98.5 mg/L of calcium are a result of local, natural variations in groundwater chemistry. The SSI for calcium at MW-104S is caused by an increase of 28.1 mg/L, well within the limits of natural variation at this site. As a result of the SSI occurring at a concentration higher than what is present in the leachate, MW-104S residing upgradient from active CCR disposal units, and local natural variation in calcium concentrations, it is evident this SSI is due to natural variation in the groundwater quality.
  - **CADL Leachate Calcium Analysis is Lower** – The calcium concentration measured in active landfill leachate (26.9 mg/L as shown in Table 2) is below the concentration that triggered the SSI (28.1 mg/L). Dilution of leachate constituents would occur upon encountering a permeable unit, decreasing the concentrations of the constituents when measured in a monitoring well. Therefore, the source of the SSI cannot be the active CCR landfill.
  - **Statistical Outlier** – The November 2017 verification sampling concentration of calcium in the groundwater is a statistically significant outlier compared to the background data when tested with the Dixon's Outlier Test (FTN 2017b) (see Appendix A).

## 2.3 Total Dissolved Solids (TDS) at MW-104S

The SSI of TDS in the groundwater at MW-104S is a result of natural variation in the groundwater quality. The primary lines of evidence for this demonstration are as follows:

- **Primary Lines of Evidence:**
  - **Natural Variation in Groundwater Quality** – As previously discussed, MW-104S is considered a Stratum I background monitoring well and is upgradient of the active landfill. The other two background wells in Stratum I, MW-101S and MW-102S, exhibit TDS variations from 149 mg/L to 421 mg/L, as shown in Figure 7. The SSI of TDS in MW-104S is within these limits set by the other background monitoring wells and also within the previously stated published limits of natural variation in groundwater quality in the area of 11 mg/L to 5,330 mg/L (Kresse et al. 2014).
  - **CADL Leachate TDS Analysis** – Table 2 summarizes the three most recent sampling events for TDS at MW-104S and the December 2017 leachate sampling analysis. The concentration of TDS at MW-104S is consistently higher than the measured TDS in the leachate from the active landfill. Dilution of leachate constituents would occur upon encountering a permeable unit, decreasing the concentrations of the constituents when measured in a monitoring well.

## 2.4 Calcium at MW-105D

The source of the SSI of calcium in the groundwater at MW-105D is natural variation in the groundwater quality. This SSI is not a result of leachate seeping from the base of the active landfill. The primary lines of evidence to support this demonstration are as follows:

- **Primary Lines of Evidence:**
  - **Landfill Leachate Calcium Analysis** – The concentration of calcium in the groundwater at MW-105D is nearly double the concentration of calcium measured in the leachate from the active landfill (Table 2). Dilution dictates that a source other than the landfill leachate caused this SSI.
  - **Natural Variation in Groundwater Quality** – Figure 8 provides evidence of variation in calcium concentration, in Stratum III background monitoring wells (MW-114D, MW-115D and MW-118D), ranging from 34.7 to 79 mg/L. It is evident that spatial variation in calcium concentration exist within the certified groundwater monitoring network, and that the SSI of calcium at MW-105S is a result of this natural variation in groundwater quality.

## 2.5 Total Dissolved Solids at MW-105D

The source of the SSI detected of TDS in the groundwater at MW-105D is not leachate migrating from the base of the active landfill. The Stratum III sand unit, where MW-105 is screened, exhibits natural background variations in TDS. The primary lines of evidence for an alternate source of TDS in groundwater at MW-105D are as follows:

- **Primary Lines of Evidence:**
  - **Natural Variation in Groundwater Quality** – Stratum III background monitoring wells, MW-114D, MW-115D, and MW-118D exhibit variation in TDS as shown in Figure 9. MW-114D has the lowest TDS concentration range from 241 to 300 mg/L, while MW-118D has the highest TDS concentration range from 415 to 484 mg/L (Figure 9). The TDS concentrations over time at MW-105D fall within that range, and shows similar trends to the background monitoring wells.
  - **CADL Leachate TDS Analysis** – The last two groundwater sampling events in December and November 2017 indicate TDS is present at MW-105D in concentrations above what is present in the active landfill leachate (Table 2). This information in conjunction with the above provide a weight of evidence indicating the source of the increased concentration of TDS at MW-105D is natural variation in groundwater quality associated with Stratum III.

## 2.6 Calcium at MW-112D

The SSI of calcium at MW-112D in Stratum III is a result of natural variation in the groundwater quality and not migration of calcium in leachate from the base of the active landfill. The primary line of evidence behind this demonstration is as follows:

- **Primary Line of Evidence:**
  - **Natural Variation in Groundwater Quality** – Calcium concentrations measured over time in the groundwater at MW-112D are among the lowest measured in Stratum III. Figure 8 shows time-concentration trends of calcium for the three background monitoring wells screened in this unit, and MW-105D. MW-112D is the lowest out of the five monitoring wells and exhibits similar trends over time. It is evident that calcium concentrations in groundwater vary naturally within the certified groundwater monitoring network, and therefore the SSI of calcium at MW-112D is a result of that natural variation.

## 2.7 Boron at MW-109D

The SSI of boron in the groundwater at MW-109D is not a result of boron from leachate migrating from the base of the active landfill. The primary lines of evidence for this demonstration are as follows:

- **Primary Lines of Evidence:**
  - **Background Groundwater** – Figure 10 shows the boron time-concentration trends for the three background monitoring wells in Stratum III and MW-109D. It is evident that boron at MW-109D is trending with the background data, with the exception of the statistical outlier data point from November 2017.
  - **Statistical Outlier** – The November 2017 groundwater sampling event yielded a statistically significant outlier concentration for boron at MW-109D, according to Dixon's Outlier Test (see Appendix A). The December 2017 groundwater sampling event data showed the boron concentration going back down to background levels (Figure 10). Removing the outlier data point makes the overall time-concentration trend of boron at MW-109D agree well with the three background monitoring well trends.
  - **Sulfate at MW-109D** – The sulfate concentration in the leachate from the active landfill is 149 mg/L. If the SSI of boron in MW-109D was a result of leachate migration from the base of the active landfill, the concentration of sulfate in MW-109D would be increasing from the sulfate in the leachate. Figure 11 shows that sulfate concentrations have decreased from 84 to 71.1 mg/L since March 2017. The sulfate at MW-109D is decreasing and has stayed within the range of the sulfate concentrations measured over time in the Stratum III background wells. Since boron and sulfate are both leachate constituents, but only a boron SSI was determined at MW-109D, it is evident the source of the boron SSI is not leachate from the active landfill.

# Section 3
# Conclusions

The information provided in this report serves as the alternate source demonstration prepared in accordance with 40 CFR 257.94(e)(2) of the CCR Rule and demonstrates that the SSIs and SSL determined based on the first semiannual detection monitoring event performed in 2017 are not due to leakage from the base of the active landfill, but are due to the following:

- The source of the pH SSL in groundwater at MW-103S is natural variation in the groundwater quality. This conclusion is based on the following primary lines of evidence:
  - Similar trends of decreasing pH are observed in monitoring wells in the same area as MW-103S (Figure 5) and the natural pH range of the groundwater in this area is between 2.0 and 8.1 su (FTN 2017b, Kresse et al. 2014); and
  - CCR leachate is alkaline meaning groundwater impacted due to leakage from the active landfill would be increasing in pH, not decreasing. The pH of the active landfill leachate is 8.15 su.
- The source of the calcium SSI in groundwater at MW-104S is natural variation in the groundwater quality. This conclusion is based on the following primary lines of evidence:
  - MW-104S is considered a background monitoring well and other background monitoring wells in the network exhibit a range of calcium concentrations in the groundwater similar to MW-104S (as shown in Figure 6); and
  - Concentrations of calcium in the active landfill leachate are less than the concentration in MW-104S.
- The source of the TDS SSI in groundwater at MW-104S is natural variation in the groundwater quality. This conclusion is based on the following primary lines of evidence:
  - MW-104S is an upgradient, Stratum I background monitoring well with TDS concentrations within the background fluctuations measured at MW-101S, another Stratum I background monitoring well (see Figure 7).
  - The TDS concentrations measured in MW-104S are greater than the TDS measured in the leachate sample from the active landfill (Table 2).
- The source of the calcium and TDS SSIs in the groundwater at MW-105D are natural variation in the groundwater quality. This conclusion is based on the following primary lines of evidence:
  - Stratum III background monitoring wells indicate calcium and TDS concentration ranges occurring naturally in the groundwater. Time-concentration trends (Figure 8 and 9) show calcium and TDS at MW-105D to be within those background ranges.

  - Calcium and TDS concentrations in the leachate from the active landfill are below the measured concentrations in MW-105D.

- The source of the calcium SSI in the groundwater at MW-112D is natural variation in the groundwater quality. This conclusion is based on the following primary line of evidence:
  - Calcium concentrations at MW-112D are among the lowest in Stratum III, below all of the background monitoring wells (Figure 8). This indicates no impacts of calcium from the active landfill leachate.
- The source of the boron SSI in the groundwater at MW-109D is not leachate migrating from below the active CADL. This conclusion is based on the following primary lines of evidence:
  - The November 2017 boron concentration is a statistical outlier according to Dixon's Outlier Test (see Appendix A).
  - Deleting the outlier data point makes the time-concentration trend of boron at MW-109D conform to the trends shown in the background monitoring wells (Figure 10).
  - Sulfate, another constituent in the CADL leachate, is decreasing in concentration at MW-109D, providing evidence that leachate is not migrating from the active CADL to MW-109D (Figure 11).

Therefore, based on the information provided in this *ASD* report, Entergy will continue to conduct detection monitoring as per 40 CFR 257.94 at the certified groundwater monitoring network. Based on the information provided, Entergy is not required to implement an assessment monitoring program pursuant to the CCR Rule during the second semiannual detection monitoring event scheduled for the first half of 2018.

# Section 4
# Certification

I hereby certify that the alternative source demonstration presented within this document for the White Bluff Plant 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:** R. KENT NILSSON **Expiration Date:** 12/31/18

**Company:** TRC Environmental Corporation **Date:** 4/10/18


(SEAL)

# Section 5
# References


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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. doi: http://dx.doi.org/10.3133/sir20145149.

TRC. 2017a. Groundwater Monitoring System Certification, White Bluff Steam Electric Generating Station, Redfield, Arkansas. Prepared for Entergy Arkansas Inc. Baton Rouge: TRC Environmental Corporation.

TRC. 2017b. Statistical Methods Certification, White Bluff Steam Electric Generating Station, Redfield, Arkansas. Prepared for Entergy Arkansas Inc. Baton Rouge: TRC Environmental Corporation.

TRC. 2018. Site Conceptual Model: Entergy White Bluff Plant Coal Ash Disposal Landfill, Redfield, Jefferson County, Arkansas. January 2018.

**Table 1**
**Seep and CCR Leachate Chemistry - December 21, 2017**

| PARAMETER | RESULTS | |
|---|---|---|
| | SEEP | LEACHATE |
| pH | 11.01 | 8.15 |
| Specific Conductance, mS/cm | 4.613 | 0.4991 |
| Calcium, mg/L | 15.5 | 26.9 |
| Magnesium, mg/L | 0.0665 BJ | 6.09 |
| Sodium, mg/L | 876 | 82.8 |
| Potassium, mg/L | 23.4 | 4.32 |
| Sulfate, mg/L | 1060 | 149 |
| Chloride, mg/L | 18.6 | 11.2 |
| Boron, mg/L | 13.9 | 2.85 |

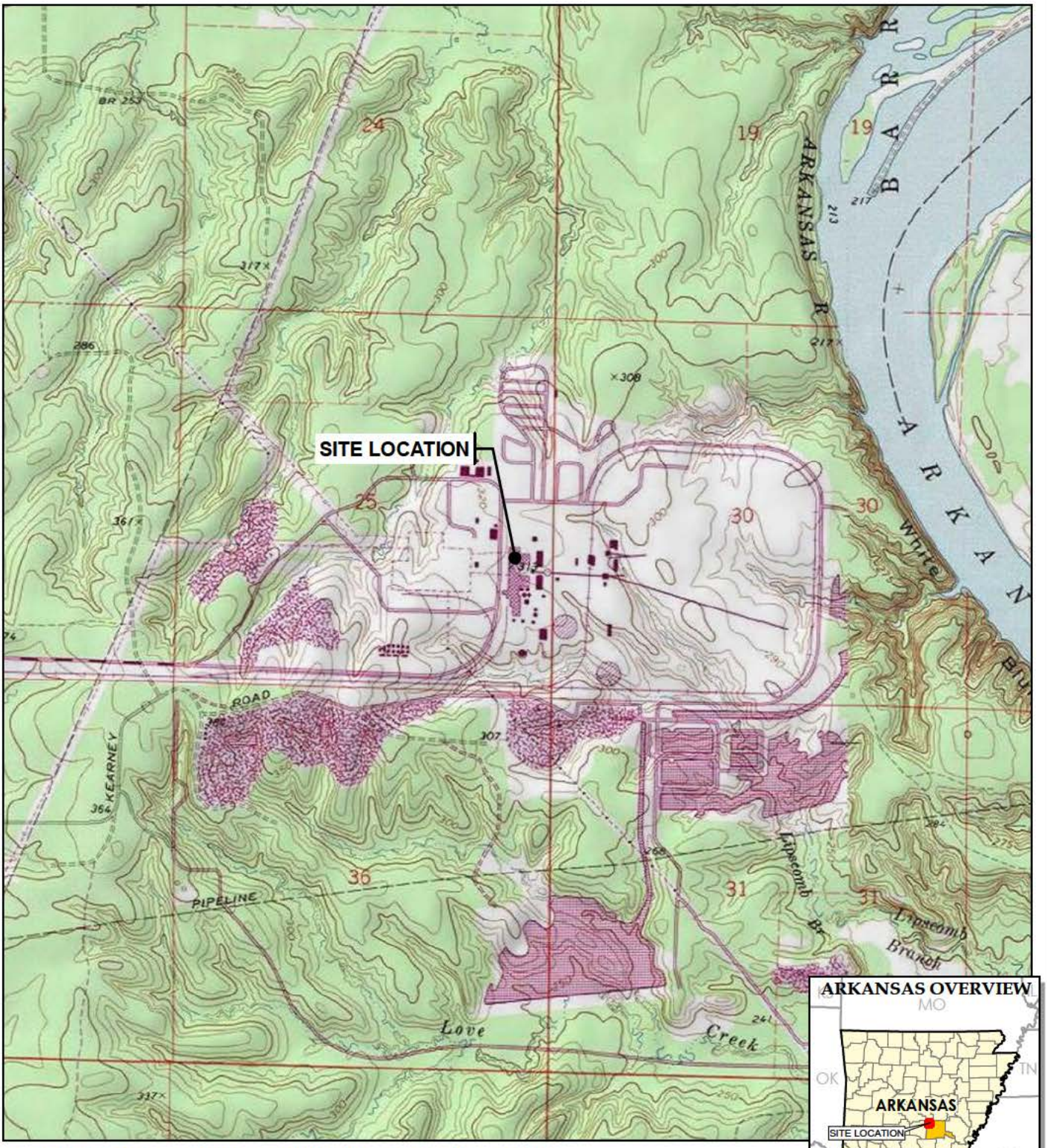
Prepared by: K. Barber 1/31/2018
Checked by: L. Auner 2/7/2018

**Table 2**
**Calcium and TDS in Leachate and Wells With SSIs**

| SAMPLE LOCATION | DATE | CALCIUM (mg/L) | TDS (mg/L) |
|---|---|---|---|
| Leachate | 12/21/2017 | 26.9 | 317 J3 |
| MW-104S | 8/30/2017 | 28.1 | 338 |
| | 11/16/2017 | 29.9 | 329 |
| | 12/20/2017 | 31.9 | 341 |
| MW-105D | 8/29/2017 | 50.1 | 303 |
| | 11/16/2017 | 54.1 | 333 |
| | 12/20/2017 | 52.3 | 319 |

Note:
J3: The associated batch QC was outside the established quality control range for precision.

Prepared by: K. Barber 2/7/2018
Checked by: L. Auner 2/7/2018




BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

N

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: 734.971.7080
TRC - GIS

PROJECT:

**ENTERGY WHITE BLUFF PLANT**
**1100 WHITE BLUFF ROAD**
**REDFIELD, ARKANSAS**

TITLE:

# SITE LOCATION MAP

| | |
|---|---|
| DRAWN BY: | B. DEEGAN |
| CHECKED BY: | K. BARBER |
| APPROVED BY: | J. HOUSE |
| DATE: | MARCH 2018 |
| PROJ. NO.: | 270853 |
| FILE: | 270853-001slmWB.mxd |

**FIGURE 1**

E:\Entergy\Arkansas\2018_270853\270853-001slmWB.mxd -- Saved By: SMAJOR on 3/23/2018, 11:29:32 AM

TRC - GIS

MW-101D
MW-101S
MW-102D
MW-102S
MW-104S
MW-104D
MW-105S
MW-105D
MW-114D
MW-118D
MW-112D
MW-109D
MW-106S
MW-106D
MW-111S
MW-107D
PZ-7
MW-110S
MW-110D
MW-108D
MW-113D
MW-103S
MW-103D
MW-115D
PZ-5

## LEGEND

- SURFACE SEEP
- STRATUM I BACKROUND WELL
- STRATUM I MONITORING WELL
- STRATUM III BACKROUND WELL
- STRATUM III MW
- STRATUM III PIEZOMETER
- APPROX. EXTENT OF CLOSED CADL
- APPROX. EXTENT OF CCR UNIT

## NOTES

1. BASE MAP IMAGERY FROM ESRI/DIGITAL GLOBE, 2016.
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**

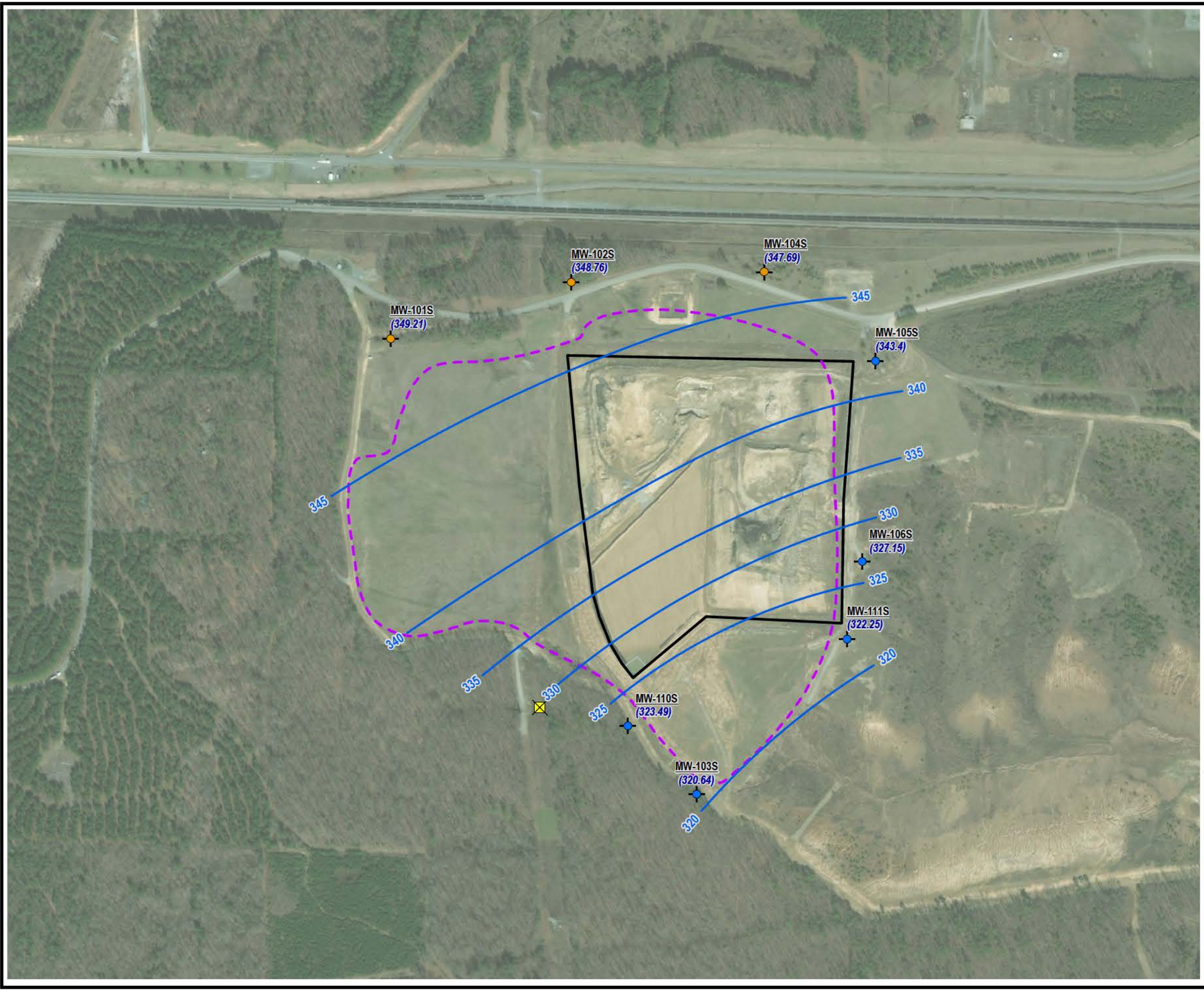
TITLE:
# CADL EXTENT AND CCR GROUNDWATER MONITORING LOCATIONS

| | | | |
|---|---|---|---|
| DRAWN BY: | B. DEEGAN | PROJ. NO.: | 270853 |
| CHECKED BY: | K. BARBER | | |
| APPROVED BY: | J.HOUSE | | **FIGURE 2** |
| DATE: | APRIL 2018 | | |

TRC
Two United Plaza
8550 United Plaza Blvd., Suite 502
Baton Rouge, LA
Phone: 734.971.7080

FILE NO.: 270853-002WB.mxd

Coordinate System: NAD 1983 StatePlane Arkansas South F PS 0302 Feet (Foot US)
Map Rotation: 0
Plot Date: 4/2/2018, 09:48:16 AM by BDEEGAN – LAYOUT: ANSI B(11"x17")
Path: E:\Entergy\Arkansas\2018_270853\270853-002WB.mxd




## LEGEND

- SURFACE SEEP
- STRATUM I BACKROUND WELL
- STRATUM I MONITORING WELL
- GROUNDWATER CONTOURS (AUGUST 28, 2017)
- APPROX. EXTENT OF CLOSED CADL
- APPROX. EXTENT OF CCR UNIT

## NOTES

1. BASE MAP IMAGERY FROM ESRI/DIGITAL GLOBE, 2016.
2. COAL ASH DISPOSAL LANDFILL (CADL)
3. GROUNDWATER LEVELS MEASURED BY FTN ON AUGUST 28, 2018

N

0 400 800 Feet

1 " = 400 '

1:4,800

PROJECT:

**ENTERGY WHITE BLUFF PLANT**
**1100 WHITE BLUFF ROAD**
**REDFIELD, ARKANSAS**

TITLE:

**STRATUM I POTENTIOMETRIC MAP**
**AUGUST 28, 2017**

| | | | |
|---|---|---|---|
| DRAWN BY: | B. DEEGAN | PROJ. NO.: | 270853 |
| CHECKED BY: | K. BARBER | | |
| APPROVED BY: | J.HOUSE | | **FIGURE 3** |
| DATE: | APRIL 2018 | | |

TRC
Two United Plaza
8550 United Plaza Blvd., Suite 502
Baton Rouge, LA
Phone: 734.971.7080

FILE NO.: 270853-003WB.mxd

Plot Date: 4/2/2018, 09:49:05 AM by BDEEGAN – LAYOUT: ANSI B(11"x17")
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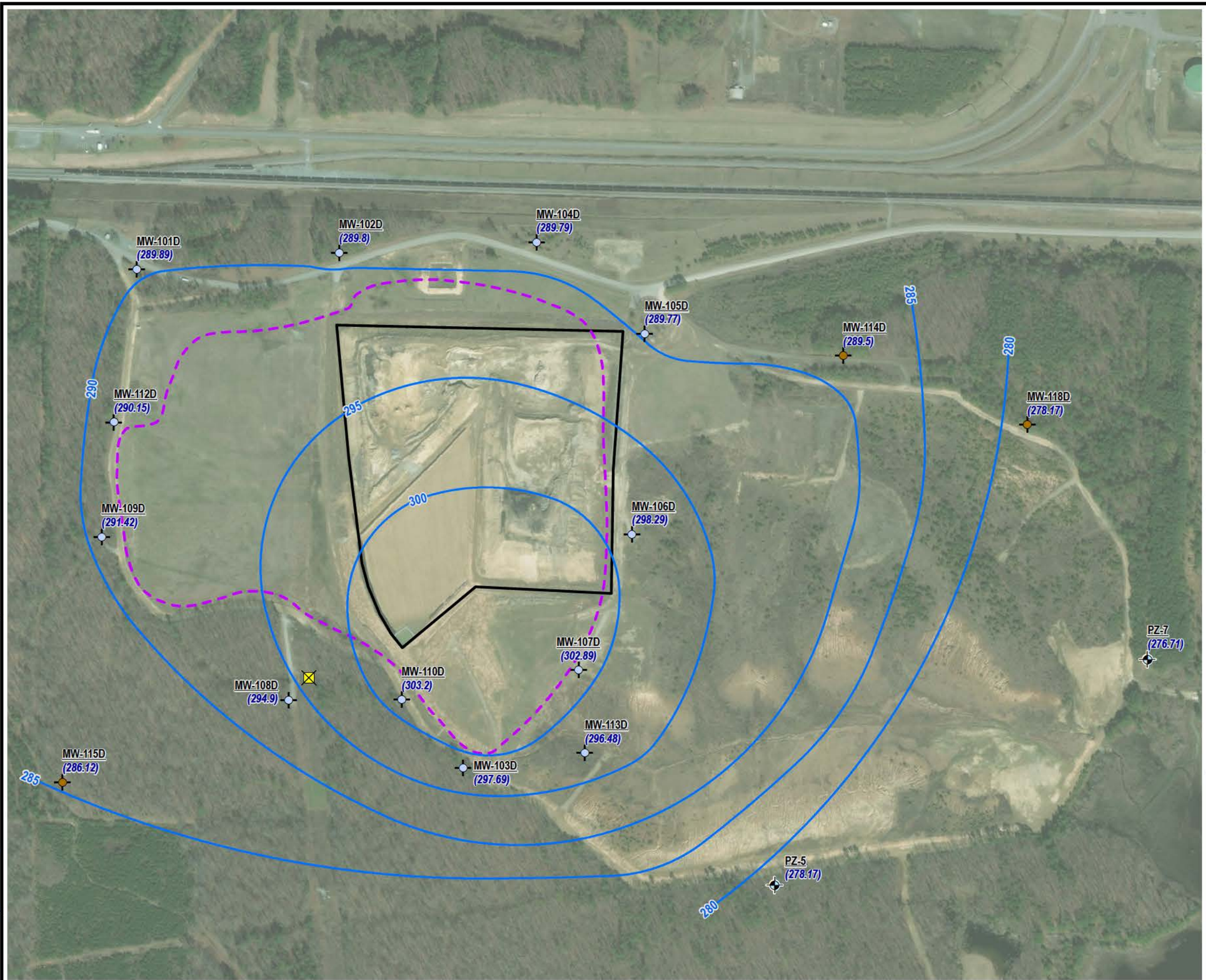
Coordinate System: NAD 1983 StatePlane Arkansas South F PS 0302 Feet (Foot US)
Map Rotation: 0

TRC - GIS




## LEGEND

- SURFACE SEEP
- STRATUM III BACKROUND WELL
- STRATUM III MONITORING WELL
- STRATUM III PIEZOMETER
- GROUNDWATER CONTOURS (AUGUST 28, 2017)
- APPROX. EXTENT OF CLOSED CADL
- APPROX. EXTENT OF CCR UNIT

## NOTES

1. BASE MAP IMAGERY FROM ESRI/DIGITAL GLOBE, 2016.
2. COAL ASH DISPOSAL LANDFILL (CADL)
3. GROUDWATER LEVELS MEASURED BY FTN ON AUGUST 28, 2017.

N

0 400 800
Feet

1 " = 400 '
1:4,800

PROJECT:
**ENTERGY WHITE BLUFF PLANT**
**1100 WHITE BLUFF ROAD**
**REDFIELD, ARKANSAS**

TITLE:
# STRATUM III POTENTIOMETRIC MAP (AUGUST 28TH, 2017)

| | | | |
|---|---|---|---|
| DRAWN BY: | B. DEEGAN | PROJ. NO.: | 270853 |
| CHECKED BY: | K. BARBER | | |
| APPROVED BY: | J. HOUSE | | **FIGURE 4** |
| DATE: | APRIL 2018 | | |

TRC
Two United Plaza
8550 United Plaza Blvd., Suite 502
Baton Rouge, LA
Phone: 734.971.7080

FILE NO.: 270853-004WB.mxd

Plot Date: 4/2/2018, 09:49:51 AM by BDEEGAN – LAYOUT: ANSI B (11"x17")
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TRC - GIS

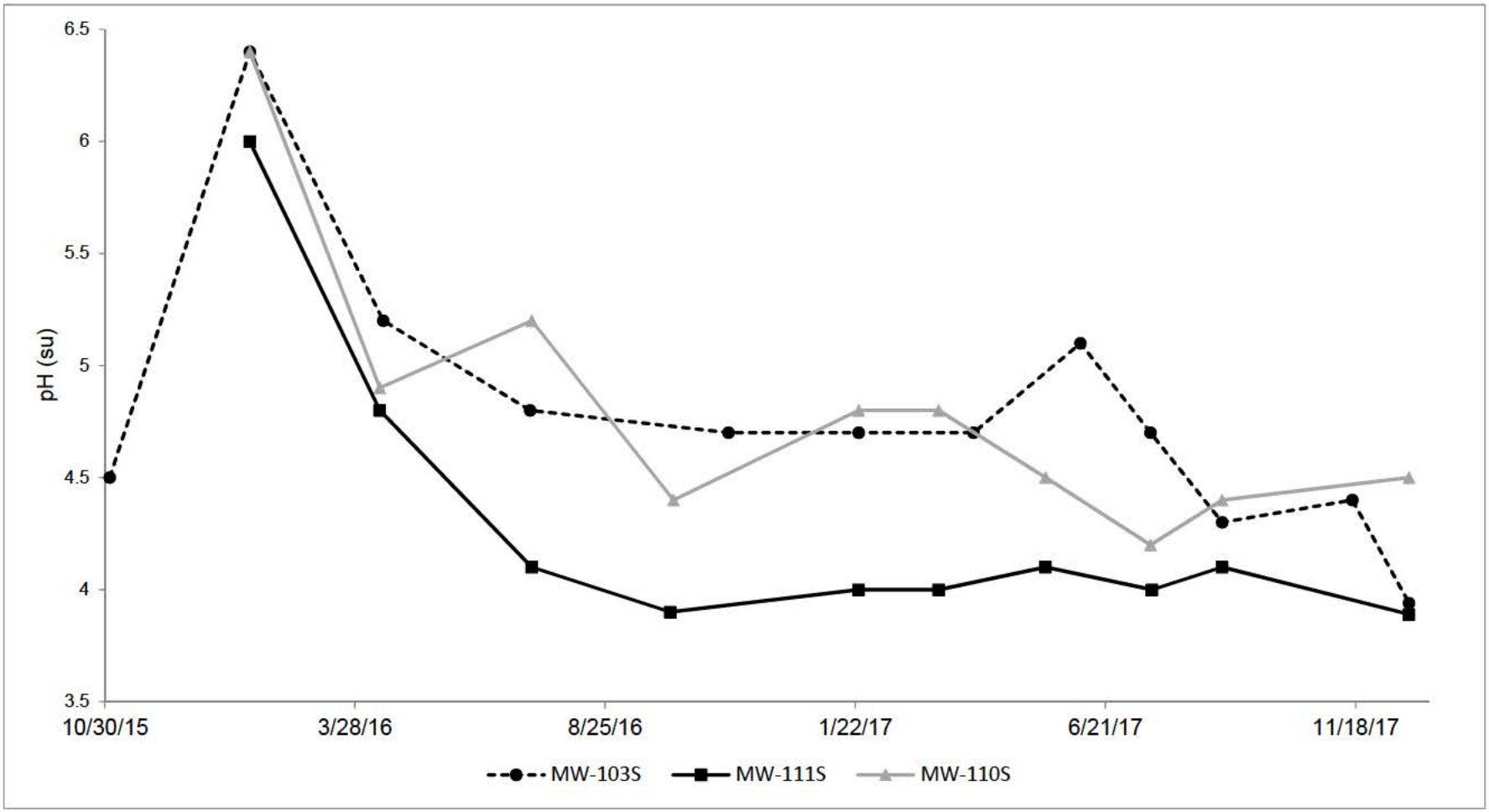



Figure 5: Decreasing trends in pH at wells around MW-103S, where an SSI was observed. These trends provide evidence of natural pH variation causing the SSI, not leachate released from CCR disposal units.

Figure 5
pH Time-Trend Plot (MW-103S SSL)

Prepared by: K. Barber 1/31/2018
Checked by: L. Auner 2/7/2018

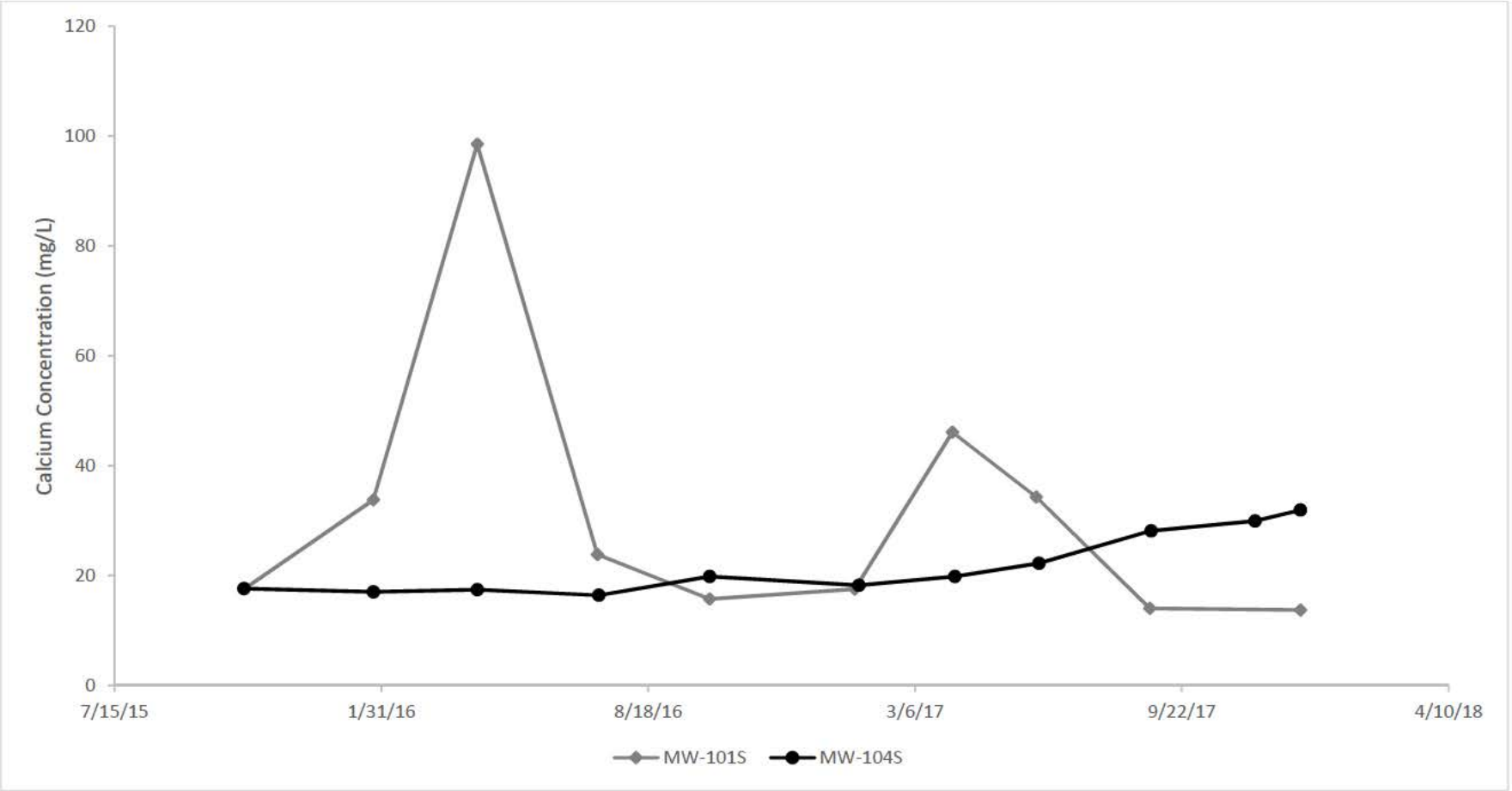



Figure 6: Calcium concentration trends in MW-101S show natural variations in calcium ranging from about 10 mg/L to 100 mg/L. The SSI observed at MW-104S is well within this range, providing evidence of natural variation in groundwater being the cause of this SSI.

# Figure 6
# Calcium Time-Trend Plot (MW-104S SSI)

Prepared by: K. Barber 1/31/2018
Checked by: L. Auner 2/7/2018

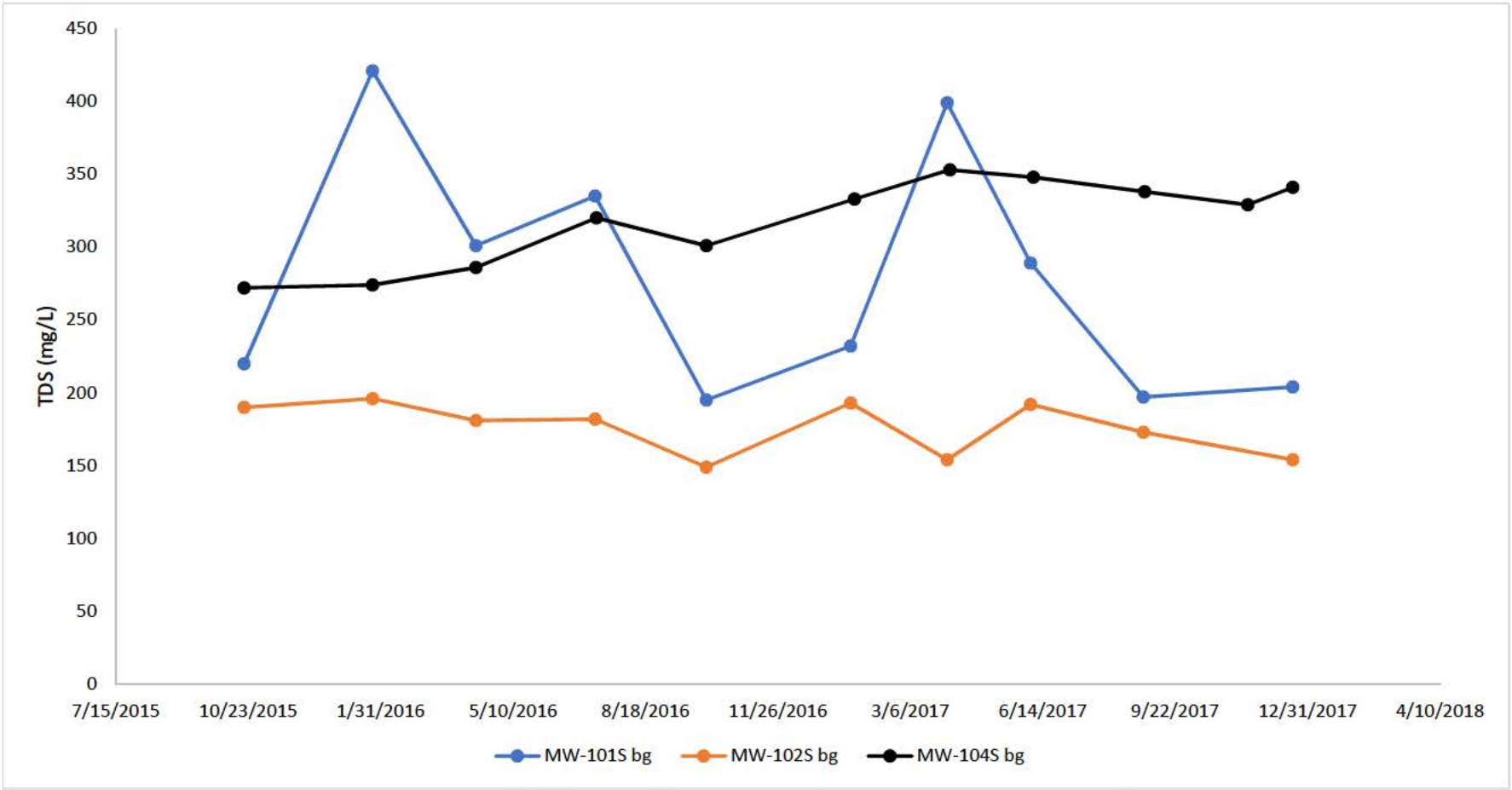



Figure 7: All Stratum I background monitoring wells. Shows SSI of TDS in MW-104S is representative of typical groundwater quality.

# Figure 7
# Stratum I Background TDS Time-Trend Plot (MW-104S SSI)

Prepared by: K. Barber 2/7/2018
Checked by: L. Auner 2/7/2018

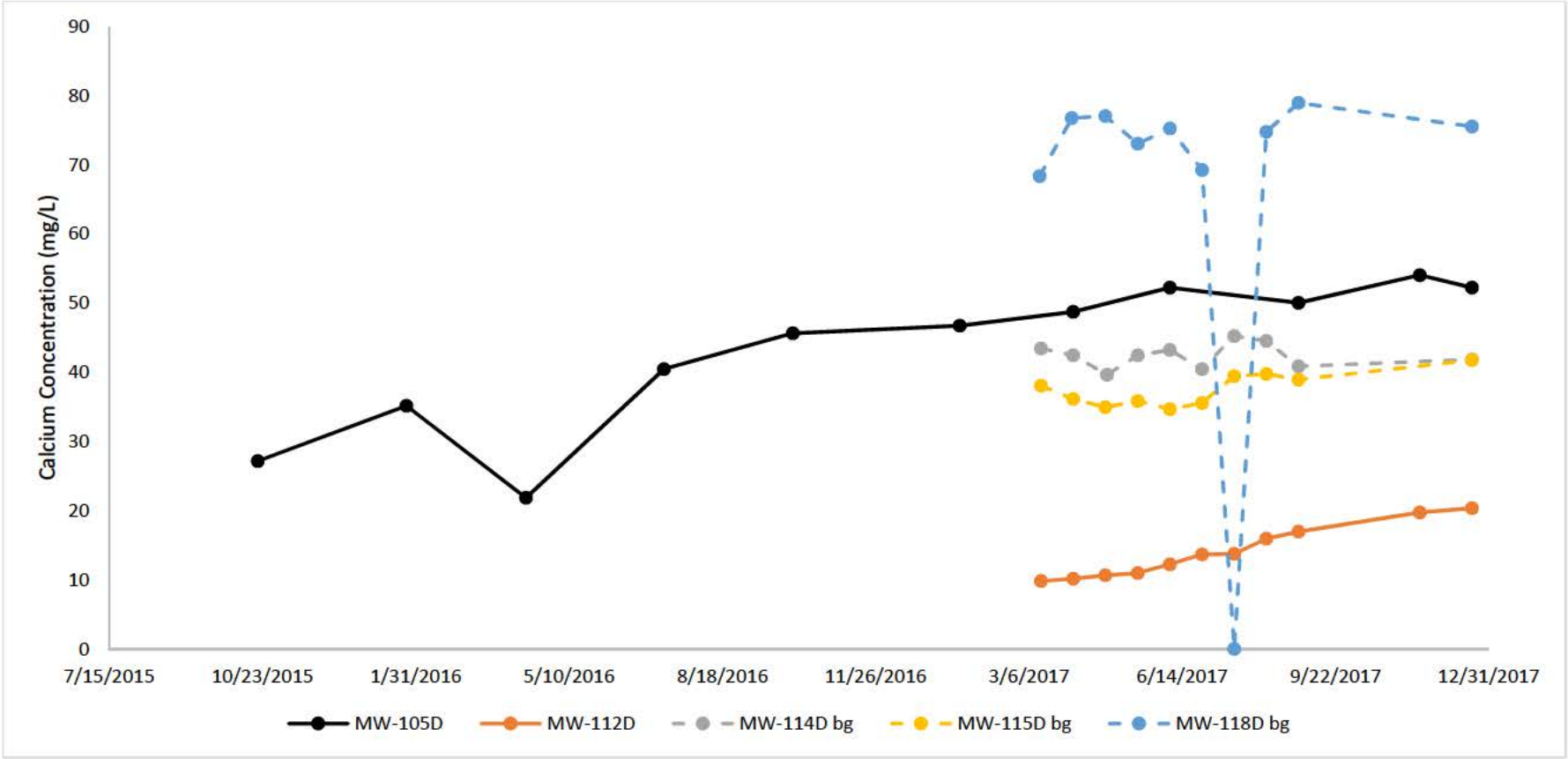



Figure 8: Dotted lines represent background monitoring wells. Shows SSIs of calcium in GW at MW-105D and MW-112D are within or below natural background calcium variation.

## Figure 8
## Calcium Time-Trend Plot (MW-105D and MW-112D SSIs)

Prepared by: K. Barber 2/7/2018
Checked by: L. Auner 2/7/2018

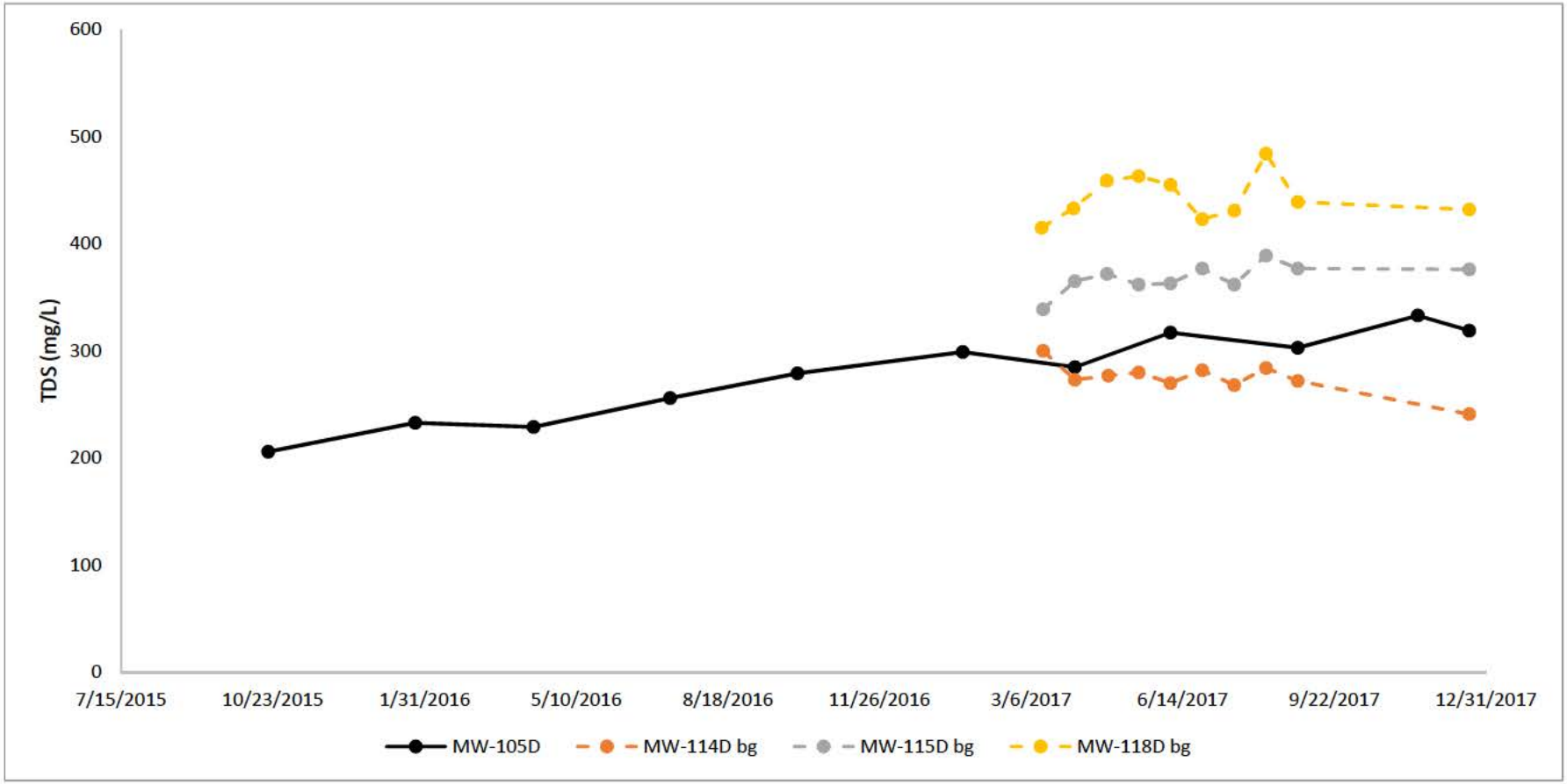



Figure 9: Dotted lines are Stratum III background monitoring wells. Shows the SSI of TDS in MW-105D is within natural background variation.

# Figure 9
# TDS Time-Trend Plot (MW-105D SSI)

Prepared by: K. Barber 2/7/2018
Checked by: L. Auner 2/7/2018

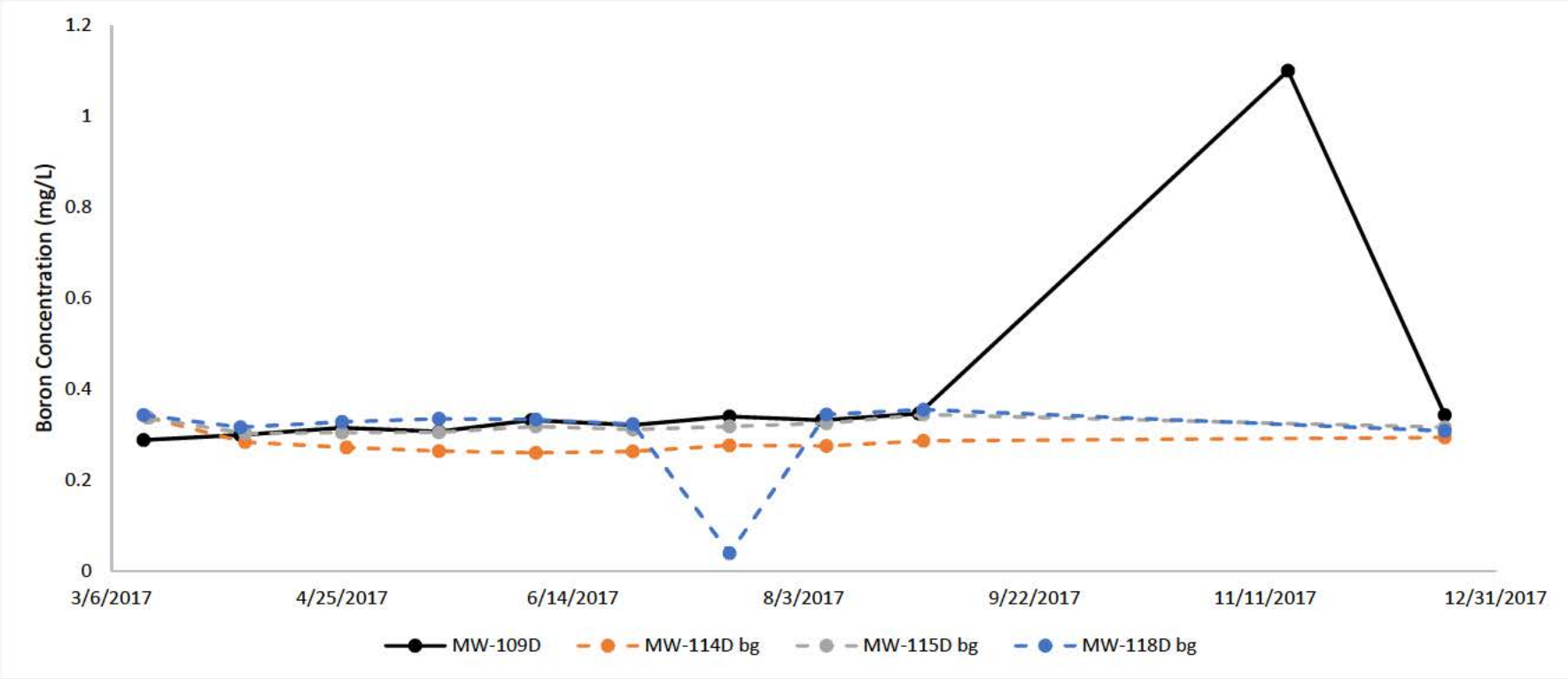



Figure 10: Stratum III background monitoring wells and MW-109D boron concentrations. The November data point for MW-109D is a statistically significant outlier (Dixon's Outlier Test)

# Figure 10
# Boron Time-Trend Plot (MW-109D SSI)

Prepared by: K. Barber 2/7/2018
Checked by: L. Auner 2/7/2018

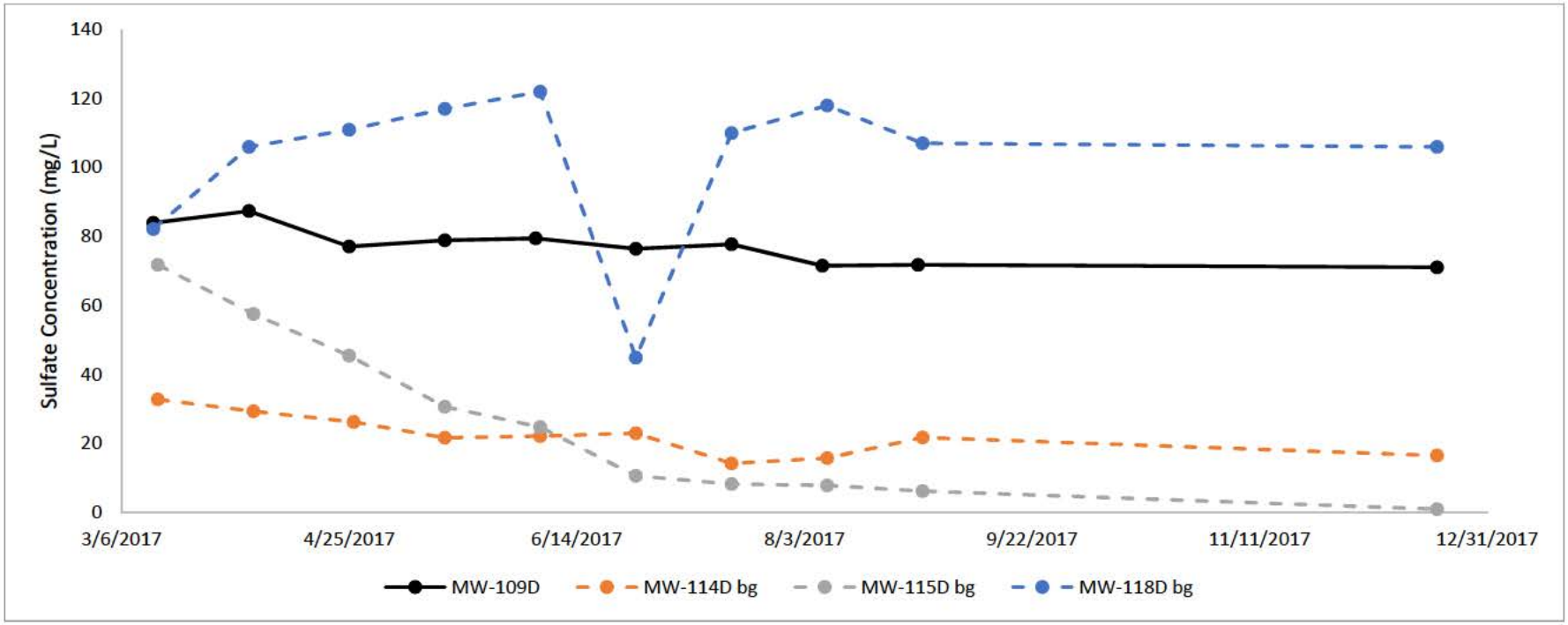



Figure 11: Stratum III background monitoring wells and MW-109D sulfate time-concentration trends.

Figure 11
Sulfate Time-Trend Plot (MW-109D SSI)

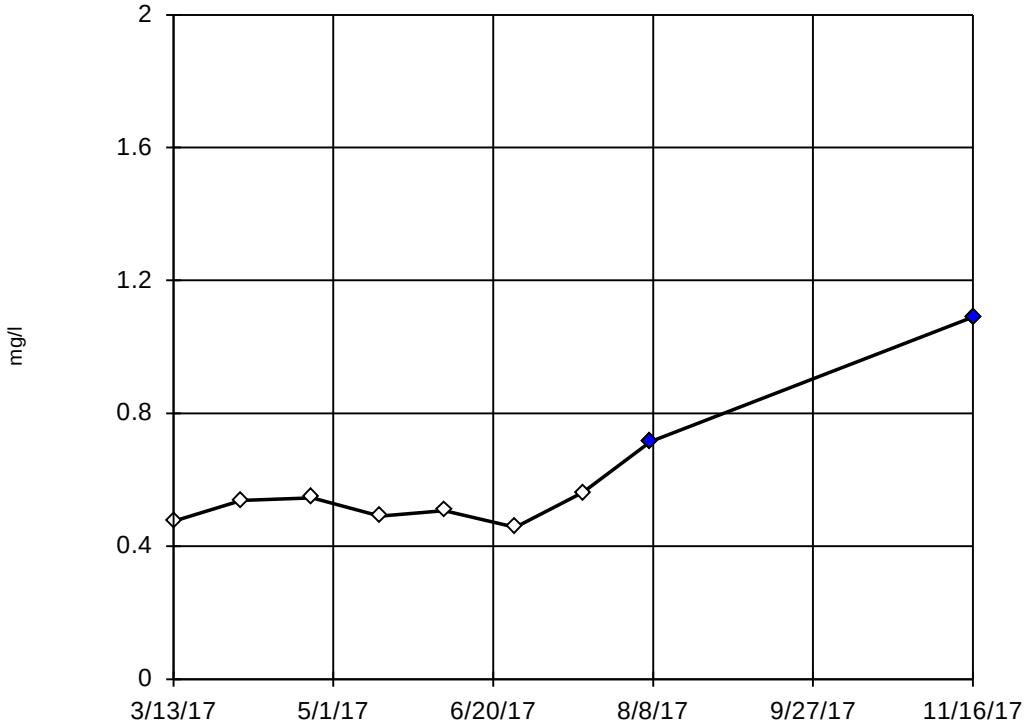
Prepared by: K. Barber 2/7/2018
Checked by: L. Auner 2/7/2018

# Appendix A
# Dixon's Outlier Test

# Statistically Significant Outliers in November 2017 Data

# Dixon's Outlier Test

## MW-108S




n = 9

Statis ical outliers are drawn as solid.
Testing for 2 high outliers.
Mean = 0.5979.
Std. Dev. = 0.1994.
0.715: c = 0.6375
tabl = 0.512.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0 9531
Critical = 0.838
The distribution, after removal of suspect val-ues, was found to be nor-mally distributed.

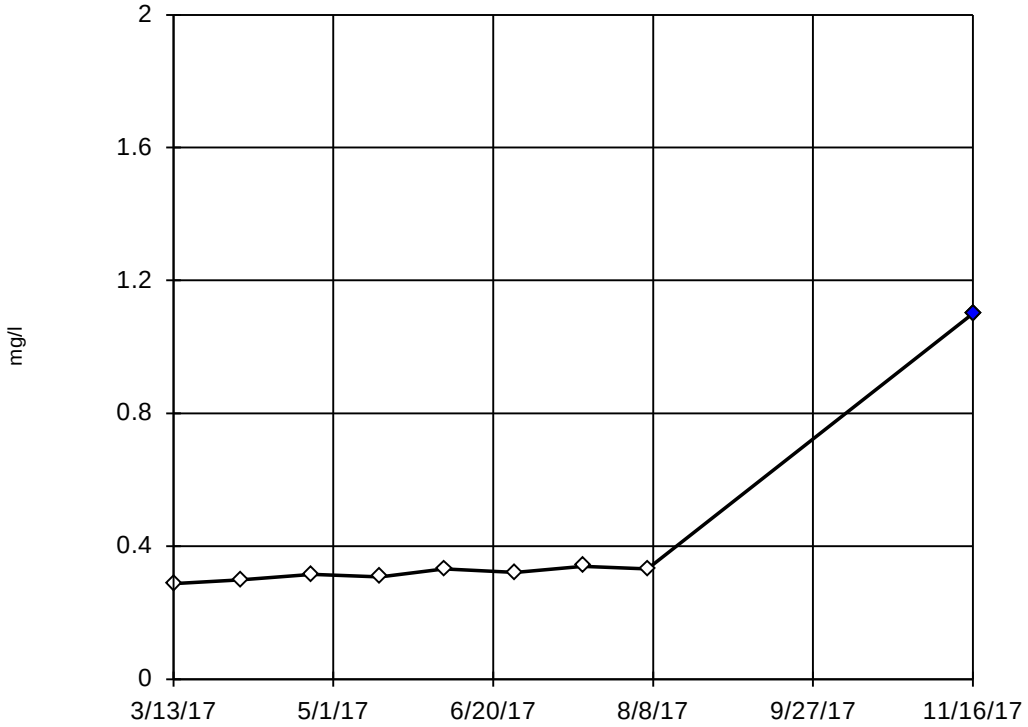
Constituent: Boron Analysis Run 12/5/2017 10:33 AM View: Stratum I and III, Appendix III

Entergy White Bluff Class 3 N Landfill Client: Entergy Data: Entergy White Bluff EPA Groundwater Database

Sanitas™ v.9.5 32 For the statistical analyses of ground water by FTN Associates only. UG

# Dixon's Outlier Test

## MW-109D




n = 9

Statis ical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 0.4038.
Std. Dev. = 0.2616.
1.1: c = 0.9488
tabl = 0.512.
Alpha = 0.05.

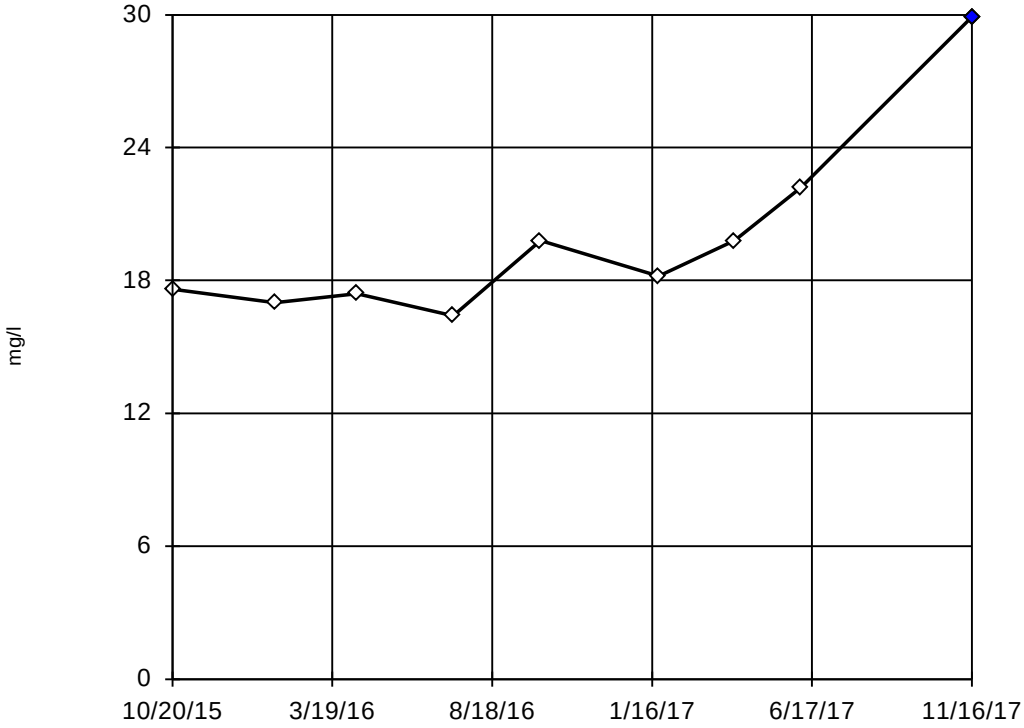
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0 9596
Critical = 0.851
The distribution, after removal of suspect val-ue, was found to be nor-mally distributed.

Constituent: Boron Analysis Run 12/5/2017 10:33 AM View: Stratum I and III, Appendix III

Entergy White Bluff Class 3 N Landfill Client: Entergy Data: Entergy White Bluff EPA Groundwater Database

# Dixon's Outlier Test

MW-104S (bg)




n = 9

Statis ical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 19.81.
Std. Dev. = 4.188.
29.9: c = 0.5969
tabl = 0.512.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0 9103
Critical = 0.851
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Calcium Analysis Run 12/5/2017 10:33 AM View: Stratum I and III, Appendix III

Entergy White Bluff Class 3 N Landfill Client: Entergy Data: Entergy White Bluff EPA Groundwater Database

# Alternate Source Demonstration

1st Half 2018 Sampling Event

Entergy White Bluff Plant
Coal Ash Disposal Landfill
Redfield, Jefferson County, Arkansas

September 2018

*Privileged and Confidential*
*Prepared at the Request of Counsel/Attorney-Client Communication/Attorney Work Product*

# Alternate Source Demonstration

## 1st Half 2018 Sampling Event

## Entergy White Bluff Plant
## Coal Ash Disposal Landfill
## Redfield, Jefferson County, Arkansas

September 2018

*Prepared For*
*Entergy Arkansas, Inc.*
*White Bluff Plant*
*1100 White Bluff Road*
*Redfield, Arkansas 72132*


R. Kent Nilsson, P.E.
Senior Engineer

Jason S. House
Project Manager

# Table of Contents



## List of Figures



## List of Appendices

# Executive Summary

Entergy Arkansas, LLC (Entergy) operates the Entergy White Bluff Plant (Plant), a coal fired power plant, to generate electricity. The Plant is located near Redfield, Jefferson County, Arkansas, as shown in Figure 1.

Coal combustion residuals (CCR) are produced as part of the electrical generation operations and have historically been managed by Entergy as follows:

- Beneficial use in local construction projects;
- Beneficial use as road bed material at the facility landfill; and
- Placement into Entergy's on-site coal ash disposal landfill (CADL).

Entergy operates a Class 3N non-commercial industrial landfill under Arkansas Department of Environmental Quality (ADEQ) Solid Waste Permit No. 0199-S3N-R3. Entergy also manages CCR at the landfill as provided in the federal Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule (CCR Rule), effective October 17, 2015.

Pursuant to the CCR Rule, Entergy has installed a groundwater monitoring system and has implemented groundwater monitoring at the landfill. The CCR certified groundwater monitoring network consists of 23 wells screened within two hydrogeologic units at the landfill (see Figure 2). These units are referred to as Stratum I (shallow) and III (deep). These units are separated by a low permeability hydrogeologic unit (Stratum II). Stratum I monitoring wells are designated by the letter "S" after the well number, and Stratum III monitoring wells are designated by the letter "D" after the well number. Potentiometric maps for Stratum I and Stratum III are shown in Figures 3 and 4, respectively.

Pursuant to the CCR Rule, eight quarterly background groundwater monitoring events were performed from the fourth quarter 2015 through the third quarter 2017. The samples were analyzed for the parameters in Appendix III to Part 257 – Constituents for Detection Monitoring and in Appendix IV to Part 257 – Constituents for Assessment Monitoring. Following background monitoring, the first semiannual detection monitoring event per the CCR Rule was performed in August 2017. Pursuant to the CCR Rule, statistical analysis of these results relative to background results was performed in accordance with 40 CFR 257.93(f) and the Statistical Analysis Plan. Based on the results of the statistical analysis, statistically significant increases (SSIs) were identified and evaluated in the Alternate Source Demonstration (ASD) report dated

April 2018. Entergy performed the second semiannual detection monitoring sampling event in March 2018 pursuant to the CCR Rule.

Statistical analysis of the second semiannual detection monitoring event results for the Appendix III constituents relative to the background results was performed pursuant to 40 CFR 257.93(f) and the Statistical Analysis Plan. Based on the results of the statistical analysis, verification samples were collected from six wells for five constituents in May 2018. The statistical analysis was then re-evaluated for resampled parameters. Based on the results of the statistical analysis SSIs were identified as follows:

- Calcium (MW-104S);
- Calcium, Fluoride, and TDS (MW-111S);
- Calcium and TDS (MW-105D);
- Boron (MW-109D);
- Boron, Calcium, and TDS (MW-112D); and
- Calcium (MW-115D).

The SSIs for boron in MW-109D, calcium in MW-105D and MW-112D, and TDS in MW-105D are a result of increasing trends at 98% confidence levels using Sen's Slope test. The remainder of the SSIs are a result of exceedances of the intrawell prediction limits.

Pursuant to 40 CFR 257.94(e)(2), Entergy may demonstrate that a source other than the CCR management unit caused the SSIs or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The information provided in this report serves as the ASD prepared in accordance with 40 CFR 257.94(e)(2) of the CCR Rule and demonstrates that the SSIs determined based on the 1st Half 2018 semiannual detection monitoring event performed in March 2018 and subsequent verification sampling in May 2018 are not due to leakage from the base of the active landfill, but are due to the following:

- The source of the calcium SSI in groundwater at MW-104S is natural variation in groundwater quality. This conclusion is based on the following primary line of evidence:
  - MW-104S is a background groundwater monitoring well and higher calcium concentrations have been measured in MW-101S, another background monitoring well in Stratum I.
- The source of the calcium SSI in groundwater at MW-111S is natural variation in groundwater quality. This conclusion is based on the following primary lines of evidence:
  - Higher calcium concentrations have been measured in MW-101S, a background monitoring well in Stratum I. In addition, the calcium concentrations measured at

MW-111S are similar to the concentrations measured in MW-104S, which is another background monitoring well. Therefore, the calcium concentrations detected at MW-111S are well within the limits of natural variation and are consistent with background water quality at this site.

- The source of the fluoride and TDS SSIs in the groundwater at MW-111S is likely impacts to groundwater from the closed (pre-CCR Rule) portions of the CADL. This conclusion is based on the following primary line of evidence:
  - MW-111S is located immediately downgradient from closed portions of the CADL and fluoride and TDS concentrations in MW-111S exceed the maximum concentrations in the three Stratum I background monitoring wells.
- The source of the calcium and TDS SSIs in the groundwater at MW-105D is natural variation in groundwater quality. This conclusion is based on the following primary line of evidence:
  - Higher calcium and TDS concentrations have been measured in MW-118D, which is located significantly farther from the CADL than any other Stratum III well.
- The source of the boron SSI in the groundwater at MW-109D is a statistical outlier in the data. This conclusion is based on the following primary line of evidence:
  - The November 2017 boron concentration is a statistical outlier based on the results of the Dixon's Outlier Test (see Appendix A). Excluding the outlier the boron concentrations in MW-109D are less than the maximum concentration observed at MW-118D, which is located significantly farther from the CADL than any other Stratum III well.
- The source of the boron, calcium, and TDS SSIs in the groundwater at MW-112D is natural variation in groundwater quality. This conclusion is based on the following primary line of evidence:
  - Higher boron, calcium, and TDS concentrations have been measured in MW-118D, which is located significantly farther from the CADL than any other Stratum III well.
- The source of the calcium SSI in the groundwater at MW-115D is natural variation in groundwater quality. This conclusion is based on the following primary line of evidence:
  - Higher calcium concentrations have been measured in MW-118D, which is located significantly farther from the CADL than any other Stratum III well.

Therefore, based on the information provided in this ASD report, Entergy will continue to conduct detection monitoring as per 40 CFR 257.94 at the CCR certified groundwater monitoring well network.

# Section 1
# Introduction

## 1.1 Background

The Entergy White Bluff power plant operates an on-site CADL that is located in Jefferson County at 1100 White Bluff Road in Redfield, Arkansas, as shown in Figure 1. The White Bluff plant has been generating and disposing CCR since it began operations in 1981. Historic CCR management has included beneficial re-use as a construction material and disposal in the CADL. Early disposal utilized approximately 20 acres of existing ravines for disposal areas that were closed prior to the effective date of the CCR Rule (October 17, 2015). Closure was performed in accordance with the original facility permit (TRC 2018a).

Entergy operates a Class 3N non-commercial industrial landfill at the Entergy White Bluff plant under Arkansas Department of Environmental Quality Solid Waste Permit No. 0199-S3N-R3. Entergy also manages CCR at the landfill (CADL) as provided in the federal Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule (CCR Rule), effective October 17, 2015.

Currently, four active CCR disposal cells are located at the CADL that operate pursuant to the CCR Rule. Approximate limits of the active CCR cells and the closed portions of the CADL are shown in Figure 2. Three of the active disposal cells (Cells 1, 2, and 3) have an 18-inch compacted clay bottom liner and the fourth cell (Cell 4) has a two-foot compacted clay bottom liner and a leachate collection system. The four active CCR cells at the CADL were constructed on top of, and adjacent to, the closed portions of the CADL (TRC 2018a).

The certified groundwater monitoring network at the landfill consists of 23 wells, installed in accordance with the CCR Rule into the upper shallow sand unit (Stratum I) and the deeper sand unit (Stratum III). Pursuant to the CCR Rule, Entergy obtained certification by a qualified Arkansas professional engineer stating that the groundwater monitoring system has been designed and constructed to meet the requirements of 40 CFR 257.91 of the CCR Rule (TRC 2017a). Also, pursuant to CFR 257.93(f)(6) of the CCR Rule, statistical analysis of the monitoring results is performed in accordance with the Statistical Analysis Plan (FTN 2017a). Entergy obtained certification by a qualified Arkansas professional engineer stating that the selected statistical method is appropriate for evaluating the groundwater monitoring data for the active CCR cells at the CADL (TRC 2017b).

Pursuant to the CCR Rule, eight quarterly background groundwater monitoring events were performed from the fourth quarter 2015 through the third quarter 2017. The samples were analyzed for the parameters in Appendix III to Part 257 – Constituents for Detection Monitoring and in Appendix IV to Part 257 – Constituents for Assessment Monitoring. Following background monitoring, the first semiannual detection monitoring event per the CCR Rule was performed in August 2017. Pursuant to the CCR Rule, statistical analysis of these results relative to background results was performed in accordance with 40 CFR 257.93(f) and the Statistical Analysis Plan. Based on the results of the statistical analysis, SSIs were identified and evaluated in the ASD completed in March 2018 (TRC 2018b) and revised in April 2018 (TRC 2018c). Entergy performed the 1st Half 2018 semiannual detection monitoring sampling event in March 2018 pursuant to the CCR Rule.

Statistical analysis of the second semiannual detection monitoring event results for the Appendix III constituents relative to the background results was performed pursuant to 40 CFR 257.93(f) and the Statistical Analysis Plan. Based on the results of this statistical analysis verification samples were collected from six wells for five constituents in May 2018. The statistical analysis was then re-evaluated for resampled parameters. Based on the results of the statistical analysis the following SSIs were identified in Stratum I and Stratum III monitoring wells:

- Calcium (MW-104S);
- Calcium, Fluoride, and Total Dissolved Solids (TDS) (MW-111S);
- Calcium and TDS (MW-105D);
- Boron (MW-109D);
- Boron, Calcium, and TDS (MW-112D); and
- Calcium (MW-115D).

The SSIs for boron in MW-109D, calcium in MW-105D and MW-112D, and TDS in MW-105D are a result of increasing trends at 98% confidence levels using Sen's Slope test. The remainder of the SSIs are a result of exceedances of the intrawell prediction limits.

## 1.2 Purpose

Pursuant to 40 CFR 257.93(h), SSIs were determined for the second detection monitoring event for Appendix III constituents (Appendix III constituents include: pH, boron, calcium, chloride, fluoride, sulfate, and TDS). SSIs were identified at two monitoring wells screened within Stratum I (wells MW-104S and MW-111S) and four in Stratum III (wells MW-105D, MW-109D, MW-112D, and MW-115D). Pursuant to 40 CFR 257.94(e)(2), Entergy may demonstrate that a source other than the active CCR landfill caused the SSIs or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

This report provides written documentation of the ASD for the SSIs determined for the second semiannual detection monitoring event, pursuant to 40 CFR 257.94(e)(2) of the CCR Rule.

## 1.3 Site Hydrogeology

The uppermost aquifer at the site is the Jackson Group aquifer (Kresse et al. 2014). Historical hydrogeological investigations have identified three subsurface strata at the CADL associated with the uppermost aquifer system:

- **Stratum I** is the uppermost, shallow permeable unit and consists of interbedded silty sand, clayey sand, silt, and clay. Stratum I ranges from 0 feet (ft) to 54 ft in thickness and ranges in elevation from 378 ft above mean sea level (amsl) to 320 ft amsl. Groundwater in Stratum I is unconfined. The direction of groundwater flow in Stratum I is to the southeast and is not subject to seasonal changes in direction. Stratum I sands have an estimated hydraulic conductivity ranging from $4 \times 10^{-4}$ centimeters per second (cm/s) to $4 \times 10^{-5}$ cm/s. Groundwater velocities in this stratum range from approximately 2 ft/year to 20 ft/year (TRC 2018a). A Stratum I potentiometric contour map with water-level measurements from March 26, 2018, is shown in Figure 3.
- **Stratum II** underlies Stratum I and is generally composed of very stiff fat clay and ranges from 25 ft to 55 ft in thickness with elevations from 337 ft amsl to 268 ft amsl (TRC 2018a). Stratum II is considered to be a confining layer, and therefore, it is not monitored under the certified CCR groundwater monitoring program.
- **Stratum III** underlies Stratum II and is heterogeneous in composition with clayey sand and/or silty sand comprising most of the unit, with a stiff to very stiff clay and silt uppermost layer. Stratum III ranges in thickness from 5 ft to 20 ft with typical elevations ranging from 287 to 258 ft amsl. Stratum I and III are the two permeable hydrogeological units encompassing the uppermost aquifer system at the CADL. The direction of groundwater flow in Stratum III is generally radial away from an apparent mound in hydraulic head near the south end of the CADL. The general flow pattern in Stratum III does not vary seasonally. In-situ hydraulic conductivities in Stratum III range from $2.53 \times 10^{-4}$ cm/s to $4.18 \times 10^{-7}$ cm/s, and groundwater flow velocities are estimated to be approximately <1 ft/year to 10 ft/year (TRC 2018a). A Stratum III potentiometric contour map with water-level measurements from March 26, 2018, is shown in Figure 4.

The certified groundwater detection monitoring system at White Bluff consists of 23 monitoring wells; eight of which are installed into Stratum I and 15 into Stratum III. After well installation background monitoring began in October 2015 per 40 CFR 257.93(d) and 257.94(b), eight rounds of background sampling were conducted through June 7, 2017. The first semiannual detection monitoring sampling event was conducted in August 2017. The 1st Half 2018 semiannual detection monitoring sampling event was conducted in March 2018. Sampling and analysis were performed in accordance with the protocols documented in the Groundwater Sampling and

Analysis Plan (FTN 2017c), with statistical analysis performed per the Statistical Analysis Plan (FTN 2017a). Sampling and analysis protocols are also described in the Statistical Methods Certification (TRC 2017b).

## 1.4 General Groundwater Quality

The dominant groundwater type in the Jackson Group aquifer is sodium- and calcium-sulfate, with generally poor water quality. Reported sulfate concentrations in the aquifer range from 0.6 mg/L to 3,080 mg/L, iron from 0.05 mg/L to 19 mg/L, and TDS from 11 mg/L to 5,330 mg/L. Reported pH values range from 2.9 standard units (su) to 8.0 su (FTN 2017b, Kresse et al. 2014). A relatively high percentage of silts and clays in Stratums I and III have been documented to affect low-flow sample collection. The results of historical groundwater monitoring at the White Bluff site, conducted from 1991-1996, showed that normal indicator parameters were masked by naturally elevated concentrations of the constituents (FTN 2014, TRC 2018a).

# Section 2
# Alternate Source Demonstration

The 1st Half 2018 semiannual detection monitoring event was performed in March 2018. Based on initial laboratory analytical results, verification sampling was performed in May 2018. Statistical analysis of the second semiannual detection monitoring data and verification sampling 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 intrawell statistical analysis, the following SSIs were determined:

- Calcium (MW-104S);
- Calcium, Fluoride, and TDS (MW-111S);
- Calcium and TDS (MW-105D);
- Boron (MW-109D);
- Boron, Calcium, and TDS (MW-112D); and
- Calcium (MW-115D).

All other Appendix III constituents were within their intrawell prediction limits in all the CCR Rule groundwater monitoring system wells.

## 2.1 Calcium at MW-104S

The calcium SSI at MW-104S is a result of natural variation in groundwater quality. The primary line of evidence for this demonstration is as follows:

- **Primary Line of Evidence:**
  - **Natural Variation in Groundwater Quality** – Calcium was detected in MW-104S at a concentration of 30.6 mg/L in the March 2018 sample, which exceeds the intrawell prediction limit of 23.81 mg/L. MW-104S is upgradient of both the closed and active portions of the CADL, therefore, concentrations measured in MW-104S are reflective of background water quality. The concentration of calcium in MW-101S, which is also a background well, has varied from 13.7 to 98.5 mg/L, indicating that calcium concentrations as high as 98.5 mg/L have been documented that result from natural variation in groundwater quality in Stratum I. Therefore, the calcium concentration measured at MW-104S is within this range of natural variation in background groundwater quality.

## 2.2 Calcium at MW-111S

The calcium SSI at MW-111S is a result of natural variation in groundwater quality. The primary line of evidence for this demonstration is as follows:

- **Primary Line of Evidence:**
  - **Natural Variation in Groundwater Quality** – Calcium was detected in MW-111S at a concentration of 37.2 mg/L in the March 2018 sample and 34 mg/L in the May 2018 verification sample. These concentrations exceed the intrawell prediction limit of 33.91 mg/L. However, background concentrations of calcium in Stratum I have varied from 13.7 to 98.5 mg/L at upgradient monitoring well MW-101S. In addition, the calcium concentrations measured at MW-111S are similar to the concentrations measured in MW-104S, which is another background monitoring well. Therefore, the calcium concentrations detected at MW-111S are well within the limits of natural variation and are consistent with background water quality at this site.

## 2.3 Fluoride at MW-111S

The fluoride SSI at MW-111S is likely a result of impacts to groundwater from the recently closed portion of the CADL. The primary line of evidence for this demonstration is as follows:

- **Primary Line of Evidence:**
  - **Impacts to groundwater from the closed portion of the CADL** – Fluoride was detected in MW-111S at a concentration of 0.284 mg/L in the March 2018 sample and 0.32 mg/L in the May 2018 verification sample. These concentrations exceed the intrawell prediction limit of 0.2466 mg/L. MW-111S is located immediately downgradient from the closed (pre-CCR Rule) portion of the CADL and the maximum fluoride concentrations in the three background wells in Stratum I (MW-101S, MW-102S, and MW-104S) range from 0.0929 mg/L to 0.135 mg/L. For these reasons, it is likely that the fluoride concentrations detected in Stratum I at MW-111S are related to the closed (pre-CCR Rule) portion of the CADL. The measured fluoride concentrations are significantly less than the federal maximum contaminant level (MCL) of 4.0 mg/L.

## 2.4 TDS at MW-111S

The TDS SSI at MW-111S is likely a result of impacts to groundwater from the recently closed portion of the CADL. The primary line of evidence for this demonstration is as follows:

- **Primary Line of Evidence:**
  - **Impacts to groundwater from the closed portion of the CADL** – TDS was detected in MW-111S at a concentration of 533 mg/L in the March 2018 sample and 542 mg/L in the May 2018 verification sample. These concentrations exceed the intrawell prediction limit of 511.5 mg/L. MW-111S is located immediately downgradient from

the closed (pre-CCR Rule) portion of the CADL and the maximum TDS concentrations in the three background wells in Stratum I (MW-101S, MW-102S, and MW-104S) range from 196 mg/L to 421 mg/L. For these reasons, it is likely that the TDS concentrations detected in Stratum I at MW-111S are related to the closed (pre-CCR Rule) portion of the CADL.

## 2.5 Calcium at MW-105D

The calcium SSI at MW-105D is a result of natural variation in groundwater quality. The primary line of evidence for this demonstration is as follows:

- **Primary Line of Evidence:**
  - **Natural Variation in Groundwater Quality** – Calcium was detected in MW-105D at a concentration of 53.9 mg/L in the March 2018 sample and 19 mg/L in the May 2018 verification sample. Calcium concentrations in MW-105D show a statistically significant upward trend at the 98% confidence level. However, the May 2018 concentration was the lowest calcium concentration historically detected in MW-105D, not supporting the upward trend. In addition, calcium concentrations in MW-118D, which is located significantly farther from the CADL than any other Stratum III well, have ranged from 68.4 to 79.3 mg/L, indicating that calcium concentrations as high as 79.3 mg/L result from natural variation in groundwater quality in Stratum III. Therefore, the calcium concentrations measured at MW-105D are within the range of natural variation.

## 2.6 Total Dissolved Solids at MW-105D

The TDS SSI at MW-105D is a result of natural variation in groundwater quality. The primary line of evidence for this demonstration is as follows:

- **Primary Line of Evidence:**
  - **Natural Variation in Groundwater Quality** – TDS was detected in MW-105D at a concentration of 345 mg/L in the March 2018 sample and 205 mg/L in the May 2018 verification sample. TDS concentrations in MW-105D show a statistically significant upward trend at the 98% confidence level. However, the May 2018 concentration was the lowest TDS concentration historically detected in MW-105D, not supporting the upward trend. In addition, TDS concentrations in MW-118D have ranged from 415 to 484 mg/L, indicating that TDS concentrations as high as 484 mg/L result from natural variation in groundwater quality in Stratum III.

## 2.7 Boron at MW-109D

The boron SSI at MW-109D is a result of a statistical outlier in the data. The primary line of evidence for this demonstration is as follows:

- **Primary Line of Evidence:**
  - **Statistical Outlier** – Boron concentrations in MW-109D show a statistically significant upward trend at the 98% confidence level. However, the November 2017 groundwater sampling event yielded a statistically significant outlier concentration for boron at MW-109D, according to Dixon's Outlier Test (see Appendix A). Excluding the outlier the boron concentrations in MW-109D are less than the maximum concentration observed at MW-118D.

## 2.8 Boron at MW-112D

The boron SSI at MW-112D is a result of natural variation in groundwater quality. The primary line of evidence for this demonstration is as follows:

- **Primary Line of Evidence:**
  - **Natural Variation in Groundwater Quality –** Boron was detected in MW-112D at a concentration of 0.256 mg/L in the March 2018 sample and 0.241 mg/L in the May 2018 verification sample. These concentrations exceed the intrawell prediction limit of 0.236 mg/L. However, boron concentrations in MW-118D have ranged from 0.316 to 0.355 mg/L, indicating that boron concentrations as high as 0.355 mg/L result from natural variation in groundwater quality in Stratum III.

## 2.9 Calcium at MW-112D

The calcium SSI at MW-112D in Stratum III is a result of natural variation in groundwater quality. The primary line of evidence for this demonstration is as follows:

- **Primary Line of Evidence:**
  - **Natural Variation in Groundwater Quality** – Calcium was detected in MW-112D at a concentration of 24.5 mg/L in the March 2018 sample and 24.4 mg/L in the May 2018 verification sample. Calcium concentrations in MW-112D show a statistically significant upward trend at the 98% confidence level. However, calcium concentrations measured in the groundwater at MW-112D are among the lowest calcium concentrations historically measured in Stratum III. In addition, calcium concentrations in MW-118D have ranged from 68.4 to 79.3 mg/L, indicating that calcium concentrations as high as 79.3 mg/L result from natural variation in groundwater quality in Stratum III.

## 2.10 TDS at MW-112D

The TDS SSI at MW-112D is a result of natural variation in groundwater quality. The primary line of evidence for this demonstration is as follows:

- **Primary Line of Evidence:**
  - **Natural Variation in Groundwater Quality** – TDS was detected in MW-112D at a concentration of 190 mg/L in the March 2018 sample and 202 mg/L in the May 2018 verification sample. These concentrations exceed the intrawell prediction limit of 187.6 mg/L. However, TDS concentrations in MW-112D are the lowest TDS concentrations historically detected in Stratum III. TDS concentrations in MW-118D have ranged from 415 to 484 mg/L, indicating that TDS concentrations as high as 484 mg/L result from natural variation in groundwater quality in Stratum III.

## 2.11 Calcium at MW-115D

The calcium SSI at MW-115D is a result of natural variation in groundwater quality. The primary line of evidence for this demonstration is as follows:

- **Primary Line of Evidence:**
  - **Natural Variation in Groundwater Quality** – Calcium was detected in MW-115D at a concentration of 44.1 mg/L in the March 2018 sample and 43.5 mg/L in the May 2018 verification sample. These concentrations exceed the intrawell prediction limit of 43.38 mg/L. However, calcium concentrations in MW-118D have ranged from 68.4 to 79.3 mg/L, indicating that calcium concentrations as high as 79.3 mg/L result from natural variation in groundwater quality in Stratum III.

# Section 3
# 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 and demonstrates that the SSIs determined based on statistical analysis of the 1st Half 2018 semiannual detection monitoring event performed in March 2018 and subsequent verification sampling in May 2018 are not due to leakage from the base of the active CADL, but are due to the following:

- The source of the calcium SSI in groundwater at MW-104S is natural variation in the groundwater quality. This conclusion is based on the following primary line of evidence:
  - MW-104S is considered a background monitoring well, and higher calcium concentrations have been measured in MW-101S, another background monitoring well in Stratum I.
- The source of the calcium SSI in groundwater at MW-111S is natural variation in the groundwater quality. This conclusion is based on the following primary line of evidence:
  - Higher calcium concentrations have been measured in MW-101S, a background monitoring well in Stratum I. In addition, the calcium concentrations measured at MW-111S are similar to the concentrations measured in MW-104S, which is another background monitoring well. Therefore, the calcium concentrations detected at MW-111S are well within the limits of natural variation and are consistent with background water quality at this site.
- The source of the fluoride and TDS SSIs in the groundwater at MW-111S is likely the result of impacts to groundwater from the recently closed (pre-CCR Rule) portions of the CADL. This conclusion is based on the following primary line of evidence:
  - MW-111S is located immediately downgradient from closed portions of the CADL and fluoride and TDS concentrations in MW-111S exceed the maximum concentrations in the three Stratum I background monitoring wells.
- The source of the calcium and TDS SSIs in the groundwater at MW-105D is natural variation in groundwater quality. This conclusion is based on the following primary line of evidence:
  - Higher calcium and TDS concentrations have been measured in MW-118D, which is located significantly farther from the CADL than any other Stratum III well.
- The source of the boron SSI in the groundwater at MW-109D is a statistical outlier in the data. This conclusion is based on the following primary line of evidence:
  - The November 2017 boron concentration is a statistical outlier based on the results of the Dixon's Outlier Test (see Appendix A). Excluding the outlier the boron

concentrations in MW-109D are less than the maximum concentration observed at MW-118D, which is located significantly farther from the CADL than any other Stratum III well.

- The source of the boron, calcium, and TDS SSIs in the groundwater at MW-112D is natural variation in the groundwater quality. This conclusion is based on the following primary line of evidence:
  - Higher boron, calcium, and TDS concentrations have been measured in MW-118D, which is located significantly farther from the CADL than any other Stratum III well.
- The source of the calcium SSI in the groundwater at MW-115D is natural variation in the groundwater quality. This conclusion is based on the following primary line of evidence:
  - Higher calcium concentrations have been measured in MW-118D, which is located significantly farther from the CADL than any other Stratum III well.

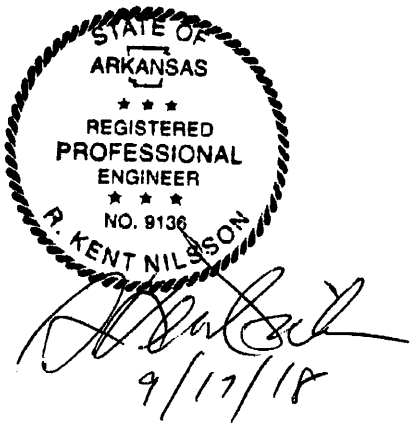
Therefore, based on the information provided in this ASD report, Entergy will continue to conduct detection monitoring as per 40 CFR 257.94 at the certified groundwater monitoring network at the CADL.

# Section 4
# Certification

I hereby certify that the alternative source demonstration presented within this document for the White Bluff Plant 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:** R. Kent Nilsson **Expiration Date:** December 31, 2018

**Company:** TRC Environmental Corporation **Date:** September 17, 2018




(SEAL)

# Section 5
# References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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. doi: http://dx.doi.org/10.3133/sir20145149.

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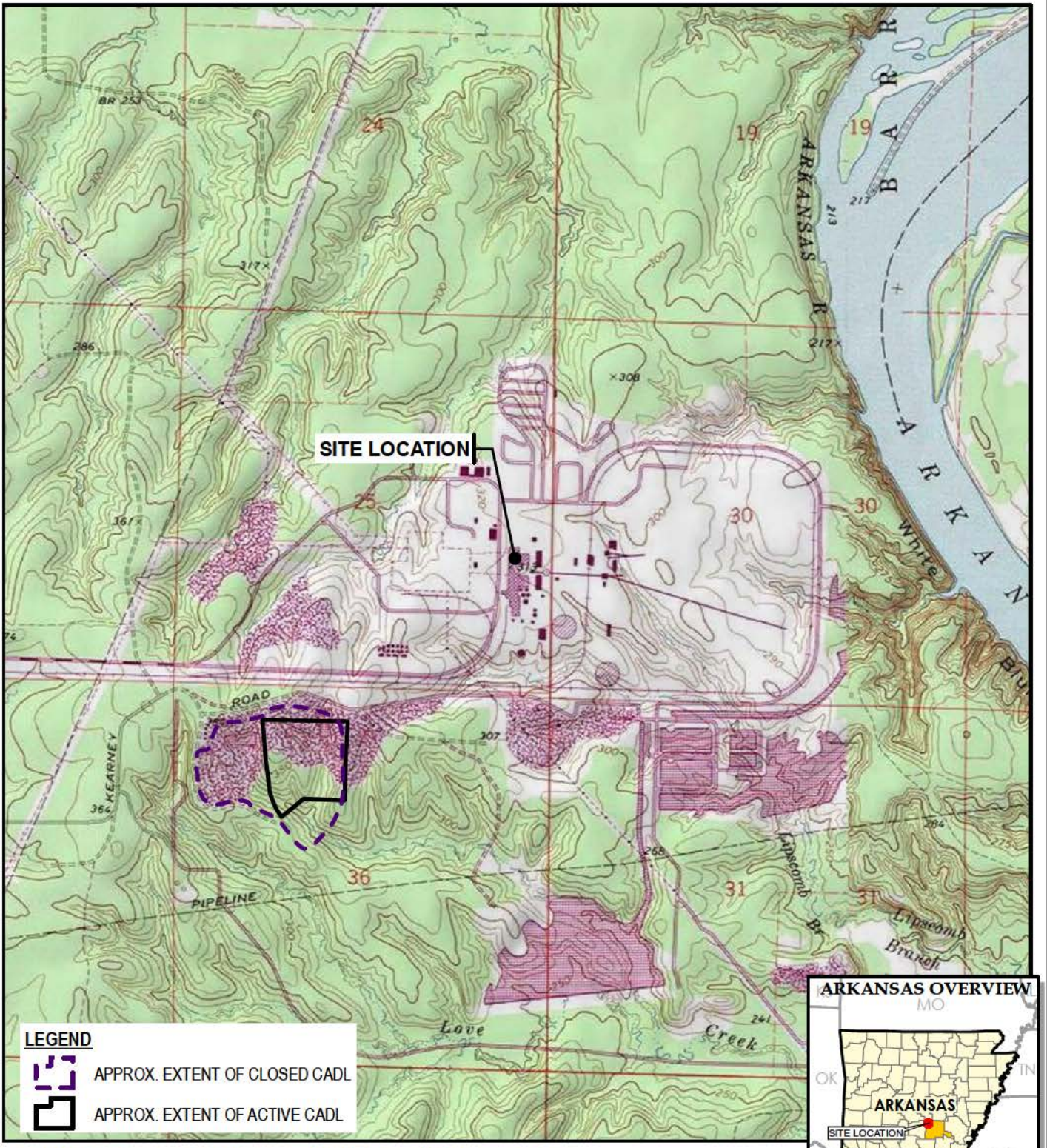
TRC. 2017b. Statistical Methods Certification, White Bluff Steam Electric Generating Station, Redfield, Arkansas. Prepared for Entergy Arkansas Inc. Baton Rouge: TRC Environmental Corporation.

TRC. 2018a. Site Conceptual Model: Entergy White Bluff Plant Coal Ash Disposal Landfill, Redfield, Jefferson County, Arkansas. January 2018.

TRC. 2018b. Alternate Source Demonstration, Entergy White Bluff Plant, Coal Ash Disposal Landfill, Redfield, Jefferson County, Arkansas. March 2018.

TRC. 2018c. Alternate Source Demonstration, Entergy White Bluff Plant, Coal Ash Disposal Landfill, Redfield, Jefferson County, Arkansas. April 2018.




BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

N

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:

# SITE LOCATION MAP

| | |
|---|---|
| DRAWN BY: | A. REIS |
| CHECKED BY: | S. SELLWOOD |
| APPROVED BY: | J. HOUSE |
| DATE: | SEPTEMBER 2018 |
| PROJ. NO.: | 306268 |
| FILE: | 306268-001slmWB.mxd |

**FIGURE 1**

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TRC - GIS

Coordinate System: NAD 1983 StatePlane Arkansas South FIPS 0302 Feet (Foot US)
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MW-101D
MW-101S
MW-102D
MW-102S
MW-104S
MW-104D
MW-105S
MW-105D
MW-114D
MW-118D
MW-112D
MW-109D
MW-106S
MW-106D
MW-111S
MW-107D
PZ-7
MW-108D
MW-110S
MW-110D
MW-103S
MW-103D
MW-113D
MW-115D
PZ-5

## LEGEND

- SURFACE SEEP
- 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 ESRI/DIGITAL GLOBE, 2016.
2. COAL ASH DISPOSAL LANDFILL (CADL)

0 400 800 Feet

1 " = 400 '
1:4,800

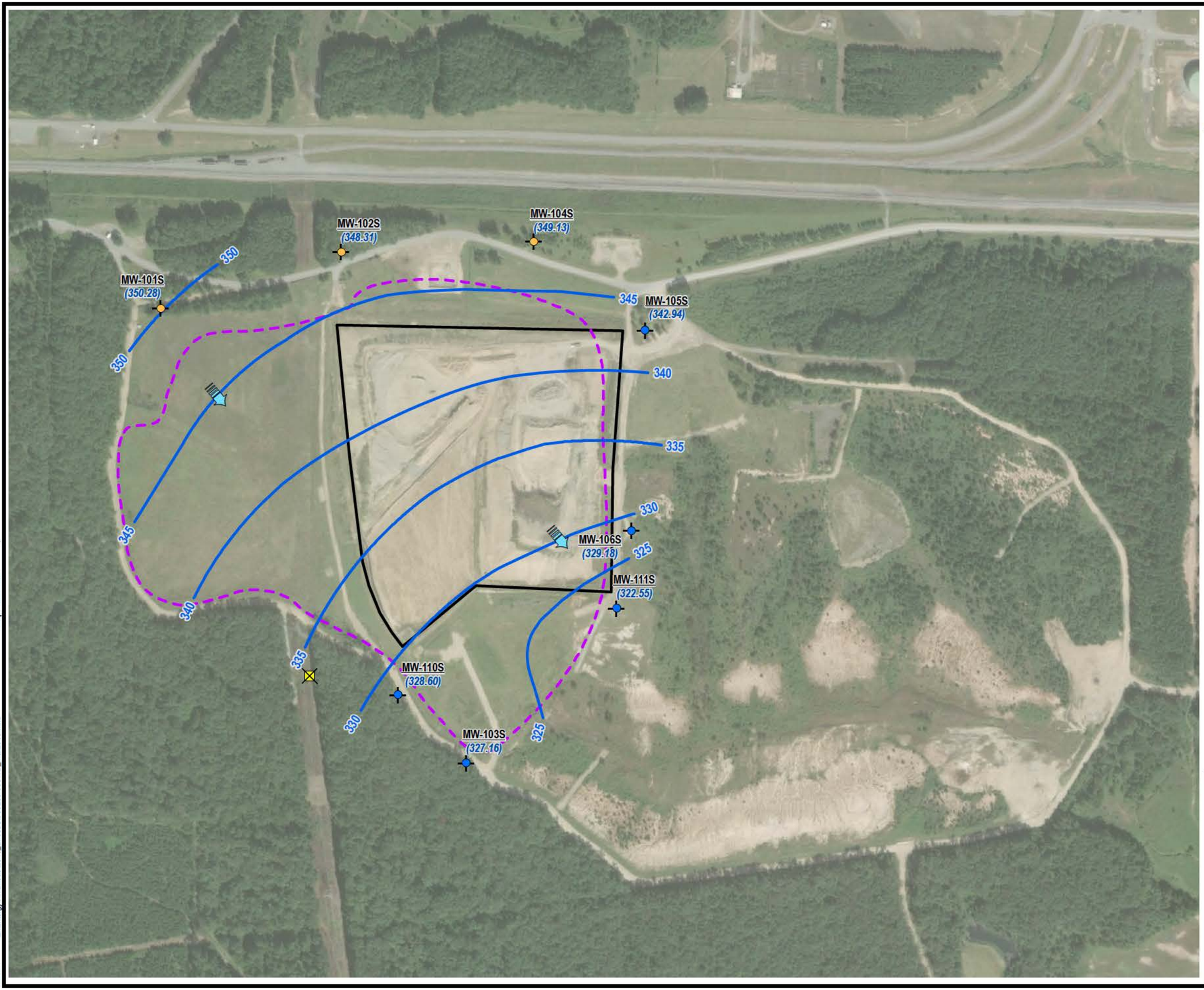
PROJECT:
**ENTERGY WHITE BLUFF PLANT**
**1100 WHITE BLUFF ROAD**
**REDFIELD, ARKANSAS**

TITLE:
# CADL EXTENT AND CCR GROUNDWATER MONITORING LOCATIONS

| | | | |
|---|---|---|---|
| DRAWN BY: | A. REIS | PROJ. NO.: | 306268 |
| CHECKED BY: | S. SELLWOOD | | |
| APPROVED BY: | J. HOUSE | | **FIGURE 2** |
| DATE: | SEPTEMBER 2018 | | |

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

FILE NO.: 306268-002WB.mxd




## LEGEND

- SURFACE SEEP
- STRATUM I BACKROUND WELL
- STRATUM I MONITORING WELL
- GROUNDWATER CONTOURS (MARCH 26, 2018)
- APPROX. EXTENT OF CLOSED CADL
- APPROX. EXTENT OF ACTIVE CADL
- GROUNDWATER FLOW DIRECTION

## NOTES

1. BASE MAP IMAGERY FROM ESRI/DIGITAL GLOBE, 2016.
2. COAL ASH DISPOSAL LANDFILL (CADL)
3. GROUNDWATER LEVELS MEASURED BY FTN ON MARCH 26, 2018

0 400 800 Feet

1 " = 400 '

1:4,800

PROJECT:
**ENTERGY WHITE BLUFF PLANT**
**1100 WHITE BLUFF ROAD**
**REDFIELD, ARKANSAS**

TITLE:
**STRATUM I POTENTIOMETRIC MAP**
**MARCH 26, 2018**

| | | | |
|---|---|---|---|
| DRAWN BY: | A. REIS | PROJ. NO.: | 306268 |
| CHECKED BY: | S. SELLWOOD | | |
| APPROVED BY: | J. HOUSE | | |
| DATE: | SEPTEMBER 2018 | | |

**FIGURE 3**

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

FILE NO.: 306268-003WB_mar2018.mxd

Plot Date: 9/17/2018, 13:43:18 PM by AREIS -- LAYOUT: ANSI B(11"x17")
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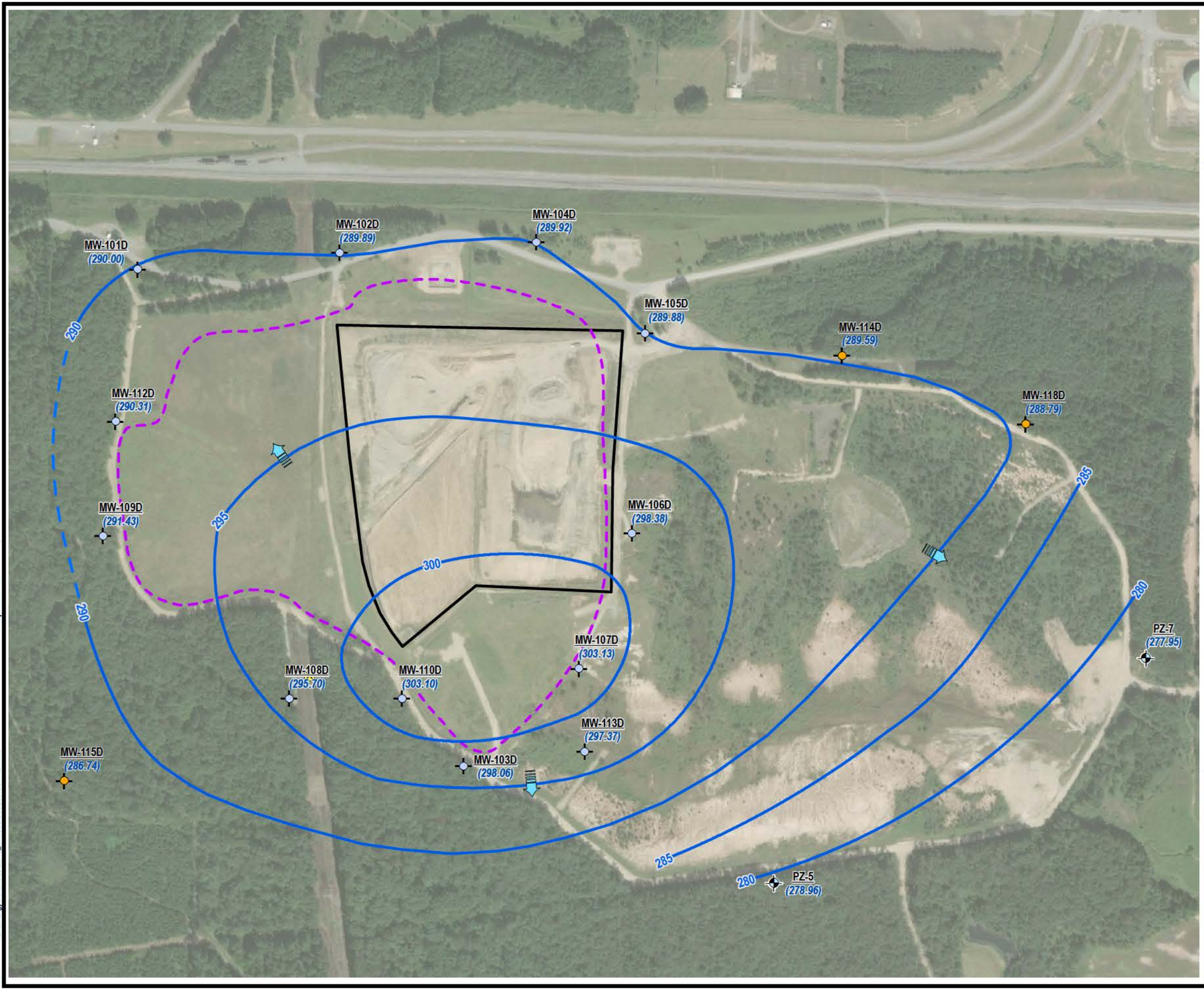
Map Rotation: 0

TRC - GIS




## LEGEND

- SURFACE SEEP
- STRATUM III BACKROUND WELL
- STRATUM III MONITORING WELL
- STRATUM III PIEZOMETER
- GROUNDWATER CONTOURS (MARCH 26, 2018, DASHED WHERE INFERRED)
- APPROX. EXTENT OF CLOSED CADL
- APPROX. EXTENT OF ACTIVE CADL
- GROUNDWATER FLOW DIRECTION

## NOTES

1. BASE MAP IMAGERY FROM ESRI/DIGITAL GLOBE, 2016.
2. COAL ASH DISPOSAL LANDFILL (CADL)
3. GROUDWATER LEVELS MEASURED BY FTN ON MARCH 26, 2018.

0 400 800 Feet

1 " = 400 '

1:4,800

PROJECT:
**ENTERGY WHITE BLUFF PLANT**
**1100 WHITE BLUFF ROAD**
**REDFIELD, ARKANSAS**

TITLE:
**STRATUM III POTENTIOMETRIC MAP**
**MARCH 26, 2018**

| | | | |
|---|---|---|---|
| DRAWN BY: | A. REIS | PROJ. NO.: | 306268 |
| CHECKED BY: | S. SELLWOOD | | |
| APPROVED BY: | J. HOUSE | | **FIGURE 4** |
| DATE: | SEPTEMBER 2018 | | |

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

FILE NO.: 306268-004WB.mxd

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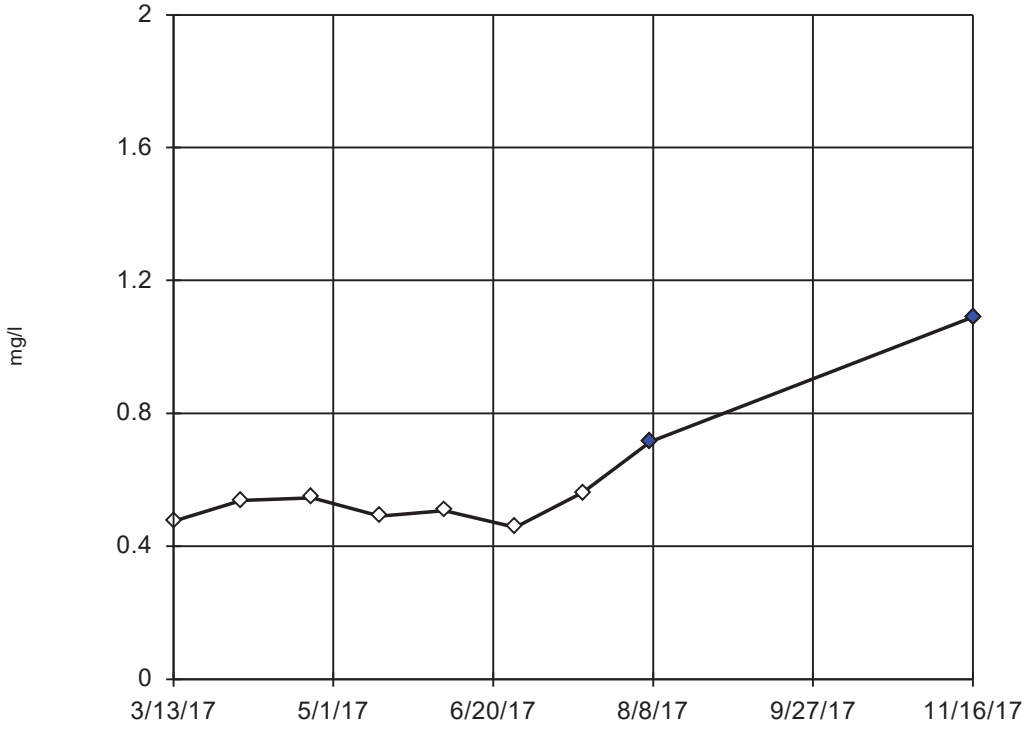
TRC - GIS

# Appendix A
# Dixon's Outlier Test

## Statistically Significant Outliers in November 2017 Data

# Dixon's Outlier Test

## MW-108S




n = 9

Statis ical outliers are drawn as solid.
Testing for 2 high outliers.
Mean = 0.5979.
Std. Dev. = 0.1994.
0.715: c = 0.6375
tabl = 0.512.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0 9531
Critical = 0.838
The distribution, after removal of suspect val-ues, was found to be nor-mally distributed.

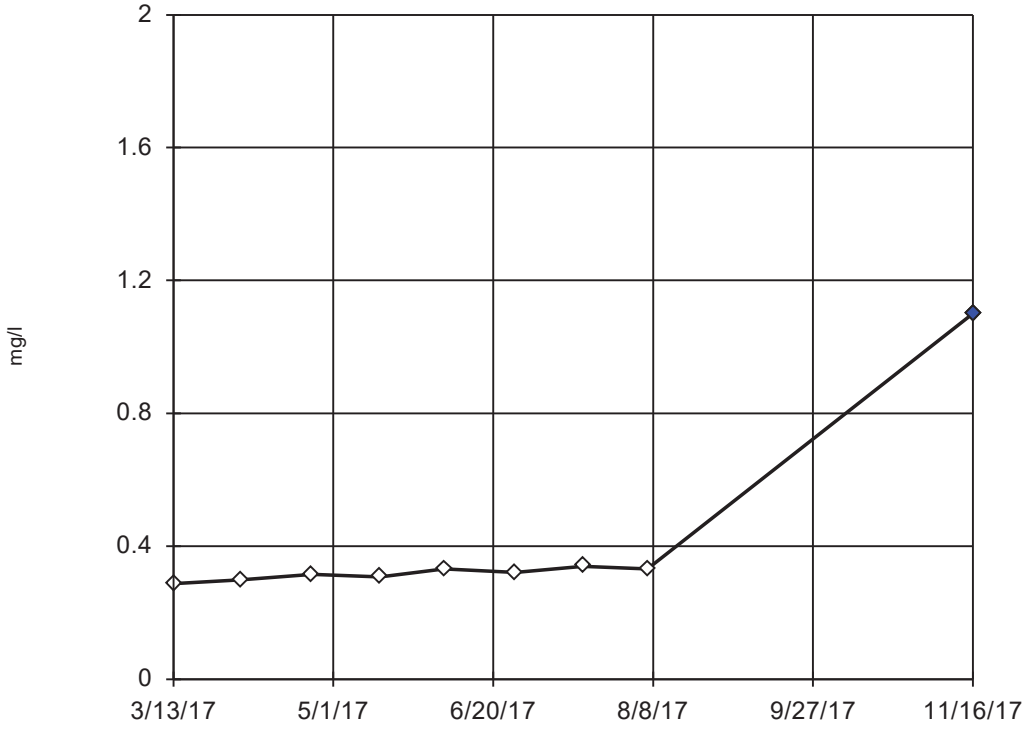
Constituent: Boron Analysis Run 12/5/2017 10:33 AM View: Stratum I and III, Appendix III

Entergy White Bluff Class 3 N Landfill Client: Entergy Data: Entergy White Bluff EPA Groundwater Database

Sanitas™ v.9.5 32 For the statistical analyses of ground water by FTN Associates only. UG

# Dixon's Outlier Test

## MW-109D




n = 9

Statis ical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 0.4038.
Std. Dev. = 0.2616.
1.1: c = 0.9488
tabl = 0.512.
Alpha = 0.05.

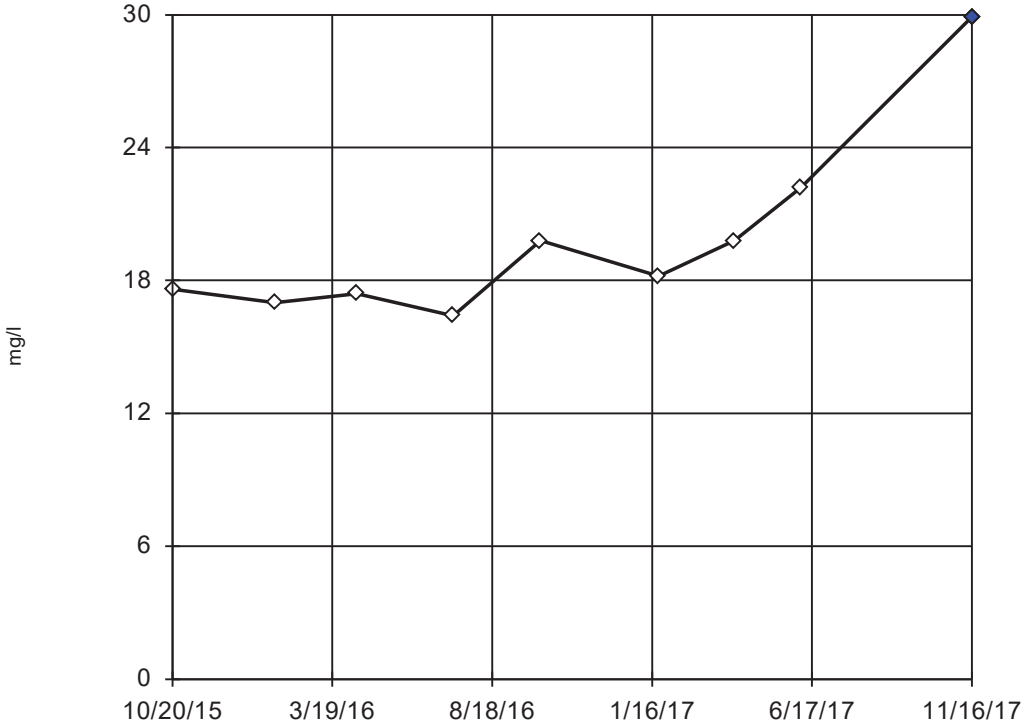
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0 9596
Critical = 0.851
The distribution, after removal of suspect val-ue, was found to be nor-mally distributed.

Constituent: Boron Analysis Run 12/5/2017 10:33 AM View: Stratum I and III, Appendix III

Entergy White Bluff Class 3 N Landfill Client: Entergy Data: Entergy White Bluff EPA Groundwater Database

# Dixon's Outlier Test

MW-104S (bg)




n = 9

Statis ical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 19.81.
Std. Dev. = 4.188.
29.9: c = 0.5969
tabl = 0.512.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0 9103
Critical = 0.851
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Calcium Analysis Run 12/5/2017 10:33 AM View: Stratum I and III, Appendix III

Entergy White Bluff Class 3 N Landfill Client: Entergy Data: Entergy White Bluff EPA Groundwater Database