ftn Associates Ltd.
water resources / environmental consultants

ENTERGY ARKANSAS, LLC
INDEPENDENCE PLANT
LANDFILL CELLS 12 – 15

2019 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 30, 2020

ENTERGY ARKANSAS, LLC
ENTERGY INDEPENDENCE PLANT
LANDFILL CELLS 12 – 15

2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

Prepared for

Entergy Arkansas, LLC
PO Box 551
Little Rock, AR 72203

Prepared by

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FTN No. R07920-1993-001

January 30, 2020

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1.0 INTRODUCTION

Entergy Arkansas, LLC (Entergy), operates a landfill for the disposal of coal combustion residuals (CCRs) at the Independence plant located near Newark, 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 Independence plant CCR landfill.

2.0 GROUNDWATER MONITORING SYSTEM

Entergy's groundwater monitoring system consists of 11 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 2019

Entergy did not install any new wells or decommission any existing wells in the certified groundwater monitoring system during 2019.

4.0 GROUNDWATER MONITORING DATA

In accordance with §257.90(e)(3), all monitoring data obtained under §§257.90 through 257.98 during 2019 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.

5.0 STATUS SUMMARY OF THE 2019 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 2019 is provided in the list below:

- In accordance with §257.94(b), semiannual detection monitoring was performed during the first and second half of 2019 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.
- The first half 2019 detection monitoring sampling was performed during February and March 2019. Based on statistical evaluation of the data, resampling was performed during May 2019 to verify one potential statistically significant increase (SSI). The result from resampling confirmed the initial SSI.
- Entergy completed a successful alternate source demonstration (ASD) per §257.94(e)(2) in response to the SSI identified during the first half of 2019 detection monitoring event. 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 as 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 second half 2019 semiannual detection monitoring was performed during August and September 2019. Based on statistical evaluation of the data, no SSIs were identified and Entergy continued with detection monitoring in accordance with §257.94.
- No problems were encountered during 2019 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 2019.

6.0 PROJECTED ACTIVITIES FOR 2020

Planned activities for the program during 2020 are listed below:

- Semiannual detection monitoring is planned for February and August 2020.

APPENDIX A

Site Map

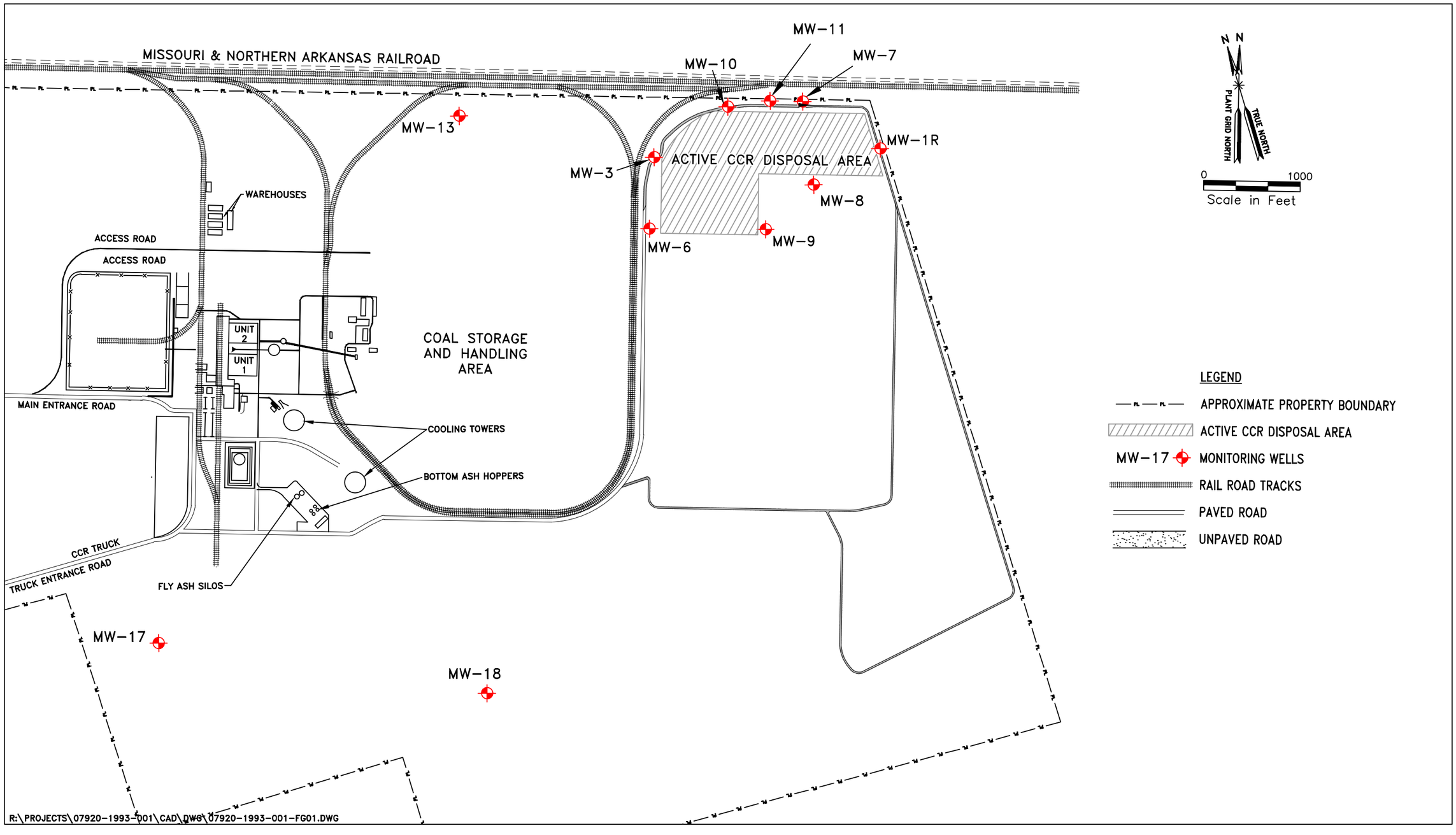

Figure 1. Groundwater monitoring network, Entergy Independence EPA CCR landfill.

APPENDIX B

Groundwater Monitoring Data

Sampling Schedule

Sampling schedule, Entergy Independence EPA CCR landfill network

Well ID	Detection Monitoring Sampling Dates and Wells Sampled			Number of Samples Collected
	2/22-3/5/2019	5/29/2019	8/26-9/9/2019	
MW-1R	X		X	2
MW-3	X		X	2
MW-6	X		X	2
MW-7	X		X	2
MW-8	X		X	2
MW-9	X		X	2
MW-10	X		X	2
MW-11	X		X	2
MW-13	X		X	2
MW-17	X	X	X	3
MW-18	X		X	2

Note: All samples collected in 2019 were part of the detection monitoring program. No samples collected in 2019 were part of an assessment monitoring program.

Field pH Data

Field pH data collected during 2019, Entergy Independence EPA CCR landfill network

Well	Date Collected	pH (su)
MW-1R	2/25/2019	6.0
	8/28/2019	5.9
MW-3	2/22/2019	6.5
	8/26/2019	6.4
MW-6	2/22/2019	6.3
	8/26/2019	5.8
MW-7	2/25/2019	6.9
	8/27/2019	7.2
MW-8	2/28/2019	6.6
	8/28/2019	6.1
MW-9	2/28/2019	6.5
	8/28/2019	6.2
MW-10	2/22/2019	6.7
	8/27/2019	6.6
MW-11	2/25/2019	6.3
	8/27/2019	6.7
MW-13	3/5/2019	6.2
	9/9/2019	7.2
MW-17	2/26/2019	6.0
	5/29/2019	5.7
	9/9/2019	6.4
MW-18	2/26/2019	6.4
	9/9/2019	6.5

Laboratory Analytical Data

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

March 04, 2019

FTN Associates - Little Rock, AR

Sample Delivery Group:	L1073714
Samples Received:	02/27/2019
Project Number:	7920-1993-001
Description:	Entergy Independence Landfill

Report To: Dana Derrington
3 Innwood Circle, Suite 220
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-1R L1073714-01 GW

Collected by: Michael Clayton | Collected date/time: 02/25/19 14:40 | Received date/time: 02/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1242965	1	02/28/19 13:56	02/28/19 15:01	AJS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1242894	1	02/28/19 02:45	02/28/19 02:45	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1242894	5	02/28/19 03:00	02/28/19 03:00	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1242899	1	02/27/19 18:47	02/28/19 11:13	CCE	Mt. Juliet, TN

MW-3 L1073714-02 GW

Collected by: Michael Clayton | Collected date/time: 02/22/19 10:55 | Received date/time: 02/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1242963	1	02/28/19 13:44	02/28/19 17:00	AJS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1242894	1	02/28/19 03:16	02/28/19 03:16	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1242894	5	02/28/19 11:49	02/28/19 11:49	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1242899	1	02/27/19 18:47	02/28/19 11:16	CCE	Mt. Juliet, TN

MW-6 L1073714-03 GW

Collected by: Michael Clayton | Collected date/time: 02/22/19 09:50 | Received date/time: 02/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1242963	1	02/28/19 13:44	02/28/19 17:00	AJS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1242894	1	02/28/19 04:48	02/28/19 04:48	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1242894	5	02/28/19 12:20	02/28/19 12:20	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1242899	1	02/27/19 18:47	02/28/19 11:18	CCE	Mt. Juliet, TN

MW-7 L1073714-04 GW

Collected by: Michael Clayton | Collected date/time: 02/25/19 12:30 | Received date/time: 02/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1242965	1	02/28/19 13:56	02/28/19 15:01	AJS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1242894	1	02/28/19 05:04	02/28/19 05:04	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1242899	1	02/27/19 18:47	02/28/19 11:21	CCE	Mt. Juliet, TN

MW-10 L1073714-05 GW

Collected by: Michael Clayton | Collected date/time: 02/22/19 12:15 | Received date/time: 02/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1242963	1	02/28/19 13:44	02/28/19 17:00	AJS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1242894	1	02/28/19 05:19	02/28/19 05:19	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1242894	5	02/28/19 05:34	02/28/19 05:34	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1242899	1	02/27/19 18:47	02/28/19 11:24	CCE	Mt. Juliet, TN

MW-11 L1073714-06 GW

Collected by: Michael Clayton | Collected date/time: 02/25/19 11:05 | Received date/time: 02/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1242965	1	02/28/19 13:56	02/28/19 15:01	AJS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1242894	1	02/28/19 05:50	02/28/19 05:50	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1242899	1	02/27/19 18:47	02/28/19 11:27	CCE	Mt. Juliet, TN

MW-17 L1073714-08 GW

Collected by: Michael Clayton
Collected date/time: 02/26/19 11:15
Received date/time: 02/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1243594	1	02/28/19 19:20	02/28/19 20:03	AJS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1242894	1	02/28/19 06:21	02/28/19 06:21	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1242899	1	02/27/19 18:47	02/28/19 11:32	CCE	Mt. Juliet, TN

MW-18 L1073714-09 GW

Collected by: Michael Clayton
Collected date/time: 02/26/19 10:20
Received date/time: 02/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1243594	1	02/28/19 19:20	02/28/19 20:03	AJS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1242894	1	02/28/19 06:36	02/28/19 06:36	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1242899	1	02/27/19 18:47	02/28/19 11:35	CCE	Mt. Juliet, TN

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	519000		2820	10000	1	02/28/2019 15:01	WG1242965

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	127000		260	5000	5	02/28/2019 03:00	WG1242894
Fluoride	127		9.90	100	1	02/28/2019 02:45	WG1242894
Sulfate	177000		387	25000	5	02/28/2019 03:00	WG1242894

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	130	J	12.6	200	1	02/28/2019 11:13	WG1242899
Calcium	106000		46.3	1000	1	02/28/2019 11:13	WG1242899

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	563000		2820	10000	1	02/28/2019 17:00	WG1242963

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	38500		51.9	1000	1	02/28/2019 03:16	WG1242894
Fluoride	184		9.90	100	1	02/28/2019 03:16	WG1242894
Sulfate	135000		387	25000	5	02/28/2019 11:49	WG1242894

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	1030		12.6	200	1	02/28/2019 11:16	WG1242899
Calcium	71700		46.3	1000	1	02/28/2019 11:16	WG1242899

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	490000		2820	10000	1	02/28/2019 17:00	WG1242963

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	34600		51.9	1000	1	02/28/2019 04:48	WG1242894
Fluoride	121		9.90	100	1	02/28/2019 04:48	WG1242894
Sulfate	141000		387	25000	5	02/28/2019 12:20	WG1242894

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	170	J	12.6	200	1	02/28/2019 11:18	WG1242899
Calcium	77100		46.3	1000	1	02/28/2019 11:18	WG1242899

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	588000		3750	13300	1	02/28/2019 15:01	WG1242965

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	4200		51.9	1000	1	02/28/2019 05:04	WG1242894
Fluoride	718		9.90	100	1	02/28/2019 05:04	WG1242894
Sulfate	61900		77.4	5000	1	02/28/2019 05:04	WG1242894

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	111	J	12.6	200	1	02/28/2019 11:21	WG1242899
Calcium	49300		46.3	1000	1	02/28/2019 11:21	WG1242899

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	1060000		5640	20000	1	02/28/2019 17:00	WG1242963

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	22300		51.9	1000	1	02/28/2019 05:19	WG1242894
Fluoride	465		9.90	100	1	02/28/2019 05:19	WG1242894
Sulfate	437000		387	25000	5	02/28/2019 05:34	WG1242894

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	4990		12.6	200	1	02/28/2019 11:24	WG1242899
Calcium	167000		46.3	1000	1	02/28/2019 11:24	WG1242899

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	231000		2820	10000	1	02/28/2019 15:01	WG1242965

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	21500		51.9	1000	1	02/28/2019 05:50	WG1242894
Fluoride	206		9.90	100	1	02/28/2019 05:50	WG1242894
Sulfate	16900		77.4	5000	1	02/28/2019 05:50	WG1242894

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	106	J	12.6	200	1	02/28/2019 11:27	WG1242899
Calcium	47400		46.3	1000	1	02/28/2019 11:27	WG1242899

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	182000		2820	10000	1	02/28/2019 20:03	WG1243594

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	608	J	51.9	1000	1	02/28/2019 06:21	WG1242894
Fluoride	79.7	J	9.90	100	1	02/28/2019 06:21	WG1242894
Sulfate	24300		77.4	5000	1	02/28/2019 06:21	WG1242894

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	154	J	12.6	200	1	02/28/2019 11:32	WG1242899
Calcium	30700		46.3	1000	1	02/28/2019 11:32	WG1242899

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	233000		2820	10000	1	02/28/2019 20:03	WG1243594

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	5550		51.9	1000	1	02/28/2019 06:36	WG1242894
Fluoride	72.8	J	9.90	100	1	02/28/2019 06:36	WG1242894
Sulfate	24900		77.4	5000	1	02/28/2019 06:36	WG1242894

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	62.8	J	12.6	200	1	02/28/2019 11:35	WG1242899
Calcium	58000		46.3	1000	1	02/28/2019 11:35	WG1242899

Method Blank (MB)

(MB) R3388247-1 02/28/19 17:00

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

L1073714-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1073714-03 02/28/19 17:00 • (DUP) R3388247-3 02/28/19 17:00

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	490000	494000	1	0.813		5

Laboratory Control Sample (LCS)

(LCS) R3388247-2 02/28/19 17:00

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8380000	95.2	85.0-115	

Method Blank (MB)

(MB) R3388251-1 02/28/19 15:01

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

L1073714-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1073714-06 02/28/19 15:01 • (DUP) R3388251-3 02/28/19 15:01

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	231000	230000	1	0.434		5

Laboratory Control Sample (LCS)

(LCS) R3388251-2 02/28/19 15:01

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8420000	95.7	85.0-115	

Method Blank (MB)

(MB) R3388254-1 02/28/19 20:03

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

L1073714-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1073714-09 02/28/19 20:03 • (DUP) R3388254-3 02/28/19 20:03

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	233000	235000	1	0.855		5

Laboratory Control Sample (LCS)

(LCS) R3388254-2 02/28/19 20:03

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8830000	100	85.0-115	

Method Blank (MB)

(MB) R3387722-1 02/28/19 00:58

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

L1073714-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1073714-02 02/28/19 03:16 • (DUP) R3387722-3 02/28/19 03:31

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	38500	38500	1	0.189		15
Fluoride	184	183	1	0.546		15

L1073714-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1073714-02 02/28/19 11:49 • (DUP) R3387722-8 02/28/19 12:04

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	135000	132000	5	2.45		15

L1073747-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1073747-09 02/28/19 15:28 • (DUP) R3387722-9 02/28/19 15:43

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	573000	573000	5	0.0546	E	15
Fluoride	3090	3130	5	1.31		15
Sulfate	254000	255000	5	0.506		15

Laboratory Control Sample (LCS)

(LCS) R3387722-2 02/28/19 01:14

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40000	40600	102	80.0-120	
Fluoride	8000	8320	104	80.0-120	
Sulfate	40000	41200	103	80.0-120	

L1073714-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1073714-02 02/28/19 03:16 • (MS) R3387722-4 02/28/19 03:47 • (MSD) R3387722-5 02/28/19 04:33

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	38500	86500	86400	95.8	95.8	1	80.0-120			0.0229	15
Fluoride	5000	184	5200	5210	100	100	1	80.0-120			0.0538	15
Sulfate	50000	135000	176000	176000	82.1	82.2	1	80.0-120	E	E	0.0314	15

L1073747-09 Original Sample (OS) • Matrix Spike (MS)

(OS) L1073747-09 02/28/19 09:26 • (MS) R3387722-7 02/28/19 09:56

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50000	564000	584000	41.3	1	80.0-120	E V
Fluoride	5000	2890	7610	94.4	1	80.0-120	
Sulfate	50000	184000	217000	65.1	1	80.0-120	E J6

Method Blank (MB)

(MB) R3387567-1 02/28/19 10:40

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

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

(LCS) R3387567-2 02/28/19 10:43 • (LCSD) R3387567-3 02/28/19 10:45

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	1020	986	102	98.6	80.0-120			3.09	20
Calcium	10000	10300	10100	103	101	80.0-120			2.12	20

L1073806-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1073806-03 02/28/19 10:48 • (MS) R3387567-5 02/28/19 10:54 • (MSD) R3387567-6 02/28/19 10:56

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	453	1460	1440	101	98.8	1	75.0-125			1.55	20
Calcium	10000	337000	342000	340000	48.8	30.8	1	75.0-125	V	V	0.529	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 multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
V	The sample concentration is too high to evaluate accurate spike recoveries.

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	T104704245-18-15
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

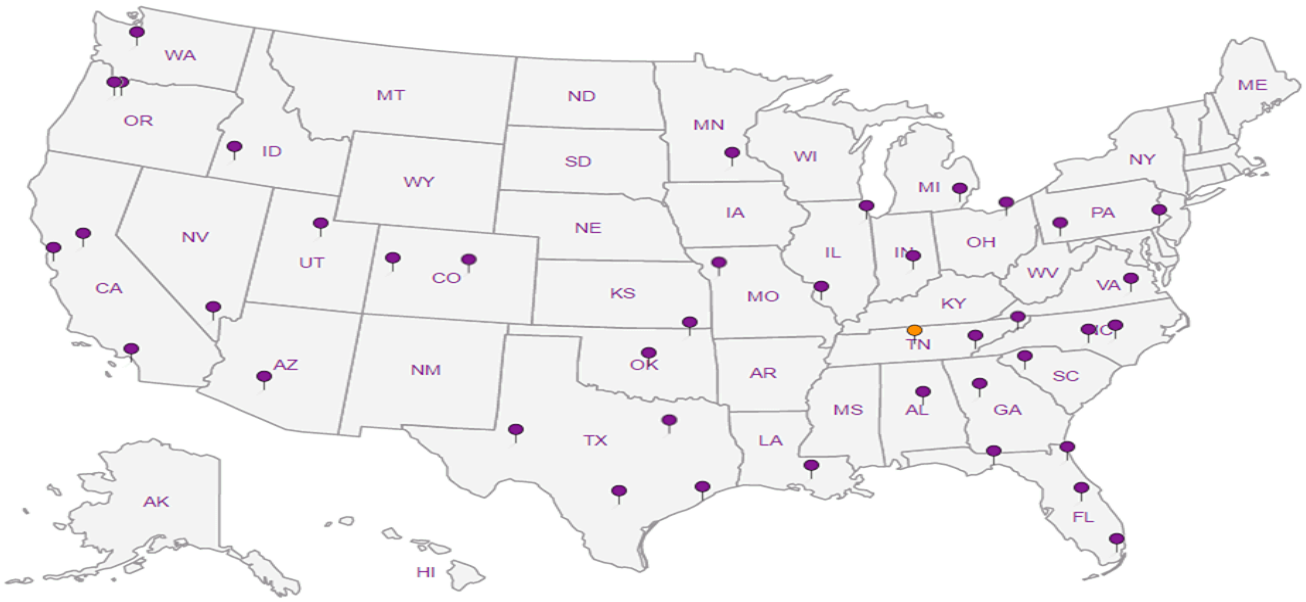
Third Party Federal Accreditations

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, mmv@ftn-assoc.com

Project Description: Entergy Independence Landfill

City/State Collected:

Phone: 501-902-9642
Fax:

Client Project # 7920-1993-001

Lab Project # FTNLRAR-ENTERGYINDY

Collected by (print): Michael Clayton

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Site/Facility ID #

P.O. #

Quote #

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

Date Results Needed

No. of Cntrs

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-1R		GW		2-25-19	1440	2	X	X		-01
MW-3		GW		2-22-19	1055	2	X	X		-02
MW-6		GW		2-22-19	950	2	X	X		-03
MW-7		GW		2-25-19	1230	2	X	X		-04
~~MW-8~~		GW				2	X	X		
~~MW-9~~		GW				2	X	X		
MW-10		GW		2-22-19	1215	2	X	X		-05
MW-11		GW		2-25-19	1105	2	X	X		-06
MW-13		GW		2-25-19	1345	2	X	X		-07
MW-17		GW		2-26-19	1115	2	X	X		-08

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

Remarks:

pH _____ Temp _____

RAD SCREEN: <0.5 mR/hr

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking # 4757 5091 9484

Relinquished by : (Signature) — Date: 2-26-19 — Time: 1600

Received by: (Signature)

Trip Blank Received: Yes / (No) HCL / MeoH TBR

Relinquished by : (Signature)

Date: Time:

Received by: (Signature)

Temp: 2.1 °C Bottles Received: 18

If preservation required by Login: Date/Time

Relinquished by : (Signature)

Date: Time:

Received for lab by: (Signature) KWillis — Date: 2/27/19 — Time: 845

Hold:

Condition: NCF / (OK)

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

Chain of Custody Page 1 of 2

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# L1073714
B092

Acctnum: FTNLRAR
Template: T139241
Prelogin: P694569
TSR: 134 - Mark W. Beasley
PB: 2/15/19 mw
Shipped Via: FedEX Standard

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, mmv@ftn-assoc.com

Project Description: Entergy Independence Landfill

City/State Collected:

Phone: 501-902-9642
Fax:

Client Project # 7920-1993-001

Lab Project # FTNLRAR-ENTERGYINDY

Collected by (print): Michael Clayton

Site/Facility ID #

P.O. #

Collected by (signature): Michael Clayton

Immediately Packed on Ice N ___ Y V

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-18	Comp	GW		12-26-19	1020	2	X	X									-09
		GW				2	X	X									
		GW				2	X	X									

Chain of Custody Page 2 of 2

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 # L1073714

Table #

Acctnum: FTNLRAR
Template: T139241
Prelogin: P694569
TSR: 134 - Mark W. Beasley
PB: 2/15/19 NW

Shipped Via: FedEX Standard

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

Remarks:

RAD SCREEN: <0.5 mR/hr

pH _____ Temp _____

Flow _____ Other _____

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

Tracking # 4757 5091 9484

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
Michael Clayton	2-26-19	1600		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 2.1+0.1 °C IR3 Bottles Received: 18
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) KWillis	Date: 2/27/19 Time: 845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

March 08, 2019

FTN Associates - Little Rock, AR

Sample Delivery Group:	L1074998
Samples Received:	03/02/2019
Project Number:	7920-1993-001
Description:	Entergy Independence Landfill

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

Entire Report Reviewed By:

Olivia Studebaker
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-8 L1074998-01 GW

Collected by: Michael Clayton
Collected date/time: 02/28/19 12:55
Received date/time: 03/02/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1245407	1	03/07/19 00:10	03/07/19 01:01	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1244718	1	03/05/19 02:40	03/05/19 02:40	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1244718	5	03/05/19 10:05	03/05/19 10:05	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1244552	1	03/05/19 14:40	03/06/19 16:06	CCE	Mt. Juliet, TN

MW-9 L1074998-02 GW

Collected by: Michael Clayton
Collected date/time: 02/28/19 13:35
Received date/time: 03/02/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1245407	1	03/07/19 00:10	03/07/19 01:01	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1244718	1	03/05/19 04:28	03/05/19 04:28	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1244718	5	03/05/19 05:01	03/05/19 05:01	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1244552	1	03/05/19 14:40	03/06/19 16:16	CCE	Mt. Juliet, TN

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.

Olivia Studebaker
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	663000		3750	13300	1	03/07/2019 01:01	WG1245407

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	68500		51.9	1000	1	03/05/2019 02:40	WG1244718
Fluoride	138		9.90	100	1	03/05/2019 02:40	WG1244718
Sulfate	191000		387	25000	5	03/05/2019 10:05	WG1244718

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	303		12.6	200	1	03/06/2019 16:06	WG1244552
Calcium	96500		46.3	1000	1	03/06/2019 16:06	WG1244552

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	571000		2820	10000	1	03/07/2019 01:01	WG1245407

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	37200		51.9	1000	1	03/05/2019 04:28	WG1244718
Fluoride	101		9.90	100	1	03/05/2019 04:28	WG1244718
Sulfate	195000		387	25000	5	03/05/2019 05:01	WG1244718

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	324		12.6	200	1	03/06/2019 16:16	WG1244552
Calcium	83300		46.3	1000	1	03/06/2019 16:16	WG1244552

Method Blank (MB)

(MB) R3390021-1 03/07/19 01:01

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

Laboratory Control Sample (LCS)

(LCS) R3390021-2 03/07/19 01:01

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8830000	100	85.0-115	

Method Blank (MB)

(MB) R3388823-1 03/05/19 01:35

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

L1074998-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1074998-01 03/05/19 02:40 • (DUP) R3388823-3 03/05/19 02:51

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	68500	68100	1	0.527		15
Fluoride	138	143	1	3.92		15

L1074998-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1074998-02 03/05/19 04:28 • (DUP) R3388823-6 03/05/19 04:39

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	37200	37400	1	0.654		15
Fluoride	101	102	1	1.38		15

L1074998-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1074998-02 03/05/19 05:01 • (DUP) R3388823-8 03/05/19 05:12

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	195000	196000	5	0.102		15

L1074998-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1074998-01 03/05/19 10:05 • (DUP) R3388823-9 03/05/19 10:16

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	191000	190000	5	0.453		15

Laboratory Control Sample (LCS)

(LCS) R3388823-2 03/05/19 01:45

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40000	39200	98.1	80.0-120	
Fluoride	8000	7960	99.5	80.0-120	
Sulfate	40000	40100	100	80.0-120	

L1074998-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1074998-01 03/05/19 02:40 • (MS) R3388823-4 03/05/19 03:01 • (MSD) R3388823-5 03/05/19 03:12

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	68500	113000	114000	90.1	90.4	1	80.0-120	E	E	0.153	15
Fluoride	5000	138	4990	5010	97.1	97.5	1	80.0-120			0.380	15
Sulfate	50000	182000	224000	224000	82.8	84.0	1	80.0-120	E	E	0.269	15

L1074998-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1074998-02 03/05/19 04:28 • (MS) R3388823-7 03/05/19 04:50

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50000	37200	84200	94.1	1	80.0-120	
Fluoride	5000	101	5010	98.2	1	80.0-120	
Sulfate	50000	183000	225000	83.4	1	80.0-120	E

Method Blank (MB)

(MB) R3389354-1 03/06/19 15:58

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) R3389354-2 03/06/19 16:00 • (LCSD) R3389354-3 03/06/19 16:03

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Boron	1000	956	957	95.6	95.7	80.0-120			0.0547	20
Calcium	10000	9730	9760	97.3	97.6	80.0-120			0.313	20

L1074998-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1074998-01 03/06/19 16:06 • (MS) R3389354-5 03/06/19 16:11 • (MSD) R3389354-6 03/06/19 16:14

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron	1000	303	1250	1260	95.2	95.3	1	75.0-125			0.0824	20
Calcium	10000	96500	105000	105000	85.2	85.4	1	75.0-125			0.0211	20

Guide to Reading and Understanding Your Laboratory Report

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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 multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
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Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
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Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).

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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	T104704245-18-15
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

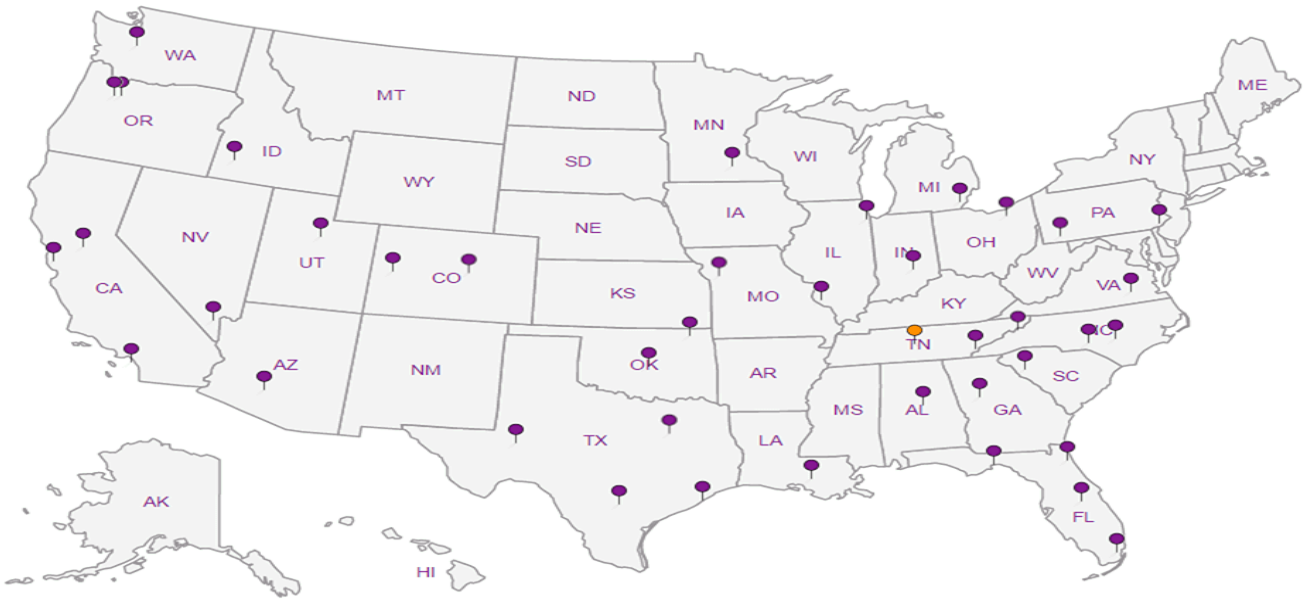
Third Party Federal Accreditations

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, mmv@ftn-assoc.com**

Project Description: **Entergy Independence Landfill**

City/State Collected:

Phone: **501-902-9642**
Fax:

Client Project # **7920-1993-001**

Lab Project # **FTNLRAR-ENTERGYINDY**

Collected by (print): Michael Clayton

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Date Results Needed

Quote #

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	B, Ca 250mlHDPE-HNO3 <2	Cl, F, SO4, TDS 250mlHDPE-NoPres								Remarks	Sample # (lab only)
~~MW-1R~~		GW				2	X	X									
~~MW-3~~		GW				2	X	X									
~~MW-6~~		GW				2	X	X									
~~MW-7~~		GW				2	X	X									
MW-8	Grab	GW		2-28-19	1255	2	X	X									-01
MW-9	Grab	GW		2-28-19	1335	2	X	X									-02
~~MW-10~~		GW				2	X	X									
~~MW-11~~		GW				2	X	X									~~-03~~ TD
MW-13	Grab	GW		3/1/19	1420	2	X	X									
~~MW-17~~		GW				2	X	X									

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 # L1074998
1006

Acctnum: **FTNLRAR**
Template: **T139241**
Prelogin: **P694568**
TSR: **134 - Mark W. Beasley**
PB:
Shipped Via: **FedEX Ground**

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

Remarks:

RAD SCREEN: <0.5 mR/hr

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: ✓Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / (No) HCL / MeoH TBR
Michael Clayton	3/1/19	1700		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 1.9-0.1 °C Bottles Received: 4
				pH #2
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 3/2 Time: 8:45
			Malik T.	

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Pace Analytical®
National Center for Testing & Innovation

Login #: L1074998	Client: FTNLRAR	Date: 3/2/19	Evaluated by: Troy Dunlap

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time	X	Login Clarification Needed		**If Broken Container:**
	Temperature not in range		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type		Please specify Metals requested.		Insufficient packing material inside cooler
	pH not in range.		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Courie
	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments: Did not receive MW-13.

Client informed by:		Call		Email		Voice Mail		Date: 3/4/19	Time: 0910
TSR Initials: MB	Client Contact: Dana Derrington								

Login Instructions:

Client notified

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

March 13, 2019

FTN Associates - Little Rock, AR

Sample Delivery Group:	L1076475
Samples Received:	03/07/2019
Project Number:	7920-1993-001
Description:	Entergy Independence Landfill
Report To:	Dana Derrington
	3 Innwood Circle, Suite 220
	Little Rock, AR 72211

Entire Report Reviewed By:

Olivia Studebaker
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-13 L1076475-01 GW

Collected by: Michael Clayton
Collected date/time: 03/05/19 10:30
Received date/time: 03/07/19 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1247643	1	03/12/19 14:07	03/12/19 14:35	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1247148	1	03/09/19 19:34	03/09/19 19:34	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1248331	1	03/11/19 17:28	03/12/19 18:31	CCE	Mt. Juliet, TN

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.

Olivia Studebaker
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	309000		2820	10000	1	03/12/2019 14:35	WG1247643

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	22700		51.9	1000	1	03/09/2019 19:34	WG1247148
Fluoride	128		9.90	100	1	03/09/2019 19:34	WG1247148
Sulfate	44100		77.4	5000	1	03/09/2019 19:34	WG1247148

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	69.0	J	12.6	200	1	03/12/2019 18:31	WG1248331
Calcium	58200		46.3	1000	1	03/12/2019 18:31	WG1248331

Method Blank (MB)

(MB) R3391261-1 03/12/19 14:35

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

Laboratory Control Sample (LCS)

(LCS) R3391261-2 03/12/19 14:35

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8650000	98.3	85.0-115	

Method Blank (MB)

(MB) R3390267-1 03/09/19 13:05

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

L1076138-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1076138-01 03/09/19 14:22 • (DUP) R3390267-3 03/09/19 14:36

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	11100	11200	1	0.126		15
Fluoride	ND	63.3	1	1.72	J	15
Sulfate	18300	18400	1	0.483		15

L1076350-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1076350-08 03/09/19 18:20 • (DUP) R3390267-6 03/09/19 18:35

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	6870	6900	1	0.472		15
Fluoride	133	134	1	0.747		15
Sulfate	55400	55500	1	0.121		15

Laboratory Control Sample (LCS)

(LCS) R3390267-2 03/09/19 13:20

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40000	39500	98.8	80.0-120	
Fluoride	8000	8210	103	80.0-120	
Sulfate	40000	39700	99.3	80.0-120	

L1076138-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1076138-01 03/09/19 14:22 • (MS) R3390267-4 03/09/19 14:51 • (MSD) R3390267-5 03/09/19 15:06

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	11100	60800	60900	99.4	99.5	1	80.0-120			0.0746	15
Fluoride	5000	ND	4920	4890	97.2	96.6	1	80.0-120			0.589	15
Sulfate	50000	18300	68400	68500	100	100	1	80.0-120			0.134	15

L1076350-08 Original Sample (OS) • Matrix Spike (MS)

(OS) L1076350-08 03/09/19 18:20 • (MS) R3390267-7 03/09/19 18:49

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50000	6870	56100	98.4	1	80.0-120	
Fluoride	5000	133	4910	95.6	1	80.0-120	
Sulfate	50000	55400	104000	96.7	1	80.0-120	E

Method Blank (MB)

(MB) R3391142-1 03/13/19 09:49

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

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

(LCS) R3391142-2 03/13/19 10:03 • (LCSD) R3391142-3 03/13/19 10:05

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	1000	1010	100	101	80.0-120			0.864	20
Calcium	10000	10100	10200	101	102	80.0-120			0.425	20

L1076180-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1076180-01 03/12/19 17:22 • (MS) R3391152-2 03/12/19 17:27 • (MSD) R3391152-3 03/12/19 17:30

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	ND	1080	1070	97.8	97.7	1	75.0-125			0.0883	20
Calcium	10000	94100	101000	102000	73.1	79.1	1	75.0-125	V		0.583	20

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Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
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Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
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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 identification of the analyte is acceptable; the reported value is an estimate.
V	The sample concentration is too high to evaluate accurate spike recoveries.

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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	T104704245-18-15
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

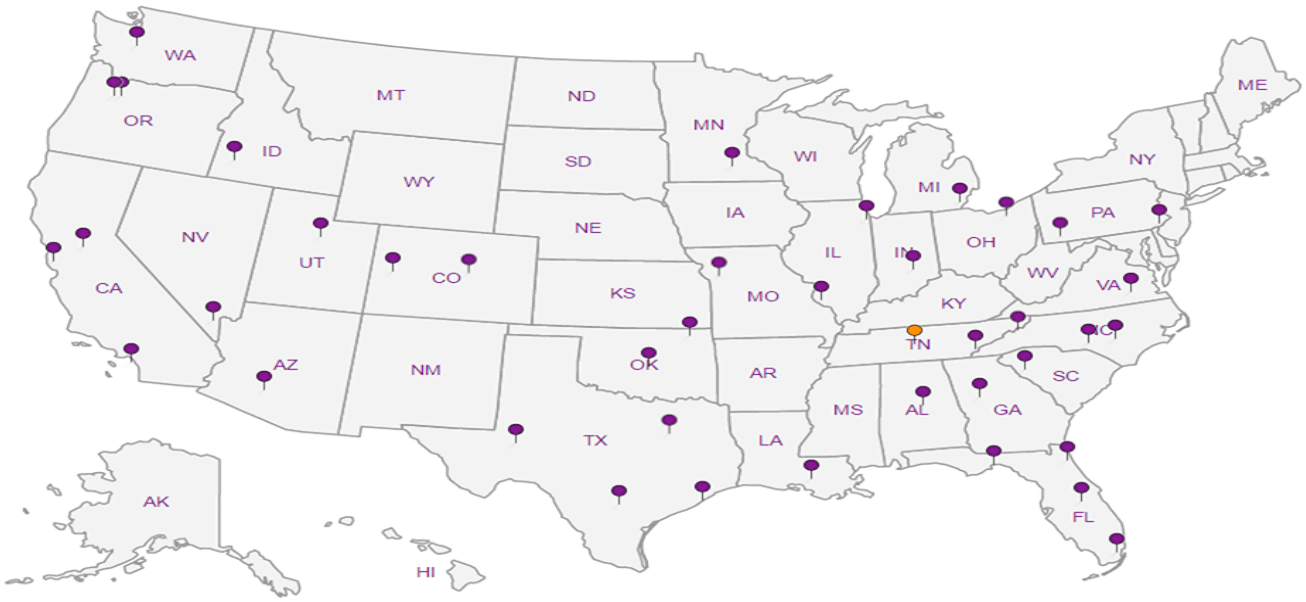
Third Party Federal Accreditations

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, mmv@ftn-assoc.com**

Project Description: **Entergy Independence Landfill**

City/State Collected:

Phone: **501-902-9642**
Fax:

Client Project # **7920-1993-001**

Lab Project # **FTNLRAR-ENTERGYINDY**

Collected by (print):

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Date Results Needed

Quote #

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-18~~		GW				2	X	X		-
MW-13	Grab	GW		3/5/19	1030	2	X	X		-01
~~---~~		GW				2	X	X		

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# 1076475
A110

Acctnum: **FTNLRAR**
Template: **T139241**
Prelogin: **P694568**
TSR: **134 - Mark W. Beasley**
PB:
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 __ FedEx __ Courier __ _____

Tracking # 4757 5091 9495

Sample Receipt Checklist
COC Seal Present/Intact: ✓NP __Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: ✓Y __N
RAD SCREEN: <0.[illegible]/hr

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	3/5/19	1700	
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: 4.3+1-4.4 °C Bottles Received: 2

Date: 3/7/19 Time: 9:00

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

March 26, 2019

FTN Associates - Little Rock, AR

Sample Delivery Group:	L1079845
Samples Received:	02/27/2019
Project Number:	7920-1993-001
Description:	Entergy Independence Landfill

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

Entire Report Reviewed By:

Olivia Studebaker
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-17 L1079845-01 GW

Collected by: Michael Clayton
Collected date/time: 02/25/19 11:15
Received date/time: 02/27/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1254172	1	03/23/19 06:56	03/23/19 06:56	ELN	Mt. Juliet, TN

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.

Olivia Studebaker
Project Manager

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Sulfate	25200		77.4	5000	1	03/23/2019 06:56	WG1254172

Method Blank (MB)

(MB) R3394443-1 03/22/19 23:46

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

L1079377-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1079377-02 03/23/19 06:08 • (DUP) R3394443-6 03/23/19 06:24

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Sulfate	16700	16700	1	0.110		15

Laboratory Control Sample (LCS)

(LCS) R3394443-2 03/23/19 00:02

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Sulfate	40000	41500	104	80.0-120	

L1079377-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1079377-02 03/23/19 06:08 • (MS) R3394443-7 03/23/19 06:40

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
	ug/l	ug/l	ug/l	%		%	
Sulfate	50000	16700	67600	102	1	80.0-120	

Guide to Reading and Understanding Your Laboratory Report

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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 multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
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Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description

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	T104704245-18-15
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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

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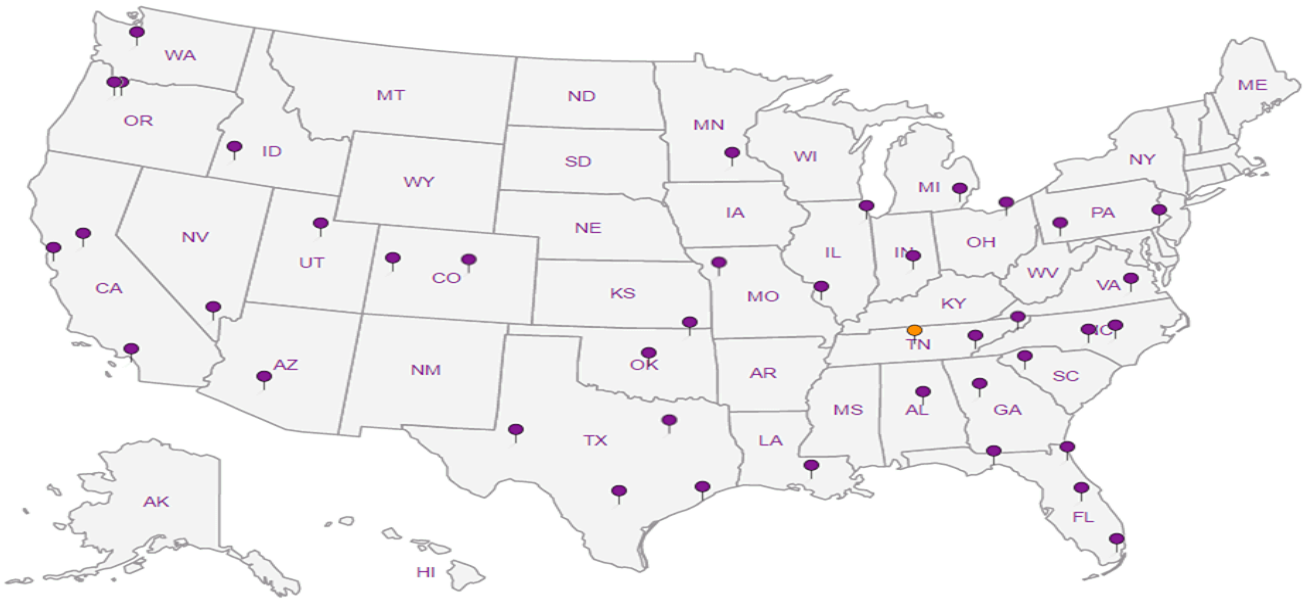

FTN Associates - Little Rock, AR

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, mmv@ftn-assoc.com

Project Description: Entergy Independence Landfill

City/State Collected:

Phone: 501-902-9642
Fax:

Client Project # 7920-1993-001

Lab Project # FTNLRAR-ENTERGYINDY

Collected by (print): Michael Clayton

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

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
MW-1R		GW		2-25-19	1440	2	X	X
MW-3		GW		2-22-19	1055	2	X	X
MW-6		GW		2-22-19	950	2	X	X
MW-7		GW		2-25-19	1230	2	X	X
~~MW-8~~		GW				~~2~~	~~X~~	~~X~~
~~MW-9~~		GW				~~2~~	~~X~~	~~X~~
MW-10		GW		2-22-19	1215	2	X	X
MW-11		GW		2-25-19	1105	2	X	X
MW-13		GW		2-25-19	1345	2	X	X
MW-17		GW		2-26-19	1115	2	X	X

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

Remarks:

pH _____ Temp _____

RAD SCREEN: <0.5 mR/hr

Flow _____ Other _____

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

Tracking # 4757 5091 9484

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	2-26-19	1600	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			KWillis

Trip Blank Received: Yes / (No)
HCL / MeoH
TBR

Temp: 2.1 °C Bottles Received: 18

Date: 2/27/19 Time: 845

Sample Receipt Checklist
COC Seal Present/Intact: __NP X Y __N
COC Signed/Accurate: X Y __N
Bottles arrive intact: X Y __N
Correct bottles used: X Y __N
Sufficient volume sent: X Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: X Y __N

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Chain of Custody Page 1 of 2

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# L1073719
B092
L1079845

AV 3/18/19

Acctnum: FTNLRAR
Template: T139241
Prelogin: P694569
TSR: 134 - Mark W. Beasley
PB: 2/15/19 MW
Shipped Via: FedEX Standard

Remarks	Sample # (lab only)
	~~-01~~
	~~-02~~
	~~-03~~
	~~-04~~
	-05
	-06
	-07
	~~-08~~ -01

Andy Vann

From: Mark Beasley
Sent: Monday, March 18, 2019 3:48 PM
To: Login; Sample Storage
Subject: L1073714 *FTNLRAR* relog

Relog L1073714-08 for SULFATE. Log as R5 due 3/25.

Thanks
Mark

From: Heather Ferguson [mailto:hlf@ftn-assoc.com]
Sent: Monday, March 18, 2019 3:35 PM
To: Mark Beasley
Cc: Dana Derrington
Subject: FW: Pace National Report for 7920-1993-001 Entergy Independence Landfill L1073714
Importance: High

Hi Mark,

Could you have the lab re-run the sample for MW-17 for sulfate if it's still within hold time?

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

June 07, 2019

FTN Associates - Little Rock, AR

Sample Delivery Group:	L1103969
Samples Received:	05/31/2019
Project Number:	7920-1993-001
Description:	Entergy Independence Landfill

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

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

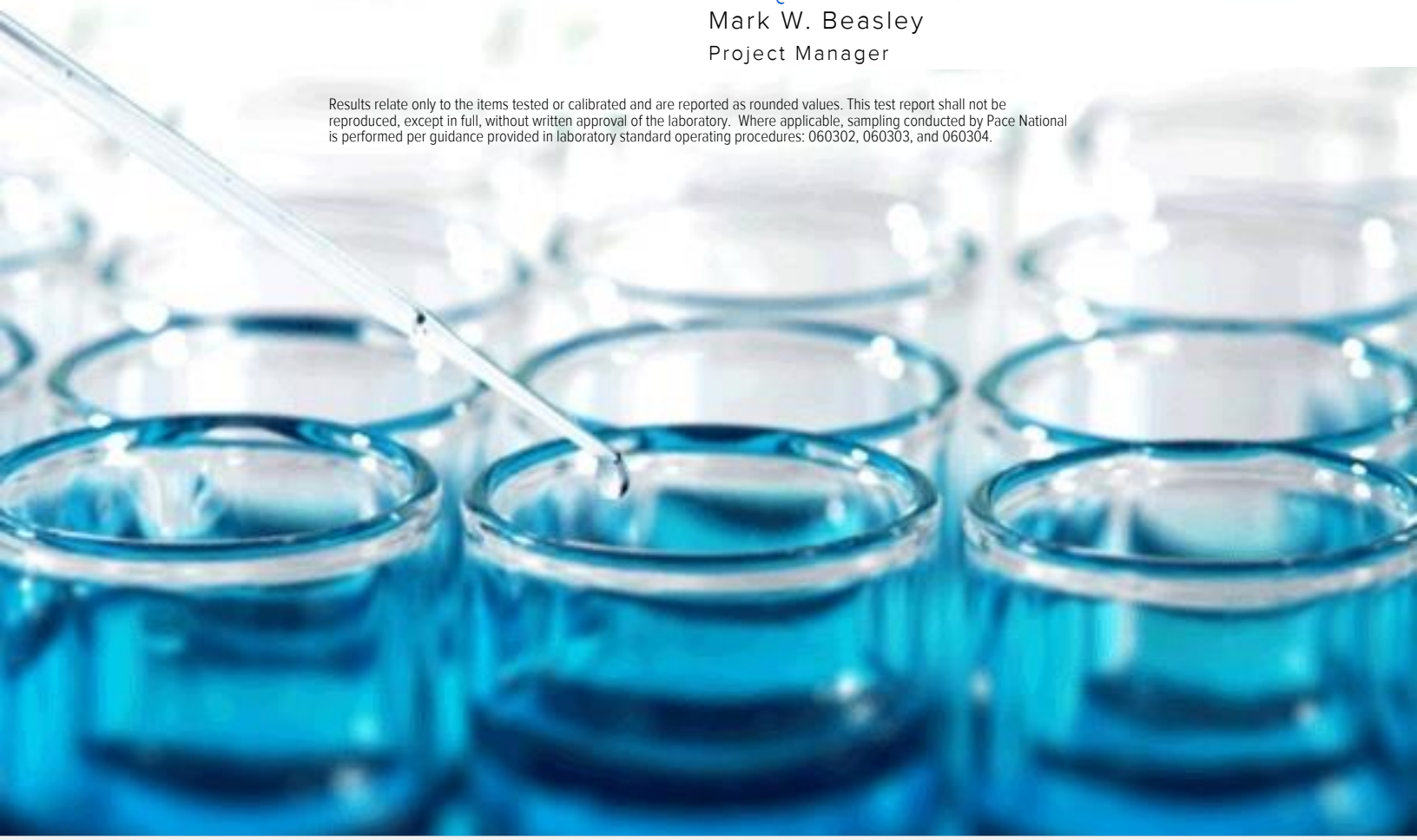

TABLE OF CONTENTS

MW-17 L1103969-01 GW

Collected by	Collected date/time	Received date/time
M.C.	05/29/19 11:05	05/31/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1291417	1	06/06/19 23:52	06/06/19 23:52	ELN	Mt. Juliet, TN

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	23800		77.4	5000	1	06/06/2019 23:52	WG1291417

Method Blank (MB)

(MB) R3418708-1 06/06/19 18:17

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

L1103824-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1103824-02 06/06/19 19:38 • (DUP) R3418708-3 06/06/19 19:53

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	U	0.000	1	0.000		15

L1103933-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1103933-01 06/06/19 22:52 • (DUP) R3418708-6 06/06/19 23:07

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	8340	8360	1	0.255		15

Laboratory Control Sample (LCS)

(LCS) R3418708-2 06/06/19 18:32

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Sulfate	40000	41500	104	80.0-120	

L1103919-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1103919-01 06/06/19 21:08 • (MS) R3418708-4 06/06/19 21:52 • (MSD) R3418708-5 06/06/19 22:07

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Sulfate	50000	11200	61600	61500	101	101	1	80.0-120			0.206	15

L1103934-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1103934-01 06/06/19 23:22 • (MS) R3418708-7 06/06/19 23:37

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Sulfate	50000	15400	65600	100	1	80.0-120	

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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	T104704245-18-15
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

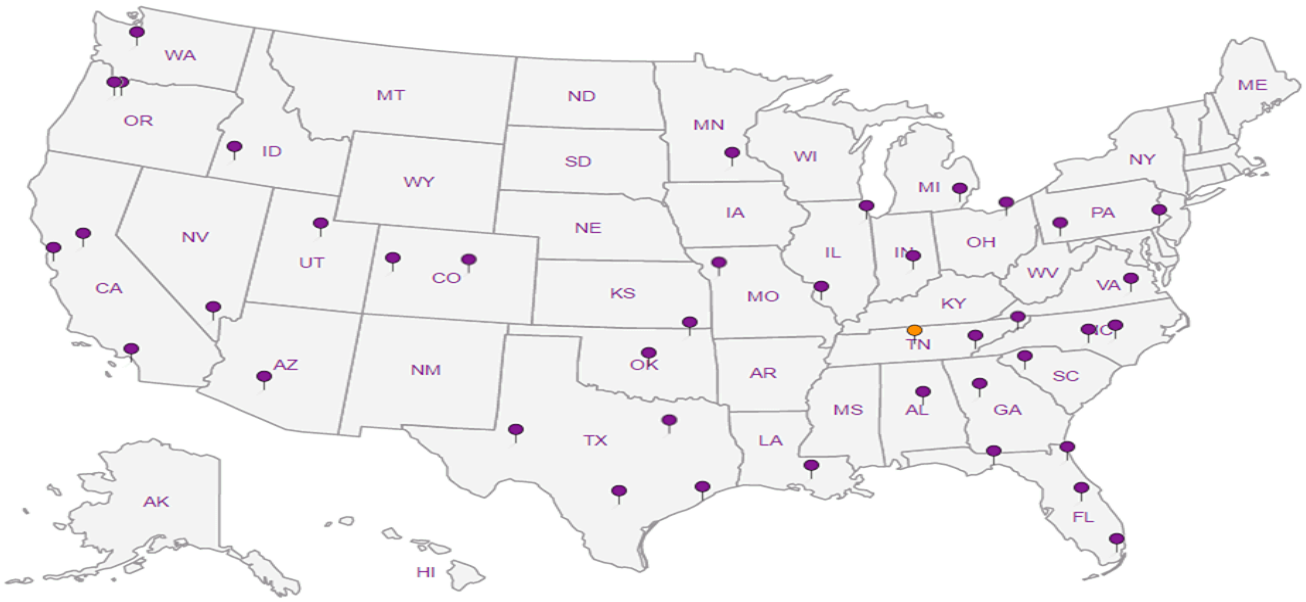
Third Party Federal Accreditations

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, mmv@ftn-assoc.com**

Project Description: **Entergy Independence Landfill**

City/State Collected:

Phone: **501-902-9642**
Fax:

Client Project # **7920-1993-001**

Lab Project # **FTNLRAR-ENTERGYINDY**

Collected by (print): Michael Clayton

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

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

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Sulfate 125mlHDPE-NoPres										Remarks	Sample # (lab only)
MW-17	Grab	GW		5-29-19	1105	1	X											-01
		GW				1	X											

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# L1103969

G043

Acctnum: **FTNLRAR**
Template: **T150694**
Prelogin: **P710123**
TSR: **134 - Mark W. Beasley**
PB: 5-21-19 Gm
Shipped Via: **FedEX Ground**

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

Remarks:

RAD SCREEN: <0.5 mR/hr

pH _____ Temp _____
Flow _____ Other _____

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

Tracking # 1023 1353 6970

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	
Michael Clayton	5-30-19	1700			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: 0-4.0+0.3=4.3	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 5/31/19 Time: 0845	Hold: / Condition: NCF / OK

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

September 09, 2019

FTN Associates - Little Rock, AR

Sample Delivery Group:	L1134358
Samples Received:	08/29/2019
Project Number:	7920-1993-001
Description:	Entergy Independence Landfill

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

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

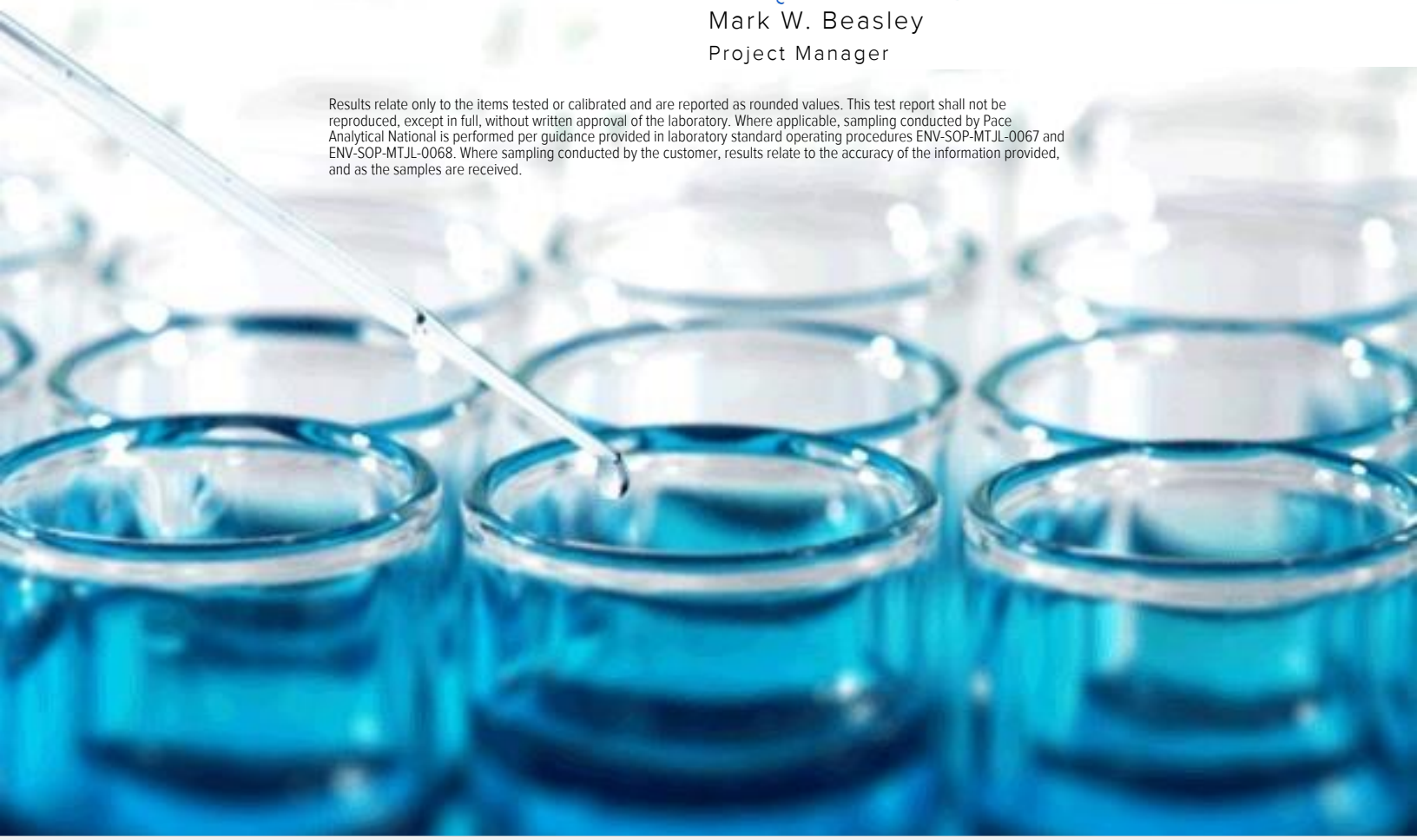


TABLE OF CONTENTS

MW-1R L1134358-01 GW

Collected by: Michael Clayton | Collected date/time: 08/28/19 11:05 | Received date/time: 08/29/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1338509	1	09/01/19 12:39	09/01/19 14:10	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1337989	1	09/03/19 20:02	09/03/19 20:02	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1337989	5	09/03/19 20:13	09/03/19 20:13	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1339493	1	09/04/19 08:52	09/04/19 18:05	CCE	Mt. Juliet, TN

MW-3 L1134358-02 GW

Collected by: Michael Clayton | Collected date/time: 08/26/19 16:00 | Received date/time: 08/29/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1337600	1	09/01/19 00:56	09/01/19 02:53	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1337989	1	09/03/19 20:24	09/03/19 20:24	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1339493	1	09/04/19 08:52	09/04/19 18:16	CCE	Mt. Juliet, TN

MW-6 L1134358-03 GW

Collected by: Michael Clayton | Collected date/time: 08/26/19 15:00 | Received date/time: 08/29/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1337600	1	09/01/19 00:56	09/01/19 02:53	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1337989	1	09/03/19 20:46	09/03/19 20:46	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1337989	5	09/03/19 20:56	09/03/19 20:56	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1339493	1	09/04/19 08:52	09/04/19 18:19	CCE	Mt. Juliet, TN

MW-7 L1134358-04 GW

Collected by: Michael Clayton | Collected date/time: 08/27/19 15:05 | Received date/time: 08/29/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1337605	1	09/01/19 00:48	09/01/19 02:34	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1337989	1	09/03/19 21:07	09/03/19 21:07	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1337989	5	09/04/19 09:02	09/04/19 09:02	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1339493	1	09/04/19 08:52	09/04/19 18:22	CCE	Mt. Juliet, TN

MW-8 L1134358-05 GW

Collected by: Michael Clayton | Collected date/time: 08/28/19 12:20 | Received date/time: 08/29/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1338510	1	09/01/19 12:44	09/01/19 14:37	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1337989	1	09/03/19 21:51	09/03/19 21:51	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1337989	5	09/03/19 22:02	09/03/19 22:02	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1339493	1	09/04/19 08:52	09/04/19 18:30	CCE	Mt. Juliet, TN

MW-9 L1134358-06 GW

Collected by: Michael Clayton | Collected date/time: 08/28/19 13:15 | Received date/time: 08/29/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1338510	1	09/01/19 12:44	09/01/19 14:37	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1337989	1	09/03/19 22:12	09/03/19 22:12	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1337989	5	09/03/19 22:23	09/03/19 22:23	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1339493	1	09/04/19 08:52	09/04/19 18:33	CCE	Mt. Juliet, TN

MW-10 L1134358-07 GW

Collected by: Michael Clayton
Collected date/time: 08/27/19 09:55
Received date/time: 08/29/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1337605	1	09/01/19 00:48	09/01/19 02:34	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1337989	1	09/03/19 22:34	09/03/19 22:34	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1337989	10	09/04/19 09:24	09/04/19 09:24	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1339493	1	09/04/19 08:52	09/04/19 18:36	CCE	Mt. Juliet, TN

MW-11 L1134358-08 GW

Collected by: Michael Clayton
Collected date/time: 08/27/19 13:40
Received date/time: 08/29/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1337605	1	09/01/19 00:48	09/01/19 02:34	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1337989	1	09/03/19 22:56	09/03/19 22:56	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1339493	1	09/04/19 08:52	09/04/19 18:39	CCE	Mt. Juliet, TN

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	825000		3750	13300	1	09/01/2019 14:10	WG1338509

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	150000		260	5000	5	09/03/2019 20:13	WG1337989
Fluoride	159		9.90	100	1	09/03/2019 20:02	WG1337989
Sulfate	202000		387	25000	5	09/03/2019 20:13	WG1337989

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	96.8	J	12.6	200	1	09/04/2019 18:05	WG1339493
Calcium	113000	O1 V	46.3	1000	1	09/04/2019 18:05	WG1339493

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	449000		2820	10000	1	09/01/2019 02:53	WG1337600

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	30000		51.9	1000	1	09/03/2019 20:24	WG1337989
Fluoride	224		9.90	100	1	09/03/2019 20:24	WG1337989
Sulfate	76200		77.4	5000	1	09/03/2019 20:24	WG1337989

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	386		12.6	200	1	09/04/2019 18:16	WG1339493
Calcium	59700		46.3	1000	1	09/04/2019 18:16	WG1339493

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	391000		2820	10000	1	09/01/2019 02:53	WG1337600

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	30200		51.9	1000	1	09/03/2019 20:46	WG1337989
Fluoride	138		9.90	100	1	09/03/2019 20:46	WG1337989
Sulfate	101000		387	25000	5	09/03/2019 20:56	WG1337989

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	71.6	J	12.6	200	1	09/04/2019 18:19	WG1339493
Calcium	67000		46.3	1000	1	09/04/2019 18:19	WG1339493

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	756000		3750	13300	1	09/01/2019 02:34	WG1337605

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	86500		51.9	1000	1	09/03/2019 21:07	WG1337989
Fluoride	506		9.90	100	1	09/03/2019 21:07	WG1337989
Sulfate	108000		387	25000	5	09/04/2019 09:02	WG1337989

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	74.6	J	12.6	200	1	09/04/2019 18:22	WG1339493
Calcium	76900		46.3	1000	1	09/04/2019 18:22	WG1339493

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	648000	J3	3750	13300	1	09/01/2019 14:37	WG1338510

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	75000		51.9	1000	1	09/03/2019 21:51	WG1337989
Fluoride	185		9.90	100	1	09/03/2019 21:51	WG1337989
Sulfate	195000		387	25000	5	09/03/2019 22:02	WG1337989

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	09/04/2019 18:30	WG1339493
Calcium	96100		46.3	1000	1	09/04/2019 18:30	WG1339493

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	700000		3750	13300	1	09/01/2019 14:37	WG1338510

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	55900		51.9	1000	1	09/03/2019 22:12	WG1337989
Fluoride	173		9.90	100	1	09/03/2019 22:12	WG1337989
Sulfate	260000		387	25000	5	09/03/2019 22:23	WG1337989

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	391		12.6	200	1	09/04/2019 18:33	WG1339493
Calcium	98200		46.3	1000	1	09/04/2019 18:33	WG1339493

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	1300000		5640	20000	1	09/01/2019 02:34	WG1337605

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	15600		51.9	1000	1	09/03/2019 22:34	WG1337989
Fluoride	453		9.90	100	1	09/03/2019 22:34	WG1337989
Sulfate	576000		774	50000	10	09/04/2019 09:24	WG1337989

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	4850		12.6	200	1	09/04/2019 18:36	WG1339493
Calcium	181000		46.3	1000	1	09/04/2019 18:36	WG1339493

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	513000		2820	10000	1	09/01/2019 02:34	WG1337605

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	79800		51.9	1000	1	09/03/2019 22:56	WG1337989
Fluoride	222		9.90	100	1	09/03/2019 22:56	WG1337989
Sulfate	62900		77.4	5000	1	09/03/2019 22:56	WG1337989

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	91.2	J	12.6	200	1	09/04/2019 18:39	WG1339493
Calcium	89400		46.3	1000	1	09/04/2019 18:39	WG1339493

Method Blank (MB)

(MB) R3446564-1 09/01/19 02:53

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

L1134743-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1134743-06 09/01/19 02:53 • (DUP) R3446564-3 09/01/19 02:53

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	1190000	1210000	1	2.33		5

Laboratory Control Sample (LCS)

(LCS) R3446564-2 09/01/19 02:53

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8680000	98.6	85.0-115	

Method Blank (MB)

(MB) R3446562-1 09/01/19 02:34

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

L1134358-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1134358-07 09/01/19 02:34 • (DUP) R3446562-3 09/01/19 02:34

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Dissolved Solids	1300000	1310000	1	0.614		5

Laboratory Control Sample (LCS)

(LCS) R3446562-2 09/01/19 02:34

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Dissolved Solids	8800000	8640000	98.2	85.0-115	

Method Blank (MB)

(MB) R3446676-1 09/01/19 14:10

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

L1134216-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1134216-01 09/01/19 14:10 • (DUP) R3446676-3 09/01/19 14:10

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	704000	768000	1	8.70	J3	5

Laboratory Control Sample (LCS)

(LCS) R3446676-2 09/01/19 14:10

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8370000	95.1	85.0-115	

Method Blank (MB)

(MB) R3446714-1 09/01/19 14:37

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

L1134358-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1134358-05 09/01/19 14:37 • (DUP) R3446714-3 09/01/19 14:37

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	648000	575000	1	12.0	J3	5

Laboratory Control Sample (LCS)

(LCS) R3446714-2 09/01/19 14:37

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8460000	96.1	85.0-115	

Method Blank (MB)

(MB) R3446998-1 09/03/19 15:39

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

L1134115-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1134115-06 09/03/19 17:52 • (DUP) R3446998-3 09/03/19 18:03

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Chloride	ND	390	1	2.91	J	15
Fluoride	ND	0.000	1	0.000		15
Sulfate	ND	0.000	1	0.000		15

L1134358-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1134358-04 09/03/19 21:07 • (DUP) R3446998-6 09/03/19 21:18

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Chloride	86500	87000	1	0.610		15
Fluoride	506	524	1	3.47		15

L1134358-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1134358-04 09/04/19 09:02 • (DUP) R3446998-8 09/04/19 09:13

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Sulfate	108000	107000	5	0.770		15

Laboratory Control Sample (LCS)

(LCS) R3446998-2 09/03/19 15:50

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Chloride	40000	39400	98.5	80.0-120	
Fluoride	8000	8540	107	80.0-120	
Sulfate	40000	40800	102	80.0-120	

L1134225-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1134225-02 09/03/19 18:24 • (MS) R3446998-4 09/03/19 18:35 • (MSD) R3446998-5 09/03/19 18:46

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	4000	53700	54000	99.4	100	1	80.0-120			0.584	15
Fluoride	5000	129	5400	5470	105	107	1	80.0-120			1.36	15
Sulfate	50000	ND	51700	52200	100	101	1	80.0-120			0.924	15

L1134494-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1134494-01 09/03/19 23:07 • (MS) R3446998-7 09/03/19 23:18

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50000	5500	55200	99.5	1	80.0-120	
Fluoride	5000	184	5400	104	1	80.0-120	
Sulfate	50000	ND	49700	97.7	1	80.0-120	

Method Blank (MB)

(MB) R3447343-1 09/04/19 17:57

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

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

(LCS) R3447343-2 09/04/19 18:00 • (LCSD) R3447343-3 09/04/19 18:02

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	982	976	98.2	97.6	80.0-120			0.681	20
Calcium	10000	9860	9820	98.6	98.2	80.0-120			0.369	20

L1134358-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1134358-01 09/04/19 18:05 • (MS) R3447343-5 09/04/19 18:11 • (MSD) R3447343-6 09/04/19 18:13

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	96.8	1070	1070	97.0	97.3	1	75.0-125			0.352	20
Calcium	10000	113000	121000	120000	76.3	71.7	1	75.0-125		V	0.378	20

Guide to Reading and Understanding Your Laboratory Report

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

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

Abbreviations and Definitions

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

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
V	The sample concentration is too high to evaluate accurate spike recoveries.

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	T104704245-18-15
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

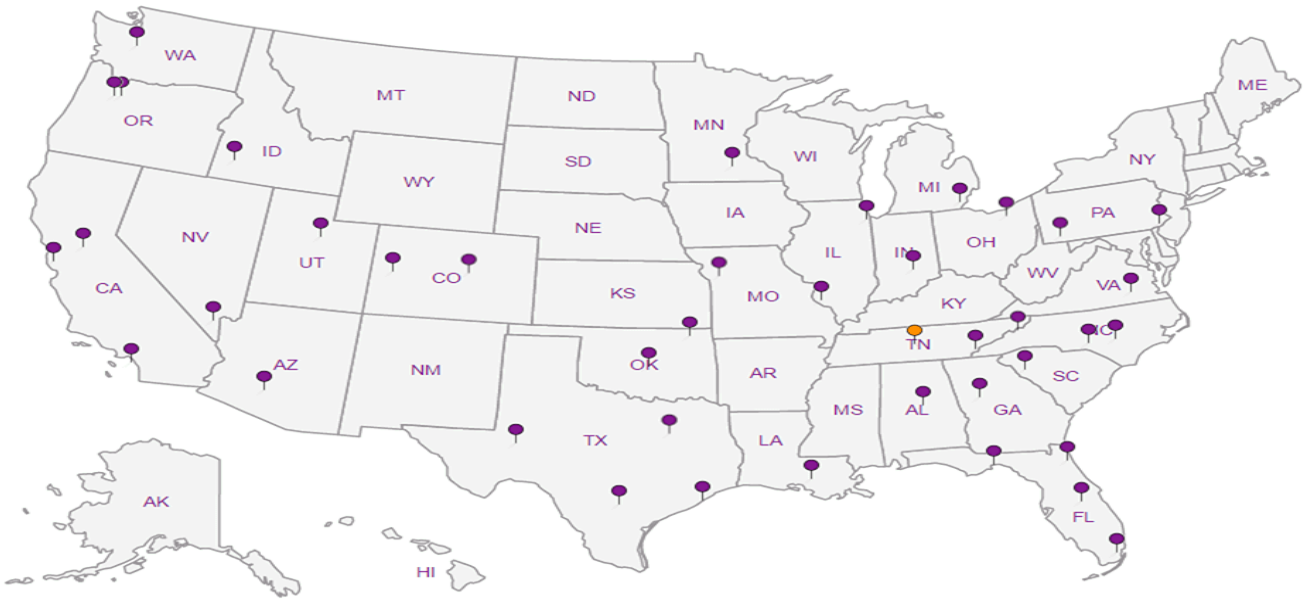
Third Party Federal Accreditations

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.



Chain of Custody

Page ___ of ___

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: CZ

Analysis / Container / Preservative

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

Report to: **Dana Derrington**

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

Project Description: **Entergy Independence Landfill**

City/State Collected:

Please Circle: PT MT CT ET

Phone: **501-902-9642**
Fax:

Client Project # **7920-1993-001**

Lab Project # **FTNLRAR-ENTERGYINDY**

SDG # 113958
F196

Collected by (print): Mitchell Clayton

Site/Facility ID #

P.O. #

Collected by (signature): Mitchell Clayton

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

Date Results Needed

Quote #

Acctnum: **FTNLRAR**
Template: **T139241**
Prelogin: **P725123**
PM: **134 - Mark W. Beasley**
PB:
Shipped Via: **FedEX Ground**

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-1R		GW		8/28/19	1105	2	X	X		-1
MW-3		GW		8/26/19	1600	2	X	X		-2
MW-6		GW		8/26/19	1500	2	X	X		-3
MW-7		GW		8/27/19	1505	2	X	X		-4
MW-8		GW		8/28/19	1220	2	X	X		-5
MW-9		GW		8/28/19	1315	2	X	X		-6
MW-10		GW		8/27/19	955	2	X	X		-7
MW-11		GW		8/27/19	1340	2	X	X		-8
~~MW-13~~		GW				2	X	X		
~~MW-17~~		GW				2	X	X		

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

Remarks:
RAD SCREEN: <0.5 mR/hr

pH _____ Temp _____
Flow _____ Other _____

Samples returned via: __ UPS ✓ FedEx __ Courier _____

Tracking # 1082 6000 4309

Sample Receipt Checklist

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

	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / (No) HCL / MeoH TBR	
Relinquished by : (Signature) Mitchell Clayton	8/28/19	1900			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 1.2 °C 0.6+2=0.8	Bottles Received: 16
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) Hannah Faiss	Date: 8/29/19	Time: 0845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

September 12, 2019

FTN Associates - Little Rock, AR

Sample Delivery Group:	L1137770
Samples Received:	09/11/2019
Project Number:	07920-1993-001
Description:	Entergy Independence Landfill

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

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

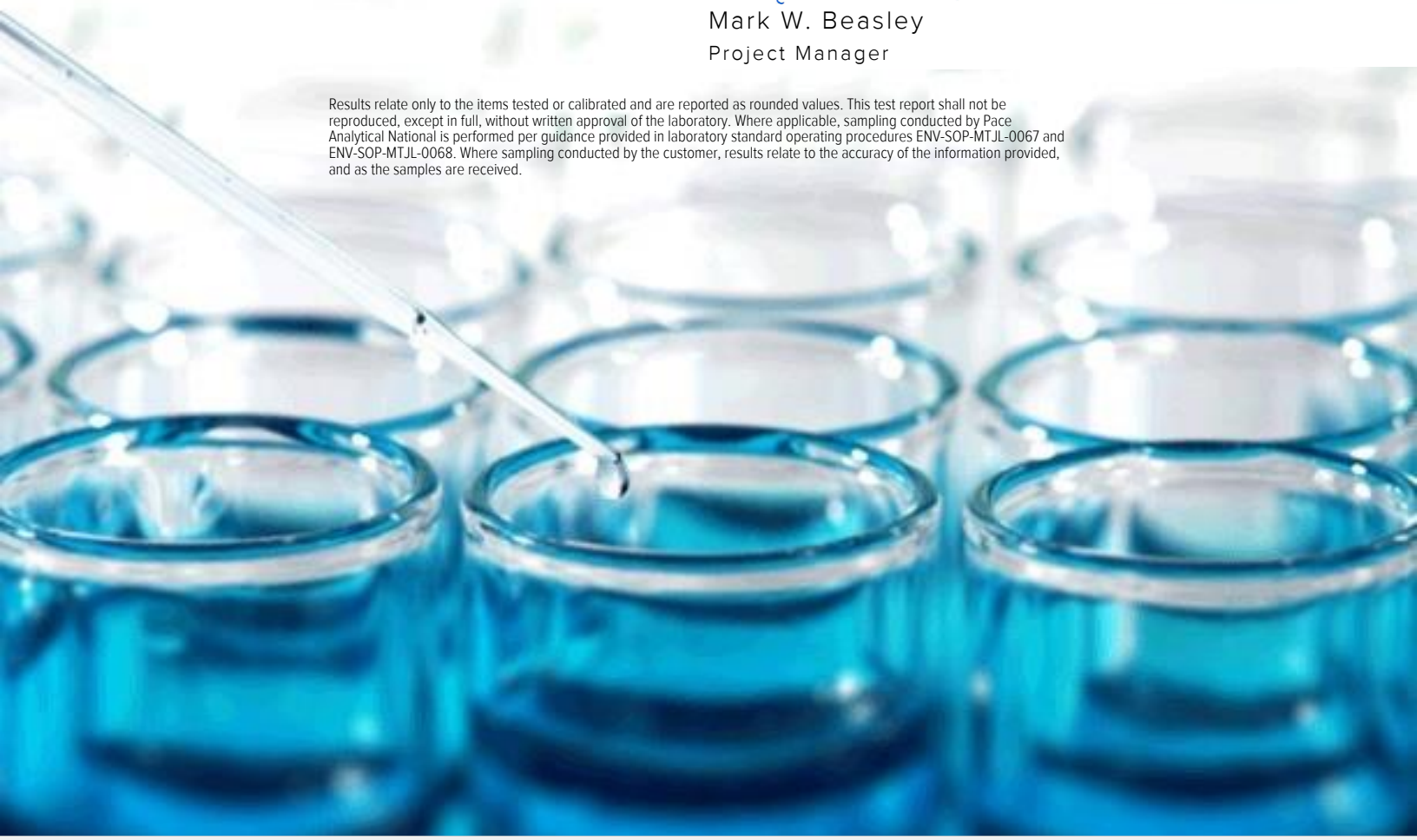


TABLE OF CONTENTS

MW-13 L1137770-01 GW

Collected by: Andrew Pruitt
Collected date/time: 09/09/19 11:49
Received date/time: 09/11/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1343780	1	09/11/19 17:47	09/11/19 18:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1343715	1	09/11/19 17:54	09/11/19 17:54	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1343715	5	09/12/19 10:53	09/12/19 10:53	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1343794	1	09/11/19 18:40	09/11/19 23:42	TRB	Mt. Juliet, TN

MW-17 L1137770-02 GW

Collected by: Andrew Pruitt
Collected date/time: 09/09/19 09:57
Received date/time: 09/11/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1343780	1	09/11/19 17:47	09/11/19 18:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1343715	1	09/11/19 19:23	09/11/19 19:23	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1343794	1	09/11/19 18:40	09/11/19 23:45	TRB	Mt. Juliet, TN

MW-18 L1137770-03 GW

Collected by: Andrew Pruitt
Collected date/time: 09/09/19 11:01
Received date/time: 09/11/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1343780	1	09/11/19 17:47	09/11/19 18:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1343715	1	09/11/19 19:38	09/11/19 19:38	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1343794	1	09/11/19 18:40	09/11/19 23:53	TRB	Mt. Juliet, TN

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	494000		2820	10000	1	09/11/2019 18:22	WG1343780

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	8350		51.9	1000	1	09/11/2019 17:54	WG1343715
Fluoride	313		9.90	100	1	09/11/2019 17:54	WG1343715
Sulfate	110000		387	25000	5	09/12/2019 10:53	WG1343715

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	463		12.6	200	1	09/11/2019 23:42	WG1343794
Calcium	81200		46.3	1000	1	09/11/2019 23:42	WG1343794

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	222000		2820	10000	1	09/11/2019 18:22	WG1343780

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	6050		51.9	1000	1	09/11/2019 19:23	WG1343715
Fluoride	87.7	J	9.90	100	1	09/11/2019 19:23	WG1343715
Sulfate	17800		77.4	5000	1	09/11/2019 19:23	WG1343715

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	U		12.6	200	1	09/11/2019 23:45	WG1343794
Calcium	49100		46.3	1000	1	09/11/2019 23:45	WG1343794

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	302000		2820	10000	1	09/11/2019 18:22	WG1343780

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Chloride	6040		51.9	1000	1	09/11/2019 19:38	WG1343715
Fluoride	77.3	J	9.90	100	1	09/11/2019 19:38	WG1343715
Sulfate	35900		77.4	5000	1	09/11/2019 19:38	WG1343715

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Boron	25.6	J	12.6	200	1	09/11/2019 23:53	WG1343794
Calcium	69100		46.3	1000	1	09/11/2019 23:53	WG1343794

Method Blank (MB)

(MB) R3449983-1 09/11/19 18:22

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

Laboratory Control Sample (LCS)

(LCS) R3449983-2 09/11/19 18:22

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800000	8760000	99.5	85.0-115	

Method Blank (MB)

(MB) R3449919-1 09/11/19 11:54

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloride	105	J	51.9	1000
Fluoride	U		9.90	100
Sulfate	U		77.4	5000

L1137770-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1137770-01 09/11/19 17:54 • (DUP) R3449919-5 09/11/19 18:09

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	8350	8190	1	1.89		15
Fluoride	313	304	1	2.95		15

L1137770-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1137770-01 09/12/19 10:53 • (DUP) R3449919-8 09/12/19 11:07

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	110000	112000	5	2.07		15

Laboratory Control Sample (LCS)

(LCS) R3449919-2 09/11/19 12:09

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40000	39200	98.0	80.0-120	
Fluoride	8000	8160	102	80.0-120	
Sulfate	40000	40800	102	80.0-120	

L1137770-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1137770-01 09/11/19 17:54 • (MS) R3449919-6 09/11/19 18:24 • (MSD) R3449919-7 09/11/19 18:39

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	8350	58500	58200	100	99.6	1	80.0-120			0.619	15
Fluoride	5000	313	5320	5370	100	101	1	80.0-120			0.949	15
Sulfate	50000	107000	151000	151000	89.4	88.9	1	80.0-120	E	E	0.156	15

Method Blank (MB)

(MB) R3449714-1 09/11/19 23:21

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) R3449714-2 09/11/19 23:24 • (LCSD) R3449714-3 09/11/19 23:26

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Boron	1000	1030	1020	103	102	80.0-120			0.312	20
Calcium	10000	10200	10200	102	102	80.0-120			0.0714	20

Guide to Reading and Understanding Your Laboratory Report

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

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

Abbreviations and Definitions

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

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.

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	T104704245-18-15
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

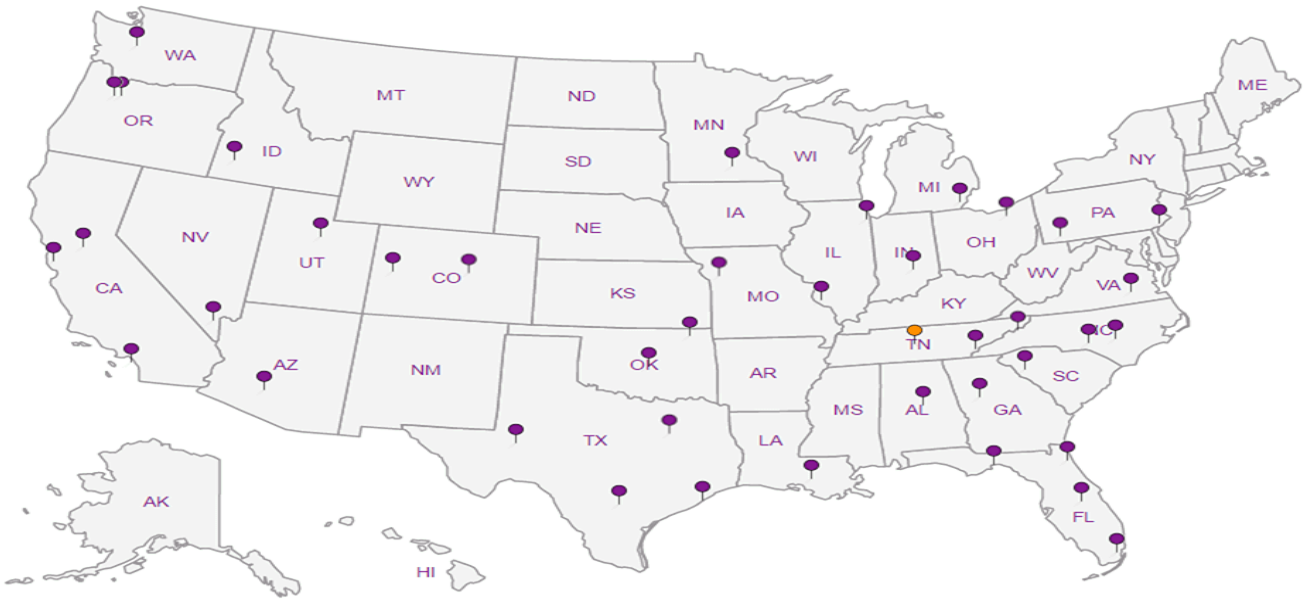
Third Party Federal Accreditations

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

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

Report to: Dana Derrington

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

Project Description: Entergy Independence Landfill

City/State Collected: Newark, AR

Please Circle: PT MT CT ET

SDG # L1137170

C016

Phone: 501-902-9642
Fax:

Client Project # 07920-1993-001

Lab Project # FTNLRAR-ENTERGYINDY

Collected by (print): Andrew Pruitt

Site/Facility ID #

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

Acctnum: FTNLRAR
Template: T155404
Prelogin: P728872
PM: 134 - Mark W. Beasley
PB: 9-4-19 MW

Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	B, Ca 250mlHDPE-HNO3 ✓2	Cl, F, SO4, TDS 250mlHDPE-NoPres	Remarks	Sample # (lab only)
~~MW-1R~~		GW				2	X	X		
MW-13	Grab	GW		9/9/19	1149	2	X	X		-01
MW-17	↓	GW			0957	2	X	X		-02
MW-18	↓	GW		↓	1101	2	X	X		-03
		GW				2	X	X		
		GW				2	X	X		
		GW				2	X	X		

* 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 # FedEx 1203 5778 4037

Sample Receipt Checklist

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Andrew Pruitt	9/9/19	1630	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mark

Trip Blank Received: Yes / (No) HCL / MeoH TBR

Temp: 4.3 +.1 = 4.4 °C Bottles Received: 6

Date: 9/11/19 Time: 8:45

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

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National Center for Testing & Innovation

ANALYTICAL REPORT

September 20, 2019

FTN Associates - Little Rock, AR

Sample Delivery Group:	L1138938
Samples Received:	08/29/2019
Project Number:	7920-1993-001
Description:	Entergy Independence Landfill

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

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

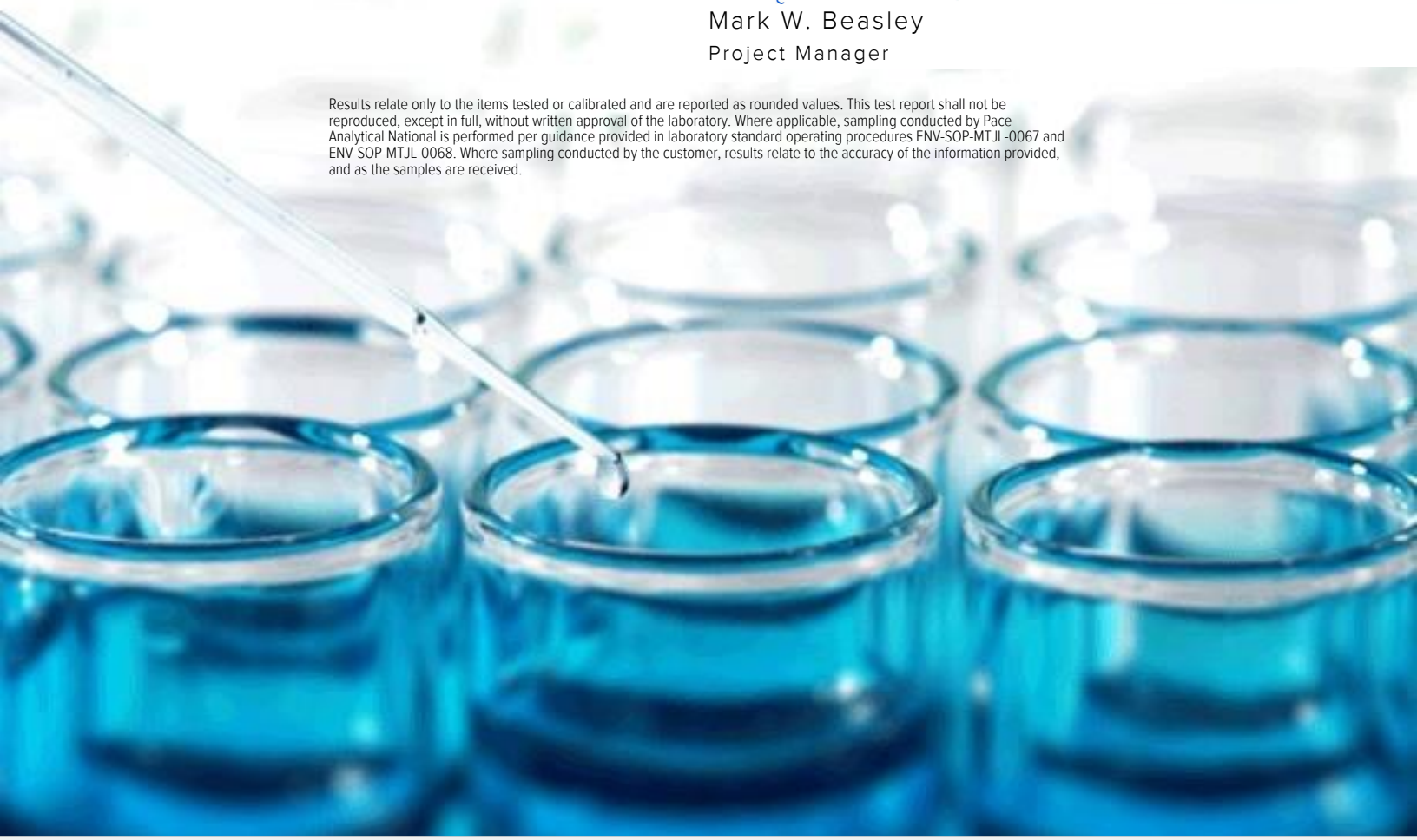

TABLE OF CONTENTS

MW-6 L1138938-01 GW

Collected by: Michael Clayton
Collected date/time: 08/28/19 15:00
Received date/time: 08/29/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1346409	1	09/16/19 16:35	09/16/19 16:35	ST	Mt. Juliet, TN

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	
Fluoride	119		9.90	100	1	09/16/2019 16:35	WG1346409

Method Blank (MB)

(MB) R3451321-1 09/16/19 12:37

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Fluoride	U		9.90	100

L1138627-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1138627-02 09/16/19 14:49 • (DUP) R3451321-6 09/16/19 15:07

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Fluoride	83.7	82.6	1	1.32	J	15

L1139077-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1139077-02 09/16/19 18:56 • (DUP) R3451321-7 09/16/19 19:14

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Fluoride	ND	23.7	1	3.73	J	15

Laboratory Control Sample (LCS)

(LCS) R3451321-3 09/16/19 13:30

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Fluoride	8000	7860	98.3	80.0-120	

L1138627-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1138627-01 09/16/19 13:57 • (MS) R3451321-4 09/16/19 14:14 • (MSD) R3451321-5 09/16/19 14:32

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Fluoride	5000	98.7	5120	5140	100	101	1	80.0-120			0.322	15

L1139077-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1139077-04 09/16/19 20:24 • (MS) R3451321-8 09/16/19 20:42

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
	ug/l	ug/l	ug/l	%		%	
Fluoride	5000	4270	8850	91.4	1	80.0-120	

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SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
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Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
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Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.

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Arizona	AZ0612	New Hampshire	2975
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Georgia	NELAP	North Carolina [3]	41
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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	T104704245-18-15
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

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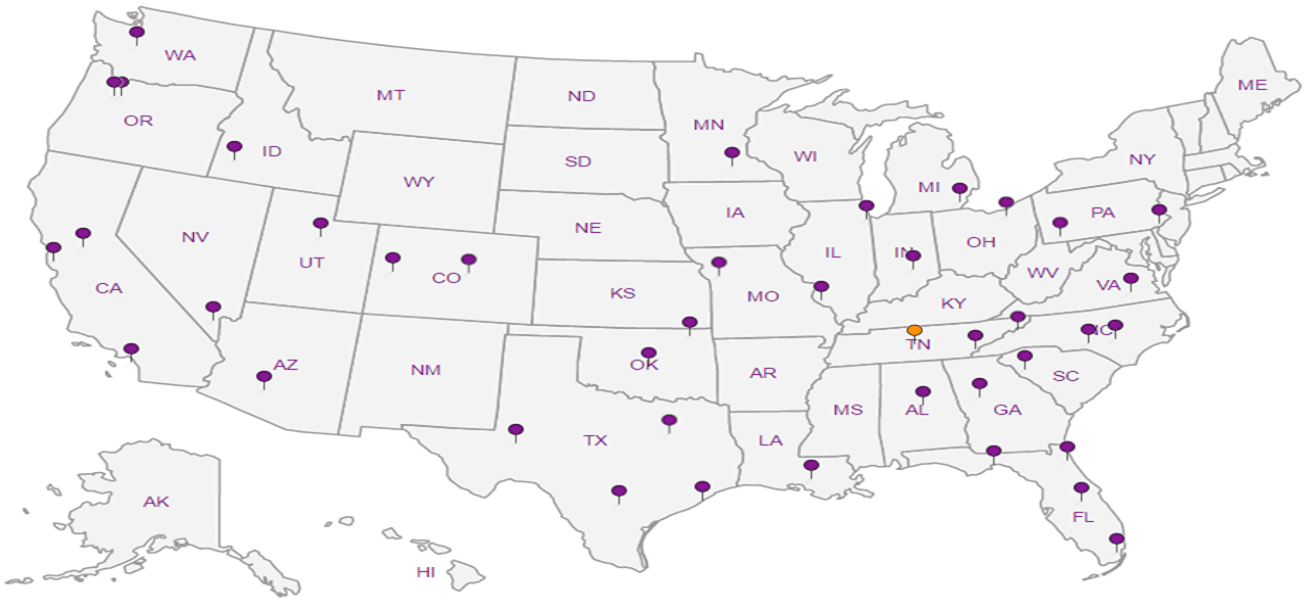

1 7

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: ≤2

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

Report to: **Dana Derrington**

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

Project Description: **Entergy Independence Landfill**

City/State Collected:

Please Circle: PT MT CT ET

Phone: **501-902-9642**
Fax:

Client Project # **7920-1993-001**

Lab Project # **FTNLRAR-ENTERGYINDY**

SDG # HS9558 9/13
F196

Collected by (print): Mitchell Clayton

Site/Facility ID #

P.O. #

Collected by (signature): Mitchell Clayton

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

Acctnum: **FTNLRAR**
Template: **T139241**
Prelogin: **P725123**
PM: **134 - Mark W. Beasley**
PB:
Shipped Via: **FedEX Ground**

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-1R		GW		8/28/19	1105	2	X	X		-1
MW-3		GW		8/26/19	1600	2	X	X		-2
MW-6		GW		8/26/19	1500	2	X	X	61	-3
MW-7		GW		8/27/19	1505	2	X	X		-4
MW-8		GW		8/28/19	1220	2	X	X		-5
MW-9		GW		8/28/19	1315	2	X	X		-6
MW-10		GW		8/27/19	955	2	X	X		-7
MW-11		GW		8/27/19	1340	2	X	X		-8
~~MW-13~~		GW				2	X	X		
~~MW-17~~		GW				2	X	X		

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

Remarks:
RAD SCREEN: <0.5 mR/hr

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking # 1082 6000 4309

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / (No) HCL / MeoH TBR	If preservation required by Login: Date/Time
Mitchell Clayton	8/28/19	1900			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 1.2+.2=0.8 °C Bottles Received: 16	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 8/29/19 Time: 0845	Hold: / Condition: NCF / OK
			Bill Faiss		

Matt Shacklock

From: Mark Beasley
Sent: Friday, September 13, 2019 9:51 AM
To: Project Service; Sample Storage
Subject: L1134358 *FTNLRAR* relog

Relog L1134358-03 for FLUORIDE. Log as R5 due 9/20.

Thanks

Mark Beasley
National Account Manager

Pace Analytical National Center for Testing & Innovation
12065 Lebanon Road | Mt. Juliet, TN 37122
615.773.9672 | Cell 615.330.1602
mbeasley@pacenational.com | pacenational.com

ESC Lab Sciences is now Pace Analytical National Center for Testing & Innovation! Please make note of my new email address and website.

APPENDIX C

Alternate Source Demonstration

Privileged and Confidential
Prepared at the Request of Counsel/Attorney-Client Communication/Attorney Work Product

Alternate Source Demonstration

1st Half 2019 Sampling Event

Entergy Independence Plant
Coal Ash Disposal Landfill
Newark, Independence County, Arkansas

September 2019

Prepared For
Entergy Arkansas, LLC
Independence Plant
555 Point Ferry Road
Newark, Arkansas 72562

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Executive Summary

Entergy performed the most recent semiannual detection monitoring sampling (1st Half 2019) in February 2019. The samples were analyzed for Appendix III parameters, the results were subject to statistical analysis, one verification sample was collected, and the statistical analysis was then re-evaluated for the resampled parameter. Based on the statistical analysis, one statistically significant increase (SSI) was identified based on exceedance of the intrawell prediction limit:

- Sulfate (MW-17).

The information provided in this report serves as Entergy's alternate source demonstration (ASD) prepared in accordance with 40 CFR 257.94(e)(2) and successfully demonstrates that the SSI for sulfate at MW-17 is not due to a release from the Unit to groundwater, but is due to the following:

- The source of the sulfate SSI in groundwater at MW-17 is natural variation in groundwater quality. This conclusion is based on the following primary lines of evidence:
  - MW-17 is a background well that is located at the southwest corner of the Plant approximately 1.28 miles from the Unit; and
  - Higher sulfate concentrations were measured in eight of the other 10 monitoring wells in the groundwater monitoring system, including background well MW-13.

Therefore, based on the information provided in this ASD report, Entergy will continue to conduct semiannual detection monitoring for the Appendix III constituents in accordance with 40 CFR 257.94 at the certified groundwater monitoring well system for the Unit.

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Section 1
Introduction

1.1 Background

Entergy Arkansas, LLC (Entergy) operates the Entergy Independence Plant (Plant), a coal-fired power plant, to generate electricity. The Plant is located at 555 Point Ferry Road in Newark, Independence County, Arkansas as shown on Figure 1. Coal combustion residuals (CCR) are produced as part of the electrical generation operations. The Plant has been generating and disposing of CCR in an on-site coal ash disposal landfill (CADL) since it began operations in 1983. The CADL is a Class 3N non-commercial industrial landfill and operates under Arkansas Division of Environmental Quality (ADEQ) Solid Waste Permit No. 0200-S3N-R2.

The CADL consists of a total of 15 disposal cells. There are currently four active CCR disposal cells (Cells 12 through 15) at the CADL in accordance with the federal Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule (CCR Rule), effective October 17, 2015, and subsequent Final Rules promulgated by the United States Environmental Protection Agency (USEPA). Cells 12 through 15 comprise the CCR management unit (Unit) per the CCR Rule and are the focus of this ASD. The closed and active cells are shown on Figure 2. Cells 1 through 11 were historically closed under Entergy's ADEQ solid waste management permit prior to the effective date of the CCR Rule. CCR has not been placed in those cells after October 15, 2015.

Historical CCR management by Entergy has consisted of the following activities:

- Beneficial use in local construction projects;
- Beneficial use as road bed material at the CADL; and
- Placement into the CADL.

1.1.1 Groundwater Monitoring and Statistical Analysis

In accordance with 40 CFR 257.90 through 257.94 of the CCR Rule, Entergy installed a groundwater monitoring system for the Unit, has collected samples from the 11 CCR groundwater monitoring system wells for laboratory analysis for CCR constituents, and performed statistical analysis of the collected samples. Entergy also obtained applicable certifications from a qualified Arkansas-registered professional engineer in accordance with the CCR Rule. CCR Rule activities for the Unit are summarized below.

Entergy installed the groundwater monitoring system for the Unit in accordance with 40 CFR 257.90 and 257.91. The groundwater monitoring system consists of 11 wells installed into the shallow sub horizon of the alluvial aquifer, which is the uppermost aquifer system underlying the Unit. Pursuant to 40 CFR 257.91(f) of the CCR Rule, Entergy obtained certification by a qualified Arkansas-registered 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 (see Groundwater Monitoring System Certification, TRC, February 26, 2018).

As discussed above, groundwater quality in the shallow sub horizon of the alluvial aquifer is currently being monitored pursuant to the following:

- ADEQ Solid Waste Permit No. 0200-S3N-R2, 11 closed and four active cells of the CADL; and
- CCR Rule, four active CCR disposal cells.

Groundwater monitoring in accordance with the ADEQ solid waste management permit began in 2002. After installation of the CCR groundwater monitoring system prior to October 15, 2017 and development of a groundwater sampling and analysis program including selection of statistical procedures to evaluate groundwater data (see Groundwater Sampling and Analysis Plan (FTN, 2017a)), eight quarterly background CCR detection monitoring events were performed from October 2015 through June 2017 in accordance with 40 CFR 257.93(d) and 257.94(b). The eight quarterly detection monitoring event samples were analyzed for the Appendix III and the Appendix IV to Part 257 – Constituents for Assessment Monitoring (Appendix IV) per 40 CFR 257.94(b).

Following completion of quarterly detection monitoring in June 2017, Entergy implemented semiannual detection monitoring per 40 CFR 257.94(b) for the Unit. The first semiannual detection monitoring event was performed in August 2017 (2nd Half 2017). Two subsequent semiannual detection monitoring events were performed during 2018. Entergy performed the most recent semiannual detection monitoring event (1st Half 2019) in February 2019 (additional verification sampling was performed in May 2019). The semiannual detection monitoring event samples were analyzed for the Appendix III constituents.

After completion of each semiannual detection monitoring event, the Appendix III laboratory analytical data were statistically evaluated to identify potential SSIs for Appendix III constituents above background. In accordance with 40 CFR 257.93(f)(6), Entergy obtained certification by a qualified Arkansas-registered professional engineer stating that the selected statistical method is appropriate for evaluating the groundwater monitoring data for the Unit (see Statistical Methods Certification, TRC, October 16, 2017).

1.2 Purpose

Pursuant to 40 CFR 257.93(h), an SSI was determined for the 1st Half 2019 semiannual detection monitoring event for one Appendix III constituent(sulfate) at monitoring well MW-17. Pursuant to 40 CFR 257.94(e)(2), Entergy may demonstrate that a source other than the Unit caused the SSI or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

This report provides written documentation of the successful ASD for the SSI determined for the 1st Half 2019 semiannual detection monitoring event, pursuant to 40 CFR 257.94(e)(2) of the CCR Rule.

1.3 Stratigraphic Horizons and Hydrogeology

Historical subsurface investigations at the CADL have identified the following three stratigraphic horizons and hydrogeology:

- **Upper Confining Unit**. A 23 to 35 feet thick upper confining unit consisting of clays and silts is present at the ground surface down to 23 to 35 feet below ground surface (bgs). Vertical hydraulic conductivity of the upper confining unit is estimated to range from 4.0×10^{-9} to 7.8×10^{-7} centimeters per second (cm/s) based on flexible wall permeability tests (FTN 2001, FTN and Golder Associates Inc. 2017).
- **Alluvial Aquifer**. An alluvial aquifer consisting of fine to medium grained sandy sub rounded to sub angular chert gravel with varying amounts of silt and clay is present beneath the upper confining unit. The alluvial aquifer is the uppermost laterally continuous water bearing zone beneath the CADL and the Unit and is the uppermost aquifer pursuant to the CCR Rule. The alluvial aquifer extends to depths of 85 to 120 feet bgs. Hydraulic conductivity of the alluvial aquifer is estimated to range from 2.1×10^{-2} to 6×10^{-2} cm/s (FTN 2015).

  Historically, groundwater monitoring investigations were performed to evaluate three potential stratigraphic zones of the alluvial aquifer designated as upper, middle, and deep. Based on geochemical fingerprinting investigations, groundwater quality indicated that the alluvial aquifer consists of two distinct sub horizons: shallow (combination of upper and middle stratigraphic zones) and deep. Based on geochemical fingerprinting, the uppermost aquifer for the CCR groundwater monitoring system is the shallow sub horizon. Therefore, the 11 monitoring wells making up the certified CCR groundwater monitoring system for the Unit are screened within the shallow sub horizon of the alluvial aquifer.

  Groundwater in the alluvial aquifer is present under confined conditions (i.e., the hydraulic head in the aquifer is present above the base of the upper confining clays and silts) except during periods of significant fluctuations of water elevation where levels can drop below the lower limits of the confining unit. During the 1st Half 2019 semiannual detection monitoring

event, groundwater flow was to the northeast. However, based on historical groundwater monitoring at the CADL, seasonal variations in groundwater flow direction have been documented with flow to the southeast, north, east, and south.

- **Bedrock**. Pennsylvanian aged bedrock consisting of chert, limestone, sandstone, and carbonaceous shale and associated residuum at the bedrock surface are present beneath the alluvial aquifer (Albin, 1967). The top of the bedrock is approximately 85 to 120 feet bgs.

1.4 General Groundwater Quality

Regionally, groundwater in the alluvial aquifer is a calcium-bicarbonate water type with sodium, magnesium, chloride, sulfate, silica, and iron comprising most of the remaining dissolved ions (Kresse et al. 2014). Elevated concentrations of trace metals including iron, manganese, and arsenic are ubiquitous in the alluvial aquifer and thought to be elevated due to the presence of carbonaceous material within the alluvial aquifer that drives redox-sensitive parameters to dissolve in groundwater (Kresse and Fazio 2003, Gonthier 2003, Kresse and Clark 2008, Welch et al. 2009, Kresse et al. 2014). Most parameters show a wide variability in concentration with respect to lateral and vertical position in the aquifer (Albin et al. 1967, Kresse et al. 2014).

Groundwater quality at the base of the alluvial aquifer can be heavily influenced by the underlying bedrock. The lower portion of the alluvial aquifer has high concentrations of chloride. The chloride concentrations in the deep alluvial aquifer sub horizon range from 1,260 to 2,220 milligrams per liter (mg/L). The source of this brackish to salty water in the deep alluvial aquifer sub horizon is likely related to upwelling of high-salinity groundwater from the underlying bedrock. An example of this type of upwelling has been documented in Morris and Bush (1986), where a similar plume of chloride (with concentrations in the 1,000s of mg/L) originated in the underlying bedrock and migrated up into the overlying alluvial aquifer.

Section 2
Alternate Source Demonstration

Pursuant to 40 CFR 257.94(e)(2), Entergy may demonstrate that a source other than the Unit caused the SSI or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. As discussed previously, the 1st Half 2019 semiannual detection monitoring event was performed in February 2019 and verification sampling was performed in May 2019. Statistical analysis of the 1st Half 2019 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 2017) and the Statistical Analysis Plan (FTN 2017b). Based on intrawell statistical analysis, the following SSI was determined:

- Sulfate at MW-17.

All other Appendix III constituent concentrations were within their intrawell prediction limits in all the CCR Rule groundwater monitoring system wells.

2.1 Sulfate at MW-17

The sulfate SSI at MW-17 is a result of natural variation in groundwater quality. The primary lines of evidence for this demonstration are as follows:

- **Primary Lines of Evidence:**
  - **Natural Variation in Groundwater Quality** – Sulfate was detected at MW-17 at a concentration of 25.2 mg/L in the February 2019 sample and 23.8 mg/L in the May 2019 verification sample. These concentrations exceed the intrawell prediction limit of 21.13 mg/L. MW-17 is a background well located at the southwest corner of the Plant approximately 1.28 miles from the Unit; and
  - Higher sulfate concentrations were measured in eight of the other 10 monitoring wells in the CCR monitoring system including background well MW-13. The concentration of sulfate at MW-13, which is also a background well has varied from 44.1 to 94.1 mg/L, indicating that sulfate concentrations as high as 94.1 mg/L have been documented that result from natural variation in groundwater quality.

Therefore, the concentration for sulfate measured at MW-17 is within the range of natural variation measured at other wells measuring background water quality in the shallow sub horizon for the alluvial aquifer.

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 SSI determined based on statistical analysis of the 1st Half 2019 semiannual detection monitoring event performed in February 2019 and subsequent verification sampling in May 2019 are not due to a release from the Unit to the uppermost aquifer system.

Based on the information provided in this ASD report, Entergy will continue to conduct semiannual detection monitoring in accordance with 40 CFR 257.94 at the certified groundwater monitoring system for the Unit.

Section 4
Certification

I hereby certify that the alternative source demonstration presented within this document for the Entergy Independence Plant Coal Ash Disposal Landfill CCR Unit has been prepared to meet the requirements of Title 40 CFR §257.94(e) 2 of the Federal CCR Rule. This document is accurate and has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of Title 40 CFR §257.94(e) 2.

Name: R. KENT NILSSON **Expiration Date:** 12/31/20

Company: TRC Environmental Corporation **Date:** 9/23/19

Section 5
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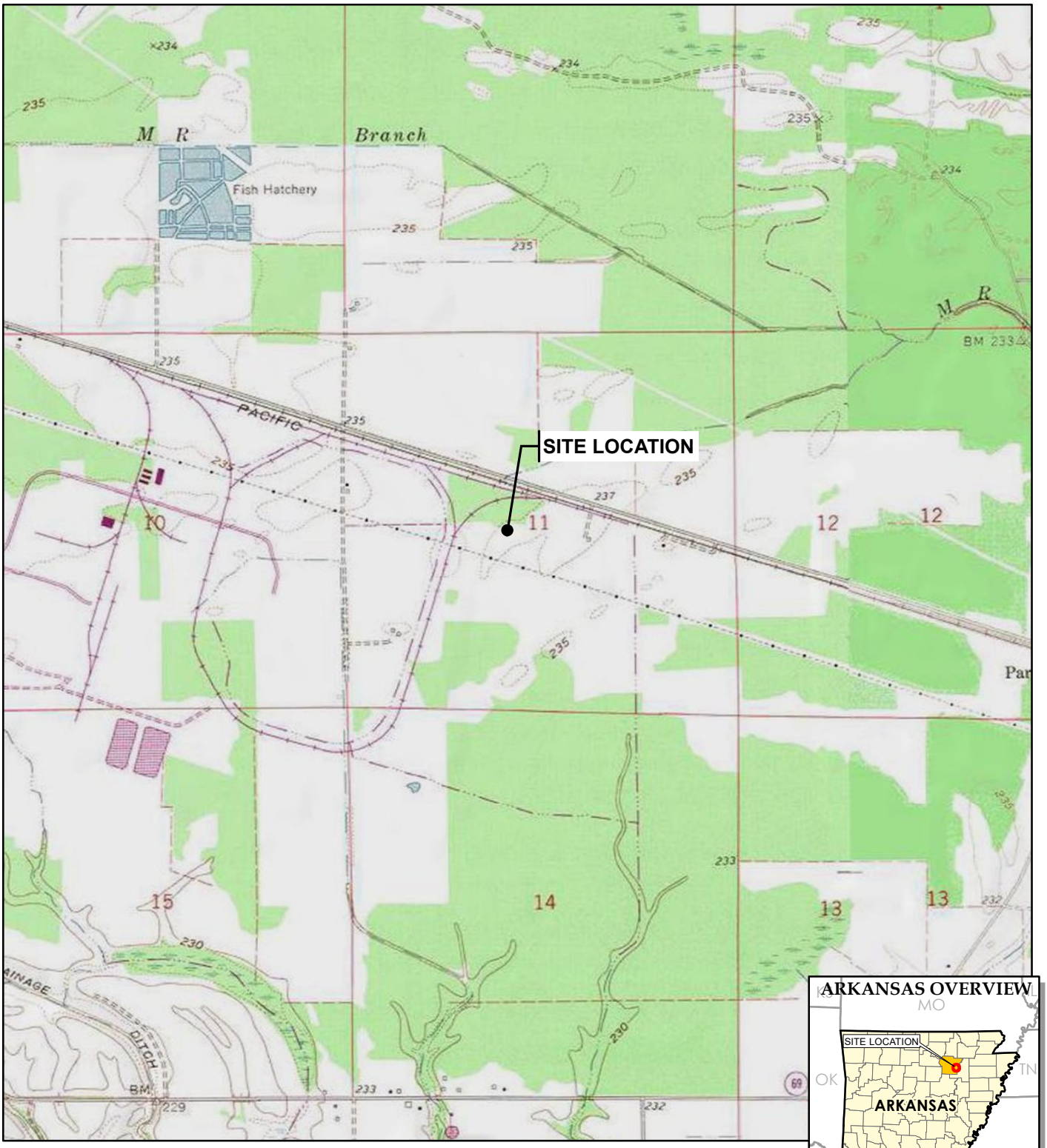

BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

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FEET

TRC
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Phone: 734.971.7080
TRC - GIS

PROJECT:

ENTERGY INDEPENDENCE PLANT
555 POINT FERRY ROAD
NEWARK, ARKANSAS

TITLE:

SITE LOCATION MAP

DRAWN BY:	S. MAJOR
CHECKED BY:	K. BARBER
APPROVED BY:	J. HOUSE
DATE:	FEBRUARY 2019
PROJ. NO.:	339065.000003
FILE:	339065-001slmIND.mxd

FIGURE 1

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LEGEND

CADL MONITORING WELLS

NOTES

1. BASE MAP IMAGERY FROM ESRI/DIGITAL GLOBE, 2016.

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PROJECT:
ENTERGY INDEPENDENCE PLANT
555 POINT FERRY ROAD
NEWARK, ARKANSAS

TITLE:
MONITORING WELL LOCATIONS FOR CCR GROUNDWATER MONITORING NETWORK

DRAWN BY:	S. MAJOR	PROJ. NO.:	339065.000003
CHECKED BY:	K. BARBER		
APPROVED BY:	J. HOUSE		**FIGURE 2**
DATE:	FEBRUARY 2019		

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FILE NO.: 339065-003IND.mxd

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Plot Date: 9/20/2019, 10:16:26 AM by SMAJOR – LAYOUT: ANSI B (11"X17")
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