HALEY ALDRICH

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ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
LANDFILL
A.B. BROWN GENERATING STATION
POSEY COUNTY, INDIANA

by
Haley & Aldrich, Inc.
Greenville, South Carolina

for
Southern Indiana Gas and Electric Company
Evansville, Indiana

File No. 129420
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1. 40 CFR § 257.90 Applicability

1.1 40 CFR § 257.90(a)

Except as provided for in § 257.100 for inactive CCR surface impoundments, all CCR landfills, CCR surface impoundments, and lateral expansions of CCR units are subject to the groundwater monitoring and corrective action requirements under § 257.90 through § 257.98.

The Landfill at A.B. Brown Generating Station (ABB) is subject to the groundwater monitoring and corrective action requirements described under Code of Federal Regulations Title 40 (40 CFR) § 257.90 through § 257.98 (Rule). This document addresses the requirement for the Owner/Operator to prepare an Annual Groundwater Monitoring and Corrective Action Report per § 257.90(e).

1.2 40 CFR § 257.90(e) - SUMMARY

Annual groundwater monitoring and corrective action report. For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by § 257.105(h)(1).

This Annual Groundwater Monitoring and Corrective Action Report documents the activities completed in 2019 for the Landfill as required by the Rule. Groundwater sampling and analysis was conducted per the requirements described in § 257.93, and the status of the groundwater monitoring program described in § 257.95 is provided in this report.

1.2.1 Status of the Groundwater Monitoring Program

As provided in the notification on 15 January 2018 statistically significant increases (SSI) of Appendix III constituents were identified downgradient of the Landfill. An evaluation of alternate sources was conducted; however, a successful alternate source demonstration (ASD) was not achieved at that time. As a result, an Assessment Monitoring program was initiated as required by § 257.94(e)(2). The notification was placed in the facility's operating record as required by 257.105(h)(5). Annual and semi-annual groundwater samples were collected as outlined in § 257.95(b) and 257.95(d)(1) and groundwater protection standards were established as required by § 257.95(d)(2). Statistical analysis was completed in January 2019 as described in § 257.93(h)(2) and statistically significant levels (SSL) of Appendix IV constituents (arsenic, cobalt and lithium) were identified downgradient of the Landfill. An alternate source evaluation was conducted and was successful in demonstrating that a source other than Landfill caused the SSLs for arsenic, cobalt and lithium. The ASD is provided in Appendix A. As a result, the Landfill remains in assessment monitoring.

1.2.2 Key Actions Completed

The following key actions were completed in 2019:

- Completed a statistical analysis of assessment monitoring results to evaluate potential SSLs;
- Prepared 2018 Annual Report including:
  - The Annual Report was placed in the facility's operating record pursuant to § 257.105(h)(1);
  - Pursuant to § 257.106(h)(1), the notification was sent to the relevant State Director and/or Tribal authority within 30 days of the Annual Report being placed in the facility's operating record [§ 257.106(d)];
  - Pursuant to § 257.107(h)(1), the Annual Report was posted to the CCR Website within 30 days of the Annual Report being placed in the facility's operating record [§ 257.107(d)] and 257.107(h)(1)];
- Conducted and certified an ASD for arsenic, cobalt and lithium (Appendix A);
- Collected and analyzed two rounds of groundwater samples in accordance with § 257.95

1.2.3 Problems Encountered

No problems such as damaged wells, issues with sample collection or lack of sampling, and problems with analytical analysis were encountered at the ABB Landfill in 2019.

1.2.4 Actions to Resolve Problems

Actions to resolve problems were not required.

1.2.5 Project Key Activities for Upcoming Year

Key activities to be completed in 2020 include the following:

- Continue Assessment Monitoring as required by § 257.95.
- Complete statistical analysis of the semiannual groundwater sampling results as required by § 257.93(h)(2).

1.3 40 CFR § 257.90(e) - INFORMATION

At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

1.3.1 40 CFR § 257.90(e)(1)

A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

As required by § 257.90(e)(1), a map showing the locations of the Landfill and associated upgradient, downgradient wells is presented as Figure 1.

1.3.2 40 CFR § 257.90(e)(2)

Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

Additional monitoring wells were not installed or decommissioned during 2019. However, location and construction details of the existing monitoring well network for the Landfill is provided for reference as Table I.

1.3.3 40 CFR § 257.90(e)(3)

In addition to all the monitoring data obtained under § 257.90 through § 257.98, a summary including 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 required by the detection monitoring or assessment monitoring programs;

In accordance with § 257.95(b) and § 257.95(d)(1), two independent samples from each background and downgradient monitoring well were collected and analyzed. A summary table including the sample names, dates of sample collection, reason for sample collection (detection or assessment), and monitoring data obtained for the groundwater monitoring program for the Landfill is presented in Table II of this report.

1.3.4 40 CFR § 257.90(e)(4)

A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and

As required by § 257.94(h) a statistical analysis of the Appendix IV constituents was completed by January 15, 2019. This statistical analysis determined that statistically significant levels of arsenic, cobalt and lithium were present downgradient of the Landfill. An evaluation of alternate sources was initiated and completed in April 2019 as required by § 257.94(e)(2). A source causing the SSL of arsenic, cobalt and lithium over background levels other than the CCR Unit was identified. As a result, the Landfill will remain in assessment monitoring.

1.3.5 40 CFR § 257.90(e)(5)

Other information required to be included in the annual report as specified in § 257.90 through § 257.98.

Other information including development of groundwater protection standards, recording groundwater monitoring results in the operating record, and an evaluation of alternate sources is discussed in preceding sections.

TABLES

TABLE I

GROUNDWATER MONITORING WELL LOCATION AND CONSTRUCTION DETAILS

A.B. BROWN GENERATING STATION - LANDFILL

MOUNT VERNON, INDIANA

Well	CCR Unit	Date Installed	Easting	Northing	Top of Pad Elevation (ft msl)	Top of Riser Elevation (ft msl)	Surface Grout (ft bgs)	Bentonite (ft bgs)	Sand Pack (ft bgs)	Screen Zone (ft bgs)	Screen Length (ft)	Well Radius (in)	Status
CCR-LF-1	Landfill	March 2016	2771247.76	970812.18	432.80	435.63	0.0 - 3.0	3.0 - 7.0	7.0 - 19.0	9.00 - 19.00	10	2	Active
CCR-LF-2	Landfill	March 2016	2772205.05	970681.32	470.10	473.00	0.0 - 30.0	30.0 - 32.0	32.0 - 45.0	35.00 - 45.00	10	2	Active
CCR-LF-3	Landfill	March 2016	2773138.97	970949.70	482.00	484.75	0.0 - 21.0	21.0 - 23.0	23.0 - 35.0	25.00 - 35.00	10	2	Active
CCR-LF-4	Landfill	March 2016	2772876.83	972312.24	476.60	478.85	0.0 - 40.8	40.8 - 43.0	43.0 - 55.0	45.00 - 55.00	10	2	Active
CCR-LF-5	Landfill	March 2016	2772003.91	972228.16	427.50	430.41	0.0 - 16.0	16.0 - 18.0	18.0 - 30.0	20.00 - 30.00	10	2	Active
CCR-LF-6	Landfill	March 2016	2771046.15	972269.53	409.20	412.05	0.0 - 0.0	0.0 - 2.66	2.66 - 9.66	4.66 - 9.66	5	2	Active
CCR-BK-1R	Background	March 2016	2770919.08	974083.40	480.10	483.39	0.0 - 50.0	50.0 - 52.0	52.0 - 64.0	54.00 - 64.00	10	2	Active
CCR-BK-2	Background	March 2016	2769728.14	972854.33	427.50	430.60	0.0 - 11.5	11.5 - 13.5	13.5 - 25.5	15.50 - 25.50	10	2	Active

Notes:

bgs = below ground surface

ft = feet

in = inches

msl = mean sea level

Datum of Elevations in NAVD 88

TABLE II
SUMMARY OF GROUNDWATER QUALITY DATA
LANDFILL - MAY THROUGH OCTOBER 2019
A.B. BROWN GENERATION STATION
MOUNT VERNON, INDIANA

Location Group	Action Level	Background			
Location Name	Maximum Contaminant Level	CCR-BK-1R	CCR-BK-1R	CCR-BK-2	CCR-BK-2
Sample Name		CCR-BK-1R-20190521	CCR-BK-1R-20191014	CCR-BK-2-20190521	CCR-BK-2-20191014
Sample Date		05/21/2019	10/14/2019	05/21/2019	10/14/2019
Lab Sample ID		180-90467-7	180-97392-1	180-90467-8	180-97392-2
Detection Monitoring - EPA Appendix III Constituents (mg/L)					
Boron, Total	NA	0.08 U	**0.056 J**	**0.58**	**0.051 J**
Calcium, Total	NA	**37**	**34**	**71**	**35**
Chloride	NA	**2.3**	**2.4**	**4.6**	**17**
Fluoride	4	0.23 U	**0.2**	0.12 U	**0.07 J**
Sulfate	NA	**23**	**22**	**60**	**20**
Total Dissolved Solids (TDS)	NA	**230**	**210**	**440**	**230**
pH (lab) (SU)	NA	**7.4 J**	**7.2 HF**	**7.5 J**	**7 HF**
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)					
Antimony, Total	0.006	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic, Total	0.01	**0.00034 J**	**0.00036 J**	**0.00041 J**	0.001 U
Barium, Total	2	**0.027 J**	**0.036**	**0.045 J-**	**0.032**
Beryllium, Total	0.004	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium, Total	0.005	0.001 U	0.001 U	0.001 U	0.001 U
Chromium, Total	0.1	0.002 U	0.002 U	**0.0087**	0.002 U
Cobalt, Total	0.006	**0.00012 J**	**0.00017 J**	**0.0005**	**0.00011 J**
Fluoride	4	0.23 U	**0.2**	0.12 U	**0.07 J**
Lead, Total	0.015	**0.00016 J**	**0.00023 J**	0.001 U	0.001 U
Lithium, Total	0.04	0.0065 U	0.005 U	0.0095 U	0.005 U
Mercury, Total	0.002	0.0002 U	-	0.0002 U	-
Molybdenum, Total	0.1	**0.00063 J**	**0.00075 J**	**0.0025 J**	0.005 U
Selenium, Total	0.05	0.005 U	0.005 U	0.005 U	0.005 U
Thallium, Total	0.002	0.001 U	0.001 U	0.001 U	0.001 U
Radiological (pCi/L)					
Radium-226	NA	**0.336 J ± 0.108**	0.0729 U ± 0.182	-0.0109 U ± 0.184	-0.0644 U ± 0.0992
Radium-228	NA	-0.0733 UJ ± 0.235	0.147 U ± 0.233	0.0733 U ± 0.246	0.323 U ± 0.292
Radium-226 & 228	5	0.336 UJ ± 0.259	0.220 U ± 0.296	0.0733 U ± 0.307	0.259 U ± 0.308
Field Parameters					
Temperature (Deg C)	NA	**15.78**	**15.72**	**14.47**	**16.04**
Dissolved Oxygen, Field (mg/L)	NA	**5.82**	**5.98**	**0.48**	**0.51**
Conductivity, Field (mS/cm)	NA	**0.34186**	**0.3542**	**0.72035**	**0.38427**
ORP, Field (mv)	NA	**43.3**	**104.9**	**47.9**	**72.1**
Turbidity, Field (NTU)	NA	**0.97**	**9.8**	**12.88**	**11.89**
pH, Field (SU)	NA	**7**	**6.34**	**7.2**	**6.54**

ABBREVIATIONS AND NOTES:

CCR: Coal Combustion Residuals.
mg/L: milligram per liter.
pCi/L: picoCurie per liter.
SU: standard units.
USEPA: United States Environmental Protection Agency.
Results in **bold** are detected.

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LANDFILL - MAY THROUGH OCTOBER 2019
A.B. BROWN GENERATION STATION
MOUNT VERNON, INDIANA

Location Group	Action Level	Downgradient							
Location Name	Maximum Contaminant Level	CCR-LF-1	CCR-LF-1	CCR-LF-2	CCR-LF-2	CCR-LF-3	CCR-LF-3	CCR-LF-4	CCR-LF-4
Sample Name		CCR-LF-1-20190520	CCR-LF-1-20191015	CCR-LF-2-20190522	CCR-LF-2-20191015	CCR-LF-3-20190520	CCR-LF-3-20191015	CCR-LF-4-20190521	CCR-LF-4-20191016
Sample Date		05/20/2019	10/15/2019	05/22/2019	10/15/2019	05/20/2019	10/15/2019	05/21/2019	10/16/2019
Lab Sample ID		180-90467-1	180-97385-1	180-90467-2	180-97385-2	180-90467-3	180-97385-3	180-90467-4	180-97385-4
Detection Monitoring - EPA Appendix III Constituents (mg/L)									
Boron, Total	NA	**0.034 J**	0.08 U	**5.4**	**0.48**	**0.13**	**0.16**	0.8 U	0.8 U
Calcium, Total	NA	**290**	**260**	**420**	**370**	**350**	**370**	**370**	**350**
Chloride	NA	**23**	**18**	**390**	**350**	**98**	**56**	**120**	**110**
Fluoride	4	**0.21 J+**	**0.1**	2.5 U	2.5 U	**0.34 J+**	**0.17 J**	**0.34 J+**	1 U
Sulfate	NA	**1100**	**1000**	**15000**	**16000**	**1600**	**1700 F1**	**7900**	**7800**
Total Dissolved Solids (TDS)	NA	**1900**	**1800**	**21000**	**22000**	**2800**	**2900**	**10000**	**11000**
pH (lab) (SU)	NA	**7.1 J**	**6.7 HF**	**6.8 J**	**6.5 HF**	**7.4 J**	**7.1 HF**	**6.9 J**	**6.7 HF**
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)									
Antimony, Total	0.006	0.002 U	-	0.02 U	-	0.002 U	-	0.02 U	-
Arsenic, Total	0.01	**0.00039 J**	**0.00094 J**	0.01 U	**0.0013**	**0.00037 J**	**0.00056 J**	**0.017**	**0.018**
Barium, Total	2	**0.029 J-**	**0.055**	0.1 UJ	**0.013**	**0.019 J-**	**0.02**	0.1 UJ	**0.014**
Beryllium, Total	0.004	0.001 U	-	0.001 U	-	0.001 U	-	0.001 U	-
Cadmium, Total	0.005	0.001 U	0.001 U	**0.0044 J**	**0.0045**	0.001 U	0.001 U	0.01 U	0.001 U
Chromium, Total	0.1	0.002 U	**0.0032 B**	0.02 U	**0.0018 JB**	**0.0025**	**0.0033 B**	0.02 U	**0.0016 JB**
Cobalt, Total	0.006	**0.0002 J**	**0.00041 J**	**0.0098**	**0.011**	**0.00028 J**	**0.00027 J**	**0.0014 J**	**0.0013**
Fluoride	4	**0.21 J+**	**0.1**	2.5 U	2.5 U	**0.34 J+**	**0.17 J**	**0.34 J+**	1 U
Lead, Total	0.015	0.001 U	-	0.01 U	-	0.001 U	-	0.01 U	-
Lithium, Total	0.04	0.0059 U	**0.0048 J**	0.05 U	0.005 U	0.0074 U	**0.0042 J**	**0.074**	**0.075**
Mercury, Total	0.002	0.0002 U	-	0.0002 U	-	0.0002 U	-	0.0002 U	-
Molybdenum, Total	0.1	**0.0009 J**	**0.0011 J**	0.05 U	**0.0025 J**	**0.0056**	**0.0016 J**	**0.021 J**	**0.022**
Selenium, Total	0.05	0.005 U	-	0.05 U	-	0.005 U	-	0.05 U	-
Thallium, Total	0.002	0.001 U	-	0.01 U	-	0.001 U	-	0.01 U	-
Radiological (pCi/L)									
Radium-226	NA	0.000 U ± 0.172	**0.271 ± 0.129**	**0.593 ± 0.295**	**0.362 ± 0.136**	**0.196 J ± 0.0954**	0.0345 U ± 0.0959	**1.61 ± 0.446**	**2.21 ± 0.337**
Radium-228	NA	0.466 R ± 0.281	-0.169 U ± 0.266	**2.31 ± 0.469**	**1.75 ± 0.436**	0.105 UJ ± 0.333	0.153 U ± 0.383	**1.50 J ± 0.41**	**1.25 ± 0.405**
Radium-226 & 228	5	0.466 R ± 0.329	0.103 U ± 0.296	**2.90 ± 0.554**	**2.11 ± 0.457**	0.301 UJ ± 0.346	0.188 U ± 0.395	**3.11 J+ ± 0.606**	**3.46 ± 0.527**
Field Parameters									
Temperature (Deg C)	NA	**15.62**	**19.97**	**16.21**	**16.23**	**16.07**	**15.73**	**16**	**14.62**
Dissolved Oxygen, Field (mg/L)	NA	**4.08**	**1.26**	**1.15**	**0.09**	**8.1**	**7.51**	**0.61**	**0.79**
Conductivity, Field (mS/cm)	NA	**2.0471**	**2.0961**	**24.022**	**23.467**	**2.937**	**3.1858**	**12.83**	**1.264**
ORP, Field (mv)	NA	**30**	**80.3**	**85.6**	**159.6**	**29.6**	**131.8**	**13.7**	**58.8**
Turbidity, Field (NTU)	NA	**0**	**1.14**	**2.73**	**1.41**	**0**	**0**	**5.06**	**1.17**
pH, Field (SU)	NA	**6.82**	**6.5**	**6.61**	**6.4**	**7.16**	**6.95**	**6.76**	**6.58**

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MOUNT VERNON, INDIANA

Location Group	Action Level	Downgradient					
Location Name	Maximum Contaminant Level	CCR-LF-5	CCR-LF-5	CCR-LF-5	CCR-LF-5	CCR-LF-6	CCR-LF-6
Sample Name		CCR-LF-5-20190520	BLIND DUPLICATE 1-20190520	CCR-LF-5-20191014	BLIND DUPLICATE 2-20191014	CCR-LF-6-20190520	CCR-LF-6-20191014
Sample Date		05/20/2019	05/20/2019	10/14/2019	10/14/2019	05/20/2019	10/14/2019
Lab Sample ID		180-90467-5	180-90467-16	180-97385-5	180-97385-7	180-90467-6	180-97385-6
Detection Monitoring - EPA Appendix III Constituents (mg/L)							
Boron, Total	NA	**1.9**	**2**	**1.1**	**1.1**	**0.73**	**0.78**
Calcium, Total	NA	**430**	**430**	**410**	**400**	**260**	**170**
Chloride	NA	**460**	**450**	**290**	**290**	**35**	**24**
Fluoride	4	**0.34 J+**	**0.3 J+**	**0.21 J**	**0.23 J**	**0.34 J+**	**0.26**
Sulfate	NA	**3000**	**3000**	**2700**	**2700**	**730**	**480**
Total Dissolved Solids (TDS)	NA	**5400**	**5200**	**4500**	**4200**	**1500**	**1100**
pH (lab) (SU)	NA	**7.2 J**	**7.3 J**	**6.9 HF**	**6.9 HF**	**7.3 J**	**7 HF**
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)							
Antimony, Total	0.006	0.02 U	0.02 U	-	-	0.002 U	-
Arsenic, Total	0.01	0.01 U	0.01 U	**0.00043 J**	**0.00046 J**	0.001 U	**0.00047 J**
Barium, Total	2	**0.023 J-**	**0.023 J-**	**0.027**	**0.026**	**0.016 J-**	**0.019**
Beryllium, Total	0.004	0.001 U	0.001 U	-	-	0.001 U	-
Cadmium, Total	0.005	0.01 U	0.01 U	**0.00023 J**	**0.00023 J**	**0.00019 J**	**0.00015 J**
Chromium, Total	0.1	0.02 U	0.02 U	**0.002 B**	**0.002 B**	0.002 U	**0.0022 B**
Cobalt, Total	0.006	0.005 U	0.005 U	**0.00035 J**	**0.00032 J**	**0.00027 J**	**0.00033 J**
Fluoride	4	**0.34 J+**	**0.3 J+**	**0.21 J**	**0.23 J**	**0.34 J+**	**0.26**
Lead, Total	0.015	0.01 U	0.01 U	-	-	0.001 U	-
Lithium, Total	0.04	0.05 U	0.05 U	**0.02**	**0.019**	**0.019 J+**	**0.016**
Mercury, Total	0.002	0.0002 U	0.0002 U	-	-	0.0002 U	-
Molybdenum, Total	0.1	0.05 U	0.05 U	**0.00068 J**	**0.00066 J**	**0.00061 J**	**0.001 J**
Selenium, Total	0.05	0.05 U	0.05 U	-	-	0.005 U	-
Thallium, Total	0.002	0.01 U	0.01 U	-	-	0.001 U	-
Radiological (pCi/L)							
Radium-226	NA	0.0326 UJ ± 0.0578	0.00860 U ± 0.216	-0.0526 U ± 0.0693	0.0199 U ± 0.0781	**0.144 J ± 0.0796**	-0.0661 U ± 0.0669
Radium-228	NA	0.0605 UJ ± 0.273	0.292 U ± 0.266	-0.370 U ± 0.303	0.374 U ± 0.34	0.129 UJ ± 0.29	0.101 U ± 0.316
Radium-226 & 228	5	0.0931 UJ ± 0.279	0.301 U ± 0.343	-0.423 U ± 0.311	0.394 U ± 0.349	0.273 UJ ± 0.301	0.0344 U ± 0.323
Field Parameters							
Temperature (Deg C)	NA	**15.72**	**15.72**	**15.6**	**15.6**	**15.03**	**20.34**
Dissolved Oxygen, Field (mg/L)	NA	**0.03**	**0.03**	**0.1**	**0.1**	**0.56**	**0.2**
Conductivity, Field (mS/cm)	NA	**6.1115**	**6.1115**	**5.2561**	**5.2561**	**1.783**	**1.4581**
ORP, Field (mv)	NA	**-7.1**	**-7.1**	**118.6**	**118.6**	**-0.7**	**98.7**
Turbidity, Field (NTU)	NA	**13.1**	**13.1**	**13.44**	**13.44**	**0**	-
pH, Field (SU)	NA	**6.98**	**6.98**	**6.74**	**6.74**	**7**	**6.79**

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Results in **bold** are detected.

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https://www.epa.gov/coalash/coal-ash-rule

FIGURES

LEGEND

- CCR MONITORING WELL
- ASH POND UNIT BOUNDARY

NOTES

1. AERIAL IMAGERY SOURCE: ESRI
2. LOCATIONS DERIVED FROM THREE I DESIGN DATA.

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SCALE IN FEET

HALEY ALDRICH

SOUTHERN INDIANA GAS AND ELECTRIC COMPANY
A.B. BROWN GENERATING STATION
MOUNT VERNON, INDIANA

GROUNDWATER MONITORING WELL LOCATIONS - LANDFILL

JANAURY 2020

FIGURE 1

APPENDIX A

Alternate Source Demonstration

HALEY ALDRICH

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REPORT ON

ALTERNATE SOURCE DEMONSTRATION (ASD) MEMORANDUM A.B. BROWN GENERATING STATION; FGD LANDFILL WEST FRANKLIN, INDIANA

by
Haley & Aldrich, Inc.
Greenville, South Carolina

for
Southern Indiana Gas and Electric Company (SIGECO)
West Franklin, Indiana

File No. 129420-015
24 July 2019

Alternate Source Demonstration (ASD) Memorandum for the Appendix IV Constituents at the FGD Landfill; A.B. Brown Generating Station

This memorandum was prepared by Haley & Aldrich to evaluate the occurrence of Appendix IV constituents detected in groundwater downgradient of the FGD Landfill and demonstrate that the FGD Landfill is not the source of arsenic and lithium encountered at monitoring well CCR-LF-4 or the source of cobalt encountered at monitoring well CCR-LF-2. The memorandum focuses on the operational history of the FGD Landfill, the spatial distribution of the detected Appendix IV constituents, subsurface conditions encountered around and beneath the FGD Landfill, and groundwater quality conditions downgradient of the FGD Landfill compared to leachable Appendix IV constituent concentrations in naturally occurring coal seams and FGD waste streams placed in the FGD Landfill.

INTRODUCTION

As required by §257.95 of the Federal CCR Rule, Haley & Aldrich performed a statistical analysis of the Appendix IV constituents detected in groundwater downgradient of the A.B. Brown FGD Landfill to evaluate the presence of any detected Appendix IV constituents at a statistically significant level (SSL) above groundwater protection standards (GWPS) in accordance with §257.95(h). Findings from this evaluation indicated the presence of SSLs for cobalt at CCR-LF-2 and arsenic and lithium at CCR-LF-4. However, as described below and consistent with §257.95(g)(3)(ii), Haley & Aldrich conducted an evaluation to demonstrate that a source other than the FGD Landfill caused the SSLs over the GWPS. This memorandum documents the findings and conclusions of this evaluation.

BACKGROUND

The Site is located in Posey County near the community of West Franklin, Indiana. The location of the Site is shown on Figure 1. The Site is located approximately 0.5 miles north of the Ohio River. The Site varies in elevation with natural ground surface elevations varying from 380 to 520-feet above mean sea level (msl). The higher elevations are generally to the north of the Site with surface topography dominated by a series of ridges separated by ravines. In general, surface topography across the site generally slopes to the west towards the western property boundary then to the south toward the Ohio River. Surface water runoff occurs via sheet flow to low lying areas or ravines which eventually lead to the Ohio River.

The Site began operations in 1978 with the construction of a 250 MW generating unit. In 1985, an additional generating unit was added. Both units burn high-sulphur coal sourced in southern Indiana. Southern Indiana Gas and Electric Company (SIGECO) currently owns the land and operates the station for supplying electric power to industrial, commercial, and residential customers in its service territory.

Consistent with §257.90 through §257.94, SIGECO installed and certified a groundwater monitoring network for the Landfill (Haley & Aldrich, *Report on Groundwater Monitoring Program, A.B. Brown Generating Station* Landfill, October 2017), collected a minimum of eight rounds of groundwater samples (nine rounds were collected for this unit) for the analysis of constituent lists as specified in the Coal Combustion Residuals (CCR) Rule. Maps showing the location of groundwater monitoring wells and groundwater elevations as measured in November 2016 and June 2017 are presented in Figures 2 and 3, respectively. Figures 2 and 3 also depict interpreted groundwater elevation contours and groundwater flow direction. Interwell statistical analysis was completed to determine if the Appendix III constituents in downgradient wells indicate a statistically significant increase (SSI) when compared to background (in this case upgradient wells). The statistical evaluation of the Appendix III constituents detected in

groundwater downgradient of the Landfill identified statistically significant increases (SSIs) above background. In accordance with § 257.94 and § 257.95, an Assessment Monitoring Program was initiated in April 2018.

As required by 40 CFR § 257.95(b) and 40 CFR § 257.95(d)(1), two rounds of groundwater sampling and analysis were completed by October 15, 2018. GWPSs, pursuant to 40 CFR § 257.95(d)(2) and in accordance with Phase I, Part 1 CCR Rule Revisions dated 17 July 2018, effective 16 August 2018, were generated for each Appendix IV constituent detected during assessment monitoring. The GWPSs were set at the maximum contaminant level (MCL) or Regional Screening Level (RSL) for those constituents that did not have a promulgated MCL since the background values for the detected Appendix IV constituents did not exceed those values.

For the FGD Landfill, which was in Assessment Monitoring in 2018, analytical results from downgradient wells were compared to each respective GWPS. If the detected constituent was greater than the GWPS for that Unit, pursuant to 40 CFR § 257.93 (f)(5), the confidence interval method was used to evaluate if that Appendix IV constituent was present at a statistically significant level (SSL). Based on the comparisons outlined above, the results of the statistical analyses conducted for those detected Appendix IV constituents confirm that an SSL for cobalt is present at monitoring well CCR-LF-2, and an SSL for arsenic and lithium is present at monitoring well CCR-LF-4.

FINDINGS AND CONCLUSIONS

Haley & Aldrich has concluded that neither the FGD Landfill nor the FGD sludge contained within the FGD Landfill are the source of cobalt detected at CCR-LF-2 or the arsenic and lithium detected at CCR-LF-4 which were identified at SSLs over GWPSs. Haley & Aldrich has also concluded the coal seam intersecting the screened interval at CCR-LF-4 is a potential alternate source of arsenic and lithium identified at SSLs at CCR-LF-4.

Operational History

- The FGD Landfill was permitted for the disposal of FGD in 1978 and began receiving FGD in 1979. The FGD Landfill only contains FGD and is not permitted to receive other CCR's.
- The process that generates FGD at the A.B. Brown Generating Station has not changed during the operating life of the FGD Landfill.
- As required by permit, waste characterization samples are collected and analyzed for inorganic constituents many of which are included on the Appendix IV list of constituents. While the detection limits exceed the GWPSs in many cases, the results support the conclusion that the composition of the FGD has not changed through time. Laboratory reports for the waste characterization samples are provided in Appendix A.

Spatial Distribution of Appendix IV Constituents

- Given that the FGD Landfill has only received FGD sludge for its entire operating history, one would expect that arsenic (CCF-LF-4), lithium (CCR-LF-4), and cobalt (CCR-LF-2) would be

collocated and identified in more than one location if the Landfill was the source of the Appendix IV SSL's.

- Arsenic was detected in background wells BK-1, BK-1R, and BK-2 at 1.1 µg/L, 2.5 µg/L, and 3.5 µg/L, respectively.
- Cobalt was detected in background wells BK-1, BK-1R, and BK-2 at 2.8 µg/L, 2.2 µg/L, and 6.2 µg/L, respectively.
- Lithium was detected in background wells BK-1, BK-1R, and BK-2 at 1.1 µg/L, 2.5 µg/L, and 3.5 µg/L, respectively.

Subsurface Conditions

- During the drilling and installation of CCR-LF-4, a 6-inch layer of black, organic rich shale containing a 2-inch coal seam was encountered at a depth of 49.5 to 50.0 feet below ground surface. The layer intersects the screened interval of CCR-LF-4. The coal from this layer was submitted for analysis of total and leachable arsenic and lithium. The results of this analysis, presented in Appendix A, were compared to the Appendix IV groundwater results, presented in Table 1. While the sample submitted for analysis exceeded hold time, the analytical results can be relied upon as they represent minimum values as this condition could only have biased the results low.
- The major coal bearing units present in Indiana are described in the July 2004 *Characterization of Indiana's Coal Resource: Availability of the Reserves, Physical and Chemical Properties to the Coal, and Present and Potential Uses* by Maria Mastalerz, Agnieszka Drobniak, John Rupp, and Nelson Shaffer. The major coal units described in the vicinity of the facility are mapped at depths greater than 200 feet.
- Of the major coal bearing units mapped in the vicinity of the facility, Danville coal is the uppermost coal bearing unit. The depth to Danville coal is mapped as being greater than 200 feet.
- The Danville contains arsenic, cobalt, and lithium at average concentrations of 12.68 mg/kg, 6.79 mg/kg, and 12.33 mg/kg, respectively (Mastalerz, et al., 2004).
- The average concentrations of arsenic, cobalt, and lithium in all major coal units within the Illinois Basin in Indiana are reported as 17.4 mg/kg, 9.05 mg/kg, and 10.93 mg/kg, respectively (Mastalerz et al., 2004).

Groundwater Quality

- Historic waste characterization reports indicate the filter cake sample results for leachable arsenic have historically been less than the reporting limit of 20 µg/L. This reporting limit is above the U.S. EPA maximum contaminant level (MCL) of 10 µg/L but supports the conclusion that the composition of FGD has been consistent over the operating history of the Landfill.
- Historic groundwater reports for the A.B. Brown Landfill Permit the indicate arsenic has not been detected above the reporting limit of 50 µg/L from approximately 1991 through 1999. Beginning in 2000, the reporting limit for arsenic was lowered to 5 µg/L. Arsenic was detected above the GWPS of 10 µg/L from 2000 until approximately 2014. After 2014, concentrations of arsenic at MW-4.3B were detected at concentrations less than the GWPS or not detected above the detection limit of 5 µg/L.

- A sample of FGD "sludge", sometimes referred to as filter cake or FGD solids, was collected on October 10, 2018, and analyzed for total and leachable antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium. The analytical results, presented in Appendix A, were compared to the Appendix IV groundwater results for the landfill, presented in Table 1.
- FGD sludge analytical sample results and the maximum detected concentration for arsenic, cobalt, and lithium, compared to the GWPS, are summarized below. As shown, the amount of these constituents detected in the leachate are well below the GWPS and the concentrations measured in groundwater. Therefore, the FGD sludge contained in the landfill could not be the source of arsenic, cobalt, or lithium detected in groundwater.

Appendix IV Constituent	GWPS (µg/L)	FGD Sludge Leachable Concentration (µg/L)	Maximum Detected at CCR-LF-4 (µg/L)	Maximum Detected at CCR-LF-2 (µg/L)
Arsenic	10	0.99 J	30 (9/27/2017)	6.2 (9/27/2018)
Cobalt	6	0.14 J	1.8(2/07/2017)	14 (6/8/2016)
Lithium	40	7.7	120 (9/27/2017)	41 (8/20/2018)

J: Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.

- Coal seam sample results indicate leachable concentrations are higher than the maximum concentrations of arsenic and lithium at CCR-LF-4. This coal seam intersects the screened interval of CCR-LF-4.
- Coal seam analytical sample results and the maximum detected concentration for arsenic and lithium at CCR-LF-4 are summarized below:

Appendix IV Constituent	GWPS (µg/L)	Leachable (µg/L)	Total (mg/kg)	Maximum Detected at CCR-LF-4 (µg/L)
Arsenic	10	69 JHB	28 H	30 (9/27/2017)
Lithium	40	160 JH	13 JH	120 (9/27/2017)
Percent Moisture 4.2%				
Percent Solid 95.8%				

J: Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
H: Sample was prepped or analyzed beyond the specified holding time.
B: Compound was found in the blank and sample.

The fact that arsenic, cobalt, and lithium do not leach from the FGD sludge at concentrations approaching the GWPSs and are well below the concentrations detected in groundwater support the conclusion that the FGD Landfill is not the source of the SSL's identified for these constituents at LF-2 and LF-4. Furthermore, the fact that arsenic and lithium leach out of the coal encountered at LF-4 at concentrations greater than the concentrations detected in groundwater at monitoring well LF-4 and

that fact that monitoring well LF-4 is the only location where coal is present in the screened interval support the conclusion that the naturally occurring coal is an alternate source of arsenic and lithium.

Consistent with§257.95(g)(3)(ii), this written successful demonstration, which includes obtaining a certification from a qualified professional engineer (certification follows), has been completed within 90-days of detecting SSL above GWPS. As a result, and consistent with §257.95(g)(3)(ii), the A.B. Brown Landfill will remain in the Assessment Monitoring Program.

SOUTHERN INDIANA GAS AND ELECTRIC COMPANY (SIGECO)
A.B. BROWN GENERATING STATION; LANDFILL
APPENDIX IV SSL ALTERNATE SOURCE EVALUATION

Pursuant to 40 CFR §257.95(g)(3)(ii), Haley & Aldrich, Inc., on behalf of SIGECO conducted an alternate source evaluation to demonstrate that a source other than the A.B. Brown Generating Station Landfill caused the statistically significant levels of arsenic and lithium encountered at monitoring well CCR-LF-4 and cobalt encountered at monitoring well CCR-LF-2 over groundwater protection standards identified during assessment monitoring. I certify that this report and all attachments were prepared by me or under my direct supervision. I am a professional engineer who is registered in the State of Indiana.

This certification and the underlying data support the conclusion that a source other than the Landfill is the cause of the statistically significant levels (SSLs) over groundwater protection standards for Appendix IV constituents detected during assessment monitoring of this unit.

The information contained in this evaluation is, to the best of my knowledge, true, accurate and complete.

HALEY & ALDRICH, INC.

Signed: _____ 15 April 2019
Certifying Engineer

Print Name:	Steven F. Putrich, P.E.
Indiana License No.:	PE11200566
Title:	CCR Program Manager
Company:	Haley & Aldrich, Inc.

HALEY ALDRICH

TABLES

TABLE 1
SUMMARY OF GROUNDWATER QUALITY DATA
LANDFILL - AUGUST 2018
A.B. BROWN GENERATING STATION
MOUNT VERNON, INDIANA
FILE NO. 129420

Location Group	Action Level												_Background	
Location Name		CCR-BK-1	CCR-BK-1R	CCR-BK-1R	CCR-BK-1R	CCR-BK-1R	CCR-BK-1R	CCR-BK-1R	CCR-BK-1R	CCR-BK-1R	CCR-BK-1R	CCR-BK-1R	CCR-BK-1R	CCR-BK-2
Sample Name	MCL	CCR-BK-1-20160811	CCR-BK-1-20161027	CCR-BK-1R-20161107	CCR-BK-1R-20161206	CCR-BK-1R-20170207	CCR-BK-1R-20170407	CCR-BK-1R-20170606	CCR-BK-1R-20170928	CCR-BK-1R-20171116	CCR-BK-1R-20180608	CCR-BK-1R-20180824	CCR-BK-1R20180827	CCR-BK-2-20160608
Sample Date		08/11/2016	10/27/2016	11/07/2016	12/06/2016	02/07/2017	04/07/2017	06/06/2017	09/28/2017	11/16/2017	06/08/2018	08/24/2018	08/27/2018	06/08/2016
Lab Sample ID		180-57528-14	180-60271-6	180-60609-5	180-61491-18	180-63324-18	180-65040-1	180-67229-16	180-70809-15	180-72643-21	180-78556-5		180-81365-1	180-55607-6
Detection Monitoring - EPA Appendix III Constituents (mg/L)														
Boron	NA	0.014 U	0.02 U	0.023 U	0.02 U	0.08 U	0.019 J	0.026 J	0.015 J+	0.041 J	-	-	0.08 U	0.018 J+
Calcium	NA	36	41	38	36	34	35	34	35	39	-	-	34	53
Antimony	0.006	0.002 U	0.002 U	0.000056 J	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00045 J	0.002 U	-	-	0.002 U
Chloride	NA	R	2.4	1.5	2.3	2.3	2.7	2.1	2.2	2.6	-	-	1.9	12
Fluoride	4	R	0.35	0.32	0.35	0.3	0.38	0.3	0.35 J+	0.3	0.37	-	0.31	R
Sulfate	NA	R	26	21	26	27	28	25	25	26 J-	-	-	21 J-	61
Total Dissolved Solids (TDS)	NA	220	210	220	200	230	250	270	210	210	-	-	220	360
pH (lab) (su)	NA	7.4 J	7.5 J	7 J	6.9 J	7.2 J	7.2 J	7.1 J	7.1 J	7.8 J	-	-	7.2 J	7.09 J
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)														
Arsenic	0.01	0.0011	0.00021 J	0.001 U	0.00031 J	0.00094 J	0.00095 J	0.00047 J	0.0025 J+	0.0015 J+	R	-	0.0011	0.00032 J
Barium	2	0.048	0.035	0.037 J-	0.031 J-	0.038	0.04	0.038	0.032 J-	0.082 J-	0.049 J-	-	0.041 J	0.041 J-
Cadmium	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ	-	0.001 U	0.001 U
Chromium	0.1	0.0025	0.00046 J	0.00087 J	0.00071 J	0.003	0.0026	0.0019 J	R	0.0027 J+	0.003 J+	-	0.0076	0.002 U
Cobalt	0.006	0.0028	0.00076	0.00051	0.0005 U	0.0011	0.001	0.00062	R	0.0022	0.0008 J	-	0.001	0.000096 J
Lead	0.015	0.00082 J	0.00024 J	0.000079 J	0.000096 J	0.00099 J	0.00092 J	0.00052 J	0.001 U	0.0008 J	0.00063 J	-	0.0011	0.000028 J
Fluoride	4	R	0.35	0.32	0.35	0.3	0.38	0.3	0.35 J+	0.3	0.37	-	0.31	R
Lithium	0.04	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0086 J	0.0036 J	-	0.0048 J	0.05 U
Mercury	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 UJ	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 UJ	0.0002 UJ	-	0.0002 U	0.0002 UJ
Molybdenum	0.1	0.0025 J	0.005 U	0.005 U	0.0015 J	0.0017 J	0.0025 J	0.0015 J	R	0.0034 J	0.0014 J	-	0.0013 J	0.0017 J
Selenium	0.05	0.00067 J	0.005 U	0.00037 J	0.00051 J	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	-	0.005 U	0.005 U
Radiological (pCi/L)														
Radium-226	NA	0.0484 U ± 0.104	0.0760 U ± 0.21	R	0.303 U ± 0.296	0.142 ± 0.0913	0.280 ± 0.0981	0.177 J ± 0.0924	R	0.165 ± 0.074	0.223 ± 0.148	-	R	0.102 J ± 0.0557
Radium-228	NA	0.0724 UJ ± 0.514	0.191 U ± 0.217	-0.0566 U ± 0.222	0.179 U ± 0.238	-0.0934 U ± 0.194	0.177 U ± 0.257	0.337 ± 0.257	0.171 U ± 0.226	0.388 U ± 0.268	0.263 U ± 0.217	-	0.285 U ± 0.313	0.0185 U ± 0.2
Radium-226 & 228	5	0.121 UJ ± 0.525	0.267 U ± 0.302	R	0.482 ± 0.38	0.142 UJ ± 0.214	0.457 J ± 0.275	0.515 J ± 0.273	0.426 J+ ± 0.243	0.553 J+ ± 0.278	R	-	R	0.120 U ± 0.207
Constituents not Monitored by the CCR Rule (mg/L)														
Beryllium	0.004	0.00012 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ	-	-	0.001 U
Thallium	0.002	0.000038 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	-	-	0.001 U
Field Parameters														
Temperature (Deg C)	NA	20.68	15.88	20.42	11.36	14.52	14.94	17.06	24.01	10.95	19.28	16.84	-	17.51
Turbidity, Field (FNU)	NA	-	-	-	-	-	-	-	0.76	-	-	-	-	-
Dissolved Oxygen, Field (mg/L)	NA	5.15	5.85	5.89	7.03	5.98	5.43	6.28	6	8.82	3.56	4.01	-	0.42
Conductivity, Field (mS/cm)	NA	0.3475	0.38255	0.36566	0.32748	0.3703	0.31348	0.35539	0.35718	0.40797	0.40732	0.55264	-	0.6551
ORP, Field (mv)	NA	222	223.99	116.48	52.8	131.91	98.13	266.28	147.09	47.02	953.28	-40.88	-	28.72
Turbidity, Field (NTU)	NA	17.39	19.19	10.68	97.13	6.47	17.2	24.08	-	131.33	57.12	184.84	-	17.85
pH, Field (su)	NA	6.8	6.95	7.02	7.14	6.87	7.22	6.95	6.88	7.13	6.94	6.98	-	6.98

ABBREVIATIONS AND NOTES:

CCR: Coal Combustion Residuals.
mg/L: milligram per liter.
pCi/L: picoCurie per liter.
su: standard units.
USEPA: United States Environmental Protection Agency.

QUALIFIERS:

J: value is estimated.
J-: value is estimated with a potentially low bias
J+: value is estimated with a potentially high bias
U: Not detected value is the laboratory reporting limit.

- USEPA. 2016. Final Rule: Disposal of Coal Combustion Residuals from Electric Utilities. July 26. 40 CFR Part 257.
https://www.epa.gov/coalash/coal-ash-rule

TABLE 1
SUMMARY OF GROUNDWATER QUALITY DATA
LANDFILL - AUGUST 2018
A.B. BROWN GENERATING STATION
MOUNT VERNON, INDIANA
FILE NO. 129420

Location Group	Action Level															
Location Name		CCR-BK-2	CCR-BK-2	CCR-BK-2	CCR-BK-2	CCR-BK-2	CCR-BK-2	CCR-BK-2	CCR-BK-2	CCR-BK-2	CCR-BK-2	CCR-BK-2	CCR-BK-2	CCR-LF-1	CCR-LF-1	CCR-LF-1
Sample Name	MCL	DUP 3-20160608	CCR-BK-2-20160810	CCR-BK-2-20161027	CCR-BK-2-20161206	CCR-BK-2-20170210	CCR-BK-2-20170405	CCR-BK-2-20170606	CCR-BK-2-20170927	CCR-BK-2-20171116	CCR-BK-2-20180608	CCR-BK-2-20180820	CCR-LF-1-20160608	CCR-LF-1-20160810	DUP-2-20160810
Sample Date		06/08/2016	08/10/2016	10/27/2016	12/06/2016	02/10/2017	04/05/2017	06/06/2017	09/27/2017	11/16/2017	06/08/2018	08/20/2018	06/08/2016	08/10/2016	08/10/2016
Lab Sample ID		180-55607-9	180-57528-15	180-60271-7	180-61491-19	180-63446-1	180-64974-1	180-67229-17	180-70809-16	180-72643-22	180-78556-6	180-81110-10	180-55607-1	180-57528-1	180-57528-7
Detection Monitoring - EPA Appendix III Constituents (mg/L)															
Boron	NA	0.017 J+	0.014 U	0.02 U	0.02 U	0.08 U	0.016 U	0.021 J	0.018 J+	0.02 J	-	0.08 U	0.031 J+	0.033 UJ	0.067 J+
Calcium	NA	53	39	46	36	34	45	37	37	35	-	36	230	230	250
Antimony	0.006	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00048 J	0.002 U	-	0.002 U	0.002 U	0.002 U
Chloride	NA	12	17	17	19	12 J+	19	14	19	19	-	15	15	11	11
Fluoride	4	R	0.14 J+	0.16	0.2 J+	0.14	0.16	0.13	R	0.13	0.16	0.13 J+	R	0.3 J+	0.3 J+
Sulfate	NA	67	30 J-	28	26	25 J+	29	27	24	23 J-	-	18 J-	1100	920 J-	970 J-
Total Dissolved Solids (TDS)	NA	360	260	350	260	230	240	270	320	250	-	230	1800	1800	1900
pH (lab) (su)	NA	7.06 J	7.1 J	6.8 J	6.7 J	8.5 J	7.2 J	7 J	6.8 J	7.3 J	-	6.8 J	6.87 J	7 J	7 J
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)															
Arsenic	0.01	0.001 U	0.001 U	0.0013	0.00051 J	0.00031 J	0.001 U	0.001 U	0.0035 J+	0.0028	0.001 U	0.001 U	0.00054 J	0.001 U	0.001 U
Barium	2	0.046 J-	0.033	0.15	0.036 J-	0.033 J-	0.034 J-	0.035	0.048 J-	0.046 J-	0.037 J-	0.033 J	0.041 J-	0.048	0.058
Cadmium	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U	0.001 U	0.001 U
Chromium	0.1	0.002 U	0.002 U	0.0047	0.00076 J	0.002 UJ	0.002 U	0.002 U	R	0.0043 J+	0.002 U	0.002 U	0.00091 J	0.0011 J	0.0016 J
Cobalt	0.006	0.00011 J	0.0001 J	0.0062	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0015 J+	0.0012	0.000098 J	0.0005 U	0.000057 J	0.000077 J	0.00018 J
Lead	0.015	0.000039 J	0.001 U	0.011	0.00057 J	0.001 U	0.001 U	0.001 U	0.0028 J+	0.0024	0.001 UJ	0.001 U	0.000033 J	0.001 U	0.00029 J
Fluoride	4	R	0.14 J+	0.16	0.2 J+	0.14	0.16	0.13	R	0.13	0.16	0.13 J+	R	0.3 J+	0.3 J+
Lithium	0.04	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.005 U	0.05 U	0.05 U	0.05 U	0.05 U
Mercury	0.002	0.0002 UJ	0.0002 U	0.0001 J	0.0002 UJ	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 UJ	0.0002 UJ	0.0002 U	0.0002 UJ	0.0002 U	0.0002 U
Molybdenum	0.1	0.0017 J	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.00062 J	0.005 U	0.00068 J	0.00051 J	0.005 U	0.0016 J	0.0015 J	0.0012 J
Selenium	0.05	0.00046 J	0.005 U	0.00098 J	0.00047 J	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.001 J	0.0013 J	0.00089 J
Radiological (pCi/L)															
Radium-226	NA	0.0696 U ± 0.0542	0.0387 U ± 0.0693	1.14 J ± 0.72	0.346 U ± 0.284	0.0539 UJ ± 0.0753	0.0198 U ± 0.0619	0.00911 UJ ± 0.049	R	0.149 ± 0.0943	0.0863 U ± 0.108	R	0.330 J ± 0.0989	0.304 J ± 0.0911	0.816 J ± 0.201
Radium-228	NA	-0.0314 U ± 0.199	0.0797 UJ ± 0.324	0.764 U ± 0.727	R	0.163 U ± 0.253	0.102 U ± 0.198	0.144 ± 0.284	0.279 U ± 0.416	2.98 ± 0.579	0.230 U ± 0.194	0.0380 U ± 0.238	0.355 U ± 0.279	0.392 U ± 0.261	0.547 U ± 0.543
Radium-226 & 228	5	0.0382 U ± 0.207	0.118 UJ ± 0.331	1.91 J ± 1.02	0.796 J ± 0.38	0.217 UJ ± 0.264	0.122 U ± 0.208	0.153 U ± 0.288	0.525 UJ ± 0.436	3.13 ± 0.587	R	0.209 UJ ± 0.251	0.685 ± 0.296	0.696 ± 0.277	1.36 ± 0.578
Constituents not Monitored by the CCR Rule (mg/L)															
Beryllium	0.004	0.001 U	0.001 U	0.0004 J	0.001 U	0.001 U	0.001 U	0.001 U	0.00018 J	0.001 U	0.001 UJ	-	0.001 U	0.001 U	0.001 U
Thallium	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.000059 J	0.001 U	-	0.001 U	0.001 U	0.001 U
Field Parameters															
Temperature (Deg C)	NA	17.51	17.4	15.98	14.25	13.49	15.79	15.68	16.85	14.23	18.58	17.12	24.21	19.33	19.33
Turbidity, Field (FNU)	NA	-	-	-	-	-	-	-	167.49	-	-	-	-	-	-
Dissolved Oxygen, Field (mg/L)	NA	0.42	0.22	0.38	0.33	0.35	1.08	0.14	0.43	0.47	0.36	0.72	1.45	1.02	1.02
Conductivity, Field (mS/cm)	NA	0.6551	0.4173	0.40128	0.30961	0.38131	0.29739	0.41407	0.38594	0.38795	0.43327	0.39173	2.08187	2.028	2.028
ORP, Field (mv)	NA	28.72	144	234.6	87.3	120.09	200.74	212.67	212.04	108.47	1080.86	154.46	92.49	96	96
Turbidity, Field (NTU)	NA	17.85	1.751	858.51	336.44	11.66	-22.18	-1.12	-	181.78	13.78	2.45	47.16	-2.224	-2.224
pH, Field (su)	NA	6.98	6.64	6.7	6.19	6.72	6.66	6.67	6.64	6.74	6.68	6.55	6.54	6.51	6.51

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LANDFILL - AUGUST 2018
A.B. BROWN GENERATING STATION
MOUNT VERNON, INDIANA
FILE NO. 129420

Location Group	Action Level	Landfill										
Location Name	MCL	CCR-LF-1	CCR-LF-1	CCR-LF-1	CCR-LF-1	CCR-LF-1	CCR-LF-1	CCR-LF-1	CCR-LF-1	CCR-LF-1	CCR-LF-1	CCR-LF-1
Sample Name		CCR-LF-1-20161025	DUP2-20161025	CCR-LF-1-20161205	CCR-LF-1-20170210	CCR-LF-1-20170405	CCR-LF-1-20170607	CCR-LF-1-20170929	CCR-LF-1-20171116	DUP 2-20171116	CCR-LF-1-20180607	CCR-LF-1-20180822
Sample Date		10/25/2016	10/25/2016	12/05/2016	02/10/2017	04/05/2017	06/07/2017	09/29/2017	11/16/2017	11/16/2017	06/07/2018	08/22/2018
Lab Sample ID		180-60160-1	180-60160-4	180-61491-10	180-63446-2	180-64974-9	180-67229-10	180-70838-12	180-72643-1	180-72643-10	180-78556-1	180-81267-4
Detection Monitoring - EPA Appendix III Constituents (mg/L)												
Boron	NA	0.037	0.04	0.04 U	0.08 U	0.041 J	0.046 J	0.028 J	0.12 J	0.033 J	-	0.04 J
Calcium	NA	270	270	270	250	290	270	260	260	260	-	270
Antimony	0.006	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00059 J	0.00065 J	0.002 U	-
Chloride	NA	13	13	16	16 J+	16	11	17	16	17	-	19
Fluoride	4	0.27	0.29	0.25 J+	0.23	0.22	0.21 J	0.18	0.27	0.21	0.27	0.26 J+
Sulfate	NA	970	1000	1100	1100 J+	1000	990	1100	1100 J-	1100 J-	-	1200 J-
Total Dissolved Solids (TDS)	NA	1900	1900	1800	1800	1800	1900	1800	1800	1800	-	2000
pH (lab) (su)	NA	6.7 J	6.8 J	6.8 J	7.2 J	6.9 J	7 J	7 J	7.5 J	7.2 J	-	6.9 J
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)												
Arsenic	0.01	0.001 U	0.00015 J	0.00052 J	0.0011	0.0012	0.00084 J	0.00084 J	0.001 U	0.0012 J+	0.001 U	0.0015
Barium	2	0.047	0.049	0.05 J-	0.036 J-	0.052 J-	0.04	0.035	0.042 J-	0.047 J-	0.045 J-	0.088 J
Cadmium	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U
Chromium	0.1	0.00097 J	0.0011 J	0.0013 J	0.00089 J-	0.0018 J	0.0017 J	0.0016 J	0.002 U	0.002 U	0.002 U	0.0062 J+
Cobalt	0.006	0.000043 J	0.000047 J	0.0005 U	0.0005 U	0.0003 J	0.00032 J	0.00066	0.00026 J	0.0003 J	0.00022 J	0.00068
Lead	0.015	0.001 U	0.001 U	0.0002 J	0.001 U	0.00068 J	0.00047 J	0.00063 J	0.001 U	0.001 U	0.00021 J	0.0011
Fluoride	4	0.27	0.29	0.25 J+	0.23	0.22	0.21 J	0.18	0.27	0.21	0.27	0.26 J+
Lithium	0.04	0.05 U	0.05 U	0.01 J	0.05 U	0.05 U	0.0096 J	0.05 U	0.05 U	0.05 U	0.0036 J	0.008 J+
Mercury	0.002	0.0002 U	0.0002 U	0.0002 UJ	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 U
Molybdenum	0.1	0.00098 J	0.0013 J	0.005 U	0.005 U	0.0012 J	0.0011 J	0.0016 J	0.0015 J	0.0014 J	0.00083 J	0.0012 J
Selenium	0.05	0.0011 J	0.00095 J	0.00089 J	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Radiological (pCi/L)												
Radium-226	NA	0.470 J ± 0.292	0.915 J ± 0.357	1.00 J ± 0.389	0.288 J ± 0.123	0.240 ± 0.102	0.732 J ± 0.159	0.349 ± 0.107	0.450 ± 0.122	0.312 ± 0.0967	0.299 ± 0.175	0.776 ± 0.153
Radium-228	NA	0.255 U ± 0.234	0.401 ± 0.242	R	0.172 U ± 0.235	0.509 ± 0.272	0.293 ± 0.236	0.397 ± 0.243	0.622 ± 0.285	0.192 U ± 0.213	0.446 ± 0.247	0.281 U ± 0.213
Radium-226 & 228	5	0.726 J ± 0.374	1.32 J ± 0.432	1.47 J ± 0.457	0.459 J ± 0.265	0.749 ± 0.291	1.02 J ± 0.284	0.747 ± 0.266	1.07 ± 0.31	0.504 J ± 0.234	R	R
Constituents not Monitored by the CCR Rule (mg/L)												
Beryllium	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ	-
Thallium	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.000055 J	0.001 U	0.001 U	-
Field Parameters												
Temperature (Deg C)	NA	19.02	19.02	15.63	11.86	14.16	16.87	18.02	16.67	16.67	30.7	19.59
Turbidity, Field (FNU)	NA	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen, Field (mg/L)	NA	1.05	1.05	1.58	1.74	1.35	2.84	6.27	5.79	5.79	5.81	2.75
Conductivity, Field (mS/cm)	NA	1.79792	1.79792	1.4898	2.02562	2.00881	1.90568	2.03117	2.01289	2.01289	2.1228	2.11697
ORP, Field (mv)	NA	50	50	32.2	187.09	102.62	108.63	164.85	146.45	146.45	1016.17	174.8
Turbidity, Field (NTU)	NA	-0.1	-0.1	6.22	1.39	39.98	30.27	32.85	16.28	16.28	19.52	11.01
pH, Field (su)	NA	6.63	6.63	6.66	6.68	6.78	6.65	6.59	6.64	6.64	6.63	6.48

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LANDFILL - AUGUST 2018
A.B. BROWN GENERATING STATION
MOUNT VERNON, INDIANA
FILE NO. 129420

Location Group	Action Level	Landfill										
Location Name	MCL	CCR-LF-2	CCR-LF-2	CCR-LF-2	CCR-LF-2	CCR-LF-2	CCR-LF-2	CCR-LF-2	CCR-LF-2	CCR-LF-2	CCR-LF-2	CCR-LF-2
Sample Name		CCR-LF-2-20160608	CCR-LF-2-20160810	CCR-LF-2-20161026	CCR-LF-2-20161205	CCR-LF-2-20170210	CCR-LF-2-20170405	CCR-LF-2-20170607	CCR-LF-2-20170927	CCR-LF-2-20171114	CCR-LF-2-20180607	CCR-LF-2-20180820
Sample Date		06/08/2016	08/10/2016	10/26/2016	12/05/2016	02/10/2017	04/05/2017	06/07/2017	09/27/2017	11/14/2017	06/07/2018	08/20/2018
Lab Sample ID		180-55607-2	180-57528-2	180-60193-7	180-61491-11	180-63446-3	180-64974-10	180-67229-11	180-70809-10	180-72643-2	180-78556-2	180-81110-5
Detection Monitoring - EPA Appendix III Constituents (mg/L)												
Boron	NA	3.4	3.9	3.8	4.5	4.2	4.3	5.3	4.7 J+	5	-	5.3
Calcium	NA	340	380	410	400	380	430	430	400	380	-	390
Antimony	0.006	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.02 U	0.0021	0.002 U	0.02 U	0.02 U	-
Chloride	NA	290	320	280	290	330 J+	320	350	350	350	-	290
Fluoride	4	R	2.5 U	2.5 U	1 U	2.5 U	1 U	2.5 U	1 U	1 U	2.5 U	5 U
Sulfate	NA	12000	12000 J-	11000 J-	12000	14000 J+	14000	14000	15000	15000 J-	-	15000
Total Dissolved Solids (TDS)	NA	19000	19000	18000	19000	19000	22000	22000	21000	21000	-	24000
pH (lab) (su)	NA	6.6 J	6.7 J	6.5 J	6.6 J	6.8 J	6.7 J	6.7 J	6.6 J	7.2 J	-	6.6 J
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)												
Arsenic	0.01	0.0028	0.0022	0.0023	0.0015	0.0016	0.01 U	0.0013	0.0062 J+	0.01 U	0.01 U	0.01 U
Barium	2	0.012 J-	0.014	0.013 J-	0.013 J-	0.012 J	R	0.013	0.011 J-	R	0.012 J	0.012 J
Cadmium	0.005	0.00075 J	0.0027	0.0047	0.0043	0.0027	0.0032 J	0.004	0.0039	0.0043 J	0.0039 J	0.0035 J
Chromium	0.1	0.00073 J	0.0014 J	0.0018 J	0.001 J	0.00067 J-	0.02 U	0.00084 J	R	0.02 U	0.02 U	0.02 U
Cobalt	0.006	0.014	0.0076	0.0076	0.0067	0.0057	0.0072	0.0079	0.0073	0.0076	0.01 J	0.011
Lead	0.015	0.00022 J	0.00096 J	0.0014	0.00045 J	0.00046 J	0.01 U	0.00036 J	0.001 U	0.01 U	0.01 UJ	0.01 U
Fluoride	4	R	2.5 U	2.5 U	1 U	2.5 U	1 U	2.5 U	1 U	1 U	2.5 U	5 U
Lithium	0.04	0.019 J	0.025 J	0.03 J	0.029 J	0.03 J	0.025 J	0.022 J	0.25 U	0.028 J	0.05 U	0.041 J
Mercury	0.002	0.0002 UJ	0.0002 U	0.0002 UJ	0.0002 UJ	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 UJ	0.0002 UJ	0.0002 U
Molybdenum	0.1	0.0048 J	0.0031 J	0.0018 J	0.0026 J	0.0015 J	0.05 U	0.0034 J	R	0.05 U	0.05 U	0.05 U
Selenium	0.05	0.0021 J	0.0021 J	0.0018 J+	0.0027 J	0.002 J	0.05 U	0.0026 J	0.0034 J+	0.05 U	0.05 U	0.05 U
Radiological (pCi/L)												
Radium-226	NA	0.213 J ± 0.0852	0.350 ± 0.172	0.627 J ± 0.319	0.566 J ± 0.348	0.576 J ± 0.162	0.451 ± 0.143	0.308 J ± 0.108	0.503 J ± 0.136	0.465 ± 0.122	0.486 ± 0.2	0.466 J ± 0.114
Radium-228	NA	0.940 ± 0.307	1.03 ± 0.609	1.52 ± 0.401	1.44 ± 0.347	1.59 ± 0.355	1.36 ± 0.34	1.46 ± 0.389	1.83 ± 0.407	1.84 ± 0.381	1.30 ± 0.32	1.86 ± 0.384
Radium-226 & 228	5	1.15 ± 0.319	1.38 ± 0.633	2.15 J ± 0.513	2.01 J ± 0.491	2.17 J ± 0.39	1.81 ± 0.369	1.77 ± 0.403	2.33 ± 0.429	2.31 ± 0.4	1.79 ± 0.377	2.32 J ± 0.401
Constituents not Monitored by the CCR Rule (mg/L)												
Beryllium	0.004	0.001 U	0.001 U	0.00013 J	0.00028 J	0.00013 J	0.01 U	0.001 U	0.00018 J	0.01 U	0.01 UJ	-
Thallium	0.002	0.00018 J	0.00034 J	0.00037 J	0.001 U	0.001 U	0.01 U	0.00056 J	0.00065 J	0.01 U	0.01 U	-
Field Parameters												
Temperature (Deg C)	NA	17.41	17.54	19.88	12.73	15	16.13	17.12	16.95	15.85	16.36	16.53
Turbidity, Field (FNU)	NA	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen, Field (mg/L)	NA	0.14	0.28	0.62	0.47	0.12	0.11	0.13	0.05	0.15	0.16	0.07
Conductivity, Field (mS/cm)	NA	19.4913	19.51	18.0976	16.545	19.5139	20.3435	19.871	20.6399	21.9844	23.93	23.8507
ORP, Field (mv)	NA	-46.57	9	20	-90.2	14.64	105.47	48.33	-16.58	18.31	449.61	41.43
Turbidity, Field (NTU)	NA	138.29	23.46	92.84	44.98	33.32	17.4	15.67	556.68	48.42	7.73	32.76
pH, Field (su)	NA	6.38	6.38	6.53	6.32	6.42	6.58	6.42	6.45	6.41	6.44	6.28

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MOUNT VERNON, INDIANA
FILE NO. 129420

Location Group	Action Level	Landfill											
Location Name		CCR-LF-3	CCR-LF-3	CCR-LF-3	CCR-LF-3	CCR-LF-3	CCR-LF-3	CCR-LF-3	CCR-LF-3	CCR-LF-3	CCR-LF-3	CCR-LF-3	CCR-LF-3
Sample Name	MCL	CCR-LF-3-20160608	CCR-LF-3-20160809	CCR-LF-3-20161026	CCR-LF-3-20161205	CCR-LF3-20170315	CCR-LF-3-20170405	CCR-LF-3-20170606	CCR-LF-3-20170928	CCR-LF-3-20171114	CCR-LF-3-20180607	CCR-LF-3-20180820	BLIND DUPLICATE 2-20180820
Sample Date		06/08/2016	08/09/2016	10/26/2016	12/05/2016	03/15/2017	04/05/2017	06/06/2017	09/28/2017	11/14/2017	06/07/2018	08/20/2018	08/20/2018
Lab Sample ID		180-55607-3	180-57528-3	180-60193-8	180-61491-12	180-64383-1	180-64974-11	180-67229-12	180-70809-11	180-72643-3	180-78556-3	180-81110-6	180-81110-12
Detection Monitoring - EPA Appendix III Constituents (mg/L)													
Boron	NA	0.0087 U	0.042 J+	0.02 U	0.02 U	0.014 J	0.015 J	0.04 J	0.023 J+	0.039 J	-	0.08 U	0.063 J
Calcium	NA	320	300	370	370	280	350	320	260	200	-	290	280
Antimony	0.006	0.002 U	0.002 U	0.002 U	0.002 U	0.0011 J	0.002 U	0.00066 J	0.002 U	0.002 U	0.002 U	-	-
Chloride	NA	51	41	44	42	41	48	34	59	70	-	31	32
Fluoride	4	R	0.24 J	0.23 J	R	0.1 J	0.25	0.21 J	R	0.18	0.2 J	0.19 J+	0.2 J+
Sulfate	NA	1900	1600 J-	2000 J-	2000	1700	1600	1600	1300	1100 J-	-	1500 J-	1500 J-
Total Dissolved Solids (TDS)	NA	3200	3200	3400	3200	2600	2800	3000	2300	1900	-	2900	2800
pH (lab) (su)	NA	6.94 J	7.2 J	6.9 J	6.8 J	6.8 J	7 J	7.1 J	7.1 J	7.7 J	-	7.2 J	6.9 J
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)													
Arsenic	0.01	0.00047 J	0.001 U	0.00032 J	0.00045 J	0.00062 J	0.00026 J	0.00025 J	0.0088 J+	0.001 U	0.001 U	0.001 U	0.001 U
Barium	2	0.027 J-	0.026	0.03 J-	0.03 J-	0.026	0.025 J-	0.027	0.026 J-	0.025 J-	0.029 J-	0.025 J	0.025 J
Cadmium	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.00011 J	0.0001 J	0.000095 J	0.001 UJ	0.001 U	0.001 U
Chromium	0.1	0.002	0.0018 J	0.0022	0.0025	0.0019 J	0.0017 J	0.0018 J	R	0.002 U	0.002 U	0.0035 U	0.0032 U
Cobalt	0.006	0.00071	0.0006 J+	0.0003 J	0.0005 U	0.00048 J	0.00038 J	0.0004 J	R	0.00044 J	0.00033 J	0.0005 U	0.0005 U
Lead	0.015	0.000059 J	0.000074 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.001 U	0.001 U
Fluoride	4	R	0.24 J	0.23 J	R	0.1 J	0.25	0.21 J	R	0.18	0.2 J	0.19 J+	0.2 J+
Lithium	0.04	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.018 J	0.05 U	0.005 U	0.0098 J	0.05 U
Mercury	0.002	0.0002 UJ	0.0002 U	0.0002 UJ	0.0002 UJ	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 UJ	0.0002 UJ	0.0002 U	0.0002 U
Molybdenum	0.1	0.00089 J	0.00098 J	0.0015 J	0.0012 J	0.0013 J	0.005 U	0.0017 J	R	0.0026 J	0.0014 J	0.0011 J	0.0012 J
Selenium	0.05	0.0022 J	0.0022 J	0.0024 J+	0.002 J	0.0017 J	0.005 U	0.0019 J	0.002 J+	0.0016 J	0.0011 J+	0.0014 J	0.0011 J
Radiological (pCi/L)													
Radium-226	NA	0.168 J ± 0.0729	0.107 ± 0.0624	0.217 U ± 0.28	0.398 U ± 0.307	0.120 U ± 0.0869	0.0829 U ± 0.0845	R	R	0.0670 U ± 0.0519	0.138 U ± 0.116	R	R
Radium-228	NA	0.229 U ± 0.261	0.258 U ± 0.248	0.266 U ± 0.319	R	0.616 ± 0.321	0.584 ± 0.299	0.182 ± 0.202	R	0.590 ± 0.255	0.387 ± 0.24	0.235 U ± 0.232	0.404 U ± 0.268
Radium-226 & 228	5	0.398 U ± 0.271	0.366 U ± 0.256	0.483 U ± 0.424	1.10 J ± 0.446	0.736 J ± 0.332	0.666 J ± 0.311	0.330 J+ ± 0.216	0.523 J+ ± 0.226	0.657 J ± 0.26	R	0.432 J+ ± 0.245	0.710 J+ ± 0.289
Constituents not Monitored by the CCR Rule (mg/L)													
Beryllium	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ	-	-
Thallium	0.002	0.000015 J	0.001 U	0.00018 J	0.001 U	0.001 U	0.001 U	0.00007 J	0.0001 J	0.00027 J	0.001 U	-	-
Field Parameters													
Temperature (Deg C)	NA	17.58	17.07	20.23	13.91	13.5	15.71	17.14	17.3	15.72	18.36	17.36	17.36
Turbidity, Field (FNU)	NA	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen, Field (mg/L)	NA	4.54	4.33	5.41	4.68	5.15	5.02	5.72	5.34	3.46	5.33	4.85	4.85
Conductivity, Field (mS/cm)	NA	3.52381	3.414	3.13537	2.9634	3.10374	3.11922	2.99956	2.60234	2.2566	3.03772	3.12913	3.12913
ORP, Field (mv)	NA	117.52	93	90	35	161.76	134.03	151.21	154.67	166.8	582.16	164.55	164.55
Turbidity, Field (NTU)	NA	7.32	-0.3407	-1.48	0	0.57	-1.66	-0.63	-0.44	-0.67	1.66	0.38	0.38
pH, Field (su)	NA	6.63	6.73	6.84	6.71	6.8	7.07	6.85	6.86	6.63	6.74	6.6	6.6

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TABLE 1
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LANDFILL - AUGUST 2018
A.B. BROWN GENERATING STATION
MOUNT VERNON, INDIANA
FILE NO. 129420

Location Group	Action Level	Landfill														
Location Name		CCR-LF-4	CCR-LF-4	CCR-LF-4	CCR-LF-4	CCR-LF-4	CCR-LF-4	CCR-LF-4	CCR-LF-4	CCR-LF-4	CCR-LF-4	CCR-LF-4	CCR-LF-4	CCR-LF-4	CCR-LF-4	CCR-LF-4
Sample Name	MCL	CCR-LF-4-20160607	CCR-LF-4-20160809	CCR-LF-4-20161025	CCR-LF-4-20161206	CCR-LF-4-20170207	DUP 2-20170207	CCR-LF-4-20170405	CCR-LF-4-20170607	DUP2-20170607	CCR-LF-4-20170927	DUP3-20170927	CCR-LF-4-20171116	CCR-LF-4-20180608	DUP2-20180608	CCR-LF-4-20180821
Sample Date		06/07/2016	08/09/2016	10/25/2016	12/06/2016	02/07/2017	02/07/2017	04/05/2017	06/07/2017	06/07/2017	09/27/2017	09/27/2017	11/16/2017	06/08/2018	06/08/2018	08/21/2018
Lab Sample ID		180-55566-4	180-57528-4	180-60160-2	180-61491-13	180-63324-15	180-63324-17	180-64974-12	180-67229-13	180-67229-20	180-70809-12	180-70809-20	180-72643-4	180-78556-4	180-78556-8	180-81110-7
Detection Monitoring - EPA Appendix III Constituents (mg/L)																
Boron	NA	0.16	0.13 J+	0.2 U	0.15 J+	0.14	0.15	0.021 J	0.2	0.26	0.2 J+	0.19 J+	0.22 J	-	-	0.2
Calcium	NA	420	420	370	410	410	420	46	440	440	420	430	440	-	-	360
Antimony	0.006	0.002 U	0.002 U	0.02 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.02 U	0.02 U	0.02 U	-
Chloride	NA	110	99	91	110	110	120	130	88	89	130	130	130	-	-	600
Fluoride	4	0.35 J	1 U	2.5 U	1 U	0.51 J	0.54 J	1 U	2.5 U	2.5 U	1 U	1 U	1 U	1 U	1 U	2.5 U
Sulfate	NA	8200	7500 J-	6500	7900	7900	8100	8400	7300	7400	8700	8600	8600 J-	-	-	5600 J-
Total Dissolved Solids (TDS)	NA	13000	13000	11000	12000	12000	12000	12000	12000	13000	12000	12000	11000	-	-	12000
pH (lab) (su)	NA	6.7 J	6.9 J	6.8 J	6.7 J	6.8 J	6.8 J	7.2 J	6.8 J	6.8 J	6.8 J	6.7 J	7.5 J	-	-	6.8 J
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)																
Arsenic	0.01	0.016	0.016	0.011	0.018	0.019	0.02	0.0021	0.0057	0.0057	0.03	0.028	0.021	0.015 J	0.01 J	0.016
Barium	2	0.013	0.012	0.0078 J	0.014 J-	0.016	0.021	R	0.014	0.016	0.011 J-	0.011 J-	R	0.011 J	R	0.011 J
Cadmium	0.005	0.001 U	0.001 U	0.01 U	0.001 U	0.001 U	0.001 U	0.001 U	0.000092 J	0.0001 J	0.001 U	0.00011 J	0.01 U	0.01 UJ	0.01 UJ	0.001 U
Chromium	0.1	0.002 U	0.002 U	0.02 U	0.0005 J	0.00076 J	0.0013 J	0.002 U	0.00044 J	0.00075 J	R	R	0.02 U	0.02 U	0.02 U	0.002 U
Cobalt	0.006	0.0011	0.00091	0.0012 J	0.00088	0.0018	0.0019	0.00015 J	0.0018	0.002	0.0012 J+	0.0017 J+	0.0013 J	0.0013 J	0.00079 J	0.001
Lead	0.015	0.0002 J	0.000084 J	0.01 U	0.00018 J	0.00047 J	0.00079 J	0.001 U	0.001 U	0.00045 J	0.001 U	0.001 U	0.01 U	0.079 J	0.01 UJ	0.001 U
Fluoride	4	0.35 J	1 U	2.5 U	1 U	0.51 J	0.54 J	1 U	2.5 U	2.5 U	1 U	1 U	1 U	1 U	1 U	2.5 U
Lithium	0.04	0.099	0.11	0.078	0.093	0.087	0.089	0.092	0.087	0.091	0.12	0.1	0.1	0.068 J	0.046 J	0.096
Mercury	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 UJ	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 U
Molybdenum	0.1	0.021	0.023	0.013 J	0.022	0.02	0.022	0.005 U	0.018	0.018	0.026	0.026	0.024 J	0.022 J	0.014 J	0.021
Selenium	0.05	0.00061 J	0.0007 J	0.05 U	0.00055 J	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.05 U	0.05 U	0.05 U	0.005 U
Radiological (pCi/L)																
Radium-226	NA	3.99 ± 0.49	3.96 ± 0.46	5.22 J ± 0.894	4.16 J ± 0.851	3.51 ± 0.492	3.88 ± 0.528	5.78 J- ± 0.819	5.08 J ± 0.589	2.55 J ± 0.349	2.87 ± 0.381	2.81 ± 0.371	3.22 ± 0.409	3.06 ± 0.522	3.08 ± 0.523	3.10 ± 0.392
Radium-228	NA	0.630 ± 0.351	1.38 ± 0.358	0.995 ± 0.307	R	1.44 ± 0.365	0.950 ± 0.318	2.36 J- ± 0.682	1.49 ± 0.406	1.27 ± 0.388	1.21 J ± 0.305	2.35 J ± 0.468	1.35 ± 0.346	1.18 ± 0.338	1.18 ± 0.315	1.28 ± 0.323
Radium-226 & 228	5	4.62 ± 0.602	5.34 ± 0.583	6.21 J ± 0.945	5.14 J ± 0.913	4.95 ± 0.613	4.83 ± 0.616	8.14 J- ± 1.07	6.58 J ± 0.716	3.83 J ± 0.522	4.08 ± 0.488	5.16 ± 0.597	4.58 ± 0.536	4.24 ± 0.622	4.27 ± 0.611	4.38 ± 0.508
Constituents not Monitored by the CCR Rule (mg/L)																
Beryllium	0.004	0.001 U	0.001 U	0.01 U	0.00014 J	0.00018 J	0.00019 J	0.001 U	0.00013 J	0.00016 J	0.00028 J	0.00022 J	0.01 U	0.01 UJ	0.01 UJ	-
Thallium	0.002	0.000033 J	0.001 U	0.01 U	0.001 U	0.001 U	0.001 U	0.001 U	0.00012 J	0.0001 J	0.000089 J	0.000059 J	0.01 U	0.01 U	0.01 U	-
Field Parameters																
Temperature (Deg C)	NA	19.18	22.92	15.3	12.7	14.59	14.59	15.17	15.98	15.98	16.94	16.94	13.51	19.72	19.72	18.58
Turbidity, Field (FNU)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen, Field (mg/L)	NA	1.24	1.19	0.51	0.53	0.37	0.37	0.26	1.65	1.65	0.54	0.54	0.3	0.61	0.61	0.58
Conductivity, Field (mS/cm)	NA	13.6008	13.77	9.08224	11.125	12.0347	12.0347	12.4354	10.9543	10.9543	12.5405	12.5405	12.8545	12.6597	12.6597	12.4934
ORP, Field (mv)	NA	-21	-14	10	-15.3	-19.74	-19.74	-9.68	31.27	31.27	-18.97	-18.97	-39.78	347.28	347.28	-30.82
Turbidity, Field (NTU)	NA	17.71	9.251	10.36	20.29	8.51	8.51	25.59	14.89	14.89	47.58	47.58	13.77	12.89	12.89	3.42
pH, Field (su)	NA	6.53	6.49	6.73	6.53	6.62	6.62	6.7	6.59	6.59	6.61	6.61	6.64	6.58	6.58	6.48

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TABLE 1
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LANDFILL - AUGUST 2018
A.B. BROWN GENERATING STATION
MOUNT VERNON, INDIANA
FILE NO. 129420

Location Group	Action Level	Landfill											
Location Name		CCR-LF-5	CCR-LF-5	CCR-LF-5	CCR-LF-5	CCR-LF-5	CCR-LF-5	CCR-LF-5	CCR-LF-5	CCR-LF-5	CCR-LF-5	CCR-LF-5	CCR-LF-5
Sample Name	MCL	CCR-LF-5-20160608	CCR-LF-5-20160809	CCR-LF-5-20161026	CCR-LF-5-20161205	DUP 2-20161205	CCR-LF-5-20170207	CCR-LF-5-20170404	CCR-LF-5-20170606	CCR-LF-5-20170927	CCR-LF-5-20171114	CCR-LF-5-20180605	CCR-LF-5-20180820
Sample Date		06/08/2016	08/09/2016	10/26/2016	12/05/2016	12/05/2016	02/07/2017	04/04/2017	06/06/2017	09/27/2017	11/14/2017	06/05/2018	08/20/2018
Lab Sample ID		180-55607-4	180-57528-5	180-60193-10	180-61491-14	180-61491-16	180-63324-16	180-64974-13	180-67229-14	180-70809-13	180-72643-5	180-78475-6	180-81110-8
Detection Monitoring - EPA Appendix III Constituents (mg/L)													
Boron	NA	1.1	0.61	0.68	0.91	0.9	1.1	1.2	1.2	1.1 J+	0.86	-	0.93
Calcium	NA	340	330	400	430	420	430	480	450	440	430	-	410
Antimony	0.006	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00055 J	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	-
Chloride	NA	380	240	250	260	260	330	270	320	260	270	-	34
Fluoride	4	R	0.091 J	0.19 J	R	R	0.22 J	0.17 J	0.23 J	0.23 J+	0.12 J	0.5 U	1 U
Sulfate	NA	2500	2000 J-	2100 J-	2500	2500	2400	2300	2300	2500	2700 J-	-	3000 J-
Total Dissolved Solids (TDS)	NA	4300	4000	4000	4500	4400	4300	4300	4500	4500	4300	-	4400
pH (lab) (su)	NA	7 J	7.2 J	6.9 J	6.9 J	7 J	7.1 J	7.3 J	7.1 J	7 J	7.5 J	-	6.9 J
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)													
Arsenic	0.01	0.00061 J	0.001 U	0.00063 J	0.00038 J	0.00027 J	0.0028	0.00033 J	0.00032 J	0.015	0.001 U	0.001 U	0.001 U
Barium	2	0.025 J-	0.026	0.03 J-	0.028 J-	0.028 J-	0.031	0.026 J-	0.026	0.025 J-	0.026 J-	0.026 J-	0.024 J
Cadmium	0.005	0.00015 J	0.00018 J	0.001 U	0.00015 J	0.00016 J	0.00024 J	0.00016 J	0.00018 J	0.00025 J	0.00017 J	0.00021 J	0.00022 J
Chromium	0.1	0.00092 J	0.00093 J	0.0011 J	0.00073 J	0.00063 J	0.022	0.00061 J	0.0006 J	R	0.002 U	0.002 U	0.002 U
Cobalt	0.006	0.00031 J	0.0005 U	0.00034 J	0.0005 U	0.0005 U	0.0033	0.00019 J	0.00018 J	0.00076 J+	0.00025 J	0.00019 J	0.0005 U
Lead	0.015	0.00023 J	0.00031 J	0.0003 J	0.00013 J	0.00015 J	0.0012	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.00011 J
Fluoride	4	R	0.091 J	0.19 J	R	R	0.22 J	0.17 J	0.23 J	0.23 J+	0.12 J	0.5 U	1 U
Lithium	0.04	0.024 J	0.02 J	0.024 J	0.026 J	0.027 J	0.027 J	0.022 J	0.023 J	0.031 J	0.025 J	0.019 J	0.031 J
Mercury	0.002	0.000053 J-	0.0002 U	0.0002 UJ	0.000077 J-	0.000078 J-	0.00012 J	0.0002 U	0.00008 J	0.00012 J	0.00015 J-	0.000086 J-	0.000081 J
Molybdenum	0.1	0.00058 J	0.005 U	0.005 U	0.005 U	0.005 U	0.0023 J	0.005 U	0.00087 J	0.005 U	0.005 U	0.00069 J	0.00063 J
Selenium	0.05	0.005 U	0.00054 J	0.005 U	0.005 U	0.00035 J	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Radiological (pCi/L)													
Radium-226	NA	0.106 J ± 0.064	0.252 ± 0.126	0.115 U ± 0.247	0.334 U ± 0.281	-0.0390 U ± 0.186	0.161 ± 0.0973	0.0594 U ± 0.0672	0.0697 UJ ± 0.0573	R	0.135 ± 0.067	0.162 U ± 0.162	R
Radium-228	NA	-0.129 U ± 0.202	0.242 U ± 0.422	0.227 U ± 0.256	0.307 U ± 0.221	0.103 U ± 0.196	0.0356 U ± 0.183	0.362 U ± 0.252	0.115 ± 0.224	0.0879 U ± 0.224	0.222 U ± 0.219	0.0364 U ± 0.186	0.260 U ± 0.3
Radium-226 & 228	5	-0.0225 U ± 0.211	0.494 U ± 0.44	0.342 U ± 0.356	0.641 ± 0.358	0.103 U ± 0.27	0.197 UJ ± 0.207	0.421 ± 0.261	0.185 UJ ± 0.231	0.246 UJ ± 0.237	0.357 J ± 0.229	0.198 U ± 0.247	0.465 UJ ± 0.312
Constituents not Monitored by the CCR Rule (mg/L)													
Beryllium	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ	-
Thallium	0.002	0.000025 J	0.001 U	0.000067 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	-
Field Parameters													
Temperature (Deg C)	NA	17.1	20.92	15.39	13.81	13.81	14.76	16.45	17.41	18.75	15.23	16.07	16.72
Turbidity, Field (FNU)	NA	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen, Field (mg/L)	NA	0.53	0.41	0.51	0.21	0.21	0.09	0.18	0.14	0.21	0.09	0.06	0.15
Conductivity, Field (mS/cm)	NA	4.88274	4.322	3.36377	4.0028	4.0028	4.99069	4.54569	4.65393	4.80614	4.81019	5.44825	5.0729
ORP, Field (mv)	NA	58.7	154	50	24.6	24.6	187.04	195.99	106.41	124.58	94.61	300.95	113.22
Turbidity, Field (NTU)	NA	51.2	73.4	25.93	19.16	19.16	10.48	8.41	17.73	14.61	4.59	4.63	8.91
pH, Field (su)	NA	6.9	6.75	6.92	6.79	6.79	6.81	6.68	6.84	6.77	6.77	6.75	6.69

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LANDFILL - AUGUST 2018
A.B. BROWN GENERATING STATION
MOUNT VERNON, INDIANA
FILE NO. 129420

Location Group	Action Level	Landfill												
Location Name		CCR-LF-6	CCR-LF-6	CCR-LF-6	CCR-LF-6	CCR-LF-6	CCR-LF-6	CCR-LF-6	CCR-LF-6	CCR-LF-6	CCR-LF-6	CCR-LF-6	CCR-LF-6	CCR-LF-6
Sample Name	MCL	CCR-LF-6-20160608	DUP 2-20160608	CCR-LF-6-20160809	CCR-LF-6-20161026	CCR-LF-6-20161205	CCR-LF6-20170315	CCR-LF-6-20170404	DUP 2-20170404	CCR-LF-6-20170606	CCR-LF-6-20170927	CCR-LF-6-20171114	CCR-LF-6-20180605	CCR-LF-6-20180820
Sample Date		06/08/2016	06/08/2016	08/09/2016	10/26/2016	12/05/2016	03/15/2017	04/04/2017	04/04/2017	06/06/2017	09/27/2017	11/14/2017	06/05/2018	08/20/2018
Lab Sample ID		180-55607-5	180-55607-8	180-57528-6	180-60193-9	180-61491-15	180-64383-2	180-64974-14	180-64974-15	180-67229-15	180-70809-14	180-72643-6	180-78475-7	180-81110-9
Detection Monitoring - EPA Appendix III Constituents (mg/L)														
Boron	NA	1	0.96	0.94	0.67	0.64	0.78	1	1.1	0.99	1 J+	0.59	-	0.79
Calcium	NA	250	250	250	200	210	300	310	320	290	250	210	-	190
Antimony	0.006	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0011 J	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	-
Chloride	NA	67	68	59	43	48	100	85	84	68	42	50	-	21
Fluoride	4	R	R	0.26	0.43	0.32	0.12	0.32	0.32	0.37	0.39 J+	0.42	0.51	0.47
Sulfate	NA	1100	1100	820 J-	680 J-	770	1100	960	1000	910	870	720 J-	-	520 J-
Total Dissolved Solids (TDS)	NA	1900	1900	1900	1300	1300	2000	1900	1800	1900	1600	1400	-	1200
pH (lab) (su)	NA	7.09 J	7.07 J	7.2 J	7 J	7.1 J	7 J	7.4 J	7.4 J	7.1 J	7.2 J	7.6 J	-	7.1 J
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)														
Arsenic	0.01	0.00039 J	0.00029 J	0.001 U	0.00029 J	0.00029 J	0.00043 J	0.0003 J	0.00046 J	0.001 U	0.0097 J+	0.001 U	0.001 U	0.001 U
Barium	2	0.015 J-	0.016 J-	0.016	0.017 J-	0.021 J-	0.018	0.017 J-	0.021 J-	0.018	0.017 J-	0.018 J-	0.024 J-	0.03 J
Cadmium	0.005	0.00012 J	0.00012 J	0.001 U	0.001 U	0.00017 J	0.00011 J	0.00015 J	0.00013 J	0.000089 J	0.00014 J	0.00015 J	0.001 UJ	0.00021 J
Chromium	0.1	0.002 U	0.002 U	0.002 U	0.00035 J	0.00066 J	0.002 U	0.002 U	0.00056 J	0.002 U	R	0.002 U	0.002 U	0.0023 U
Cobalt	0.006	0.00011 J	0.00019 J	0.0005 U	0.000099 J	0.0005 U	0.00016 J	0.00047 J	0.00057	0.00017 J	R	0.00022 J	0.00021 J	0.00086 J+
Lead	0.015	0.000045 J	0.000044 J	0.001 U	0.00015 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ	0.00017 J
Fluoride	4	R	R	0.26	0.43	0.32	0.12	0.32	0.32	0.37	0.39 J+	0.42	0.51	0.47
Lithium	0.04	0.023 J	0.02 J	0.023 J	0.017 J	0.019 J	0.019 J	0.017 J	0.017 J	0.022 J	0.019 J	0.017 J	0.014 J	0.021 J
Mercury	0.002	0.0002 UJ	0.0002 UJ	0.0002 U	0.0002 UJ	0.0002 UJ	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 UJ	0.0002 UJ	0.0002 U
Molybdenum	0.1	0.00066 J	0.0011 J	0.005 U	0.005 U	0.0016 J	0.00087 J	0.005 U	0.005 U	0.0012 J	R	0.0012 J	0.0012 J	0.0015 J
Selenium	0.05	0.005 U	0.00093 J	0.005 U	0.005 U	0.00074 J	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.002 J
Radiological (pCi/L)														
Radium-226	NA	0.108 J ± 0.0623	0.0721 U ± 0.0593	0.110 ± 0.0729	0.248 U ± 0.309	0.214 U ± 0.284	0.0587 U ± 0.0685	0.101 U ± 0.0802	0.0753 U ± 0.0695	R	R	0.131 ± 0.0691	0.169 U ± 0.169	R
Radium-228	NA	0.194 U ± 0.219	-0.0212 U ± 0.228	0.200 U ± 0.277	0.232 U ± 0.279	0.405 U ± 0.283	0.0519 U ± 0.255	0.155 U ± 0.246	0.183 U ± 0.239	0.0229 ± 0.267	-0.0356 U ± 0.202	0.296 U ± 0.221	0.0736 U ± 0.174	0.320 U ± 0.269
Radium-226 & 228	5	0.302 U ± 0.227	0.0508 U ± 0.236	0.310 U ± 0.286	0.480 U ± 0.416	0.619 ± 0.401	0.111 U ± 0.264	0.255 U ± 0.259	0.258 U ± 0.249	0.286 UJ ± 0.287	0.141 UJ ± 0.215	0.426 J ± 0.232	0.242 U ± 0.243	0.615 J+ ± 0.287
Constituents not Monitored by the CCR Rule (mg/L)														
Beryllium	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UJ	-
Thallium	0.002	0.001 U	0.000028 J	0.001 U	0.000073 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	-
Field Parameters														
Temperature (Deg C)	NA	18.19	18.19	23.5	18.51	12.72	10.17	14.6	14.6	17.09	20.28	15.71	17.47	21.59
Turbidity, Field (FNU)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen, Field (mg/L)	NA	0.48	0.48	0.2	0.39	0.96	0.94	0.7	0.7	0.34	0.26	0.4	0.5	0.15
Conductivity, Field (mS/cm)	NA	2.27865	2.27865	2.18	1.40432	1.3022	2.44599	2.17252	2.17252	2.04141	1.83595	1.69982	1.46838	1.43063
ORP, Field (mv)	NA	38	38	34	40	26.5	166.45	181.6	181.6	79.49	130.2	102.65	320.9	112.41
Turbidity, Field (NTU)	NA	29.28	29.28	45.06	1.73	0.71	0.12	-1.46	-1.46	3.17	42.73	4.34	0.88	0.9
pH, Field (su)	NA	6.93	6.93	6.75	7.01	7.07	7.05	6.94	6.94	6.94	6.87	6.94	6.97	6.86

ABBREVIATIONS AND NOTES:

CCR: Coal Combustion Residuals.
mg/L: milligram per liter.
pCi/L: picoCurie per liter.
su: standard units.
USEPA: United States Environmental Protection Agency.

QUALIFIERS:

J: value is estimated.
J-: value is estimated with a potentially low bias
J+: value is estimated with a potentially high bias
U: Not detected value is the laboratory reporting limit.

- USEPA. 2016. Final Rule: Disposal of Coal Combustion Residuals from Electric Utilities. July 26. 40 CFR Part 257.
https://www.epa.gov/coalash/coal-ash-rule

FIGURES

LEGEND

- MONITORING WELL
- TOPOGRAPHIC DIVIDE
- APPROXIMATE WASTE BOUNDARY

NOTES

1. LOCATIONS DERIVED FROM THREE I DESIGN DATA.
2. AERIAL IMAGERY SOURCE: ESRI

N

0 500 1,000 1,500 2,000
SCALE IN FEET

HALEY ALDRICH

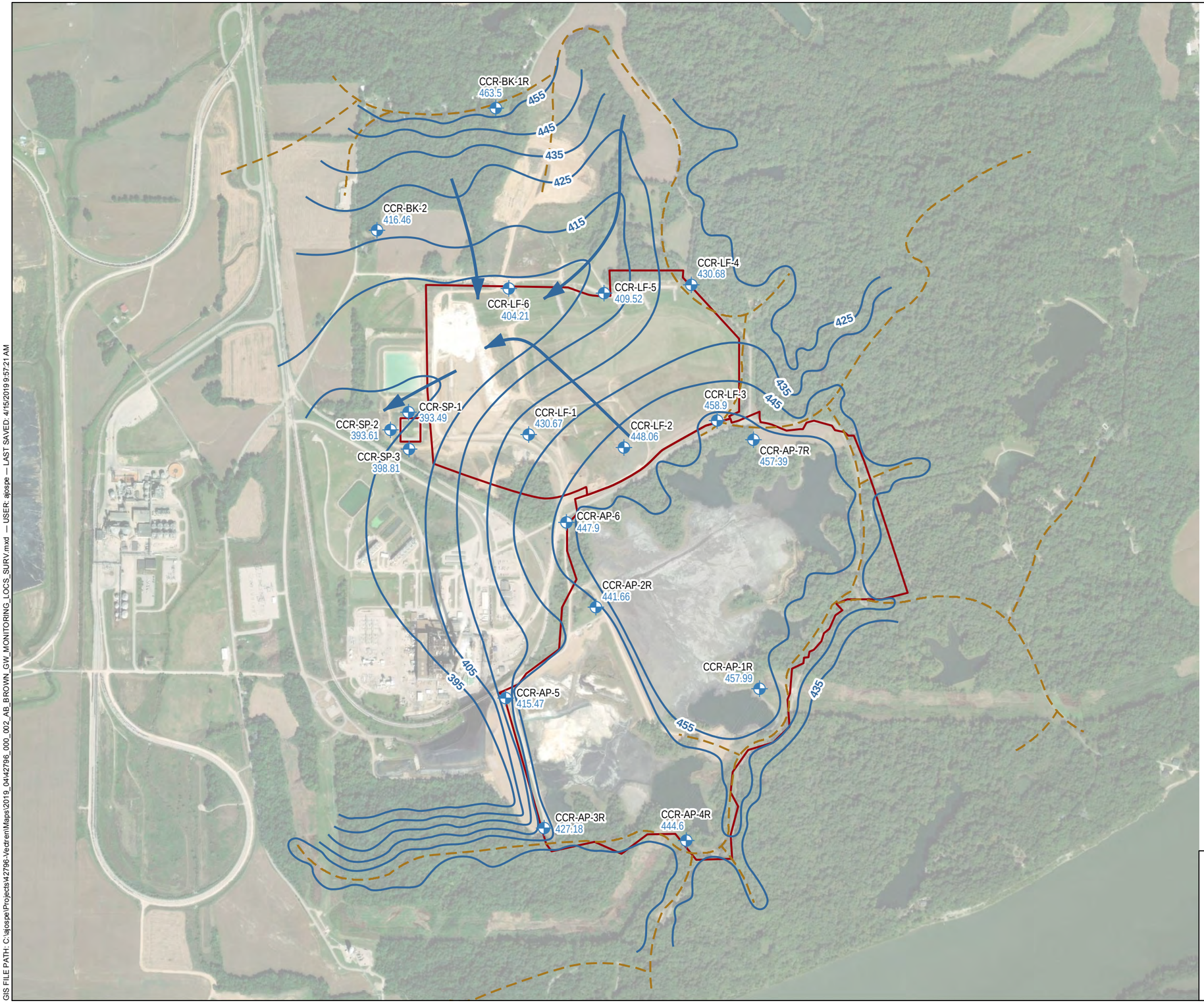
VECTREN CORPORATION
A.B. BROWN GENERATING STATION
8511 WELBORN ROAD
MOUNT VERNON, IN 47620

GROUNDWATER MONITORING WELL LOCATIONS FOR COMPLIANCE WITH FEDERAL CCR RULE

APRIL 2019

FIGURE 1

GIS FILE PATH: C:\ajospe\Projects\42796-Vectren\Maps\2019_04\42796_000_002_AB_BROWN_GW_MONITORING_LOCS_SURV.mxd — USER: ajospe — LAST SAVED: 4/15/2019 9:57:21 AM



LEGEND

- MONITORING WELL
- GROUNDWATER ELEVATION CONTOUR, IN FEET
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- TOPOGRAPHIC DIVIDE
- APPROXIMATE WASTE BOUNDARY

NOTES

1. LOCATIONS DERIVED FROM THREE I DESIGN DATA.
2. WATER LEVELS MEASURED JUNE 2017.
3. AERIAL IMAGERY SOURCE: ESRI

N

0 500 1,000 1,500 2,000

SCALE IN FEET

HALEY ALDRICH

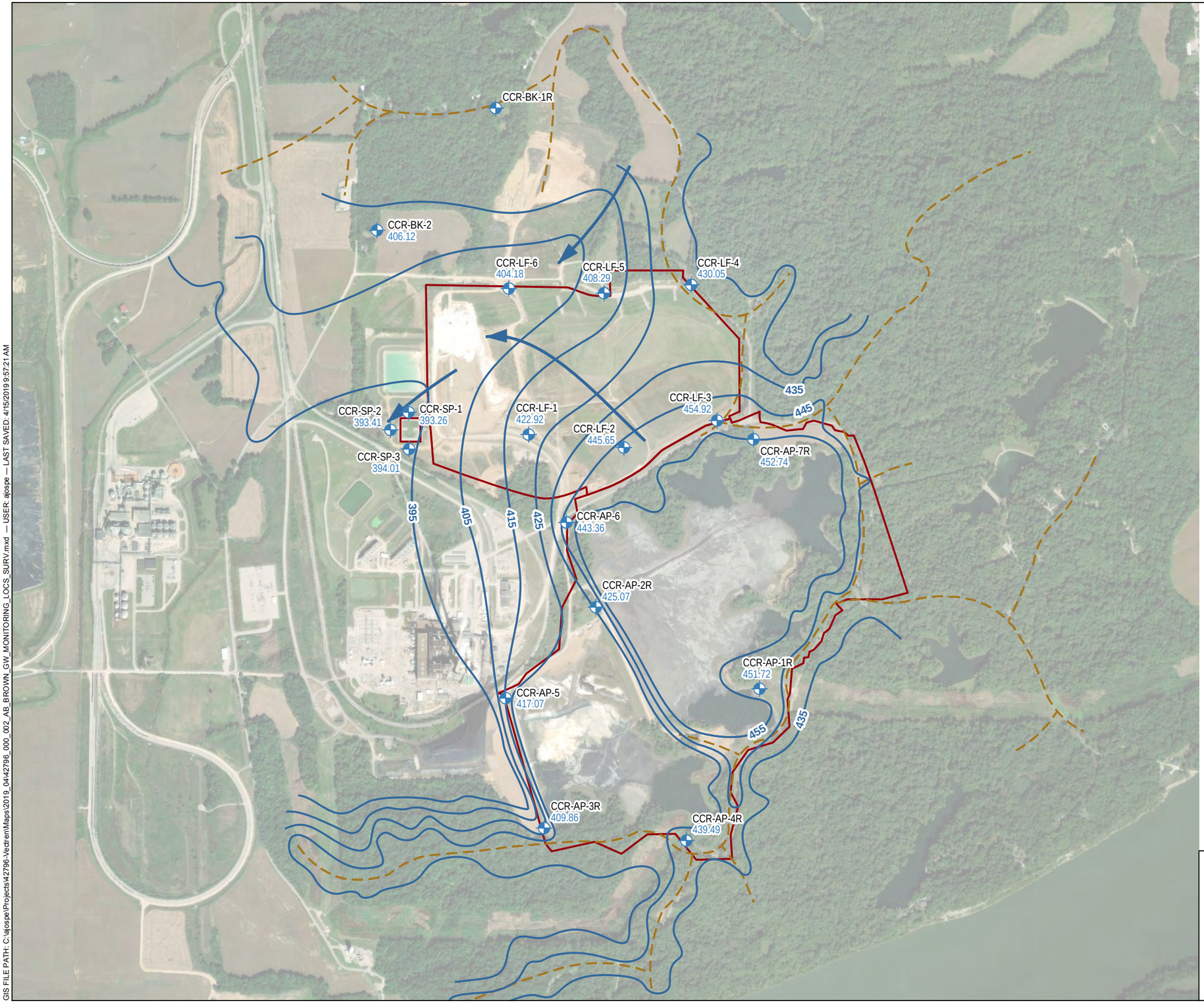
VECTREN CORPORATION
A.B. BROWN GENERATING STATION
8511 WELBORN ROAD
MOUNT VERNON, IN 47620

GROUNDWATER ELEVATION CONTOURS - NOVEMBER 2017

APRIL 2019

FIGURE 2

GIS FILE PATH: C:\ajospe\Projects\42796-Vectren\Maps\2019_04\42796_000_002_AB_BROWN_GW_MONITORING_LOCS_SURV.mxd — USER: ajospe — LAST SAVED: 4/15/2019 9:57:21 AM



LEGEND

- MONITORING WELL
- GROUNDWATER ELEVATION CONTOUR, IN FEET
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- TOPOGRAPHIC DIVIDE
- APPROXIMATE WASTE BOUNDARY

NOTES

1. LOCATIONS DERIVED FROM THREE I DESIGN DATA.
2. WATER LEVELS MEASURED NOVEMBER 2017.
3. AERIAL IMAGERY SOURCE: ESRI

N

0 500 1,000 1,500 2,000

SCALE IN FEET

HALEY ALDRICH

VECTREN CORPORATION
A.B. BROWN GENERATING STATION
8511 WELBORN ROAD
MOUNT VERNON, IN 47620

GROUNDWATER ELEVATION CONTOURS - JUNE 2017

APRIL 2019

FIGURE 3

GIS FILE PATH: C:\ajospe\Projects\42796-Vectren\Maps\2019_04\42796_000_002_AB_BROWN_GW_MONITORING_LOCS_SURV.mxd — USER: ajospe — LAST SAVED: 4/15/2019 9:57:21 AM

APPENDIX A

Analytical Report

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

TestAmerica Job ID: 180-82992-1
Client Project/Site: Vectren ASD Sampling

For:
Haley & Aldrich, Inc.
400 Augusta Street
Suite 130
Greenville, South Carolina 29601

Attn: Sean Lewis

Veronica Bortot

Authorized for release by:
10/30/2018 2:19:20 PM

Veronica Bortot, Senior Project Manager
(412)963-2435
veronica.bortot@testamericainc.com

PA Lab ID: 02-00416

Table of Contents

Job ID: 180-82992-1

Laboratory: TestAmerica Pittsburgh

Narrative

Job Narrative
180-82992-1

Comments
No additional comments.

Receipt
The sample was received on 10/12/2018 1:00 PM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 18.3º C.

GC Semi VOA

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

SPLP
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.
Project/Site: Vectren ASD Sampling

TestAmerica Job ID: 180-82992-1

Laboratory: TestAmerica Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-19
California	State Program	9	2891	04-30-19
Connecticut	State Program	1	PH-0688	09-30-20
Florida	NELAP	4	E871008	06-30-19
Illinois	NELAP	5	200005	06-30-19
Kansas	NELAP	7	E-10350	01-31-19
Louisiana	NELAP	6	04041	06-30-19
Nevada	State Program	9	PA00164	07-31-19
New Hampshire	NELAP	1	2030	04-04-19
New Jersey	NELAP	2	PA005	06-30-19
New York	NELAP	2	11182	03-31-19
North Carolina (WW/SW)	State Program	4	434	12-31-18
Oregon	NELAP	10	PA-2151	01-28-19
Pennsylvania	NELAP	3	02-00416	04-30-19
South Carolina	State Program	4	89014	04-30-19
Texas	NELAP	6	T104704528-15-2	03-31-19
US Fish & Wildlife	Federal		LE94312A-1	07-31-19
USDA	Federal		P330-16-00211	06-26-19
Utah	NELAP	8	PA001462015-4	05-31-19
Virginia	NELAP	3	460189	09-14-19
West Virginia DEP	State Program	3	142	01-31-19
Wisconsin	State Program	5	998027800	08-31-19

Sample Summary

Client: Haley & Aldrich, Inc.
Project/Site: Vectren ASD Sampling

TestAmerica Job ID: 180-82992-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-82992-1	FGD Sludge	Solid	10/10/18 13:52	10/12/18 13:00

Method Summary

Client: Haley & Aldrich, Inc.
Project/Site: Vectren ASD Sampling

TestAmerica Job ID: 180-82992-1

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	TAL PIT
6020A	SPLP Metals	SW846	TAL PIT
7470A	SPLP Mercury	SW846	TAL PIT
EPA 6020A	Metals (ICP/MS)	SW846	TAL PIT
EPA 7471B	Mercury (CVAA)	SW846	TAL PIT
2540G	SM 2540G	SM22	TAL PIT
3010A	Preparation, Total Metals	SW846	TAL PIT
3050B	Preparation, Metals	SW846	TAL PIT
7470A	Preparation, Mercury	SW846	TAL PIT
7471B	Preparation, Mercury	SW846	TAL PIT
DI Leach	Deionized Water Leaching Procedure	ASTM	TAL PIT
EPA 1312	SPLP Extraction	SW846	TAL PIT

Protocol References:

ASTM = ASTM International

SM22 = Standard Methods For The Examination Of Water And Wastewater, 22nd Edition

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Vectren ASD Sampling

TestAmerica Job ID: 180-82992-1

Client Sample ID: FGD Sludge
Date Collected: 10/10/18 13:52
Date Received: 10/12/18 13:00

Lab Sample ID: 180-82992-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	EPA 1312			125 g	2500 mL	260869	10/24/18 16:00	MTT	TAL PIT
SPLP East	Analysis	EPA 9056A		2.5	1 mL	1.0 mL	260915	10/25/18 16:26	MJH	TAL PIT
	Instrument ID: CHIC2100A									
SPLP East	Leach	EPA 1312			125 g	2500 mL	260869	10/24/18 16:00	MTT	TAL PIT
SPLP East	Prep	3010A			50 mL	50 mL	261002	10/25/18 12:25	NAM	TAL PIT
SPLP East	Analysis	6020A		1			261210	10/26/18 10:51	RSK	TAL PIT
	Instrument ID: A									
SPLP East	Leach	EPA 1312			125 g	2500 mL	260869	10/24/18 16:00	MTT	TAL PIT
SPLP East	Prep	7470A			50 mL	50 mL	261091	10/26/18 09:09	KA	TAL PIT
SPLP East	Analysis	7470A		1			261181	10/26/18 17:38	KA	TAL PIT
	Instrument ID: HGZ									
Total/NA	Analysis	2540G		1			259850	10/15/18 13:07	CLL	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FGD Sludge
Date Collected: 10/10/18 13:52
Date Received: 10/12/18 13:00

Lab Sample ID: 180-82992-1
Matrix: Solid
Percent Solids: 44.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Leach	DI Leach			010.1108 g	100 mL	260097	10/17/18 10:35	CMR	TAL PIT
Soluble	Analysis	EPA 9056A		5			260068	10/17/18 16:26	CMR	TAL PIT
	Instrument ID: CHICS2000									
Total/NA	Prep	3050B			1.04 g	100 mL	259888	10/16/18 15:33	NAM	TAL PIT
Total/NA	Analysis	EPA 6020A		1	1.0 mL	1.0 mL	260252	10/17/18 20:02	WTR	TAL PIT
	Instrument ID: M									
Total/NA	Prep	7471B			0.56 g	100 mL	259862	10/15/18 13:56	KA	TAL PIT
Total/NA	Analysis	EPA 7471B		1			260017	10/16/18 14:05	KA	TAL PIT
	Instrument ID: HGZ									

Laboratory References:
TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Client: Haley & Aldrich, Inc.
Project/Site: Vectren ASD Sampling

TestAmerica Job ID: 180-82992-1

Analyst References:

Lab: TAL PIT

Batch Type: Leach

CMR = Carl Reagle

MTT = Michaela Trueman

Batch Type: Prep

KA = Kayla Kalamasz

NAM = Nicole Marfisi

Batch Type: Analysis

CLL = Cheryl Loheyde

CMR = Carl Reagle

KA = Kayla Kalamasz

MJH = Matthew Hartman

RSK = Robert Kurtz

WTR = Bill Reinheimer

Client Sample ID: FGD Sludge

Lab Sample ID: 180-82992-1
Date Collected: 10/10/18 13:52
Matrix: Solid
Date Received: 10/12/18 13:00

Method: EPA 9056A - Anions, Ion Chromatography - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	3.1		0.25	0.066	mg/L			10/25/18 16:26	2.5

Method: 6020A - SPLP Metals - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.99	J	1.0	0.32	ug/L		10/25/18 12:25	10/26/18 10:51	1
Barium	10		10	0.37	ug/L		10/25/18 12:25	10/26/18 10:51	1
Cadmium	ND		1.0	0.13	ug/L		10/25/18 12:25	10/26/18 10:51	1
Beryllium	ND		1.0	0.057	ug/L		10/25/18 12:25	10/26/18 10:51	1
Chromium	4.3		2.0	0.63	ug/L		10/25/18 12:25	10/26/18 10:51	1
Lead	0.12	J	1.0	0.094	ug/L		10/25/18 12:25	10/26/18 10:51	1
Selenium	83		5.0	0.81	ug/L		10/25/18 12:25	10/26/18 10:51	1
Cobalt	0.14	J	0.50	0.075	ug/L		10/25/18 12:25	10/26/18 10:51	1
Molybdenum	33		5.0	0.47	ug/L		10/25/18 12:25	10/26/18 10:51	1
Antimony	ND		2.0	1.1	ug/L		10/25/18 12:25	10/26/18 10:51	1
Thallium	ND		1.0	0.063	ug/L		10/25/18 12:25	10/26/18 10:51	1
Lithium	7.7		5.0	2.6	ug/L		10/25/18 12:25	10/26/18 10:51	1

Method: 7470A - SPLP Mercury - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		10/26/18 09:09	10/26/18 17:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	56.0		0.1	0.1	%			10/15/18 13:07	1
Percent Solids	44.0		0.1	0.1	%			10/15/18 13:07	1

Client Sample ID: FGD Sludge

Lab Sample ID: 180-82992-1
Date Collected: 10/10/18 13:52
Matrix: Solid
Date Received: 10/12/18 13:00
Percent Solids: 44.0

Method: EPA 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	57		11	7.6	mg/Kg	☼		10/17/18 16:26	5

Method: EPA 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.88		0.22	0.057	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Barium	3.0		2.2	0.12	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Beryllium	0.067	J	0.22	0.016	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Cadmium	0.16	J	0.22	0.037	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Chromium	4.8		0.44	0.14	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Cobalt	0.11		0.11	0.018	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Molybdenum	1.6		1.1	0.14	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Lead	0.23		0.22	0.077	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Antimony	ND		0.44	0.14	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Selenium	4.8		1.1	0.13	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Thallium	0.031	J	0.22	0.028	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Lithium	ND		1.1	0.60	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1

Client: Haley & Aldrich, Inc.
Project/Site: Vectren ASD Sampling

TestAmerica Job ID: 180-82992-1

Client Sample ID: FGD Sludge
Date Collected: 10/10/18 13:52
Date Received: 10/12/18 13:00

Lab Sample ID: 180-82992-1
Matrix: Solid
Percent Solids: 44.0

Method: EPA 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.22		0.080	0.018	mg/Kg	☼	10/15/18 13:56	10/16/18 14:05	1

Method: EPA 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 180-260915/6
Matrix: Solid
Analysis Batch: 260915

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.10	0.026	mg/L			10/25/18 05:33	1

Lab Sample ID: LCS 180-260915/5
Matrix: Solid
Analysis Batch: 260915

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromide	5.00	4.92		mg/L		98	80 - 120
Chloride	25.0	25.0		mg/L		100	80 - 120
Fluoride	1.25	1.29		mg/L		103	80 - 120
Sulfate	25.0	24.9		mg/L		100	80 - 120

Lab Sample ID: LB 180-260097/1-A
Matrix: Solid
Analysis Batch: 260068

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		1.0	0.68	mg/Kg			10/17/18 13:46	1

Lab Sample ID: LCS 180-260097/2-A
Matrix: Solid
Analysis Batch: 260068

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromide	50.0	47.7		mg/Kg		95	80 - 120
Chloride	250	225		mg/Kg		90	80 - 120
Fluoride	12.5	11.9		mg/Kg		96	80 - 120
Sulfate	250	225		mg/Kg		90	80 - 120

Lab Sample ID: LB 180-260869/1-A
Matrix: Solid
Analysis Batch: 260915

Client Sample ID: Method Blank
Prep Type: SPLP East

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.10	0.026	mg/L			10/25/18 16:11	1

Method: 6020A - SPLP Metals

Lab Sample ID: MB 180-261002/1-A
Matrix: Solid
Analysis Batch: 261210

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 261002

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0	0.32	ug/L		10/25/18 12:25	10/26/18 10:30	1
Barium	ND		10	0.37	ug/L		10/25/18 12:25	10/26/18 10:30	1
Beryllium	ND		1.0	0.057	ug/L		10/25/18 12:25	10/26/18 10:30	1
Cadmium	ND		1.0	0.13	ug/L		10/25/18 12:25	10/26/18 10:30	1
Chromium	ND		2.0	0.63	ug/L		10/25/18 12:25	10/26/18 10:30	1
Cobalt	ND		0.50	0.075	ug/L		10/25/18 12:25	10/26/18 10:30	1

Method: 6020A - SPLP Metals (Continued)

Lab Sample ID: MB 180-261002/1-A
Matrix: Solid
Analysis Batch: 261210

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 261002

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		1.0	0.094	ug/L		10/25/18 12:25	10/26/18 10:30	1
Molybdenum	ND		5.0	0.47	ug/L		10/25/18 12:25	10/26/18 10:30	1
Antimony	ND		2.0	1.1	ug/L		10/25/18 12:25	10/26/18 10:30	1
Selenium	ND		5.0	0.81	ug/L		10/25/18 12:25	10/26/18 10:30	1
Thallium	ND		1.0	0.063	ug/L		10/25/18 12:25	10/26/18 10:30	1
Lithium	ND		5.0	2.6	ug/L		10/25/18 12:25	10/26/18 10:30	1

Lab Sample ID: LCS 180-261002/2-A
Matrix: Solid
Analysis Batch: 261210

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 261002

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	40.0	42.1		ug/L		105	80 - 120
Barium	2000	2000		ug/L		100	80 - 120
Beryllium	50.0	49.6		ug/L		99	80 - 120
Cadmium	50.0	47.1		ug/L		94	80 - 120
Chromium	200	205		ug/L		102	80 - 120
Cobalt	500	517		ug/L		103	80 - 120
Lead	20.0	20.9		ug/L		104	80 - 120
Molybdenum	1000	991		ug/L		99	80 - 120
Antimony	500	497		ug/L		99	80 - 120
Selenium	10.0	9.91		ug/L		99	80 - 120
Thallium	50.0	49.6		ug/L		99	80 - 120
Lithium	50.0	56.4		ug/L		113	80 - 120

Lab Sample ID: LCSD 180-261002/3-A
Matrix: Solid
Analysis Batch: 261210

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 261002

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	40.0	41.4		ug/L		103	80 - 120	2	20
Barium	2000	1960		ug/L		98	80 - 120	2	20
Beryllium	50.0	48.1		ug/L		96	80 - 120	3	20
Cadmium	50.0	46.6		ug/L		93	80 - 120	1	20
Chromium	200	205		ug/L		102	80 - 120	0	20
Cobalt	500	516		ug/L		103	80 - 120	0	20
Lead	20.0	20.6		ug/L		103	80 - 120	1	20
Molybdenum	1000	965		ug/L		97	80 - 120	3	20
Antimony	500	493		ug/L		99	80 - 120	1	20
Selenium	10.0	9.61		ug/L		96	80 - 120	3	20
Thallium	50.0	49.6		ug/L		99	80 - 120	0	20
Lithium	50.0	54.3		ug/L		109	80 - 120	4	20

Lab Sample ID: LB 180-260869/1-B
Matrix: Solid
Analysis Batch: 261210

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 261002

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0	0.32	ug/L		10/25/18 12:25	10/26/18 10:34	1

Method: 6020A - SPLP Metals (Continued)

Lab Sample ID: LB 180-260869/1-B
Matrix: Solid
Analysis Batch: 261210

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 261002

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		10	0.37	ug/L		10/25/18 12:25	10/26/18 10:34	1
Beryllium	ND		1.0	0.057	ug/L		10/25/18 12:25	10/26/18 10:34	1
Cadmium	ND		1.0	0.13	ug/L		10/25/18 12:25	10/26/18 10:34	1
Chromium	ND		2.0	0.63	ug/L		10/25/18 12:25	10/26/18 10:34	1
Cobalt	ND		0.50	0.075	ug/L		10/25/18 12:25	10/26/18 10:34	1
Lead	ND		1.0	0.094	ug/L		10/25/18 12:25	10/26/18 10:34	1
Molybdenum	ND		5.0	0.47	ug/L		10/25/18 12:25	10/26/18 10:34	1
Antimony	ND		2.0	1.1	ug/L		10/25/18 12:25	10/26/18 10:34	1
Selenium	ND		5.0	0.81	ug/L		10/25/18 12:25	10/26/18 10:34	1
Thallium	ND		1.0	0.063	ug/L		10/25/18 12:25	10/26/18 10:34	1
Lithium	ND		5.0	2.6	ug/L		10/25/18 12:25	10/26/18 10:34	1

Method: 7470A - SPLP Mercury

Lab Sample ID: MB 180-261091/1-A
Matrix: Solid
Analysis Batch: 261181

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 261091

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		10/26/18 09:09	10/26/18 17:34	1

Lab Sample ID: LCS 180-261091/2-A
Matrix: Solid
Analysis Batch: 261181

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 261091

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2.50	2.48		ug/L		99	80 - 120

Lab Sample ID: LCSD 180-261091/3-A
Matrix: Solid
Analysis Batch: 261181

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 261091

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	2.50	2.44		ug/L		98	80 - 120	1	20

Lab Sample ID: LB 180-260869/1-D
Matrix: Solid
Analysis Batch: 261181

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 261091

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		10/26/18 09:09	10/26/18 17:37	1

Method: EPA 6020A - Metals (ICP/MS)

Lab Sample ID: MB 180-259888/1-A
Matrix: Solid
Analysis Batch: 260252

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 259888

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.10	0.026	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Barium	ND		1.0	0.057	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Beryllium	ND		0.10	0.0075	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Cadmium	ND		0.10	0.017	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Chromium	ND		0.20	0.066	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Cobalt	ND		0.050	0.0083	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Lead	ND		0.10	0.035	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Molybdenum	ND		0.50	0.062	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Antimony	ND		0.20	0.062	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Selenium	ND		0.50	0.060	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Thallium	ND		0.10	0.013	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Lithium	ND		0.50	0.28	mg/Kg		10/15/18 19:17	10/17/18 18:30	1

Lab Sample ID: LCS 180-259888/2-A
Matrix: Solid
Analysis Batch: 260252

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 259888

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	4.00	3.90		mg/Kg		98	80 - 120
Barium	200	179		mg/Kg		89	80 - 120
Beryllium	5.00	5.07		mg/Kg		101	80 - 120
Cadmium	5.00	4.95		mg/Kg		99	80 - 120
Chromium	20.0	19.8		mg/Kg		99	80 - 120
Cobalt	50.0	48.4		mg/Kg		97	80 - 120
Lead	2.00	1.92		mg/Kg		96	80 - 120
Molybdenum	100	94.8		mg/Kg		95	80 - 120
Antimony	50.0	45.9		mg/Kg		92	80 - 120
Selenium	1.00	0.964		mg/Kg		96	80 - 120
Thallium	105	98.5		mg/Kg		94	80 - 120
Lithium	5.00	5.05		mg/Kg		101	80 - 120

Method: EPA 7471B - Mercury (CVAA)

Lab Sample ID: MB 180-259862/1-A
Matrix: Solid
Analysis Batch: 260017

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 259862

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.033	0.0074	mg/Kg		10/15/18 13:56	10/16/18 13:42	1

Lab Sample ID: LCS 180-259862/2-A
Matrix: Solid
Analysis Batch: 260017

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 259862

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.417	0.384		mg/Kg		92	80 - 120

HPLC/IC

Analysis Batch: 260068

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	Soluble	Solid	EPA 9056A	260097
LB 180-260097/1-A	Method Blank	Soluble	Solid	EPA 9056A	260097
LCS 180-260097/2-A	Lab Control Sample	Soluble	Solid	EPA 9056A	260097

Leach Batch: 260097

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	Soluble	Solid	DI Leach	
LB 180-260097/1-A	Method Blank	Soluble	Solid	DI Leach	
LCS 180-260097/2-A	Lab Control Sample	Soluble	Solid	DI Leach	

Leach Batch: 260869

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	SPLP East	Solid	EPA 1312	
LB 180-260869/1-A	Method Blank	SPLP East	Solid	EPA 1312	

Analysis Batch: 260915

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	SPLP East	Solid	EPA 9056A	260869
LB 180-260869/1-A	Method Blank	SPLP East	Solid	EPA 9056A	260869
MB 180-260915/6	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-260915/5	Lab Control Sample	Total/NA	Solid	EPA 9056A	

Metals

Prep Batch: 259862

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	Total/NA	Solid	7471B	
MB 180-259862/1-A	Method Blank	Total/NA	Solid	7471B	
LCS 180-259862/2-A	Lab Control Sample	Total/NA	Solid	7471B	

Prep Batch: 259888

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	Total/NA	Solid	3050B	
MB 180-259888/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 180-259888/2-A	Lab Control Sample	Total/NA	Solid	3050B	

Analysis Batch: 260017

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	Total/NA	Solid	EPA 7471B	259862
MB 180-259862/1-A	Method Blank	Total/NA	Solid	EPA 7471B	259862
LCS 180-259862/2-A	Lab Control Sample	Total/NA	Solid	EPA 7471B	259862

Analysis Batch: 260252

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	Total/NA	Solid	EPA 6020A	259888
MB 180-259888/1-A	Method Blank	Total/NA	Solid	EPA 6020A	259888
LCS 180-259888/2-A	Lab Control Sample	Total/NA	Solid	EPA 6020A	259888

Metals (Continued)

Leach Batch: 260869

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	SPLP East	Solid	EPA 1312	
LB 180-260869/1-B	Method Blank	SPLP East	Solid	EPA 1312	
LB 180-260869/1-D	Method Blank	SPLP East	Solid	EPA 1312	

Prep Batch: 261002

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	SPLP East	Solid	3010A	260869
LB 180-260869/1-B	Method Blank	SPLP East	Solid	3010A	260869
MB 180-261002/1-A	Method Blank	Total/NA	Solid	3010A	
LCS 180-261002/2-A	Lab Control Sample	Total/NA	Solid	3010A	
LCSD 180-261002/3-A	Lab Control Sample Dup	Total/NA	Solid	3010A	

Prep Batch: 261091

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	SPLP East	Solid	7470A	260869
LB 180-260869/1-D	Method Blank	SPLP East	Solid	7470A	260869
MB 180-261091/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 180-261091/2-A	Lab Control Sample	Total/NA	Solid	7470A	
LCSD 180-261091/3-A	Lab Control Sample Dup	Total/NA	Solid	7470A	

Analysis Batch: 261181

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	SPLP East	Solid	7470A	261091
LB 180-260869/1-D	Method Blank	SPLP East	Solid	7470A	261091
MB 180-261091/1-A	Method Blank	Total/NA	Solid	7470A	261091
LCS 180-261091/2-A	Lab Control Sample	Total/NA	Solid	7470A	261091
LCSD 180-261091/3-A	Lab Control Sample Dup	Total/NA	Solid	7470A	261091

Analysis Batch: 261210

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	SPLP East	Solid	6020A	261002
LB 180-260869/1-B	Method Blank	SPLP East	Solid	6020A	261002
MB 180-261002/1-A	Method Blank	Total/NA	Solid	6020A	261002
LCS 180-261002/2-A	Lab Control Sample	Total/NA	Solid	6020A	261002
LCSD 180-261002/3-A	Lab Control Sample Dup	Total/NA	Solid	6020A	261002

General Chemistry

Analysis Batch: 259850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	Total/NA	Solid	2540G	

COLUMBUS
240507

Chain of Custody Record

270501

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Mark Miesfeldt	Site Contact:	Date: 10/10/18	COC No: 270501
Company Name: HALEY & ALDRICH	Tel/Fax: (864) 230-3757	Lab Contact:	Carrier:	1 of 1 COCs
Address:	Analysis Turnaround Time			Sampler:
City/State/Zip:	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: (864) 230-3757	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: Vectren ASD Sampling	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Sample Specific Notes:
Ra 226 / Ra 228 Standard Target List	10/10/18	1:45p	G	S	1	N		
Ra226 / Ra 228 GFPC	10/10/18	1:46p	G	S	1	N		
Ra226 / Ra228 Standard Target List								
TCLP Metals, TCLP Mercury	10/10/18	1:50p	G	S	1	N		
Metals, Mercury, Anions, Moisture	10/10/18	1:52p	G	S	1	N		

180-82992 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other NONE

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: _____ Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Brandi Rucker	Vectren	10/10/18 3:00p			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
					10/12/18 1300
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

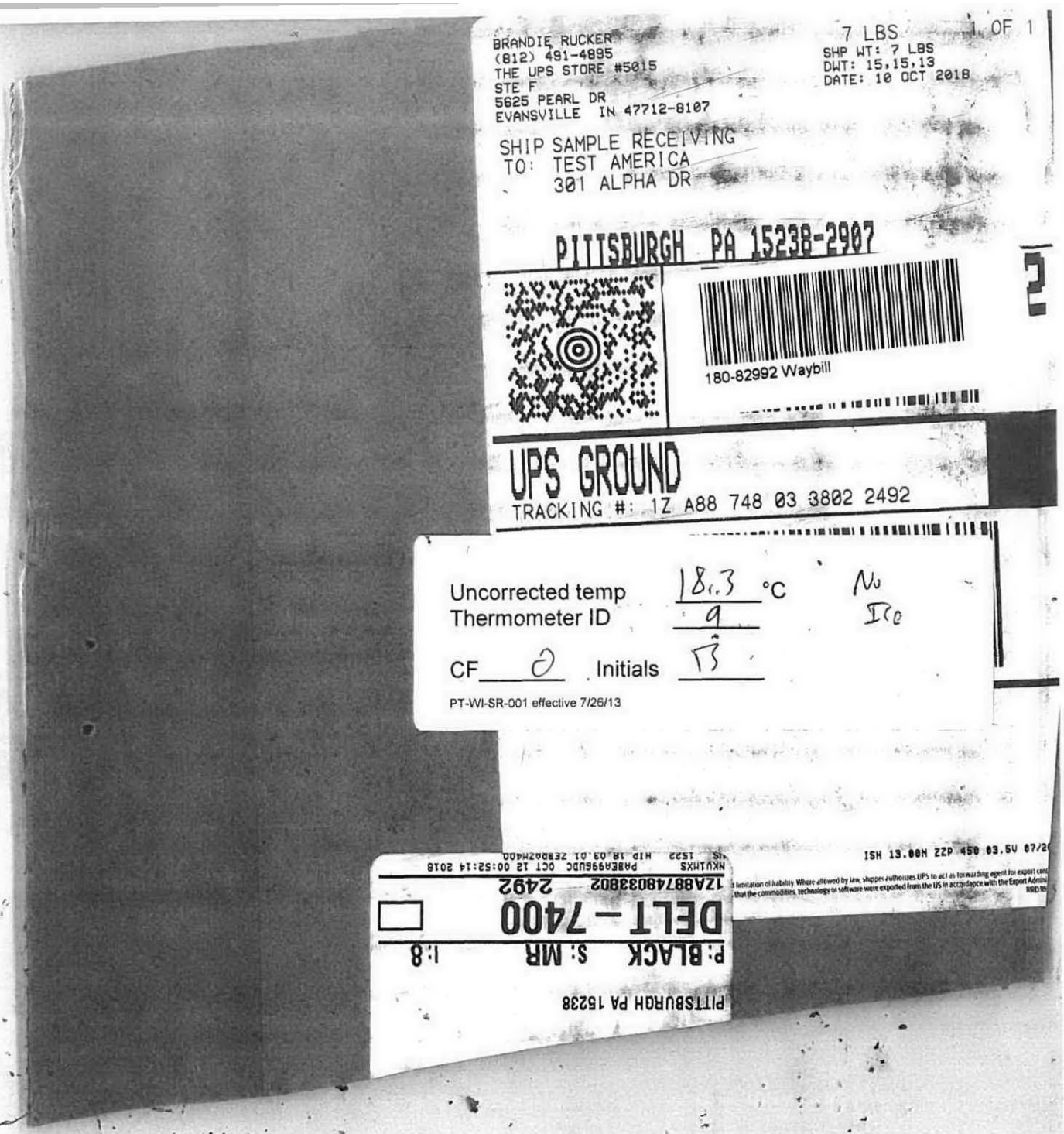
TABLE 3
MAXIMUM CONTAMINANT LEVELS, BACKGROUND LEVELS,
LABORATORY REPORTING LIMITS, AND METHOD DETECTION LIMITS
F.B. CULLEY GENERATING STATION - EAST ASH POND
NEWBURGH, INDIANA

180 9531

Analyte Group	Analyte	Analytical Method	Maximum Contaminant Level	Reporting Limit	Method Detection Limit
Detection Monitoring - EPA Appendix III Constituents - 40 CFR Part 257					
Inorganics	Boron	EPA 6020A	--	0.5	0.04
Inorganics	Calcium	EPA 6020A	--	0.0005	0.0001
Anions	Chloride	EPA 9056A	--	1.0	0.08
Anions	Fluoride	EPA 9056A	4.0	0.1	0.05
Anions	Sulfate	EPA 9056A	--	1.0	0.2
Wet Chemistry	pH	EPA 9040C	--	N/A	N/A
Wet Chemistry	Total Dissolved Solids	SM 2540C	--	30	10
Assessment Monitoring - EPA Appendix IV Constituents - 40 CFR Part 257					
Inorganics	Antimony	EPA 6020A	0.006	0.005	0.001
Inorganics	Arsenic	EPA 6020A	0.010	0.005	0.002
Inorganics	Barium	EPA 6020A	2	0.005	0.001
Inorganics	Beryllium	EPA 6020A	0.004	0.002	0.0002
Inorganics	Cadmium	EPA 6020A	0.005	0.002	0.0002
Inorganics	Chromium	EPA 6020A	0.1	0.005	0.002
Inorganics	Cobalt	EPA 6020A	--	0.002	0.0002
Inorganics	Lead	EPA 6020A	0.05	0.003	0.0006
Inorganics	Lithium	EPA 6020A	--	0.00500	0.00107
Inorganics	Molybdenum	EPA 6020A	--	0.005	0.001
Inorganics	Selenium	EPA 6020A	0.01	0.005	0.002
Inorganics	Thallium	EPA 6020A	0.002	0.002	0.00006
Inorganics	Mercury	EPA 7470A	0.002	0.0002	0.00003
Anions	Fluoride	EPA 9056A	4.0	0.1	0.05
Radiochemistry	Radium 226 and 228 combined	EPA 903.0/904.0	5 pCi/L	1 pCi/L	N/A

SPLP

NOTES:
Units in mg/L except where noted
-- = not established
CFR = Code of Federal Regulations
EPA = U.S. Environmental Protection Agency
mg/L = milligrams per liter
N/A = not applicable
pCi/L = picocuries per liter
SM = Standard Method
TBD = to be determined


BRANDIE RUCKER
(812) 491-4895
THE UPS STORE #5015
STE F
5625 PEARL DR
EVANSVILLE IN 47712-8107
7 LBS
1 OF 1
SHP WT: 7 LBS
DWT: 15,15,13
DATE: 10 OCT 2018
SHIP SAMPLE RECEIVING
TO: TEST AMERICA
301 ALPHA DR
PITTSBURGH PA 15238-2907
180-82992 Waybill
UPS GROUND
TRACKING #: 1Z A88 748 03 3802 2492
Uncorrected temp 18.3 °C
Thermometer ID 9
CF 0 Initials TB
PT-WI-SR-001 effective 7/26/13
No Ice
DELT - 7400
1ZA887480338O2 2492
P: BLACK S: MR I: 8
PITTSBURGH PA 15238

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-7058 Fax (412) 963-2468

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)

Field	Value
Client Contact	Shipping/Receiving
Company	TestAmerica Laboratories, Inc.
Address	13715 Rider Trail North,
City	Earth City
State, Zip	MO, 63045
Phone	314-298-8566(Tel) 314-298-8757(Fax)
Email	
Project Name	Vectren ASD Sampling
Site	
Sampler	
Phone	
Due Date Requested	11/2/2018
TAT Requested (days)	
PO #	
WO #	
Project #	18019531
SSOW#	
Lab PM	Bortot, Veronica
E-Mail	veronica.bortot@testamericainc.com
Carrier Tracking No(s)	
State of Origin	Indiana
Accreditations Required (See note)	
COC No	180-344309.1
Page	Page 1 of 1
Job #	180-82992-1

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/Dry_Grind Radium-226	Ra226Ra228_GFPC/ Combined Radium-226 and Radium-228	9320_Ra228/Dry_Grind Radium-228	9320_Ra228/1312_E SPLP -9320 Radium-228 (GFPC)	9315_Ra226/1312_E SPLP 9315	Ra226Ra228_GFPC/ SPLP CALCULATION	Total Number of containers	Special Instructions/Note:
				Preservation Code:										
VECTREN ASD SAMPLING (180-82992-1)	10/10/18	13:52 Eastern		Solid			X	X	X	X	X	X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Date: Time: Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	10/15/18 1700	TA Pitt	Michael Fleem	10/16/18 0945	TA STL

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-7058 Fax (412) 963-2468

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bortot, Veronica	Carrier Tracking No(s):	COC No: 180-345122.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: veronica.bortot@testamericainc.com	State of Origin: Indiana	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 180-82992-1
Address: 13715 Rider Trail North,	Due Date Requested: 11/2/2018			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045	PO #:			
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	WO #:			
Email:				
Project Name: Vectren ASD Sampling	Project #: 18019531			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/Dry_Grind Radium-226	9315_Ra226/DPS_21 Radium-226	Ra226Ra228_GFPC/ Combined Radium-226 and Radium-228	9320_Ra228/Dry_Grind Radium-228	9320_Ra228/DPS_0 Radium-228	9320_Ra228/1312_E SPLP -9320 Radium-228 (GFPC)	9320_Ra228/PrecSep_0 SPLP -9320 Radium-228 (GFPC)	9315_Ra226/1312_E SPLP 9315	9315_Ra226/PrecSep_21 SPLP 9315	Ra226Ra228_GFPC/ SPLP CALCULATION				Total Number of containers	Special Instructions/Note:
			Preservation Code:																		
VECTREN ASD SAMPLING (180-82992-1)	10/10/18	13:52 Eastern		Solid			X	X	X	X	X	X	X	X	X	X				2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:
Empty Kit Relinquished by:	Date: Time: Method of Shipment:

Relinquished by:	Date/Time: 10/25/18 1700	Company TA PIT	Received by: Michael Fleeman	Date/Time: 10/26/18 0945	Company TA STL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 180-82992-1

Login Number: 82992
List Number: 1
Creator: Neri, Tom

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

TestAmerica Job ID: 180-82992-1
Client Project/Site: Vectren ASD Sampling

For:
Haley & Aldrich, Inc.
400 Augusta Street
Suite 130
Greenville, South Carolina 29601

Attn: Sean Lewis

Veronica Bortot

Authorized for release by:
10/30/2018 2:19:16 PM

Veronica Bortot, Senior Project Manager
(412)963-2435
veronica.bortot@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

PA Lab ID: 02-00416

Table of Contents

Job ID: 180-82992-1

Laboratory: TestAmerica Pittsburgh

Narrative

Job Narrative
180-82992-1

Comments
No additional comments.

Receipt
The sample was received on 10/12/2018 1:00 PM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 18.3º C.

GC Semi VOA

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

SPLP
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.
Project/Site: Vectren ASD Sampling

TestAmerica Job ID: 180-82992-1

Laboratory: TestAmerica Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-19
California	State Program	9	2891	04-30-19
Connecticut	State Program	1	PH-0688	09-30-20
Florida	NELAP	4	E871008	06-30-19
Illinois	NELAP	5	200005	06-30-19
Kansas	NELAP	7	E-10350	01-31-19
Louisiana	NELAP	6	04041	06-30-19
Nevada	State Program	9	PA00164	07-31-19
New Hampshire	NELAP	1	2030	04-04-19
New Jersey	NELAP	2	PA005	06-30-19
New York	NELAP	2	11182	03-31-19
North Carolina (WW/SW)	State Program	4	434	12-31-18
Oregon	NELAP	10	PA-2151	01-28-19
Pennsylvania	NELAP	3	02-00416	04-30-19
South Carolina	State Program	4	89014	04-30-19
Texas	NELAP	6	T104704528-15-2	03-31-19
US Fish & Wildlife	Federal		LE94312A-1	07-31-19
USDA	Federal		P330-16-00211	06-26-19
Utah	NELAP	8	PA001462015-4	05-31-19
Virginia	NELAP	3	460189	09-14-19
West Virginia DEP	State Program	3	142	01-31-19
Wisconsin	State Program	5	998027800	08-31-19

Sample Summary

Client: Haley & Aldrich, Inc.
Project/Site: Vectren ASD Sampling

TestAmerica Job ID: 180-82992-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-82992-1	FGD Sludge	Solid	10/10/18 13:52	10/12/18 13:00

Method Summary

Client: Haley & Aldrich, Inc.
Project/Site: Vectren ASD Sampling

TestAmerica Job ID: 180-82992-1

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	TAL PIT
6020A	SPLP Metals	SW846	TAL PIT
7470A	SPLP Mercury	SW846	TAL PIT
EPA 6020A	Metals (ICP/MS)	SW846	TAL PIT
EPA 7471B	Mercury (CVAA)	SW846	TAL PIT
2540G	SM 2540G	SM22	TAL PIT
3010A	Preparation, Total Metals	SW846	TAL PIT
3050B	Preparation, Metals	SW846	TAL PIT
7470A	Preparation, Mercury	SW846	TAL PIT
7471B	Preparation, Mercury	SW846	TAL PIT
DI Leach	Deionized Water Leaching Procedure	ASTM	TAL PIT
EPA 1312	SPLP Extraction	SW846	TAL PIT

Protocol References:

ASTM = ASTM International

SM22 = Standard Methods For The Examination Of Water And Wastewater, 22nd Edition

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Vectren ASD Sampling

TestAmerica Job ID: 180-82992-1

Client Sample ID: FGD Sludge
Date Collected: 10/10/18 13:52
Date Received: 10/12/18 13:00

Lab Sample ID: 180-82992-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	EPA 1312			125 g	2500 mL	260869	10/24/18 16:00	MTT	TAL PIT
SPLP East	Analysis	EPA 9056A		2.5	1 mL	1.0 mL	260915	10/25/18 16:26	MJH	TAL PIT
	Instrument ID: CHIC2100A									
SPLP East	Leach	EPA 1312			125 g	2500 mL	260869	10/24/18 16:00	MTT	TAL PIT
SPLP East	Prep	3010A			50 mL	50 mL	261002	10/25/18 12:25	NAM	TAL PIT
SPLP East	Analysis	6020A		1			261210	10/26/18 10:51	RSK	TAL PIT
	Instrument ID: A									
SPLP East	Leach	EPA 1312			125 g	2500 mL	260869	10/24/18 16:00	MTT	TAL PIT
SPLP East	Prep	7470A			50 mL	50 mL	261091	10/26/18 09:09	KA	TAL PIT
SPLP East	Analysis	7470A		1			261181	10/26/18 17:38	KA	TAL PIT
	Instrument ID: HGZ									
Total/NA	Analysis	2540G		1			259850	10/15/18 13:07	CLL	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: FGD Sludge
Date Collected: 10/10/18 13:52
Date Received: 10/12/18 13:00

Lab Sample ID: 180-82992-1
Matrix: Solid
Percent Solids: 44.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Leach	DI Leach			010.1108 g	100 mL	260097	10/17/18 10:35	CMR	TAL PIT
Soluble	Analysis	EPA 9056A		5			260068	10/17/18 16:26	CMR	TAL PIT
	Instrument ID: CHICS2000									
Total/NA	Prep	3050B			1.04 g	100 mL	259888	10/16/18 15:33	NAM	TAL PIT
Total/NA	Analysis	EPA 6020A		1	1.0 mL	1.0 mL	260252	10/17/18 20:02	WTR	TAL PIT
	Instrument ID: M									
Total/NA	Prep	7471B			0.56 g	100 mL	259862	10/15/18 13:56	KA	TAL PIT
Total/NA	Analysis	EPA 7471B		1			260017	10/16/18 14:05	KA	TAL PIT
	Instrument ID: HGZ									

Laboratory References:
TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL PIT

Batch Type: Leach

CMR = Carl Reagle

MTT = Michaela Trueman

Batch Type: Prep

KA = Kayla Kalamasz

NAM = Nicole Marfisi

Batch Type: Analysis

CLL = Cheryl Loheyde

CMR = Carl Reagle

KA = Kayla Kalamasz

MJH = Matthew Hartman

RSK = Robert Kurtz

WTR = Bill Reinheimer

Client Sample ID: FGD Sludge

Lab Sample ID: 180-82992-1
Date Collected: 10/10/18 13:52
Matrix: Solid
Date Received: 10/12/18 13:00

Method: EPA 9056A - Anions, Ion Chromatography - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	3.1		0.25	0.066	mg/L			10/25/18 16:26	2.5

Method: 6020A - SPLP Metals - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.99	J	1.0	0.32	ug/L		10/25/18 12:25	10/26/18 10:51	1
Barium	10		10	0.37	ug/L		10/25/18 12:25	10/26/18 10:51	1
Cadmium	ND		1.0	0.13	ug/L		10/25/18 12:25	10/26/18 10:51	1
Beryllium	ND		1.0	0.057	ug/L		10/25/18 12:25	10/26/18 10:51	1
Chromium	4.3		2.0	0.63	ug/L		10/25/18 12:25	10/26/18 10:51	1
Lead	0.12	J	1.0	0.094	ug/L		10/25/18 12:25	10/26/18 10:51	1
Selenium	83		5.0	0.81	ug/L		10/25/18 12:25	10/26/18 10:51	1
Cobalt	0.14	J	0.50	0.075	ug/L		10/25/18 12:25	10/26/18 10:51	1
Molybdenum	33		5.0	0.47	ug/L		10/25/18 12:25	10/26/18 10:51	1
Antimony	ND		2.0	1.1	ug/L		10/25/18 12:25	10/26/18 10:51	1
Thallium	ND		1.0	0.063	ug/L		10/25/18 12:25	10/26/18 10:51	1
Lithium	7.7		5.0	2.6	ug/L		10/25/18 12:25	10/26/18 10:51	1

Method: 7470A - SPLP Mercury - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		10/26/18 09:09	10/26/18 17:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	56.0		0.1	0.1	%			10/15/18 13:07	1
Percent Solids	44.0		0.1	0.1	%			10/15/18 13:07	1

Client Sample ID: FGD Sludge

Lab Sample ID: 180-82992-1
Date Collected: 10/10/18 13:52
Matrix: Solid
Date Received: 10/12/18 13:00
Percent Solids: 44.0

Method: EPA 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	57		11	7.6	mg/Kg	☼		10/17/18 16:26	5

Method: EPA 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.88		0.22	0.057	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Barium	3.0		2.2	0.12	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Beryllium	0.067	J	0.22	0.016	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Cadmium	0.16	J	0.22	0.037	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Chromium	4.8		0.44	0.14	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Cobalt	0.11		0.11	0.018	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Molybdenum	1.6		1.1	0.14	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Lead	0.23		0.22	0.077	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Antimony	ND		0.44	0.14	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Selenium	4.8		1.1	0.13	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Thallium	0.031	J	0.22	0.028	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1
Lithium	ND		1.1	0.60	mg/Kg	☼	10/16/18 15:33	10/17/18 20:02	1

Client: Haley & Aldrich, Inc.
Project/Site: Vectren ASD Sampling

TestAmerica Job ID: 180-82992-1

Client Sample ID: FGD Sludge
Date Collected: 10/10/18 13:52
Date Received: 10/12/18 13:00

Lab Sample ID: 180-82992-1
Matrix: Solid
Percent Solids: 44.0

Method: EPA 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.22		0.080	0.018	mg/Kg	☼	10/15/18 13:56	10/16/18 14:05	1

Method: EPA 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 180-260915/6
Matrix: Solid
Analysis Batch: 260915

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.10	0.026	mg/L			10/25/18 05:33	1

Lab Sample ID: LCS 180-260915/5
Matrix: Solid
Analysis Batch: 260915

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromide	5.00	4.92		mg/L		98	80 - 120
Chloride	25.0	25.0		mg/L		100	80 - 120
Fluoride	1.25	1.29		mg/L		103	80 - 120
Sulfate	25.0	24.9		mg/L		100	80 - 120

Lab Sample ID: LB 180-260097/1-A
Matrix: Solid
Analysis Batch: 260068

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		1.0	0.68	mg/Kg			10/17/18 13:46	1

Lab Sample ID: LCS 180-260097/2-A
Matrix: Solid
Analysis Batch: 260068

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromide	50.0	47.7		mg/Kg		95	80 - 120
Chloride	250	225		mg/Kg		90	80 - 120
Fluoride	12.5	11.9		mg/Kg		96	80 - 120
Sulfate	250	225		mg/Kg		90	80 - 120

Lab Sample ID: LB 180-260869/1-A
Matrix: Solid
Analysis Batch: 260915

Client Sample ID: Method Blank
Prep Type: SPLP East

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.10	0.026	mg/L			10/25/18 16:11	1

Method: 6020A - SPLP Metals

Lab Sample ID: MB 180-261002/1-A
Matrix: Solid
Analysis Batch: 261210

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 261002

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0	0.32	ug/L		10/25/18 12:25	10/26/18 10:30	1
Barium	ND		10	0.37	ug/L		10/25/18 12:25	10/26/18 10:30	1
Beryllium	ND		1.0	0.057	ug/L		10/25/18 12:25	10/26/18 10:30	1
Cadmium	ND		1.0	0.13	ug/L		10/25/18 12:25	10/26/18 10:30	1
Chromium	ND		2.0	0.63	ug/L		10/25/18 12:25	10/26/18 10:30	1
Cobalt	ND		0.50	0.075	ug/L		10/25/18 12:25	10/26/18 10:30	1

Method: 6020A - SPLP Metals (Continued)

Lab Sample ID: MB 180-261002/1-A
Matrix: Solid
Analysis Batch: 261210

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 261002

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		1.0	0.094	ug/L		10/25/18 12:25	10/26/18 10:30	1
Molybdenum	ND		5.0	0.47	ug/L		10/25/18 12:25	10/26/18 10:30	1
Antimony	ND		2.0	1.1	ug/L		10/25/18 12:25	10/26/18 10:30	1
Selenium	ND		5.0	0.81	ug/L		10/25/18 12:25	10/26/18 10:30	1
Thallium	ND		1.0	0.063	ug/L		10/25/18 12:25	10/26/18 10:30	1
Lithium	ND		5.0	2.6	ug/L		10/25/18 12:25	10/26/18 10:30	1

Lab Sample ID: LCS 180-261002/2-A
Matrix: Solid
Analysis Batch: 261210

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 261002

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	40.0	42.1		ug/L		105	80 - 120
Barium	2000	2000		ug/L		100	80 - 120
Beryllium	50.0	49.6		ug/L		99	80 - 120
Cadmium	50.0	47.1		ug/L		94	80 - 120
Chromium	200	205		ug/L		102	80 - 120
Cobalt	500	517		ug/L		103	80 - 120
Lead	20.0	20.9		ug/L		104	80 - 120
Molybdenum	1000	991		ug/L		99	80 - 120
Antimony	500	497		ug/L		99	80 - 120
Selenium	10.0	9.91		ug/L		99	80 - 120
Thallium	50.0	49.6		ug/L		99	80 - 120
Lithium	50.0	56.4		ug/L		113	80 - 120

Lab Sample ID: LCSD 180-261002/3-A
Matrix: Solid
Analysis Batch: 261210

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 261002

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	40.0	41.4		ug/L		103	80 - 120	2	20
Barium	2000	1960		ug/L		98	80 - 120	2	20
Beryllium	50.0	48.1		ug/L		96	80 - 120	3	20
Cadmium	50.0	46.6		ug/L		93	80 - 120	1	20
Chromium	200	205		ug/L		102	80 - 120	0	20
Cobalt	500	516		ug/L		103	80 - 120	0	20
Lead	20.0	20.6		ug/L		103	80 - 120	1	20
Molybdenum	1000	965		ug/L		97	80 - 120	3	20
Antimony	500	493		ug/L		99	80 - 120	1	20
Selenium	10.0	9.61		ug/L		96	80 - 120	3	20
Thallium	50.0	49.6		ug/L		99	80 - 120	0	20
Lithium	50.0	54.3		ug/L		109	80 - 120	4	20

Lab Sample ID: LB 180-260869/1-B
Matrix: Solid
Analysis Batch: 261210

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 261002

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0	0.32	ug/L		10/25/18 12:25	10/26/18 10:34	1

Method: 6020A - SPLP Metals (Continued)

Lab Sample ID: LB 180-260869/1-B
Matrix: Solid
Analysis Batch: 261210

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 261002

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		10	0.37	ug/L		10/25/18 12:25	10/26/18 10:34	1
Beryllium	ND		1.0	0.057	ug/L		10/25/18 12:25	10/26/18 10:34	1
Cadmium	ND		1.0	0.13	ug/L		10/25/18 12:25	10/26/18 10:34	1
Chromium	ND		2.0	0.63	ug/L		10/25/18 12:25	10/26/18 10:34	1
Cobalt	ND		0.50	0.075	ug/L		10/25/18 12:25	10/26/18 10:34	1
Lead	ND		1.0	0.094	ug/L		10/25/18 12:25	10/26/18 10:34	1
Molybdenum	ND		5.0	0.47	ug/L		10/25/18 12:25	10/26/18 10:34	1
Antimony	ND		2.0	1.1	ug/L		10/25/18 12:25	10/26/18 10:34	1
Selenium	ND		5.0	0.81	ug/L		10/25/18 12:25	10/26/18 10:34	1
Thallium	ND		1.0	0.063	ug/L		10/25/18 12:25	10/26/18 10:34	1
Lithium	ND		5.0	2.6	ug/L		10/25/18 12:25	10/26/18 10:34	1

Method: 7470A - SPLP Mercury

Lab Sample ID: MB 180-261091/1-A
Matrix: Solid
Analysis Batch: 261181

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 261091

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		10/26/18 09:09	10/26/18 17:34	1

Lab Sample ID: LCS 180-261091/2-A
Matrix: Solid
Analysis Batch: 261181

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 261091

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2.50	2.48		ug/L		99	80 - 120

Lab Sample ID: LCSD 180-261091/3-A
Matrix: Solid
Analysis Batch: 261181

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 261091

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	2.50	2.44		ug/L		98	80 - 120	1	20

Lab Sample ID: LB 180-260869/1-D
Matrix: Solid
Analysis Batch: 261181

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 261091

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		10/26/18 09:09	10/26/18 17:37	1

Method: EPA 6020A - Metals (ICP/MS)

Lab Sample ID: MB 180-259888/1-A
Matrix: Solid
Analysis Batch: 260252

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 259888

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.10	0.026	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Barium	ND		1.0	0.057	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Beryllium	ND		0.10	0.0075	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Cadmium	ND		0.10	0.017	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Chromium	ND		0.20	0.066	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Cobalt	ND		0.050	0.0083	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Lead	ND		0.10	0.035	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Molybdenum	ND		0.50	0.062	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Antimony	ND		0.20	0.062	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Selenium	ND		0.50	0.060	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Thallium	ND		0.10	0.013	mg/Kg		10/15/18 19:17	10/17/18 18:30	1
Lithium	ND		0.50	0.28	mg/Kg		10/15/18 19:17	10/17/18 18:30	1

Lab Sample ID: LCS 180-259888/2-A
Matrix: Solid
Analysis Batch: 260252

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 259888

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	4.00	3.90		mg/Kg		98	80 - 120
Barium	200	179		mg/Kg		89	80 - 120
Beryllium	5.00	5.07		mg/Kg		101	80 - 120
Cadmium	5.00	4.95		mg/Kg		99	80 - 120
Chromium	20.0	19.8		mg/Kg		99	80 - 120
Cobalt	50.0	48.4		mg/Kg		97	80 - 120
Lead	2.00	1.92		mg/Kg		96	80 - 120
Molybdenum	100	94.8		mg/Kg		95	80 - 120
Antimony	50.0	45.9		mg/Kg		92	80 - 120
Selenium	1.00	0.964		mg/Kg		96	80 - 120
Thallium	105	98.5		mg/Kg		94	80 - 120
Lithium	5.00	5.05		mg/Kg		101	80 - 120

Method: EPA 7471B - Mercury (CVAA)

Lab Sample ID: MB 180-259862/1-A
Matrix: Solid
Analysis Batch: 260017

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 259862

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.033	0.0074	mg/Kg		10/15/18 13:56	10/16/18 13:42	1

Lab Sample ID: LCS 180-259862/2-A
Matrix: Solid
Analysis Batch: 260017

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 259862

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.417	0.384		mg/Kg		92	80 - 120

HPLC/IC

Analysis Batch: 260068

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	Soluble	Solid	EPA 9056A	260097
LB 180-260097/1-A	Method Blank	Soluble	Solid	EPA 9056A	260097
LCS 180-260097/2-A	Lab Control Sample	Soluble	Solid	EPA 9056A	260097

Leach Batch: 260097

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	Soluble	Solid	DI Leach	
LB 180-260097/1-A	Method Blank	Soluble	Solid	DI Leach	
LCS 180-260097/2-A	Lab Control Sample	Soluble	Solid	DI Leach	

Leach Batch: 260869

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	SPLP East	Solid	EPA 1312	
LB 180-260869/1-A	Method Blank	SPLP East	Solid	EPA 1312	

Analysis Batch: 260915

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	SPLP East	Solid	EPA 9056A	260869
LB 180-260869/1-A	Method Blank	SPLP East	Solid	EPA 9056A	260869
MB 180-260915/6	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-260915/5	Lab Control Sample	Total/NA	Solid	EPA 9056A	

Metals

Prep Batch: 259862

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	Total/NA	Solid	7471B	
MB 180-259862/1-A	Method Blank	Total/NA	Solid	7471B	
LCS 180-259862/2-A	Lab Control Sample	Total/NA	Solid	7471B	

Prep Batch: 259888

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	Total/NA	Solid	3050B	
MB 180-259888/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 180-259888/2-A	Lab Control Sample	Total/NA	Solid	3050B	

Analysis Batch: 260017

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	Total/NA	Solid	EPA 7471B	259862
MB 180-259862/1-A	Method Blank	Total/NA	Solid	EPA 7471B	259862
LCS 180-259862/2-A	Lab Control Sample	Total/NA	Solid	EPA 7471B	259862

Analysis Batch: 260252

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	Total/NA	Solid	EPA 6020A	259888
MB 180-259888/1-A	Method Blank	Total/NA	Solid	EPA 6020A	259888
LCS 180-259888/2-A	Lab Control Sample	Total/NA	Solid	EPA 6020A	259888

Metals (Continued)

Leach Batch: 260869

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	SPLP East	Solid	EPA 1312	
LB 180-260869/1-B	Method Blank	SPLP East	Solid	EPA 1312	
LB 180-260869/1-D	Method Blank	SPLP East	Solid	EPA 1312	

Prep Batch: 261002

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	SPLP East	Solid	3010A	260869
LB 180-260869/1-B	Method Blank	SPLP East	Solid	3010A	260869
MB 180-261002/1-A	Method Blank	Total/NA	Solid	3010A	
LCS 180-261002/2-A	Lab Control Sample	Total/NA	Solid	3010A	
LCSD 180-261002/3-A	Lab Control Sample Dup	Total/NA	Solid	3010A	

Prep Batch: 261091

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	SPLP East	Solid	7470A	260869
LB 180-260869/1-D	Method Blank	SPLP East	Solid	7470A	260869
MB 180-261091/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 180-261091/2-A	Lab Control Sample	Total/NA	Solid	7470A	
LCSD 180-261091/3-A	Lab Control Sample Dup	Total/NA	Solid	7470A	

Analysis Batch: 261181

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	SPLP East	Solid	7470A	261091
LB 180-260869/1-D	Method Blank	SPLP East	Solid	7470A	261091
MB 180-261091/1-A	Method Blank	Total/NA	Solid	7470A	261091
LCS 180-261091/2-A	Lab Control Sample	Total/NA	Solid	7470A	261091
LCSD 180-261091/3-A	Lab Control Sample Dup	Total/NA	Solid	7470A	261091

Analysis Batch: 261210

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	SPLP East	Solid	6020A	261002
LB 180-260869/1-B	Method Blank	SPLP East	Solid	6020A	261002
MB 180-261002/1-A	Method Blank	Total/NA	Solid	6020A	261002
LCS 180-261002/2-A	Lab Control Sample	Total/NA	Solid	6020A	261002
LCSD 180-261002/3-A	Lab Control Sample Dup	Total/NA	Solid	6020A	261002

General Chemistry

Analysis Batch: 259850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-82992-1	FGD Sludge	Total/NA	Solid	2540G	

COLUMBUS
240507

Chain of Custody Record

270501

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Mark Miesfeldt	Site Contact:	Date: 10/10/18	COC No: 270501
Company Name: HALEY + ALDRICH	Tel/Fax: (864) 230-3757	Lab Contact:	Carrier:	1 of 1 COCs
Address:	Analysis Turnaround Time			Sampler:
City/State/Zip:	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: (864) 230-3757	TAT if different from Below ____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: Vectren ASD Sampling	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	Sample Specific Notes:
Ra 226/Ra 228 Standard Target List	10/10/18	1:45p	G	S	1	N		
Ra226/Ra228 GFPC	10/10/18	1:46p	G	S	1	N		
Ra226/Ra228 Standard Target List								
TCLP Metals, TCLP Mercury	10/10/18	1:50p	G	S	1	N		
Metals, Mercury, Anions, Moisture	10/10/18	1:52p	G	S	1	N		

180-82992 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other NONE

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal by Lab ☐ Archive for ____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:____ Corr'd:____ | Therm ID No.:____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Brandi Bucker	Vectren	10/10/18 3:00p	[signature]	[signature]	10/12/18 1300
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

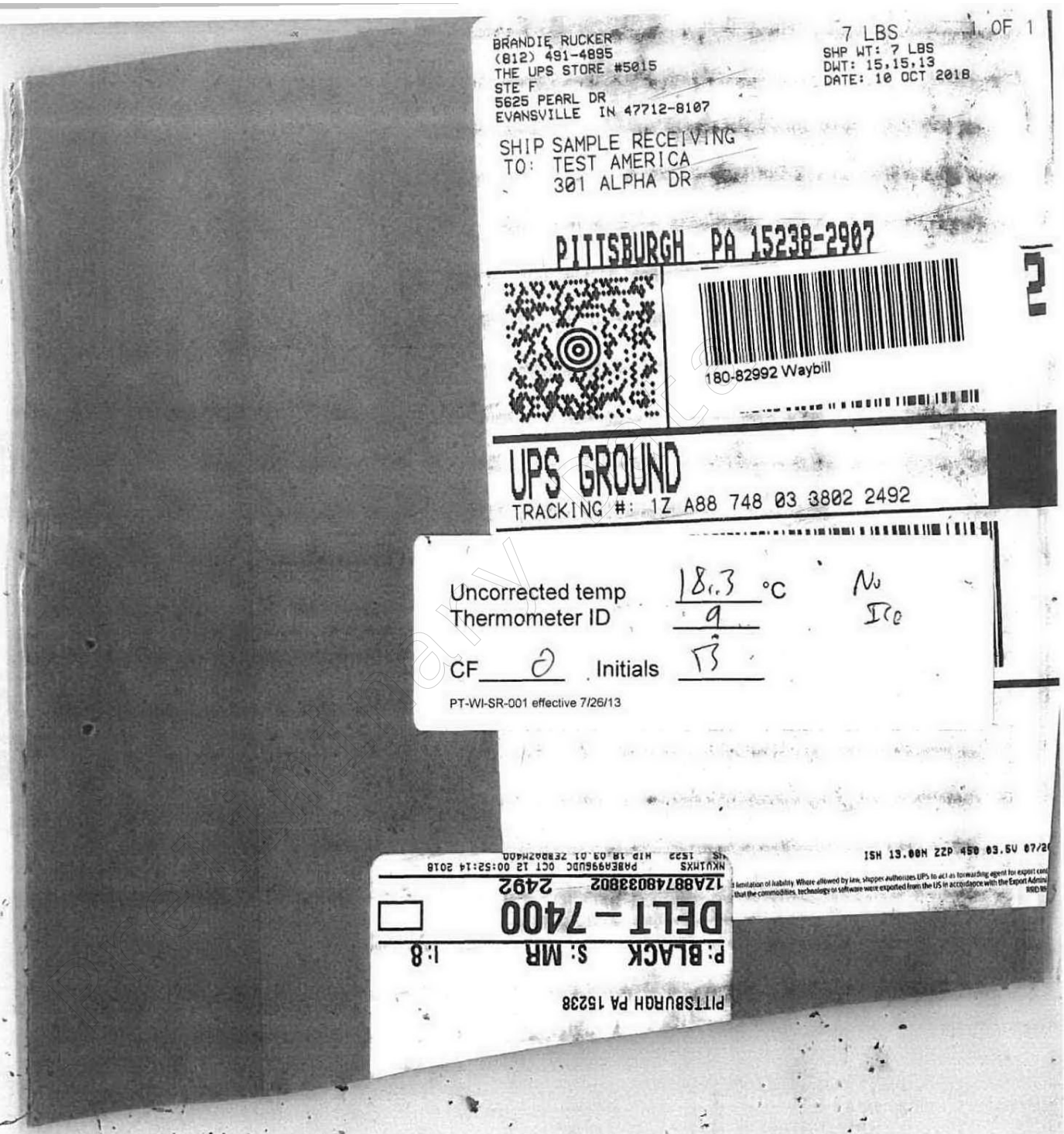
TABLE 3
MAXIMUM CONTAMINANT LEVELS, BACKGROUND LEVELS,
LABORATORY REPORTING LIMITS, AND METHOD DETECTION LIMITS
F.B. CULLEY GENERATING STATION - EAST ASH POND
NEWBURGH, INDIANA

180 9531

Analyte Group	Analyte	Analytical Method	Maximum Contaminant Level	Reporting Limit	Method Detection Limit
Detection Monitoring - EPA Appendix III Constituents - 40 CFR Part 257					
Inorganics	Boron	EPA 6020A	--	0.5	0.04
Inorganics	Calcium	EPA 6020A	--	0.0005	0.0001
Anions	Chloride	EPA 9056A	--	1.0	0.08
Anions	Fluoride	EPA 9056A	4.0	0.1	0.05
Anions	Sulfate	EPA 9056A	--	1.0	0.2
Wet Chemistry	pH	EPA 9040C	--	N/A	N/A
Wet Chemistry	Total Dissolved Solids	SM 2540C	--	30	10
Assessment Monitoring - EPA Appendix IV Constituents - 40 CFR Part 257					
Inorganics	Antimony	EPA 6020A	0.006	0.005	0.001
Inorganics	Arsenic	EPA 6020A	0.010	0.005	0.002
Inorganics	Barium	EPA 6020A	2	0.005	0.001
Inorganics	Beryllium	EPA 6020A	0.004	0.002	0.0002
Inorganics	Cadmium	EPA 6020A	0.005	0.002	0.0002
Inorganics	Chromium	EPA 6020A	0.1	0.005	0.002
Inorganics	Cobalt	EPA 6020A	--	0.002	0.0002
Inorganics	Lead	EPA 6020A	0.05	0.003	0.0006
Inorganics	Lithium	EPA 6020A	--	0.00500	0.00107
Inorganics	Molybdenum	EPA 6020A	--	0.005	0.001
Inorganics	Selenium	EPA 6020A	0.01	0.005	0.002
Inorganics	Thallium	EPA 6020A	0.002	0.002	0.00006
Inorganics	Mercury	EPA 7470A	0.002	0.0002	0.00003
Anions	Fluoride	EPA 9056A	4.0	0.1	0.05
Radiochemistry	Radium 226 and 228 combined	EPA 903.0/904.0	5 pCi/L	1 pCi/L	N/A

SPLP

NOTES:
Units in mg/L except where noted
-- = not established
CFR = Code of Federal Regulations
EPA = U.S. Environmental Protection Agency
mg/L = milligrams per liter
N/A = not applicable
pCi/L = picocuries per liter
SM = Standard Method
TBD = to be determined



TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-7058 Fax (412) 963-2468

Chain of Custody Record

TestAmerica
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10/30/2018

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bortot, Veronica	Carrier Tracking No(s):	COC No: 180-344309.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: veronica.bortot@testamericainc.com	State of Origin: Indiana	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 180-82992-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 11/2/2018			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Vectren ASD Sampling	Project #: 18019531			
Site:	SSOW#:			

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/Dry_Grind Radium-226	Ra226Ra228_GFPC/ Combined Radium-226 and Radium-228	9320_Ra228/Dry_Grind Radium-228	9320_Ra228/1312_E SPLP -9320 Radium-228 (GFPC)	9315_Ra226/1312_E SPLP 9315	Ra226Ra228_GFPC/ SPLP CALCULATION	Total Number of containers	Special Instructions/Note:
			Preservation Code:											
VECTREN ASD SAMPLING (180-82992-1)	10/10/18	13:52 Eastern		Solid			X	X	X	X	X	X	1	

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:
Empty Kit Relinquished by:	Date: Time: Method of Shipment:
Relinquished by: Date/Time: 10/15/18 1700 Company TA Pgh	Received by: Michael Fleem Date/Time: 10/16/18 0945 Company TA STL
Relinquished by: Date/Time: Company	Received by: Date/Time: Company
Relinquished by: Date/Time: Company	Received by: Date/Time: Company
Custody Seals Intact: Δ Yes Δ No / Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-7058 Fax (412) 963-2468

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bortot, Veronica	Carrier Tracking No(s):	COC No: 180-345122.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: veronica.bortot@testamericainc.com	State of Origin: Indiana	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 180-82992-1
Address: 13715 Rider Trail North,	Due Date Requested: 11/2/2018			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Vectren ASD Sampling	Project #: 18019531			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/Dry_Grind Radium-226	9315_Ra226/DPS_21 Radium-226	Ra226Ra228_GFPC/ Combined Radium-226 and Radium-228	9320_Ra228/Dry_Grind Radium-228	9320_Ra228/DPS_0 Radium-228	9320_Ra228/1312_E SPLP -9320 Radium-228 (GFPC)	9320_Ra228/PrecSep_0 SPLP -9320 Radium-228 (GFPC)	9315_Ra226/1312_E SPLP 9315	9315_Ra226/PrecSep_21 SPLP 9315	Ra226Ra228_GFPC/ SPLP CALCULATION				Total Number of containers	Special Instructions/Note:
			Preservation Code:																		
VECTREN ASD SAMPLING (180-82992-1)	10/10/18	13:52 Eastern		Solid			X	X	X	X	X	X	X	X	X	X				2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:
Empty Kit Relinquished by:	Date: Time: Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	10/25/18 1700	TAL PIT	Michael Fleeman	10/26/18 0945	TA STL
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∆ Yes ∆ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Ver: 09/20/2016

10/30/2018

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 180-82992-1

Login Number: 82992
List Number: 1
Creator: Neri, Tom

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

TestAmerica Job ID: 180-71653-1
Client Project/Site: Vectren Soil Sampling

For:
Haley & Aldrich, Inc.
400 Augusta Street
Suite 130
Greenville, South Carolina 29601

Attn: Sean Lewis

Veronica Bortot

Authorized for release by:
11/3/2017 11:31:00 AM

Veronica Bortot, Senior Project Manager
(412)963-2435
veronica.bortot@testamericainc.com

Table of Contents

Case Narrative

Client: Haley & Aldrich, Inc.
Project/Site: Vectren Soil Sampling

TestAmerica Job ID: 180-71653-1

Job ID: 180-71653-1

Laboratory: TestAmerica Pittsburgh

Narrative

Job Narrative
180-71653-1

Comments
No additional comments.

Receipt
The sample was received on 10/24/2017 10:20 AM; the sample arrived in good condition. The temperature of the cooler at receipt was 17.6º C.

Receipt Exceptions

The sample was received at the laboratory outside the required temperature criteria. Additionally the sample was outside of holding time for metals analysis. The client contacted the laboratory prior to sending the sample and indicated that the sample was out of hold .

Metals
Method(s) 6010B: Due to sample matrix effect on the internal standard (ISTD), a dilution was required for the following sample: CCR-LF-4 (49.3-50.5) (180-71653-1). All analytes referencing the yttrium internal standards required dilution due to the yttrium counts being high and outside the 70%-130% control limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Definitions/Glossary

Client: Haley & Aldrich, Inc.
Project/Site: Vectren Soil Sampling

TestAmerica Job ID: 180-71653-1

Qualifiers

Metals

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.
Project/Site: Vectren Soil Sampling

TestAmerica Job ID: 180-71653-1

Laboratory: TestAmerica Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	A2LA		PA00164	07-31-18
Arkansas DEQ	State Program	6	88-0690	06-27-18
California	State Program	9	2891	03-31-18
Connecticut	State Program	1	PH-0688	09-30-18
Florida	NELAP	4	E871008	06-30-18
Illinois	NELAP	5	200005	06-30-18
Kansas	NELAP	7	E-10350	01-31-18
Louisiana	NELAP	6	04041	06-30-18
Nevada	State Program	9	PA00164	07-31-18
New Hampshire	NELAP	1	2030	04-04-18
New Jersey	NELAP	2	PA005	06-30-18
New York	NELAP	2	11182	03-31-18
North Carolina (WW/SW)	State Program	4	434	12-31-17
Pennsylvania	NELAP	3	02-00416	04-30-18
South Carolina	State Program	4	89014	04-30-18
Texas	NELAP	6	T104704528-15-2	03-31-18
US Fish & Wildlife	Federal		LE94312A-1	07-31-18
USDA	Federal		P330-16-00211	06-26-19
Utah	NELAP	8	PA001462015-4	05-31-18
Virginia	NELAP	3	460189	09-14-18
West Virginia DEP	State Program	3	142	01-31-18
Wisconsin	State Program	5	998027800	08-31-18

Sample Summary

Client: Haley & Aldrich, Inc.
Project/Site: Vectren Soil Sampling

TestAmerica Job ID: 180-71653-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-71653-1	CCR-LF-4 (49.3-50.5)	Solid	03/11/16 15:15	10/24/17 10:20

Method Summary

Client: Haley & Aldrich, Inc.
Project/Site: Vectren Soil Sampling

TestAmerica Job ID: 180-71653-1

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL PIT
2540G	SM 2540G	SM22	TAL PIT

Protocol References:

SM22 = SM22

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Vectren Soil Sampling

TestAmerica Job ID: 180-71653-1

Client Sample ID: CCR-LF-4 (49.3-50.5)

Lab Sample ID: 180-71653-1
Matrix: Solid
Date Collected: 03/11/16 15:15
Date Received: 10/24/17 10:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			100.34 g	2000 mL	227121	10/26/17 15:00	JPM	TAL PIT
SPLP East	Prep	3010A			5 mL	50 mL	227446	10/30/17 11:55	KA	TAL PIT
SPLP East	Analysis	6010B		1			227628	10/31/17 13:44	RJG	TAL PIT
	Instrument ID: Q									
Total/NA	Analysis	2540G		1			226976	10/25/17 15:21	CLL	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-LF-4 (49.3-50.5)

Lab Sample ID: 180-71653-1
Matrix: Solid
Percent Solids: 95.8
Date Collected: 03/11/16 15:15
Date Received: 10/24/17 10:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.02 g	100 mL	227137	10/26/17 15:39	KA	TAL PIT
Total/NA	Analysis	6010B		10			227420	10/30/17 08:53	RJG	TAL PIT
	Instrument ID: C									

Laboratory References:

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL PIT

Batch Type: Leach

JPM = Jeremy Merriman

Batch Type: Prep

KA = Kayla Kalamasz

Batch Type: Analysis

CLL = Cheryl Loheyde

RJG = Rob Good

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Vectren Soil Sampling

TestAmerica Job ID: 180-71653-1

Client Sample ID: CCR-LF-4 (49.3-50.5)

Lab Sample ID: 180-71653-1
Date Collected: 03/11/16 15:15
Matrix: Solid
Date Received: 10/24/17 10:20

Method: 6010B - Metals (ICP) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	69	J H B	100	41	ug/L		10/30/17 11:55	10/31/17 13:44	1
Molybdenum	96	J H	400	28	ug/L		10/30/17 11:55	10/31/17 13:44	1
Lithium	160	J H	500	86	ug/L		10/30/17 11:55	10/31/17 13:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.2		0.1	0.1	%			10/25/17 15:21	1
Percent Solids	95.8		0.1	0.1	%			10/25/17 15:21	1

Client Sample ID: CCR-LF-4 (49.3-50.5)

Lab Sample ID: 180-71653-1
Date Collected: 03/11/16 15:15
Matrix: Solid
Date Received: 10/24/17 10:20
Percent Solids: 95.8

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	28	H	10	2.8	mg/Kg	☼	10/26/17 15:39	10/30/17 08:53	10
Molybdenum	15	J H	41	2.2	mg/Kg	☼	10/26/17 15:39	10/30/17 08:53	10
Lithium	13	J H	51	6.0	mg/Kg	☼	10/26/17 15:39	10/30/17 08:53	10

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 180-227137/1-A
Matrix: Solid
Analysis Batch: 227404

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 227137

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0	0.28	mg/Kg		10/26/17 15:39	10/28/17 14:43	1
Molybdenum	ND		4.0	0.21	mg/Kg		10/26/17 15:39	10/28/17 14:43	1
Lithium	ND		5.0	0.59	mg/Kg		10/26/17 15:39	10/28/17 14:43	1

Lab Sample ID: LCS 180-227137/2-A
Matrix: Solid
Analysis Batch: 227404

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 227137

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	50.0	49.4		mg/Kg		99	80 - 120
Molybdenum	100	102		mg/Kg		102	80 - 120
Lithium	100	98.4		mg/Kg		98	80 - 120

Lab Sample ID: MB 180-227446/1-A
Matrix: Solid
Analysis Batch: 227628

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 227446

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.76	J	10	4.1	ug/L		10/30/17 11:55	10/31/17 13:23	1
Molybdenum	ND		40	2.8	ug/L		10/30/17 11:55	10/31/17 13:23	1
Lithium	ND		50	8.6	ug/L		10/30/17 11:55	10/31/17 13:23	1

Lab Sample ID: LCS 180-227446/2-A
Matrix: Solid
Analysis Batch: 227628

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 227446

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	496		ug/L		99	80 - 120
Molybdenum	1000	971		ug/L		97	80 - 120
Lithium	1000	975		ug/L		97	80 - 120

Lab Sample ID: LCSD 180-227446/3-A
Matrix: Solid
Analysis Batch: 227628

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 227446

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	500	497		ug/L		99	80 - 120	0	20
Molybdenum	1000	959		ug/L		96	80 - 120	1	20
Lithium	1000	982		ug/L		98	80 - 120	1	20

Lab Sample ID: LB 180-227121/1-B
Matrix: Solid
Analysis Batch: 227628

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 227446

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	44.6	J	100	41	ug/L		10/30/17 11:55	10/31/17 13:39	1
Molybdenum	ND		400	28	ug/L		10/30/17 11:55	10/31/17 13:39	1
Lithium	ND		500	86	ug/L		10/30/17 11:55	10/31/17 13:39	1

QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: Vectren Soil Sampling

TestAmerica Job ID: 180-71653-1

Metals

Leach Batch: 227121

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-71653-1	CCR-LF-4 (49.3-50.5)	SPLP East	Solid	1312	
LB 180-227121/1-B	Method Blank	SPLP East	Solid	1312	

Prep Batch: 227137

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-71653-1	CCR-LF-4 (49.3-50.5)	Total/NA	Solid	3050B	
MB 180-227137/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 180-227137/2-A	Lab Control Sample	Total/NA	Solid	3050B	

Analysis Batch: 227404

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 180-227137/1-A	Method Blank	Total/NA	Solid	6010B	227137
LCS 180-227137/2-A	Lab Control Sample	Total/NA	Solid	6010B	227137

Analysis Batch: 227420

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-71653-1	CCR-LF-4 (49.3-50.5)	Total/NA	Solid	6010B	227137

Prep Batch: 227446

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-71653-1	CCR-LF-4 (49.3-50.5)	SPLP East	Solid	3010A	227121
LB 180-227121/1-B	Method Blank	SPLP East	Solid	3010A	227121
MB 180-227446/1-A	Method Blank	Total/NA	Solid	3010A	
LCS 180-227446/2-A	Lab Control Sample	Total/NA	Solid	3010A	
LCSD 180-227446/3-A	Lab Control Sample Dup	Total/NA	Solid	3010A	

Analysis Batch: 227628

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-71653-1	CCR-LF-4 (49.3-50.5)	SPLP East	Solid	6010B	227446
LB 180-227121/1-B	Method Blank	SPLP East	Solid	6010B	227446
MB 180-227446/1-A	Method Blank	Total/NA	Solid	6010B	227446
LCS 180-227446/2-A	Lab Control Sample	Total/NA	Solid	6010B	227446
LCSD 180-227446/3-A	Lab Control Sample Dup	Total/NA	Solid	6010B	227446

General Chemistry

Analysis Batch: 226976

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-71653-1	CCR-LF-4 (49.3-50.5)	Total/NA	Solid	2540G	

TestAmerica Pittsburgh

301 Alpha Drive RIDC Park
Pittsburgh, PA 15238-2907
phone 412.963.7058 fax 412.963.2468

Chain of Custody Record for
Haley & Aldrich, Inc. Blanket Service Agreement #2015-18-TestAmerica

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.

TestAmerica's services under this CoC shall be performed in accordance with the T&Cs within Blanket Service Agreement# 2015-18-TestAmerica by and between Haley & Aldrich, Inc., its subsidiaries and affiliates, and TestAmerica Laboratories Inc..

Client Contact	H&A Project Manager: Christine Horch	H&A Site Contact: Sean Lewis	Date: 10/23/17	COC No:
Haley and Aldrich	Tel/Fax: 937.530.1406	Lab Contact: Veronica Bortot	Carrier:	1 of 1 COCs
Address: 400 Augusta Street, Suite 130	Analysis Turnaround Time			Sampler:
City/State/Zip: Greenville, SC 29601	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(xxx) xxx-xxxx Phone: 864.214.8750	TAT if different from Below ______			Walk-in Client:
(xxx) xxx-xxxx FAX:	☑ 2 weeks			Lab Sampling:
H&A Project Number: 129420-004	☐ 1 week			
Site: A.B. Brown	☐ 2 days			Job / SDG No.:
H&A P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	Arsenic SPLP	Lithium SPLP	Molybdenum SPLP	Total Metals (As,Li, Mo)	Sample Specific Notes:
CCR-LF-4 (49.3-50.5)	3/11/2016	1515	G	S	3	N	N	X	X	X	X	

180-71653 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ______

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return to Client ☐ Disposal by Lab ☐ Archive for ______ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:		Cooler Temp. (°C): Obs'd: ______ Corr'd: ______		Therm ID No.: ______
Relinquished by: *[signature]*	Company: H+A	Date/Time: 10/23/17 1405	Received by: *[signature]*	Company: TA	Date/Time: 10-24-17 10:20
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-045, Rev. 1.2, dated 1/8/2016

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 180-71653-1

Login Number: 71653
List Number: 1
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	
Cooler Temperature is acceptable.	False	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	