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ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
EAST ASH POND
F.B. CULLEY GENERATING STATION
WARRICK 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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Table of Contents

List of Tables

List of Figures

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 East Ash Pond (EAP) at F.B. Culley Generating Station (FBC) 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 EAP 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 EAP. 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 (molybdenum and arsenic) were identified downgradient of the EAP. An alternate source evaluation was conducted and an ASD was prepared (Appendix A) to demonstrate that a source other than the EAP caused the SSLs for arsenic. A successful alternate source demonstration for molybdenum has not been achieved at this time. As a result, an assessment of corrective measures

was initiated as required by § 257.96. A 60-day extension to complete the assessment of corrective measures was required and certified by a professional engineer as required by 257.96(a) resulting in completion of the Assessment of Corrective Measures in September 2019.

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 (Appendix A);
- Evaluated the nature and extent of Appendix IV SSLs as required by § 257.95(g)(1);
- Collected and analyzed two rounds of groundwater samples in accordance with § 257.95
- Initiated and completed an assessment of corrective measures in accordance with § 257.96;
  - The 90-day deadline to complete the assessment of corrective measures was extended an additional 60-days in accordance with § 257.96(a). (Appendix B)
  - The assessment of corrective measures was placed in the facility's operating record in accordance with § 257.96(d).

1.2.3 Problems Encountered

Monitoring well (CCR-AP-10) was installed on the north side of the East Ash Pond to evaluate the nature and extent of arsenic and molybdenum in groundwater. The shale bedrock encountered at this location did not yield a sufficient amount of groundwater for sampling in June 2019. However, in October 2019 there was a sufficient amount of groundwater for sampling.

1.2.4 Actions to Resolve Problems

Monitoring well CCR-AP-10 will be evaluated during the first semiannual groundwater sampling event in 2020. If CCR-AP-10 does not yield enough groundwater, the monitoring well will be properly abandoned and deepened.

1.2.5 Project Key Activities for Upcoming Year

Key activities to be completed in 2020 include the following:

- Further refine the characterization of the nature and extent of molybdenum in groundwater downgradient of the EAP.
- Continue semiannual groundwater monitoring in accordance with § 257.95.

- Complete statistical analysis of the semiannual groundwater sampling results as required by § 257.93(h)(2).
- Hold a public meeting with interested and affected parties in accordance with § 257.96(e) to discuss the results of the corrective measures assessment at least 30 days prior to the selection of remedy.
- As soon as feasible following the public meeting select a remedy that, at a minimum, meets the standards outlined in § 257.97(b).
  - As part of the selected remedy SIGECO will develop a schedule for implementing and completing remedial activities as defined in § 257.97(d).
- Prepare semiannual and annual progress reports, as necessary, describing the progress in selecting and designing the remedy as outlined in § 257.97(a).

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 location of the EAP and associated upgradient, downgradient and nature and extent monitoring 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;

To characterize the horizontal and vertical nature and extent of SSLs at the EAP, three new monitoring wells were installed in the uppermost aquifer downgradient of the East Ash Pond. The new monitoring wells, identified as CCR-AP-5I, CCR-AP-10 and CCR-AP-11 as shown on Figure 1, were completed in the intermediate zone within the uppermost aquifer. Location and construction details are provided in 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 EAP 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 § 257.95(d) through § 257.95(g) a statistical analysis of the Appendix IV constituents was completed by 15 January 2019. This statistical analysis determined that statistically significant levels of molybdenum and arsenic were present downgradient of the EAP. An evaluation of alternate sources was initiated and completed in September 2019 as required by § 257.94(e)(2). A source causing the SSL of arsenic over background levels other than the CCR Unit was identified. However, a source causing the molybdenum SSL was not identified and as a result an assessment of corrective measures was completed for the EAP. The Assessment Monitoring program was established to meet the requirements of 40 CFR § 257.95. Semiannual sampling will continue in 2020.

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

F.B. CULLEY GENERATING STATION - EAST ASH POND

NEWBURGH, 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-AP-1R	Background	March 2016	2883429.69	969939.69	438.50	441.64	1.0-51.0	51.0-53.0	53.0-65.0	55.00 - 65.00	10	2	Active
CCR-AP-7	Background	March 2016	2883090.34	970774.64	429.50	434.11	1.0-16.0	16.0-18.0	18.0-30.0	20.00 - 30.00	10	2	Active
CCR-AP-9	Background	February 2017	2883998.96	969768.61	445.58	448.69	1.0-56.0	56.0-58.0	58.0-70.0	60.00 - 70.00	10	2	Active
CCR-AP-2	East Ash Pond	December 2015	2884168.67	969117.52	394.40	393.97	1.0-30.5	30.5-32.5	32.5-45.0	36.00 - 46.00	10	2	Active
CCR-AP-3	East Ash Pond	December 2015	2883542.09	969007.98	395.10	394.54	1.0-31.0	31.0-32.8	32.8-45.0	35.00 - 45.00	10	2	Active
CCR-AP-4	East Ash Pond	December 2015	2883281.93	969641.70	395.40	394.91	1.0-19.7	19.7-22.5	23.0-35.5	25.50 - 35.50	10	2	Active
CCR-AP-5	East Ash Pond	December 2015	2884016.66	969379.68	394.80	394.32	1.0-28.6	28.6-30.6	30.6-44.0	34.00 - 44.00	10	2	Active
CCR-AP-5I	East Ash Pond	Janaury 2019	2884022.40	969377.37	--	395.00	1.0-71.2	71.2-73.0	73.0-86.0	75.30 - 85.30	10	2	Available
CCR-AP-6	East Ash Pond	March 2016	2883285.03	969122.16	397.00	396.71	1.0-31.5	31.5-33.0	33.5-45.5	35.50 - 45.50	10	2	Active
CCR-AP-6I	East Ash Pond	November 2018	2883289.32	969119.72	--	397.20	1.0-60.7	60.7-62.7	62.7-64.7	34.70 - 74.70	10	2	Available
CCR-AP-8	East Ash Pond	February 2017	2883846.87	969046.03	394.15	393.83	1.0-31.5	31.5-33.0	33.5-45.5	35.50 - 45.50	10	2	Active
CCR-AP-8I	East Ash Pond	November 2018	2883853.25	969047.00	--	393.90	1.0-53.7	53.7-56.7	56.7-69.0	58.70 - 68.70	10	2	Available
CCR-AP-10	East Ash Pond	Janaury 2019	2883772.84	969536.11	--	402.40	1.0-36.5	36.5-38.0	38.0-50.5	40.20 - 50.20	10	2	Available
CCR-AP-11	East Ash Pond	Janaury 2019	2884485.51	969352.71	--	385.10	1.0-40.0	40.0-41.8	41.8-54.7	44.40 - 54.40	10	2	Available

NOTES:

bgs = below ground surface

--- = was not surveyed

ft = feet

in = inches

msl = mean sea level

Datum of Elevations in NAVD 88

TABLE II
SUMMARY OF GROUNDWATER QUALITY DATA
EAST ASH POND - MAY THROUGH OCTOBER 2019
F.B. CULLEY GENERATING STATION
NEWBURGH, INDIANA

Location Group	Action Level	Background					
Location Name		CCR-AP-7	CCR-AP-7	CCR-AP-1R	CCR-AP-1R	CCR-AP-9	CCR-AP-9
Sample Name	Maximum	CCR-AP-7-20190528	CCR-AP-7-20191023	CCR-AP-1R-20190528	CCR-AP-1R-20191023	CCR-AP-9-20190528	CCR-AP-9-20191022
Sample Date	Contaminant Level	05/28/2019	10/23/2019	05/28/2019	10/23/2019	05/28/2019	10/22/2019
Lab Sample ID		180-90609-7	180-97809-16	180-90609-1	180-97809-1	180-90609-9	180-97809-11
Detection Monitoring - EPA Appendix III Constituents (mg/L)							
Boron, Total	NA	**0.28 J**	0.08 U	**0.72 J-**	**0.43**	**0.41 J**	**0.36 J**
Calcium, Total	NA	**100**	**110**	**67**	**70**	**130**	**130**
Chloride	NA	**28**	**27**	**17**	**16**	**12**	**9.7**
Fluoride	4	**0.27 J+**	**0.14**	**0.57 J+**	**0.34**	**0.33 J+**	**0.21**
Sulfate	NA	**82**	**65**	**190**	**180**	**100**	**120**
Total Dissolved Solids (TDS)	NA	**590**	**530**	**890**	**300**	**650**	**600**
pH (lab) (SU)	NA	**7.5 J**	**7.4 HF**	**7.8 J**	**7.8 HF**	**7.5 J**	**7.6 HF**
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)							
Antimony, Total	0.006	0.002 U	0.002 U	**0.00057 J**	**0.0019 J**	**0.00061 J**	0.01 U
Arsenic, Total	0.01	**0.0037**	**0.0075**	**0.038**	**0.037**	**0.0078**	**0.013**
Barium, Total	2	**0.13**	**0.15**	**0.38**	**0.59**	**0.29**	**0.35**
Beryllium, Total	0.004	0.001 U	0.001 U	**0.005**	**0.0066**	**0.00066 J**	**0.0011 J**
Cadmium, Total	0.005	0.001 U	0.001 U	**0.00052 J**	**0.00087 J**	**0.00014 J**	0.005 U
Chromium, Total	0.1	0.002 U	**0.0018 J**	**0.11**	**0.16**	**0.016 J+**	**0.033**
Cobalt, Total	0.006	**0.00047 J**	**0.001**	**0.075**	**0.081**	**0.012**	**0.017**
Fluoride	4	**0.27 J+**	**0.14**	**0.57 J+**	**0.34**	**0.33 J+**	**0.21**
Lead, Total	0.015	0.001 U	**0.0014**	**0.076**	**0.094**	**0.01**	**0.017**
Lithium, Total	0.04	**0.011**	**0.02**	**0.16**	**0.23**	**0.041**	**0.072**
Mercury, Total	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum, Total	0.1	**0.002 J**	**0.0017 J**	**0.01**	**0.012 J**	**0.0038 J**	**0.0049 J**
Selenium, Total	0.05	0.005 U	0.005 U	0.005 U	**0.012 J**	0.005 U	**0.013 J**
Thallium, Total	0.002	0.001 U	0.001 U	**0.00074 J**	**0.0014 J**	**0.00016 J**	0.005 U
Radiological (pCi/L)							
Radium-226	NA	**0.423 ± 0.123**	**0.194 ± 0.097**	**0.564 ± 0.216**	**0.561 ± 0.237**	**1.02 ± 0.252**	**1.67 ± 0.375**
Radium-228	NA	0.112 U ± 0.31	**1.02 ± 0.324**	**1.91 ± 1.12**	**1.37 ± 0.665**	**1.30 ± 0.699**	**1.47 ± 0.625**
Radium-226 & 228	5	**0.535 J ± 0.334**	**1.21 ± 0.338**	**2.47 ± 1.14**	**1.93 ± 0.706**	**2.32 ± 0.743**	**3.13 ± 0.729**
Field Parameters							
Temperature (Deg C)	NA	**18.68**	**18.44**	**28.08**	**20.79**	**26.01**	**16.23**
Dissolved Oxygen, Field (mg/L)	NA	**0.03**	**0.18**	**4.51**	**2.01**	**3.75**	**7.72**
Conductivity, Field (mS/cm)	NA	**0.90624**	**0.97501**	**1.1438**	**1.273**	**0.91846**	**0.92719**
ORP, Field (mv)	NA	**-131.2**	**-111.5**	**79.4**	**-48.7**	**-32.9**	**-8.3**
Turbidity, Field (NTU)	NA	**1.97**	**21.59**	**3716**	**2013**	**2572**	**1547**
pH, Field (SU)	NA	**7.42**	**7.01**	**7.82**	**7.48**	**7.56**	**7.51**

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.

- 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 II
SUMMARY OF GROUNDWATER QUALITY DATA
EAST ASH POND - MAY THROUGH OCTOBER 2019
F.B. CULLEY GENERATING STATION
NEWBURGH, INDIANA

Location Group	Action Level	Downgradient								
Location Name		CCR-AP-10	CCR-AP-11	CCR-AP-11	CCR-AP-2	CCR-AP-2	CCR-AP-3	CCR-AP-3	CCR-AP-4	CCR-AP-4
Sample Name	Maximum	CCR-AP-10-20191024	CCR-AP-11-20190612	CCR-AP-11-20191023	CCR-AP-2-20190528	CCR-AP-2-20191022	CCR-AP-3-20190528	CCR-AP-3-20191022	CCR-AP-4-20190528	CCR-AP-4-20191022
Sample Date	Contaminant Level	10/24/2019	06/13/2019 180-91361-4	10/23/2019	05/28/2019	10/22/2019	05/28/2019	10/22/2019	05/28/2019	10/22/2019
Lab Sample ID		180-97809-12	1906573-5	180-97809-13	180-90609-2	180-97809-2	180-90609-3	180-97809-3	180-90609-4	180-97809-4
Detection Monitoring - EPA Appendix III Constituents (mg/L)										
Boron, Total	NA	**1.3**	**0.22 J+**	**0.21**	**6.8 J-**	**5.3**	**0.24 J**	**0.097**	**0.13 J**	0.4 U
Calcium, Total	NA	**82**	**110**	**94**	**190**	**220**	**190**	**190**	**180**	**180**
Chloride	NA	**22**	**20**	**15**	**160**	**120**	**25**	**23**	**30**	**26**
Fluoride	4	**0.49**	**0.32**	**0.3**	**0.4 J+**	**0.51**	**0.53 J+**	**0.39**	**0.37 J+**	**0.083 J**
Sulfate	NA	**4.5**	**310**	**330**	**490**	**310**	**0.5 J**	**0.91 J**	**2.8**	**4.8**
Total Dissolved Solids (TDS)	NA	**1000**	**870**	**680**	**1300**	**440**	**1000**	**990**	**940**	**910**
pH (lab) (SU)	NA	**7.5 HF**	**6.5 J**	**6.7 HF**	**7 J**	**6.8 HF**	**7.3 J**	**7.2 HF**	**6.8 J**	**6.8 HF**
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)										
Antimony, Total	0.006	**0.00052 J**	0.002 U	0.002 U	**0.0011 J**	0.01 U	0.002 U	0.002 U	0.002 U	0.01 U
Arsenic, Total	0.01	**0.013**	**0.047**	**0.013**	**0.032**	**0.02**	**0.077**	**0.069**	**0.11**	**0.32**
Barium, Total	2	**0.17**	**0.34**	**0.12**	**0.26**	**0.28**	**0.44**	**0.48**	**0.66**	**1.3**
Beryllium, Total	0.004	0.001 U	**0.00017 J**	0.001 U	**0.0021**	**0.0019 J**	0.001 U	0.001 U	0.001 U	**0.0011 J**
Cadmium, Total	0.005	0.001 U	0.001 U	0.001 U	**0.0023**	**0.0016 J**	0.001 U	0.001 U	0.001 U	0.005 U
Chromium, Total	0.1	**0.0017 J**	0.0032 U	0.002 U	**0.052**	**0.054**	0.002 U	**0.0025**	0.0034 U	**0.026**
Cobalt, Total	0.006	**0.0007**	**0.025**	**0.0049**	**0.026**	**0.026**	**0.0054**	**0.0048**	**0.0031**	**0.012**
Fluoride	4	**0.49**	**0.32**	**0.3**	**0.4 J+**	**0.51**	**0.53 J+**	**0.39**	**0.37 J+**	**0.083 J**
Lead, Total	0.015	**0.00084 J**	0.001 U	**0.00023 J**	**0.038**	**0.026**	**0.00033 J**	**0.00083 J**	**0.0043**	**0.02**
Lithium, Total	0.04	**0.057**	**0.004 J**	**0.014**	**0.031**	**0.069**	0.005 U	**0.0078**	**0.0041 J**	**0.047**
Mercury, Total	0.002	0.0002 U	0.0002 U	0.0002 U	**0.00038**	**0.00019 J**	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum, Total	0.1	**0.03**	**0.0011 J**	**0.0007 J**	**0.0078**	**0.0078 J**	**0.0099**	**0.0089**	**0.0011 J**	**0.0037 J**
Selenium, Total	0.05	**0.0053**	0.005 U	**0.0066**	**0.0065**	**0.026**	0.005 U	**0.0068**	0.005 U	**0.031**
Thallium, Total	0.002	0.001 U	0.001 U	0.001 U	**0.0009 J**	**0.00096 J**	0.001 U	0.001 U	0.001 U	0.005 U
Radiological (pCi/L)										
Radium-226	NA	**0.543 ± 0.147**	**0.56 ± 0.29**	0.0634 U ± 0.0737	**2.57 ± 0.584**	**0.560 ± 0.22**	**0.404 ± 0.159**	0.116 U ± 0.104	**0.846 ± 0.224**	**0.606 ± 0.226**
Radium-228	NA	**0.535 ± 0.307**	0.60 U ± 0.39	0.246 U ± 0.302	2.81 U ± 1.93	0.217 U ± 0.45	**1.83 ± 1.11**	0.477 U ± 0.354	**1.54 ± 0.735**	**1.18 ± 0.569**
Radium-226 & 228	5	**1.08 ± 0.34**	**1.16 J ± 0.486**	0.310 U ± 0.311	**5.38 J ± 2.02**	**0.778 ± 0.501**	**2.24 ± 1.12**	**0.593 ± 0.369**	**2.38 ± 0.768**	**1.78 ± 0.612**
Field Parameters										
Temperature (Deg C)	NA	**18.85**	**17.71**	**19.53**	**29.7**	**20.11**	**33.68**	**19.35**	**25.99**	**19.24**
Dissolved Oxygen, Field (mg/L)	NA	**3.73**	**0.03**	**0.25**	**8.31**	**4.89**	**2.14**	**1.09**	**1.55**	**1.14**
Conductivity, Field (mS/cm)	NA	**1.592**	**1.144**	**1.1326**	-	**1.1641**	**1.6096**	**1.6303**	**1.5681**	**1.7555**
ORP, Field (mv)	NA	**-96.5**	**-152.2**	**-104.1**	**122.8**	**43.7**	**-142.5**	**-7.4**	**-97.7**	**-63.9**
Turbidity, Field (NTU)	NA	**35.54**	**45.14**	**21.5**	**0.72**	**1088**	**183.72**	**0.27**	**63.06**	**486.26**
pH, Field (SU)	NA	**7.2**	**6.9**	**6.63**	**7.79**	**7.33**	**7.13**	**8.14**	**6.8**	**6.51**

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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.

- USEPA. 2016. Final Rule: Disposal of Coal Combustion Residuals from Electric Utilities. July 26. 40 CFR Part 257.
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TABLE II
SUMMARY OF GROUNDWATER QUALITY DATA
EAST ASH POND - MAY THROUGH OCTOBER 2019
F.B. CULLEY GENERATING STATION
NEWBURGH, INDIANA

Location Group	Action Level	Downgradient							
Location Name		CCR-AP-5	CCR-AP-5	CCR-AP-5	CCR-AP-5	CCR-AP-5I	CCR-AP-5I	CCR-AP-6	CCR-AP-6
Sample Name	Maximum	CCR-AP-5-20190528	BLIND DUPLICATE-20190528	CCR-AP-5-20191023	BLIND DUPLICATE-20191023	CCR-AP-5I-20190612	CCR-AP-5I-20191023	CCR-AP-6-20190528	CCR-AP-6-20191022
Sample Date	Contaminant Level	05/28/2019	05/28/2019	10/23/2019	10/23/2019	06/12/2019	10/23/2019	05/28/2019	10/22/2019
Lab Sample ID		180-90609-5	180-90609-10	180-97809-5	180-97809-14	180-91361-1 1906573-1	180-97809-6	180-90609-6	180-97809-7
Detection Monitoring - EPA Appendix III Constituents (mg/L)									
Boron, Total	NA	**35 J-**	**34 J-**	**16**	**8.8**	**14**	**2.5**	**0.85 J-**	**0.28**
Calcium, Total	NA	**260**	**270**	**220**	**220**	**250**	**120**	**190**	**200**
Chloride	NA	**160**	**170**	**59**	**61**	**240**	**80**	**39**	**37**
Fluoride	4	**1.2 J+**	**1.3 J+**	**1.3**	**1.3**	**0.31**	**0.25**	**0.67 J+**	**0.46**
Sulfate	NA	**860**	**930**	**670**	**680**	**700**	**390**	**7.5**	**3.9**
Total Dissolved Solids (TDS)	NA	**2100**	**2000**	**1500**	**1500**	**1700**	**980**	**1000**	**1000**
pH (lab) (SU)	NA	**7.3 J**	**7.3 J**	**7.5 HF**	**7.5 HF**	**7 J**	**7.4 HF**	**7.4 J**	**7.4 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	0.002 U	**0.00039 J**	**0.00083 J**	0.002 U
Arsenic, Total	0.01	**0.0011**	**0.0013**	**0.00066 J**	**0.00079 J**	**0.00072 J**	**0.00062 J**	**0.11**	**0.092**
Barium, Total	2	**0.04**	**0.042**	**0.042**	**0.043**	**0.085**	**0.035**	**0.69**	**0.6**
Beryllium, Total	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	**0.00069 J**	0.001 U
Cadmium, Total	0.005	**0.00051 J**	**0.00053 J**	**0.00016 J**	0.001 U	0.001 U	0.001 U	**0.0006 J**	**0.00018 J**
Chromium, Total	0.1	0.0027 U	0.0028 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.028**	**0.0075**
Cobalt, Total	0.006	**0.0031**	**0.0031**	**0.0023**	**0.0022**	**0.00048 J**	**0.00047 J**	**0.018**	**0.006**
Fluoride	4	**1.2 J+**	**1.3 J+**	**1.3**	**1.3**	**0.31**	**0.25**	**0.67 J+**	**0.46**
Lead, Total	0.015	**0.0011**	**0.0017**	**0.00013 J**	0.001 U	**0.00023 J**	0.001 U	**0.024**	**0.0049**
Lithium, Total	0.04	**0.087**	**0.086**	**0.095**	**0.091**	**0.035**	**0.035**	**0.014**	**0.0098**
Mercury, Total	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum, Total	0.1	**0.38**	**0.38**	**0.53**	**0.52**	**0.0017 J**	**0.0072**	**0.028**	**0.023**
Selenium, Total	0.05	0.005 U	0.005 U	**0.007**	**0.0075**	0.005 U	**0.009**	0.005 U	**0.0053**
Thallium, Total	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	**0.00018 J**	0.001 U
Radiological (pCi/L)									
Radium-226	NA	**0.107 ± 0.0722**	**0.146 ± 0.0812**	**0.103 ± 0.0685**	0.0299 U ± 0.0704	**0.85 ± 0.36**	0.0924 U ± 0.0773	**6.34 J- ± 1.43**	**0.567 ± 0.163**
Radium-228	NA	0.257 U ± 0.341	0.435 U ± 0.42	**0.497 ± 0.256**	**0.588 ± 0.301**	0.40 U ± 0.36	-0.0597 U ± 0.26	3.90 UJ ± 4.41	**0.675 ± 0.337**
Radium-226 & 228	5	0.364 UJ ± 0.349	0.581 UJ ± 0.428	**0.599 ± 0.265**	**0.617 ± 0.309**	**1.25 J ± 0.509**	0.0327 U ± 0.271	**10.2 J- ± 4.64**	**1.24 ± 0.374**
Field Parameters									
Temperature (Deg C)	NA	**20.61**	**20.61**	**18.55**	**18.55**	**17.93**	**20.04**	**35.64**	**19.94**
Dissolved Oxygen, Field (mg/L)	NA	**0.04**	**0.04**	**0.21**	**0.21**	**0.03**	**0.21**	**2.55**	**2.41**
Conductivity, Field (mS/cm)	NA	**2.1567**	**2.1567**	**1.1217**	**1.1217**	**2.4352**	**1.4368**	**1.4215**	**1.7371**
ORP, Field (mv)	NA	**35.3**	**35.3**	**76.8**	**76.8**	**205**	**-168.5**	**-229.3**	**-110.3**
Turbidity, Field (NTU)	NA	**87.1**	**87.1**	**1.44**	**1.44**	**72.85**	**2.39**	**390.25**	**92.38**
pH, Field (SU)	NA	**7.25**	**7.25**	**6.94**	**6.94**	**7.06**	**7.18**	**7.28**	**7.16**

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.

- 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 II
SUMMARY OF GROUNDWATER QUALITY DATA
EAST ASH POND - MAY THROUGH OCTOBER 2019
F.B. CULLEY GENERATING STATION
NEWBURGH, INDIANA

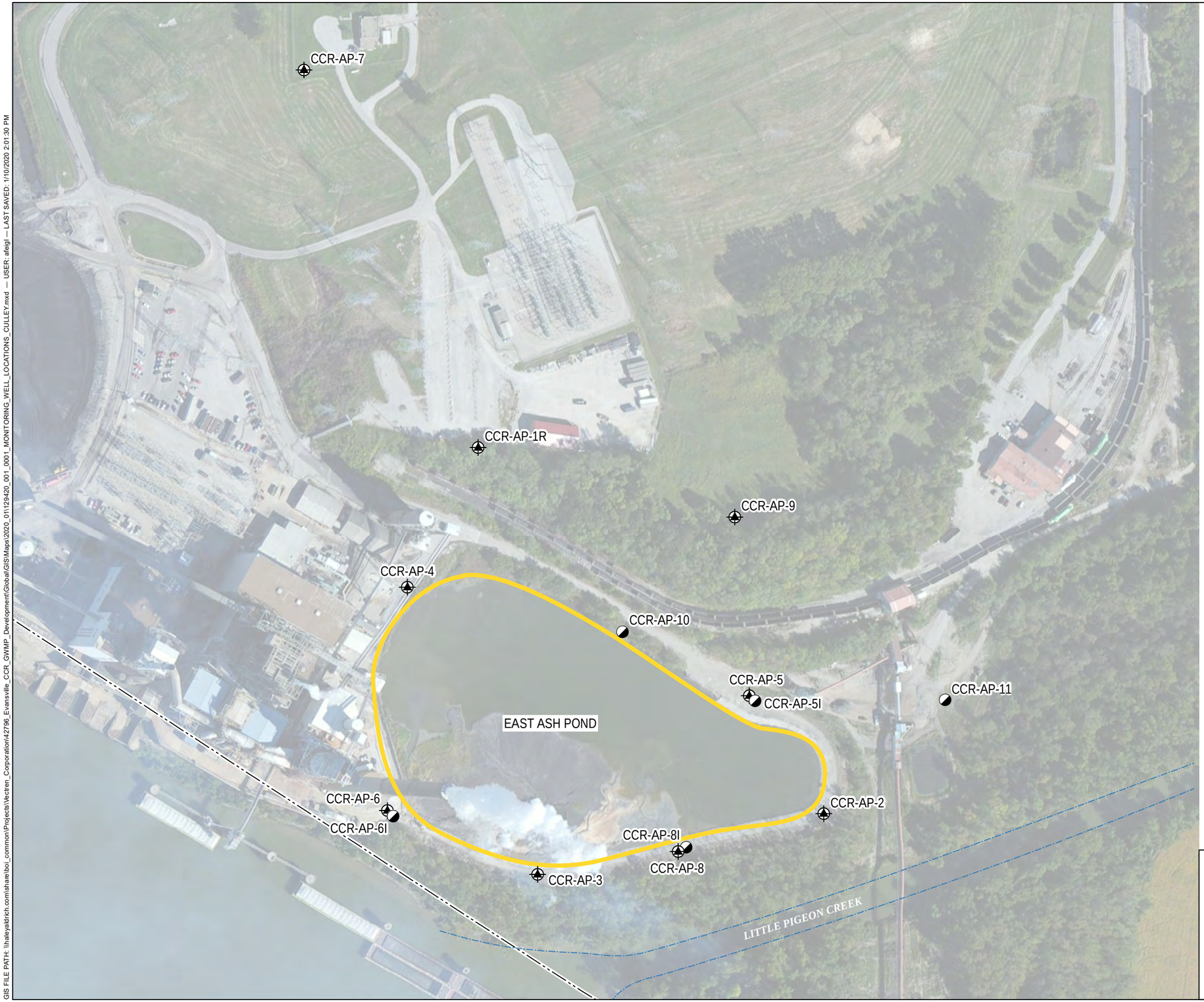
Location Group	Action Level	Downgradient					
Location Name		CCR-AP-6I	CCR-AP-6I	CCR-AP-8	CCR-AP-8	CCR-AP-8I	CCR-AP-8I
Sample Name	Maximum	CCR-AP-6I-20190612	CCR-AP-6I-20191024	CCR-AP-8-20190528	CCR-AP-8-20191022	CCR-AP-8I-20190612	CCR-AP-8I-20191024
Sample Date	Contaminant Level	06/12/2019	10/24/2019	05/28/2019	10/22/2019	06/12/2019	10/24/2019
		180-91361-2				180-91361-3	
Lab Sample ID		1906573-3	180-97809-8	180-90609-8	180-97809-9	1906573-4	180-97809-10
Detection Monitoring - EPA Appendix III Constituents (mg/L)							
Boron, Total	NA	**12**	**12**	**0.12 J**	0.08 U	**18**	**8**
Calcium, Total	NA	**340**	**560**	**270**	**310**	**490**	**380**
Chloride	NA	**350**	**170**	**15**	**15**	**130**	**350**
Fluoride	4	**0.19 J+**	**0.13 J**	**0.51 J+**	**0.072 J**	**0.12 J+**	**0.24 J**
Sulfate	NA	**860**	**1400**	**0.99 J**	**2**	**1100**	**1000**
Total Dissolved Solids (TDS)	NA	**2300**	**2600**	**1200**	**1300**	**2200**	**2400**
pH (lab) (SU)	NA	**6.9 J**	**7.3 HF**	**6.9 J**	**7.1 HF**	**7.4 J**	**6.9 HF**
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)							
Antimony, Total	0.006	0.002 U	0.002 U	**0.00046 J**	**0.00043 J**	0.002 U	0.002 U
Arsenic, Total	0.01	**0.0028**	**0.0049**	**0.1**	**0.09**	**0.0051**	**0.0022**
Barium, Total	2	**0.28**	**0.067**	**0.49**	**0.65**	**0.063**	**0.27**
Beryllium, Total	0.004	**0.00019 J**	0.001 U	0.001 U	0.001 U	**0.00018 J**	0.001 U
Cadmium, Total	0.005	0.001 U	**0.00022 J**	0.001 U	**0.00019 J**	**0.00022 J**	**0.00018 J**
Chromium, Total	0.1	0.0026 U	0.002 U	0.0034 U	**0.0067**	0.0033 U	0.002 U
Cobalt, Total	0.006	**0.00062 J+**	**0.0025**	**0.0044**	**0.0054**	**0.0031**	**0.00037 J**
Fluoride	4	**0.19 J+**	**0.13 J**	**0.51 J+**	**0.072 J**	**0.12 J+**	**0.24 J**
Lead, Total	0.015	0.001 U	**0.0011**	**0.0012**	**0.003**	0.001 U	**0.00046 J**
Lithium, Total	0.04	**0.33**	**0.056**	**0.0031 J**	**0.0093**	**0.047**	**0.41**
Mercury, Total	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum, Total	0.1	**0.34**	**0.83**	**0.0099**	**0.012**	**0.86**	**0.31**
Selenium, Total	0.05	0.005 U	**0.0041 J**	0.005 U	**0.007**	0.005 U	**0.0062**
Thallium, Total	0.002	0.001 U	0.001 U	0.001 U	0.001 U	**0.00013 J**	0.001 U
Radiological (pCi/L)							
Radium-226	NA	**1.31 ± 0.47**	0.0977 U ± 0.0836	**0.443 ± 0.148**	**0.295 ± 0.143**	**0.46 ± 0.24**	**1.14 ± 0.204**
Radium-228	NA	**1.76 ± 0.58**	0.282 U ± 0.258	0.0635 UJ ± 0.848	0.431 U ± 0.358	**0.88 ± 0.42**	**1.28 ± 0.323**
Radium-226 & 228	5	**3.07 ± 0.747**	0.380 U ± 0.271	0.506 UJ ± 0.861	**0.726 ± 0.386**	**1.34 ± 0.484**	**2.42 ± 0.382**
Field Parameters							
Temperature (Deg C)	NA	**20.34**	**19.12**	**29.13**	**22.28**	**18.71**	**18.19**
Dissolved Oxygen, Field (mg/L)	NA	**0.03**	**0.16**	**2.9**	**1.41**	**0.04**	**0.07**
Conductivity, Field (mS/cm)	NA	**2.6443**	**2.7861**	**1.409**	**2.2261**	**3.0502**	**3.1838**
ORP, Field (mv)	NA	**-182**	**-26.4**	**-98**	**-106.6**	**-231.7**	**-107.2**
Turbidity, Field (NTU)	NA	**35.69**	**43.2**	**40.92**	**112.99**	**25.06**	**12.85**
pH, Field (SU)	NA	**7.36**	**7.06**	**7.04**	**7.06**	**7.14**	**6.77**

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.

- 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

CCR-AP-11 MONITORING WELL

CCR-AP-6I NATURE AND EXTENT MONITORING WELL

APPROXIMATE UNIT BOUNDARY

APPROXIMATE PROPERTY BOUNDARY

NOTES

1. ALL LOCATIONS ARE APPROXIMATE
2. CCR COAL COMBUSTION RESIDUALS
3. AERIAL IMAGERY SOURCE: ESRI

N

0 220 440

SCALE IN FEET

HALEY ALDRICH

SOUTHERN INDIANA GAS AND ELECTRIC COMPANY
F.B. CULLEY GENERATING STATION
NEWBURGH, INDIANA

GROUNDWATER MONITORING WELL LOCATIONS

JANUARY 2020

FIGURE 1

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\Projects\Western_Corporation\42796_Evansville_CCR_GWMP_Development\Global\GIS\Maps\2020_01\129420_001_0001_MONITORING_WELL_LOCATIONS_CULLEY.mxd — USER: afeigl — LAST SAVED: 1/10/2020 2:01:30 PM

APPENDIX A

Alternate Source Demonstration

HALEY ALDRICH

HALEY ALDRICH

www.haleyaldrich.com

REPORT ON

F.B. CULLEY GENERATING STATION
EAST ASH POND – ALTERNATE SOURCE DEMONSTRATION
NEWBURGH, INDIANA

by
Haley & Aldrich, Inc.
Cleveland, Ohio

for
Southern Indiana Gas and Electric Company
Evansville, Indiana

File No. 129420
September 2019

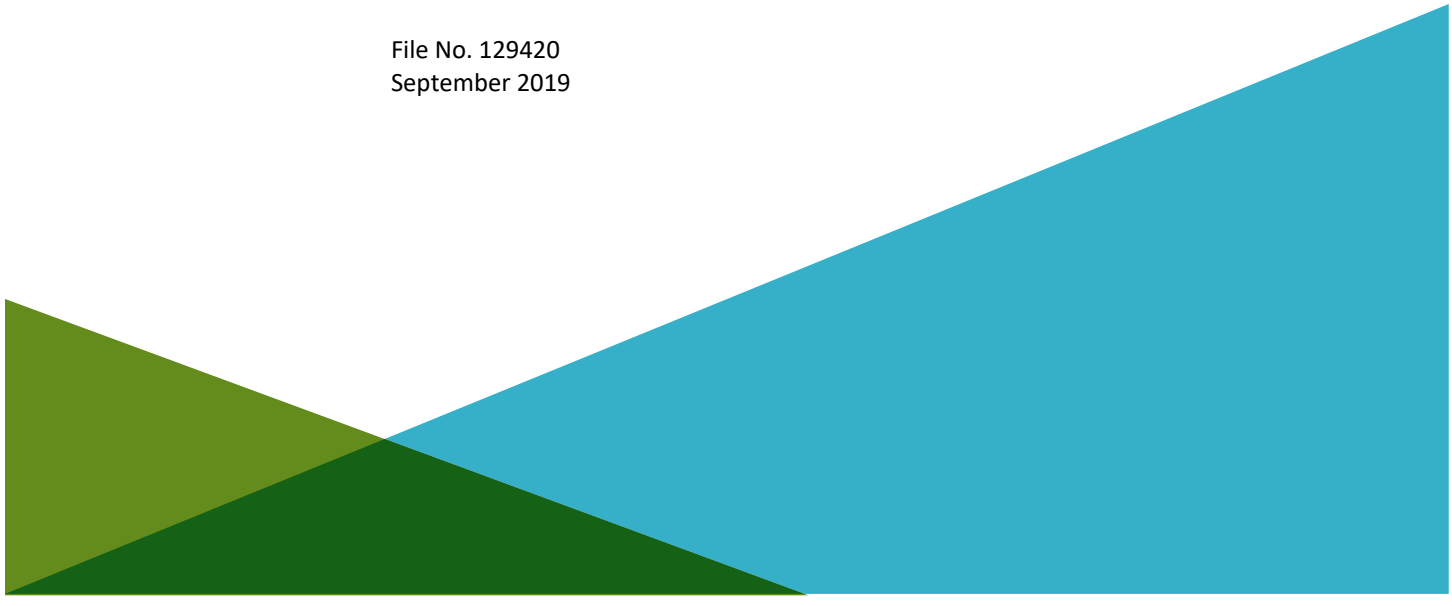


Table of Contents

List of Tables

List of Figures

List of Acronyms and Abbreviations

Abbreviation	Definition
As	Arsenic
ASD	Alternate Source Demonstration
CCR	Coal Combustion Residual
DOC	Dissolved Organic Carbon
EAP	East Ash Pond
Eh	Hydrogen Electrode
FBC	F.B. Culley Generating Station
Fe	Iron
GWPS	Groundwater Protection Standards
Haley & Aldrich	Haley & Aldrich, Inc.
ORP	Oxidation Reduction Potential
SIGECO	Southern Indiana Gas and Electric Company
Site	F.B. Culley Generating Station
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
USEPA	United States Environmental Protection Agency

1. Introduction

Haley & Aldrich, Inc. (Haley & Aldrich) prepared this Alternate Source Demonstration (ASD) for Southern Indiana Gas and Electric Company (SIGECO) for the East Ash Pond (EAP) at the F.B. Culley Generating Station (FBC or "Site"). SIGECO has been monitoring groundwater at the EAP to comply with the United States Environmental Protection Agency (USEPA) Coal Combustion Residual (CCR) Rule effective 19 October 2015 (Rule). This ASD documents that a source other than the CCR unit caused the statistically significant level (SSL) of arsenic identified at the EAP consistent with 257.95 (g)(3)(ii).

1.1 SITE DETAILS

The FBC was constructed in 1953 with design plans prepared by Commonwealth and Associates Inc. Plant development involved excavating a portion of the hillsides to the north and placing the material as fill to the south of the current facility and EAP. Little Pigeon Creek originally flowed east-to-west across the property. To facilitate construction of the generating station, Little Pigeon Creek was diverted, joining the Ohio River near the southeastern property boundary in the vicinity of the EAP. As a result, the soil conditions beneath the EAP are represented by depositional environments associated with the former Little Pigeon Creek rather than the Ohio River floodplain. SIGECO currently owns and operates the Site and supplies electric power to the industrial, commercial, and residential customers in its service territory. The Site utilizes two coal-fired units to generate power utilizing steam. CCR is currently managed on the Site in the 9.8-acre EAP (Figure 1).

The EAP was constructed in 1971 at the base of the upland area, located north of the floodplain, overlying Ohio River alluvial deposits. The eastern and southern banks are earthen dikes constructed during the development of the generating station and diversion of Little Pigeon Creek in 1953. Modifications to the East Ash Pond occurred from 1992 to 1993 by filling an approximately 14,000 square-foot area in the southwest corner to build a pad for new scrubber silos.

1.2 CCR RULE REQUIREMENTS

USEPA regulations regarding assessment monitoring programs for CCR landfills and surface impoundments provide owners and operators with the option to make an ASD when an Appendix IV constituent is identified at a SSL above the groundwater protection standard (GWPS) (40 CFR 257.95(g)(3)(ii)). According to the Rule, an owner or operator may:

- Demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase (SSI) resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Any such demonstration must be supported by a report that includes the factual or evidentiary basis for conclusions and must be certified to be accurate by a qualified professional engineer.

An evaluation was completed to assess possible alternate sources to which the identified SSLs could be attributed to the EAP at FBC.

1.3 SITE GEOLOGY

The EAP at FBC is located within the Ohio River valley which contains naturally occurring alluvial (stream) and loess (windblown) deposits derived indirectly from continental ice sheets. These sediments were transported in meltwater heavily loaded with entrained sediments that accumulated on top of the Pennsylvanian age shale, limestone and sandstone bedrock. Westerly winds simultaneously deposited silty sediments in the upland areas adjacent to the stream valley. As a result, base levels of the valley floor increased in elevation and created natural levees and outwashes. These natural levees produced slackwater lakes which deposited thick sequences of silt and clay adjacent to the river channel. When the ice sheets retreated, the sediment load in the Ohio River diminished and lowered base levels. Consequently, the river incised the slackwater lake sediments, sculpted lacustrine terraces, and deposited sand and gravel stream alluvium.

Soil types described in boring logs from monitoring wells installed in the vicinity of the EAP, as well as boring logs generated from geotechnical explorations conducted by AECOM indicate that the uppermost aquifer is comprised of a layered sequence of unconsolidated deposits consisting primarily of clay and silt associated with the slackwater lakes. Abundant black wood fragments are present in the uppermost aquifer along the southern berm of the EAP associated with former Little Pigeon Creek. This unconsolidated overburden overlies Pennsylvanian age sandstone which overlies shale. During construction of the facility and EAP, the northern portion of the pond was incised into bedrock.

Bedrock around FBC belongs to the Carbondale Group. The Group consists of Pennsylvanian age sandstone, limestone, shale and coal. The Group ranges from 260 to 470 feet thick but on average is approximately 300 feet thick. The Carbondale Group includes laterally persistent limestone units and four of Indiana's commercially important coal seams. Laterally continuous shale beds are associated with the coal formations.

The uppermost aquifer on the northern side of the EAP in the vicinity of CCR-AP-5 is located within the Pennsylvanian sandstone, which contains a coal seam. A soil boring (HASB-1) completed during the ASD indicates the coal seam is laterally continuous in the vicinity of the EAP. In the upland area to the northeast of the EAP, the top of bedrock is represented by sandstone. In CCR-AP-1R and CCR-AP-9 the sandstone has interbedded very fine organic-rich layers containing mica and pyrite. The sandstone unit and the coal seam are not present along the Ohio River where the bedrock is more deeply eroded, and the top of bedrock is represented by gray shale.

1.4 HYDROGEOLOGY

In the vicinity of the EAP, the uppermost aquifer occurs within unconsolidated Ohio River and Little Pigeon Creek alluvial deposits consisting of silt and clay with discontinuous interbedded layers of sand. To the north of the EAP the uppermost aquifer occurs in the shale and sandstone bedrock units. Recharge to the surficial aquifer occurs through direct surface infiltration.

Piezometric data recorded from the monitoring wells installed on-site indicates that the configuration of the uppermost aquifer is primarily controlled by the Ohio River. Groundwater flow in the immediate vicinity of the EAP is radial with an overall flow direction from the upland areas north of the EAP to the south toward the Ohio River (**Figure 2**). Groundwater elevations vary seasonally but the groundwater flow patterns remain consistent.

1.5 SCOPE AND OBJECTIVE

The overall objective of this investigation is to determine if a naturally occurring source of arsenic exists within the vicinity of the EAP, as well as to characterize the naturally occurring geochemical conditions present within the uppermost aquifer system that are responsible for the mobilization of naturally occurring arsenic.

2. Alternate Source Demonstration for Arsenic

Arsenic geochemistry was evaluated in surface water, porewater, soil and groundwater; and all lines of evidence indicate that arsenic found in groundwater is associated with the reductive dissolution of naturally occurring arsenic and not arsenic related to the EAP. These mechanisms, and the lines of evidence that support them, are described below.

2.1 DATA COLLECTION ACTIVITIES

The ASD included the installation of five (5) temporary monitoring wells (PW-1, PW-1D, PW-2, PW-2D and HASB-1) at the EAP in August 2019 to supplement the sampling results that were obtained from the existing CCR monitoring well network installed at the EAP. In addition, samples of soil, groundwater, and porewater from the EAP were collected and analyzed in August 2017 and November 2018 to determine if conditions within and surrounding the EAP could be releasing naturally occurring arsenic into groundwater. Surface water samples were also collected at this time to establish baseline water quality conditions in the EAP.

Five temporary monitoring wells were also installed southeast of Little Pigeon Creek to further evaluate the naturally occurring geological conditions along the Ohio River floodplain that could contribute to the occurrence of arsenic in groundwater. However, due to an extended period of time where the Ohio River was at flood stage, the proposed sampling locations southeast of Little Pigeon Creek could not be accessed and the ASD could not be completed prior to the April 15, 2019 deadline to initiate an assessment of corrective measures. As previously stated, the depositional environment encountered and resulting geochemistry represented by the Ohio River deposits were different than the depositional environment of Little Pigeon Creek found beneath the EAP. Therefore, data generated from these locations were not representative of the conditions in the vicinity of the EAP and were not included in the ASD evaluation.

This comprehensive approach was used to provide a defensible basis for evaluating the potential for an alternate source for the elevated levels of arsenic in CCR groundwater compliance wells associated with the EAP. The ASD evaluation included:

- The collection and analysis of soil samples from soil borings co-located with monitoring wells CCR-AP-2, CCR-AP-3, CCR-AP-4, CCR-AP-6 and CCR-AP-8 to identify naturally occurring iron and arsenic-bearing mineralogy in the soil opposite the well screens where elevated levels of arsenic have been observed.

- Sampling and analysis of porewater from the EAP to assess whether arsenic was present at concentrations that represent a potential source of arsenic to groundwater beneath the pond.

- Collecting groundwater samples from four (4) monitoring wells (CCR-AP-2, CCR-AP-3, CCR-AP-6 and CCR-AP-8) to determine the geochemical conditions in the aquifer (e.g., to determine whether or not iron-reducing conditions are present that could serve as a mechanism for release of arsenic to groundwater).

- Analysis of surface water impounded in the EAP to determine the surface water baseline quality and the absence/presence of arsenic concentrations coincident with the groundwater sampling events.

- Measurement of groundwater and surface water elevations to determine groundwater flow directions and variation in water table elevation and potential influences in fluctuations of surface elevations of surrounding surface water boundaries (i.e. Ohio River).

Figure 1 shows the locations of the monitoring wells used in the ASD evaluation, as well as porewater, soil, and surface water sample locations. **Figure 2** shows the potentiometric surface map for the EAP.

Groundwater sampling depths and well information is summarized in **Table 1A** while soil boring information is provided in **Table 1B**. Analytical results for groundwater are summarized in **Table 2**, surface water in **Table 3,** and porewater in **Table 4**. Soil analytical results are summarized in **Table 5**.

2.2 RESULTS AND TECHNICAL DISCUSSION

An alternate source of arsenic has been identified for the EAP. This section presents the data, technical analysis, and geochemical lines of evidence to support the ASD for the EAP.

- Iron oxyhydroxides constitute the most common source of naturally occurring arsenic in groundwater. This is due to reductive dissolution that occurs following the reaction of naturally occurring iron oxyhydroxides with organic carbon which releases arsenic into solution. This mechanism occurs within the sandstone and clay units exposed to reducing conditions along the groundwater flow path. The oxidation of sulfide minerals such as pyrite sourced from naturally occurring coal seams and shale deposits is another major source of naturally occurring arsenic. This mechanism has been well documented at many locations where gray to black marine shales are observed in the subsurface [Korte (1991), Matisoff et. al. (1982), Welch and Stollenwerk (2002)].

- Arsenic exists in nature in the oxidation states +V (arsenate), +III (arsenite), 0 (arsenic) and -III (arsine). During the ASD study, arsenic was detected in surface water, porewater, and groundwater samples. The geochemistry and origin of arsenic in these samples are provided below.

    - Arsenic speciation results for surface water, porewater, and groundwater are provided in the depth profiles in **Figure 3A**. Arsenic detected in surface water and porewater samples are predominantly arsenate (As (V)), conversely groundwater samples are predominately arsenite (As (III)). These differences in speciation are due to a different source of arsenic in groundwater. Naturally occurring arsenic is mobilized in groundwater due to reaction with naturally elevated concentrations of organic carbon, evidenced by the significant increase in total organic carbon (TOC) and dissolved organic carbon (DOC) in **Figure 3B** between surface/porewater samples and shallow groundwater samples. Because the EAP is significantly elevated in total dissolved solids (TDS), this provides a good chemical indicator for surface water contributions and is therefore plotted alongside TOC/DOC concentrations in **Figure 3B** as a differentiator. Inconsistent with TOC/DOC concentrations, TDS concentrations decrease by almost an order of magnitude between surface water samples and groundwater samples.

- In most natural aqueous systems, arsenic exhibits anionic behavior. The speciation and mobilization of arsenic in groundwater is controlled by two variables, pH and oxidation reduction potential (ORP) according to the standard hydrogen electrode (Eh). A Site-specific Eh-pH diagram constructed using water quality from the 2018 groundwater monitoring event is shown in **Figure 4**. Groundwater samples from upgradient wells (CCR-AP-1R, CCR-AP-7, and CCR-AP-9) and downgradient wells (CCR-AP-2, CCR-AP-3, CCR-AP-4, CCR-AP-5, and CCR-AP-8) collected for two 2018 sampling events (June and August) are plotted to predict the geochemical state of arsenic. In general, the results are consistent with the speciation results described above. Under oxidizing conditions with neutral pH, arsenic is typically found in the solid phase bound to iron oxyhydroxides (**Figure 4**). Under reducing conditions typically found in upgradient and downgradient groundwater (Eh < 0 Volts), arsenic is typically found in its mobilized, arsenite (+III) state. These observations suggest that the reducing conditions necessary to mobilize arsenic are naturally occurring, because they are observed in both upgradient and downgradient wells. Combined with the elevated soil concentrations of arsenic collected at upgradient location HASB-1 (18 mg/Kg, highest soil concentration for any upgradient or downgradient location), these are strong lines of evidence that indicate the sources and the conditions necessary for mobilizing arsenic are naturally occurring. The reductive mobilization pathway responsible for the occurrence of arsenic in groundwater is shown on **Figure 4** (blue arrow), which shows that the solubility of arsenic in groundwater is entirely controlled by naturally occurring oxidation reduction conditions. This conclusion is strongly supported by the relationship shown in **Figure 5** between groundwater arsenic and DOC (A), TOC (B), and dissolved iron (Fe) (C) concentrations; which shows that all elevated arsenic concentrations correlate to elevated DOC, TOC, and Fe concentrations indicative of naturally reducing conditions.

- Because arsenic was detected in surface water and porewater within the pond, further analysis was warranted. Unlike groundwater where arsenic mobility is controlled by redox conditions, arsenic is controlled in the vadose zone by pH conditions. Arsenic was present in surface water and porewater as arsenate (+V) (**Figure 3**), because solubility was controlled by elevated pH conditions. Surface water samples and porewater samples exhibited pH measurements greater than ten standard units with measured Eh values greater than zero volts. Because arsenic acts as an oxyanion, it demonstrates amphoteric solubility, and some arsenic does mobilize under high pH conditions observed in the vadose zone. However, as porewater mixes with groundwater in the capillary fringe, the rapid decrease in pH to neutral conditions creates geochemical conditions that precipitate arsenic out of solution and decrease mobility.

- Appendix III parameters (boron, sulfate and TDS) which demonstrated an SSI during Detection Monitoring and triggered Assessment Monitoring of Appendix IV parameters were used as geochemical differentiators to support the naturally occurring arsenic assessment provided above. Boron, sulfate, and TDS demonstrated SSIs and can therefore provide a useful bivariate analysis with arsenic to differentiate between anthropogenic sources (EAP) and naturally occurring sources (reductive dissolution, pyrite oxidation). Arsenic sourced from the EAP should correlate to elevated boron, sulfate, and TDS concentrations. Conversely, naturally occurring arsenic should correlate with lower boron, sulfate, and TDS reflective of background conditions. **Figure 6** provides the bivariate analysis of boron (A), sulfate (B), and TDS (C) concentrations against arsenic concentrations in all EAP groundwater samples collected between 2016 and 2018. The arsenic maximum contaminant level of 0.01 mg/L is provided (red line) for context.

All samples with elevated concentrations of arsenic correlate to low concentrations of boron, sulfate, and TDS. Samples exhibiting elevated concentrations of boron, sulfate, and TDS correspond to significantly lower concentrations of arsenic.

3. ASD Conclusions and Discussion

Arsenic geochemistry was evaluated in surface water, porewater, soil and groundwater; and all lines of evidence indicate that arsenic found in groundwater is associated with the reductive dissolution of naturally occurring arsenic and not arsenic related to the EAP. These mechanisms, and the lines of evidence that support them are recapped below. The certification statement is provided in Appendix C.

3.1 GEOLOGIC LINES OF EVIDENCE

The goals of this ASD were to 1) identify if a naturally occurring alternate source of arsenic was present, and 2) determine if naturally occurring reducing agents could mobilize the naturally occurring arsenic in groundwater. A review of the site-specific geology records for on-Site boreholes was conducted, and indicate that naturally occurring arsenic, and naturally reducing conditions responsible for the mobilization of naturally occurring arsenic exist in the vicinity of the EAP. The result of this review demonstrates that an alternate source of arsenic is present and is the source of the SSL determined during the Assessment Monitoring program conducted at the Site.

Findings that support this conclusion are summarized below:

1. Moderately weathered yellow brown to red fine-grained sandstone present in most lithology logs indicates an abundance of iron oxides, and the presence of naturally occurring arsenic bound to these oxides.
2. Black organic layer below the sandstone, likely coal, is a naturally occurring source of pyrite and arsenic and is a naturally occurring geochemical reducing agent that can mobilize naturally occurring arsenic through reductive dissolution.
3. Shale present in lithology logs is a possible naturally occurring source of arsenic and organics. Dark gray to black shale is a known source of naturally occurring arsenic and organic carbon (Pratt et. al., 1992).
4. Wood fragments observed ubiquitously in various layers. Wood is a geochemical reducing agent.
5. Most shallow wells were completed in gray lean clay with wood fragments and other organics associated with Little Pigeon Creek deposits.

3.2 SOIL LINES OF EVIDENCE

Soil data supports geologic lines of evidence summarized above with the following additional lines of evidence:

1. High TOC concentrations in CCR-AP-6I, CCR-AP-8I at 68 to 70 feet (3600 to 6400 mg/Kg), and high concentrations of organic carbon in HASB-1 (20 percent organic carbon) (upgradient location) from 35 to 38 feet indicates the presence of a naturally-occurring reducing agent that would create groundwater geochemical conditions necessary for reductive dissolution of iron oxides and iron oxyhydroxides, and subsequently the mobilization of naturally occurring arsenic into groundwater.

2. Elevated arsenic concentrations in soil samples obtained at HASB-1.

3.3 SURFACE WATER LINES OF EVIDENCE

Surface water in the pond is characterized by low arsenic concentrations; high concentrations of TDS, sulfate, and boron; and low TOC and DOC concentrations. Because TDS, sulfate, and boron tend to remain in solution, they were used as a geochemical fingerprinting tool to differentiate between anthropogenic and naturally occurring sources. Groundwater samples with elevated TDS, sulfate, and boron exhibit low concentrations of arsenic. Conversely, groundwater samples with elevated arsenic concentrations exhibit low TDS, sulfate, and boron. This method of geochemical differentiation is a widely recognized method [Myers and Thrbjornsen (2010); Thorbjornsen and Myers (2007)] and demonstrates that an alternate source exists for arsenic.

3.4 POREWATER LINES OF EVIDENCE

1. Low TOC and DOC (source of organic carbon in aquifer is naturally occurring and not originating from the EAP or fill material)
2. Majority (78 to 100 percent) of arsenic is present in the form of arsenate (As V), and likely attenuated at Vadose Zone/ Groundwater interface within capillary fringe due to lower pH conditions.

3.5 GROUNDWATER LINES OF EVIDENCE

The results of the analysis of groundwater samples collected for this ASD were combined with the available groundwater dataset from the semi-annual assessment monitoring program to make the following conclusions:

1. Elevated DOC and TOC concentrations in groundwater is naturally occurring.
2. Elevated As correlates to elevated TOC; i.e. arsenic is observed in wells with high TOC concentrations.
3. Elevated As correlates to elevated DOC; i.e. arsenic is observed in wells with high DOC concentrations.
4. The bivariate relationship between the geochemical indicator parameters and arsenic is a good geochemical differentiator that demonstrates an alternative source. Boron, sulfate, and TDS concentrations were used as a geochemical forensic tool to differentiate between anthropogenic source (EAP) and an alternative naturally occurring source(s) (reductive dissolution, pyrite oxidation) for arsenic. These analytes are useful indicator parameters and were used to trace the contribution of surface water to groundwater. A review of the bivariate relationships between arsenic and these three indicator parameters clearly demonstrate that a naturally occurring alternative source of arsenic is present within the groundwater bearing zone.
5. Majority of arsenic is present in groundwater as arsenite (As (III)), and likely mobilized from reductive dissolution of a naturally occurring source. This is opposed to the majority of arsenic in the vadose zone and surface water samples is present as arsenate (As V).
6. Site specific Eh-pH diagrams generated for the EAP show reducing conditions and arsenic present in its mobilized form at most upgradient background locations.

4. References

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Tables

TABLE 1A

ASD BOREHOLE AND WELL SUMMARY TABLE
GROUNDWATER SAMPLING
F.B. CULLEY GENERATING STATION - EAST ASH POND
NEWBURGH, INDIANA

Location Name	Date of Completion	Top of Casing Elevation (ft msl)	Screen Zone (ft bgs)	Screen Zone Elevation (ft msl)	Depth to Water (ft btoc)*	Groundwater Elevation (ft msl)	Sample/Screen Zone Lithology
CCR-AP-1R	March 2016	441.64	55.00 - 65.00	386.64 - 376.64	54.20	387.44	Gray SHALE and SILTSTONE
CCR-AP-2	December 2015	393.97	36.00 - 46.00	357.97 - 347.97	34.02	359.95	Brown SILT
CCR-AP-3	December 2015	394.54	35.00 - 45.00	359.54 - 349.54	29.00	365.54	Brown CLAY
CCR-AP-4	December 2015	394.91	25.50 - 35.50	369.41 - 359.41	9.78	385.13	Brown CLAY
CCR-AP-5	December 2015	394.32	34.00 - 44.00	360.32 - 350.32	10.86	383.46	Brown SANDSTONE
CCR-AP-5I	Janaury 2019	395.00	75.30 - 85.30	319.70 - 309.70	11.59	383.41	Gray SILTSTONE
CCR-AP-6	March 2016	396.71	35.50 - 45.50	361.21 - 351.21	38.20	358.51	Gray CLAY
CCR-AP-6I	November 2018	397.20	64.70 - 74.70	332.50 - 322.50	38.80	358.40	Brown and Gray SAND
CCR-AP-7	March 2016	434.11	20.00 - 30.00	414.11 - 404.11	10.21	423.90	Gray SILT and CLAY
CCR-AP-8	February 2017	393.83	35.50 - 45.50	358.33 - 348.33	26.86	366.97	Gray CLAY
CCR-AP-8I	November 2018	393.90	58.70 - 68.70	335.20 - 325.20	35.06	358.84	Gray SAND
CCR-AP-9	February 2017	448.69	60.00 - 70.00	388.69 - 378.69	61.31	387.38	Gray SANDSTONE
CCR-AP-10	Janaury 2019	402.40	40.20 - 50.20	362.20 - 352.20	45.18	357.22	Gray SHALE
CCR-AP-11	Janaury 2019	385.10	44.40 - 54.40	340.70 - 330.70	15.36	369.74	Gray SAND interbedded with gray CLAY
PW-1	August 2017	--	10.00 - 15.00	-- - --	--	--	Black Coal ASH
PW-1	August 2017	--	30.00 - 35.00	-- - --	--	--	Black Coal ASH
PW-2	August 2017	--	10.00 - 15.00	-- - --	--	--	Black Coal ASH
PW-2	August 2017	--	30.00 - 35.00	-- - --	--	--	Black Coal ASH
HASB-01	November 2018	--	30.00 - 40.00	-- - --	--	--	Gray LIMESTONE and Black COAL

NOTES:

*Depth to water measurements taken 6/12/2019
bgs = below ground surface
ft = feet
in = inches
btoc = below top of casing
msl = mean sea level
Datum of Elevations in NAVD 88

TABLE 1B

ASD BOREHOLE AND WELL SUMMARY TABLE
SOIL SAMPLING
F.B. CULLEY GENERATING STATION - EAST ASH POND
NEWBURGH, INDIANA

Location Name	Date of Completion	Top of Casing Elevation (ft msl)	Sample Depth (ft bgs)	Sample Elevation (ft msl)	Sample/Screen Zone Lithology
CCR-AP-2	December 2015	393.97	40.00 - 41.00	353.97 - 352.97	Brown SILT
CCR-AP-3	December 2015	394.54	40.00 - 41.00	354.54 - 353.54	Brown CLAY
CCR-AP-4	December 2015	394.91	31.00 - 32.00	363.91 - 362.91	Brown CLAY
CCR-AP-6	March 2016	396.71	40.00 - 41.00	356.71 - 355.71	Gray CLAY
CCR-AP-6I	November 2018	397.20	68.00 - 70.00	329.20 - 327.20	Brown and Gray SAND
CCR-AP-8	February 2017	393.83	40.00 - 41.00	353.83 - 352.83	Gray CLAY
CCR-AP-8I	November 2018	393.90	68.00 - 70.00	325.90 - 323.90	Gray SAND
HASB-01	November 2018	--	35.00 - 38.00	-- - --	Gray LIMESTONE and Black COAL

NOTES:

bgs = below ground surface
ft = feet
in = inches
btoc = below top of casing
msl = mean sea level
Datum of Elevations in NAVD 88

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL DATA
F.B. CULLEY GENERATING STATION - EAST ASH POND
NEWBURGH, INDIANA

Location Name	CCR-AP-2	CCR-AP-3	CCR-AP-5	CCR-AP-5	CCR-AP-5	CCR-AP-5I	CCR-AP-6	CCR-AP-6I	CCR-AP-6I	CCR-AP-8	CCR-AP-8I	CCR-AP-8I	CCR-AP-11	HASB-1
Sample Name	CCR-AP-2-20181115	CCR-AP-3-20181116	CCR-AP-4-20181115	CCR-AP-5-20181115	CCR-AP-5-20181217	CCR-AP-5I-20190213	CCR-AP-6-20181117	CCR-AP-6I-20181117	CCR-AP-6I-20190212	CCR-AP-8-20181116	CCR-AP-8I-20181117	CCR-AP-8I-20190212	CCR-AP-11-20190213	HASB-1-20181117
Sample Date	11/15/2018	11/16/2018	11/15/2018	11/15/2018	12/17/2018	02/13/2019	11/17/2018	11/17/2018	02/12/2019	11/16/2018	11/17/2018	02/12/2019	02/13/2019	11/17/2018
Lab Sample ID	180-84236-1	180-84236-5	180-84236-3	180-84236-2	180-85009-1	180-86762-1	180-84236-6	180-84236-7	180-86638-1	180-84236-4	180-84236-8	180-86638-2	180-86762-2	180-84236-9
Inorganic Compounds (mg/L)														
Antimony, Dissolved	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	-	0.002 U	0.002 U	-	0.002 U	0.002 U	-	-	0.0021
Arsenic, Dissolved	0.00098 J	0.07	0.083	0.0017	0.001	-	0.11	0.0029	-	0.08	0.0033	-	-	0.0024
Arsenic (III)-, Dissolved	0.0031	0.005 F1	0.0052	0.0012 J	-	-	0.014	0.005	-	0.0067	0.0012 J	-	-	0.0026
Arsenic (V), Dissolved	0.0021	0.0012 JF1	0.00076 J	0.0017 J	-	-	0.0022	0.0019 J	-	0.00086 J	0.0014 J	-	-	0.0009 J
Barium, Dissolved	0.039 B	0.38	0.54	0.035	0.076	-	0.56	0.1	-	0.46	0.28	-	-	0.081
Beryllium, Dissolved	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
Cadmium, Dissolved	0.001 U	0.001 U	0.001 U	0.001 U	0.00092 J	-	0.001 U	0.00014 J	-	0.001 U	0.001 U	-	-	0.001 U
Chromium, Dissolved	0.0013 J	0.0022	0.0019 J	0.0016 J	0.00098 J	-	0.0015 J	0.0013 J	-	0.0016 J	0.0013 J	-	-	0.0014 J
Cobalt, Dissolved	0.0084	0.005	0.0013	0.000076 J	0.0007	-	0.0032	0.0012	-	0.0052	0.00088	-	-	0.00059
Iron, Dissolved	0.061	50	76	0.022 J	0.05 U	-	42	0.11	-	88	18	-	-	0.099
Lead, Dissolved	0.001 U	0.001 U	0.001 U	0.000098 J	0.001 U	-	0.001 U	0.001 U	-	0.001 U	0.001 U	-	-	0.001 U
Lithium, Dissolved	0.005 U	0.005 U	0.0039 J	0.0074	0.067	-	0.005 U	0.041	-	0.005 U	0.42	-	-	0.048
Mercury, Dissolved	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	-	0.0002 U	0.0002 U	-	0.0002 U	0.0002 U	-	-	0.0002 U
Selenium, Dissolved	0.005 U	0.0021 J	0.001 J	0.0017 J	0.005 U	-	0.0016 J	0.005 U	-	0.0019 J	0.005 U	-	-	0.005 U
Thallium, Dissolved	0.001 U	0.001 U	0.001 U	0.001 U	0.000069 J	-	0.001 U	0.001 U	-	0.001 U	0.001 U	-	-	0.001 U
Antimony, Total	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00075 J	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0023
Arsenic, Total	0.0012	0.076	0.088	0.0027	0.0014	0.0007 J	0.11	0.0037	0.0048	0.1	0.004	0.00099 J	0.0026	0.0061
Arsenic (III)-, Total	-	-	-	-	0.0012 JH	-	-	-	-	-	-	-	-	-
Arsenic (V), Total	-	-	-	-	0.00085 JH	-	-	-	-	-	-	-	-	-
Barium, Total	0.043 B	0.45	0.58	0.05	0.08	0.037	0.58	0.11	0.052	0.58	0.3	0.21	0.092	0.13
Beryllium, Total	0.001 U	0.001 U	0.00018 J	0.000081 J	0.001 U	0.001 U	0.000083 J	0.001 U	0.001 U	0.001 U	0.000078 J	0.001 U	0.001 U	0.00083 J
Boron, Total	-	-	-	-	-	3.7	-	-	16	-	-	9.7	0.58	-
Cadmium, Total	0.00015 J	0.001 U	0.001 U	0.00023 J	0.00077 J	0.001 U	0.001 U	0.00015 J	0.00019 J	0.001 U	0.001 U	0.00022 J	0.001 U	0.00025 J
Calcium, Total	-	-	-	-	-	120	-	-	510	-	-	390	130	-
Chromium, Total	0.0019 J	0.0029	0.0062	0.0041	0.00067 J	0.002 U	0.0048	0.002	0.002 U	0.0024	0.0029	0.002 U	0.002 U	0.018
Cobalt, Total	0.0084	0.0055	0.003	0.00052	0.00071	0.00064	0.0044	0.0017	0.0019	0.0059	0.0016	0.00014 J	0.0016	0.0052
Iron, Total	0.7	54	81	1.2	0.082	-	44	1.2	-	100	20	-	-	11
Lead, Total	0.00053 J	0.00018 J	0.0029	0.0016	0.00021 J	0.001 U	0.0022	0.00084 J	0.0003 J	0.0005 J	0.001	0.001 U	0.00018 J	0.0056
Lithium, Total	0.005 U	0.005 U	0.0062	0.0085	0.067	0.03	0.0035 J	0.043	0.055	0.005 U	0.44	0.37	0.0077	0.064
Manganese, Total	27	0.95	0.8	0.032	5.3	-	0.84	8.6	-	6.4	3.2	-	-	0.75
Mercury, Total	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	-	0.0002 U	0.0002 U	-	0.0002 U	0.0002 U	-	-	0.0002 U
Molybdenum, Total	0.00091 J	0.01	0.00076 J	0.0094	0.25	0.0054	0.027	0.63	0.75	0.0095	0.36	0.67	0.0049 J	0.038
Selenium, Total	0.005 U	0.0021 J	0.0011 J	0.0017 J	0.001 J	0.005 U	0.0016 J	0.005 U	0.005 U	0.0019 J	0.005 U	0.005 U	0.005 U	0.0014 J
Thallium, Total	0.001 U	0.001 U	0.001 U	0.000066 J	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	0.00024 J
Other														
Alkalinity, Total (as CaCO3) (mg/L)	590	1100	960	130	270	-	1000	130	-	1300	220	-	-	570
Dissolved Organic Carbon (DOC) (mg/L)	3.5	75	27	3.7	2.4	-	51	4.6	-	58	3.9	-	-	1.7
Total Dissolved Solids (TDS) (mg/L)	1500	990	880	310	1600	960	1000	1500	2300	1200	2200	2300	680	730
Total Organic Carbon (TOC) (mg/L)	3	49	26	3	2.5	-	68	2.9	-	41	3.4	-	-	1.4
pH (lab) (SU)	-	-	-	-	-	7.3 HF	-	-	7.5 HF	-	-	7 HF	7.1 HF	-
Chloride, Dissolved (mg/L)	-	-	-	-	160	-	-	-	-	-	-	-	-	-
Fluoride, Dissolved (mg/L)	0.35	0.44	0.41	1.5	1.1	-	0.59	0.14	-	0.34	0.27	-	-	0.47
Sulfate, Dissolved (mg/L)	-	-	-	-	670	-	-	-	-	-	-	-	-	-
Chloride (mg/L)	160	26	28	3	170	82	43	120	170	16	300	370	11	6.5
Fluoride (mg/L)	0.32	0.37	0.34	1.4	1.1	0.34	0.44	0.13	0.16 J	0.25	0.26	0.27	0.97	0.47
Sulfate (mg/L)	450	0.65 J	8.9	150	700	390	1.6	790	1300	1.1	1000	1100	360	110
Radiological (pCi/L)														
Radium-226	-	-	-	-	-	0.274 ± 0.188	-	-	0.203 ± 0.0906	-	-	1.25 ± 0.222	0.283 ± 0.171	-
Radium-228	-	-	-	-	-	0.189 U ± 0.213	-	-	0.460 ± 0.246	-	-	1.87 ± 0.412	0.0228 U ± 0.24	-
Radium-226 & 228	-	-	-	-	-	0.463 U ± 0.284	-	-	0.664 ± 0.262	-	-	3.12 ± 0.468	0.305 ± 0.295	-

ABBREVIATIONS AND NOTES:
mg/L: milligram per liter
NA: Not Applicable
pCi/L: picoCurie per liter

QUALIFIERS:
B: Compound was found in the blank and sample.
F1: MS and/or MSD Recovery is outside acceptance limits.
H: Sample was prepped or analyzed beyond the specified holding time
HF: Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J: value is estimated
U: Not detected value is the laboratory reporting limit

TABLE 3
SUMMARY OF SURFACE WATER ANALYTICAL RESULTS
F.B. CULLEY GENERATING STATION - EAST ASH POND
NEWBURGH, INDIANA

	Location Name	SW-A	SW-B	SW-C	SW-D
	Sample Name	SW-A-20170803	SW-B-20170803	SW-C-20170803	SW-D-20170803
	Sample Date	08/03/2017	08/03/2017	08/03/2017	08/03/2017
Inorganic Compounds (ug/L)	**Analytical Method**				
Arsenic, Dissolved	SW6020	**2.7**	**2.9**	**2.3**	**2.8**
Arsenic (III)-, Dissolved	E1632	**1.8 J**	**1.2 J**	**1.2 J**	2 U
Arsenic (V), Dissolved	E1632	**1.3 JF1**	**1.5 J**	**1 J**	**0.81 J**
Iron, Dissolved	SW6020	50 U	50 U	**44 J**	50 U
Manganese, Dissolved	SW6020	**5600**	**5900**	**34000**	**6100**
Molybdenum, Dissolved	SW6020	**35**	**35**	**81**	**38**
Arsenic, Total	SW6020	**3.5**	**3.2**	**3.4**	**4.1**
Iron, Total	SW6020	**470**	**290**	**2200**	**1700**
Manganese, Total	SW6020	**5600**	**6200**	**31000**	**6200**
Molybdenum, Total	SW6020	**33**	**35**	**78**	**37**
Other (mg/L)					
Chloride	SW9056A	**800**	**810**	**3500**	**810**
Sulfate	SW9056A	**1100**	**1200**	**5000**	**1200**
Total Dissolved Solids (TDS)	SM2540C	**3700**	**3500**	**17000**	**3500**
Total Organic Carbon (TOC)	SM5310C	**5.1**	**5.3**	**19**	**5.1**

Notes:
ug/L: microgram per liter.
mg/L: milligram per liter.

1. Results in bold are detected.
2. Qualifiers defined as follows:
   U: Not detected above the indicated reporting limit.
   F1: MS and/or MSD Recovery is outside acceptance limits.
   J: Estimated result

TABLE 4

SUMMARY OF POREWATER ANALYTICAL RESULTS
F.B. CULLEY GENERATING STATION - EAST ASH POND
NEWBURGH, INDIANA

	Location Group	SHALLOW		DEEP	
	Location Name	PW-1	PW-2	PW-1	PW-2
	Sample Name	PW-1-A-20170802	PW-2-A-20170802	PW-1-B-20170802	PW-2-B-20170803
	Sample Date	08/02/2017	08/02/2017	08/02/2017	08/03/2017
	Sample Depth (bgs)	10 - 15 (ft)	10 - 15 (ft)	30 - 35 (ft)	30 - 35 (ft)
Inorganic Compounds (ug/L)	**Analytical Method**				
Arsenic, Dissolved	SW6020	**8.8**	**7.1**	**220**	**280**
Arsenic (III)-, Dissolved	E1632	2 U	2 U	**8.8**	**31**
Arsenic (V), Dissolved	E1632	**4.1**	**1.7 J**	**120**	**110**
Iron, Dissolved	SW6020	50 U	**42000**	50 U	50 U
Manganese, Dissolved	SW6020	5 U	**7500**	**6.4**	**140**
Molybdenum, Dissolved	SW6020	**1900**	**310**	**9500**	**8900**
Arsenic, Total	SW6020	**36**	**87**	**230**	**260**
Iron, Total	SW6020	**5000**	**120000**	50 U	50 U
Manganese, Total	SW6020	**650**	**22000**	**6.3**	**140**
Molybdenum, Total	SW6020	**1900**	**81**	**9500**	**7600**
Other (mg/L)					
Chloride	SW9056A	**570**	**760**	**340**	**170**
Sulfate	SW9056A	**1100**	**3300**	**990**	**1600**
Total Dissolved Solids (TDS)	SM2540C	**3200**	**6400**	**2700**	**3300**
Total Organic Carbon (TOC)	SM5310C	**2**	**13**	**4.2**	**7.7**

Notes:
ug/L: microgram per liter.
mg/L: milligram per liter.

1. Results in bold are detected.
2. Qualifiers defined as follows:
   U: Not detected above the indicated reporting limit.
   J: Estimated result

TABLE 5
SUMMARY OF SOIL ANALYTICAL DATA
F.B. CULLEY GENERATING STATION
NEWBURGH, INDIANA

Location Name	CCR-AP-2	CCR-AP-3	CCR-AP-4	CCR-AP-6	CCR-AP-8	CCR-AP-6I	CCR-AP-8I	HASB-1
Sample Name	CCR-AP-2 (40-41)	CCR-AP-3 (40-41)	CCR-AP-4 (31-32)	CCR-AP-6 (40-41)	CCR-AP-8 (40-41)	CCR-AP-6I (68-70)	CCR-AP-8I (68-70)	HASB-1 (35-38)
Sample Date	08/01/2017	08/01/2017	08/01/2017	08/01/2017	08/01/2017	11/16/2018	11/15/2018	11/16/2018
Sample Depth (bgs)	40 - 41 (ft)	40 - 41 (ft)	31 - 32 (ft)	40 - 41 (ft)	40 - 41 (ft)	68 - 70 (ft)	68 - 70 (ft)	35 - 38 (ft)
Inorganic Compounds (mg/kg)								
Antimony	-	-	-	-	-	0.24 U	0.24 U	0.96
Arsenic	7.7	12	8.2	8.4	8.5	3.3	3.3	18
Barium	-	-	-	-	-	18	8	32
Beryllium	-	-	-	-	-	0.14	0.13	0.93
Cadmium	-	-	-	-	-	0.06 J	0.04 J	3.5
Chromium	-	-	-	-	-	4.9	4.7	29
Cobalt	-	-	-	-	-	4	2.5	13
Iron	26000	22000	24000	25000	27000	-	-	-
Lead	-	-	-	-	-	2.8	2.6	23
Lithium	-	-	-	-	-	2.3	2	21
Mercury	-	-	-	-	-	0.037 U	0.039 U	0.064
Molybdenum	-	-	-	-	-	3.1	12	25
Selenium	-	-	-	-	-	0.59 U	0.089 J	9.8
Thallium	-	-	-	-	-	0.039 J	0.035 J	1.1
Other								
Total Organic Carbon (TOC) (mg/kg)						3600	6400	200000
SPLP Inorganics (ug/L)								
Antimony	-	-	-	-	-	2 U	2 U	5.3
Arsenic	0.32 J	2.8	2.2	3.0	1.7	6.1	3.7	1.9
Barium	-	-	-	-	-	19	24	9.1 J
Beryllium	-	-	-	-	-	0.26 J	0.15 J	1 U
Cadmium	-	-	-	-	-	1 U	1 U	1 U
Chromium	-	-	-	-	-	12 B	9.3 B	4.6 B
Cobalt	-	-	-	-	-	3.1	1.2	0.099 J
Iron	71 J	290	31 U	440	32 J	-	-	-
Lead	-	-	-	-	-	3.9	2.2	0.31 J
Lithium	-	-	-	-	-	5.1	4.8 J	8.8
Mercury	-	-	-	-	-	0.2 U^	0.2 U^	0.2 U^
Molybdenum	-	-	-	-	-	47	160	210
Selenium	-	-	-	-	-	5 U	5 U	37
Thallium	-	-	-	-	-	1 U	1 U	1 U
SPLP Other								
Alkalinity, Bicarbonate (as CaCO3) (mg/	-	-	-	-	-	10	28	62
Alkalinity, Carbonate (mg/L)	-	-	-	-	-	18	16	14
Alkalinity, Phenolphthalein (mg/L)	-	-	-	-	-	9	8	7
Ammonia (mg/L)	-	-	-	-	-	0.1 U	0.1 U	0.079 J
Chloride (mg/L)	-	-	-	-	-	6.3	7.3	6.8
Fluoride (mg/L)	-	-	-	-	-	0.35	0.51	0.86
Nitrate (as N) (mg/L)	-	-	-	-	-	0.034 J	0.034 J	0.031 J
Sulfate (mg/L)	-	-	-	-	-	8.9	5.7	30

ABBREVIATIONS AND NOTES:
bgs: below ground surface
ft: feet
mg/Kg: milligram per kilogram
mg/L: milligram per liter
ug/L: microgram per liter

QUALIFIERS:
^: Instrument related QC is outside acceptance limits.
B: Compound was found in the blank and sample.
J: value is estimated
U: Not detected value is the laboratory reporting limit

Figures

LEGEND

- CCR MONITORING WELL
- NATURE AND EXTENT MONITORING WELL
- POREWATER SAMPLE
- SOIL BORING/ GROUNDWATER SAMPLE
- SURFACE WATER SAMPLE
- APPROXIMATE WASTE BOUNDARY OF EASTERN ASH POND
- F.B. CULLEY PROJECT BOUNDARY

NOTES

1. ALL LOCATIONS ARE APPROXIMATE
2. AERIAL IMAGERY SOURCE: ESRI

N

0 280 560

SCALE IN FEET

HALEY ALDRICH

F.B. CULLEY GENERATING STATION
EAST ASH POND
NEWBURGH, INDIANA

SITE MAP

SEPTEMBER 2019

FIGURE 1

GIS FILE PATH: \\haleyaldrichshare\boi_common\Projects\Vectren_Corporation\42796_Evansville_CCR_GWMP_Development\Global\GIS\Maps\2019_11\129420_001_0001_SITE_MAP.mxd — USER: hwaehholz — LAST SAVED: 11/27/2019 9:36:12 AM

LEGEND

- CCR MONITORING WELL
- GROUNDWATER ELEVATION CONTOURS, 1-FT INTERVAL
- INFERRED GROUNDWATER CONTOUR
- APPROXIMATE CCR BOUNDARY
- APPROXIMATE F.B. CULLEY PROJECT BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL
3. WATER LEVEL MEASURED 6/12/2019
4. AERIAL IMAGERY SOURCE: GOOGLE 2018

N

0 200 400

APPROXIMATE SCALE IN FEET

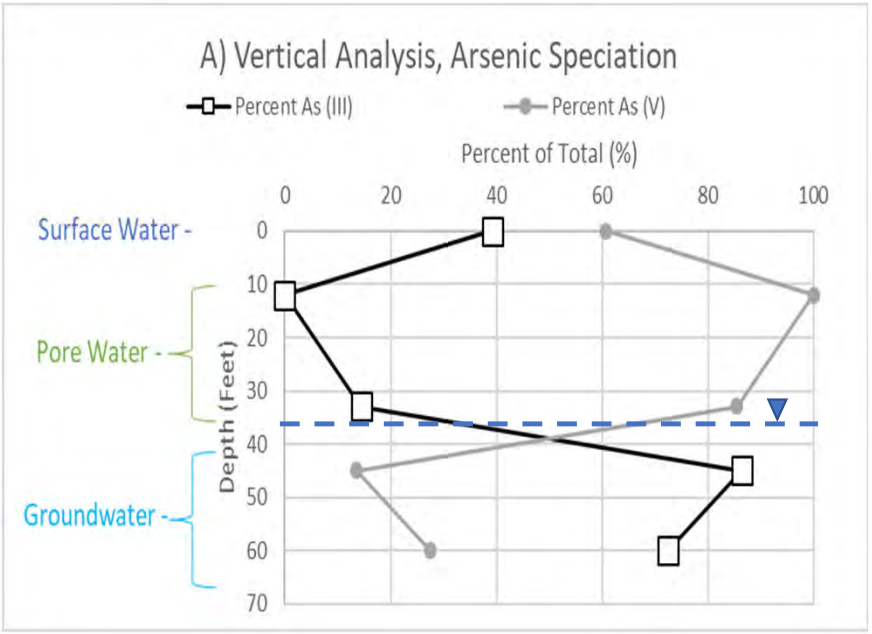
HALEY ALDRICH

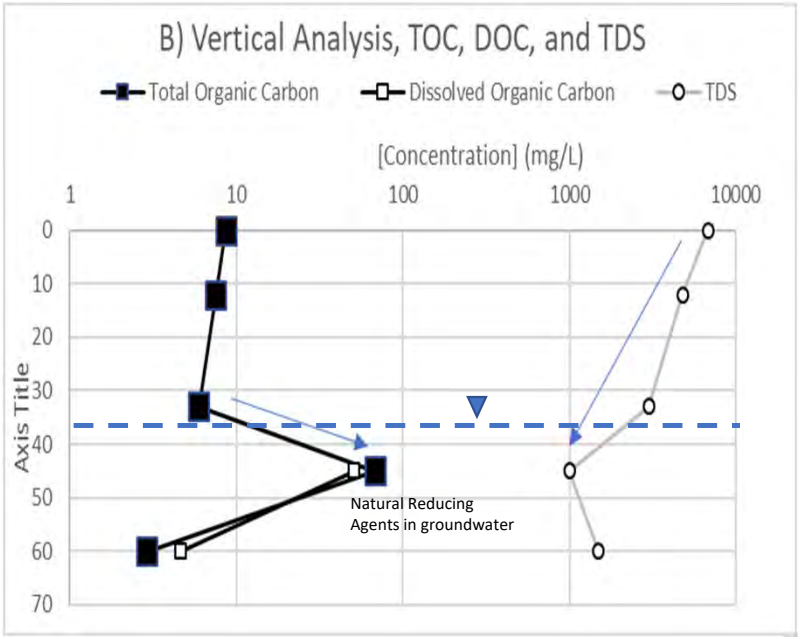
F.B. CULLEY GENERATING STATION
EAST ASH POND
NEWBURGH, INDIANA

POTENTIOMETRIC SURFACE MAP

SEPTEMBER 2019

FIGURE 2





Notes:
1) Dataset Used: ASD Dataset

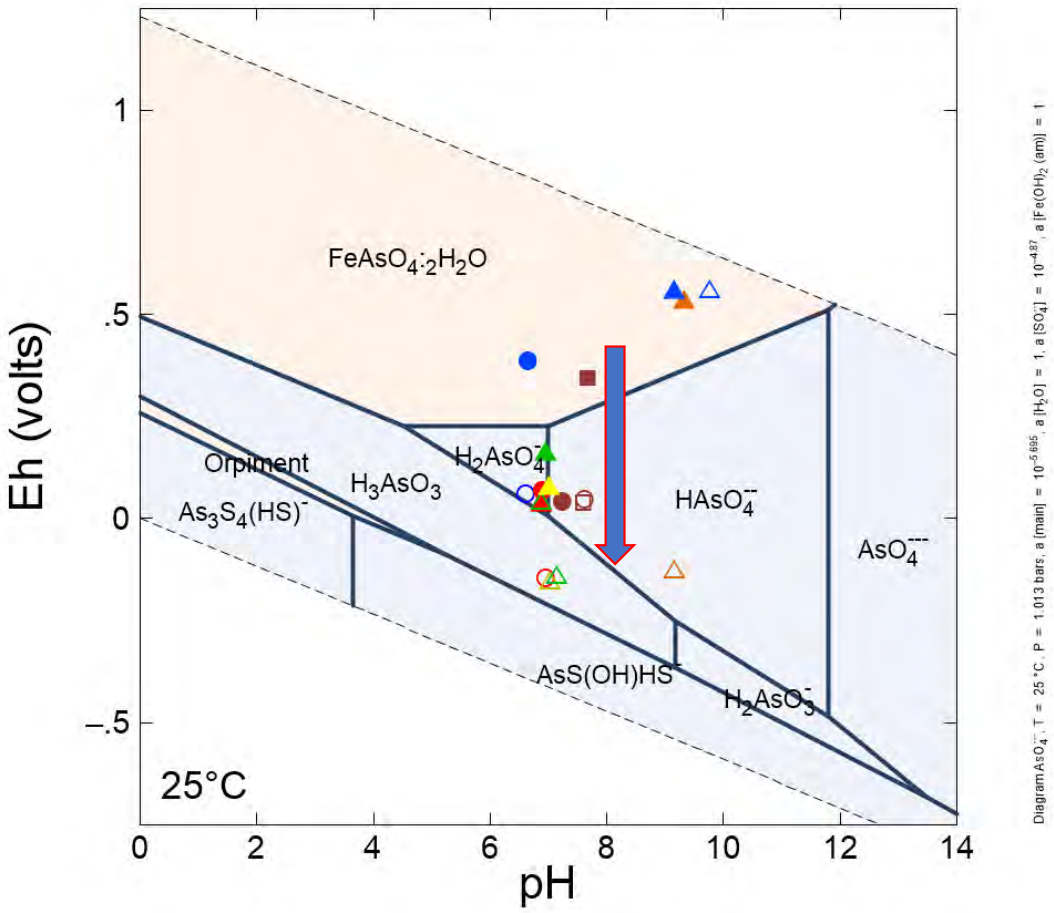
HALEY ALDRICH

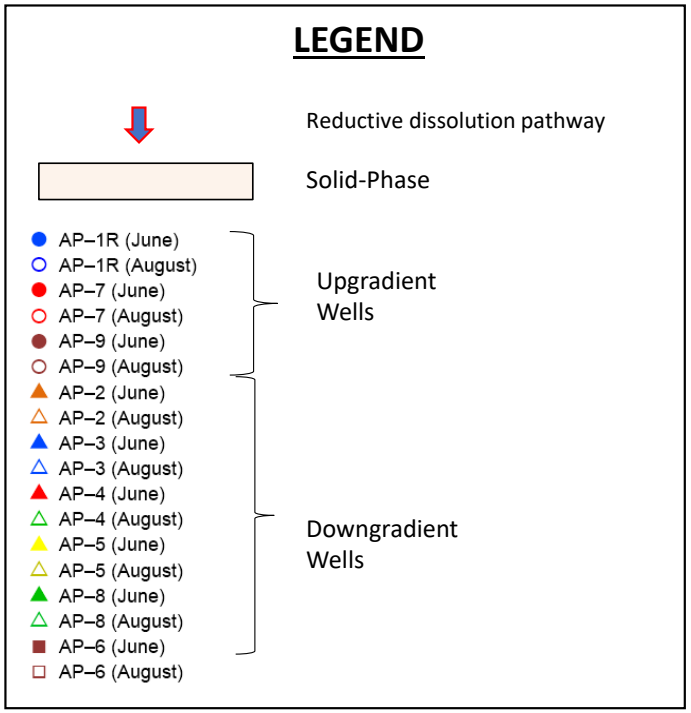
F.B. Culley Generating Station
East Ash Pond
Newburgh, Indiana

Vertical Analysis of
Arsenic And Differentiators

September 2019

FIGURE 3





Notes:

1) Field ORP measurements used as Standard Hydrogen Electrode (SHE).
2) Field pH measurements plotted for accuracy.
3) Assumptions: Solute activities = measured concentrations in mols/L
4) Modelled system Fe-As-S-O-H using Site-specific laboratory obtained data
5) Thermodynamic Database: Minteq.dat for GWB (Compiled by J.P. Gustafsson, 2005)
6) System in equilibrium with the amorphous $Fe(OH)_2$

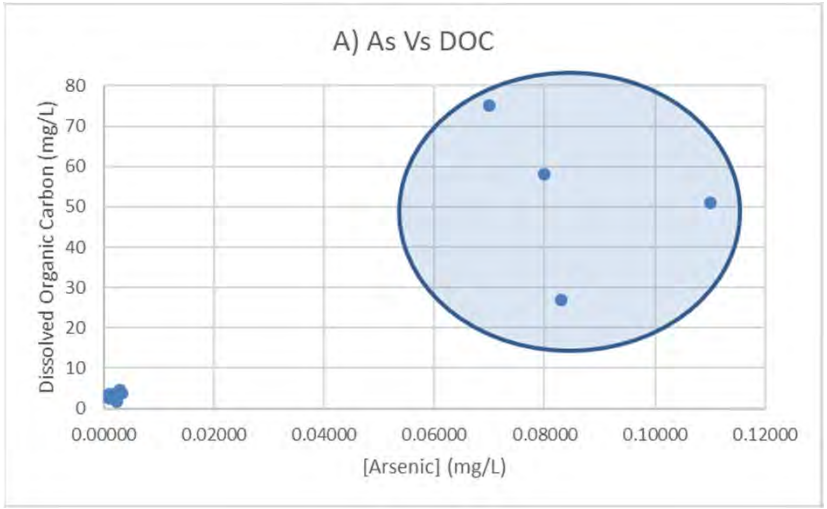
HALEY ALDRICH

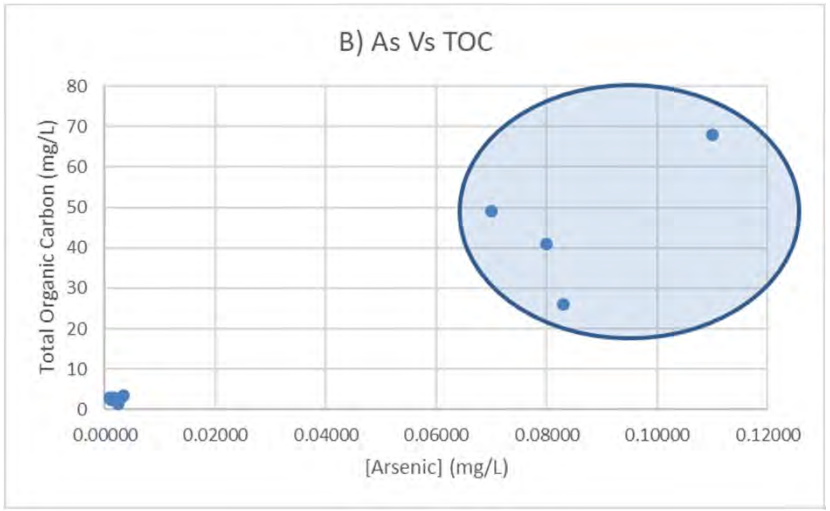
F.B. Culley Generating Station
East Ash Pond
Newburgh, Indiana

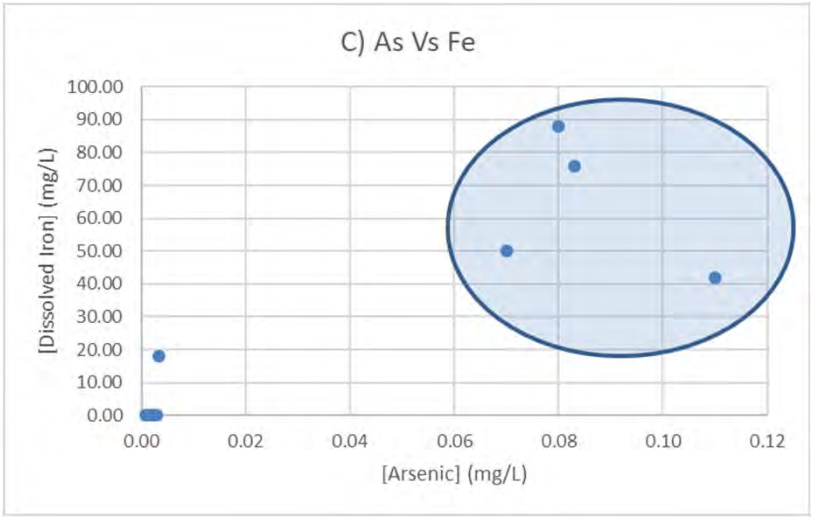
Eh-pH Stability Diagram of Arsenic

September 2019

FIGURE 4







Notes:
1) Dataset Used: ASD Dataset

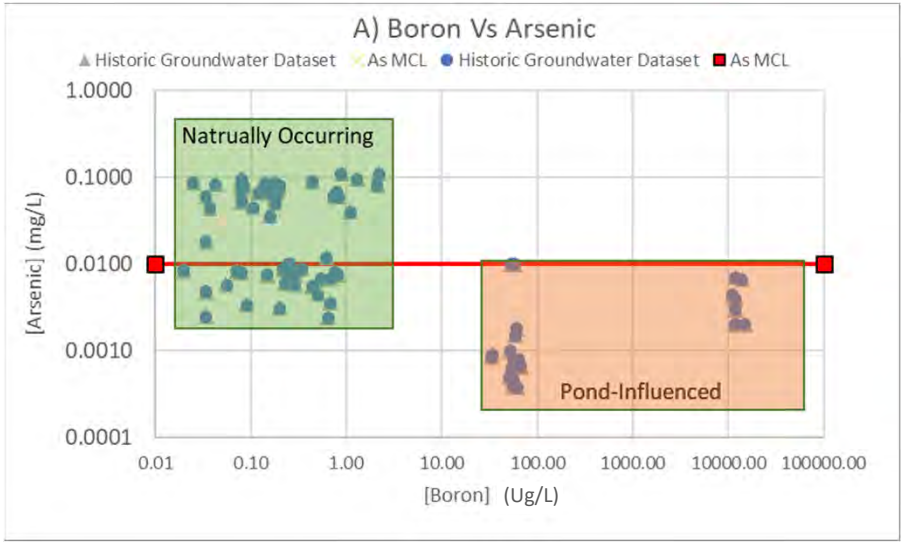
HALEY ALDRICH

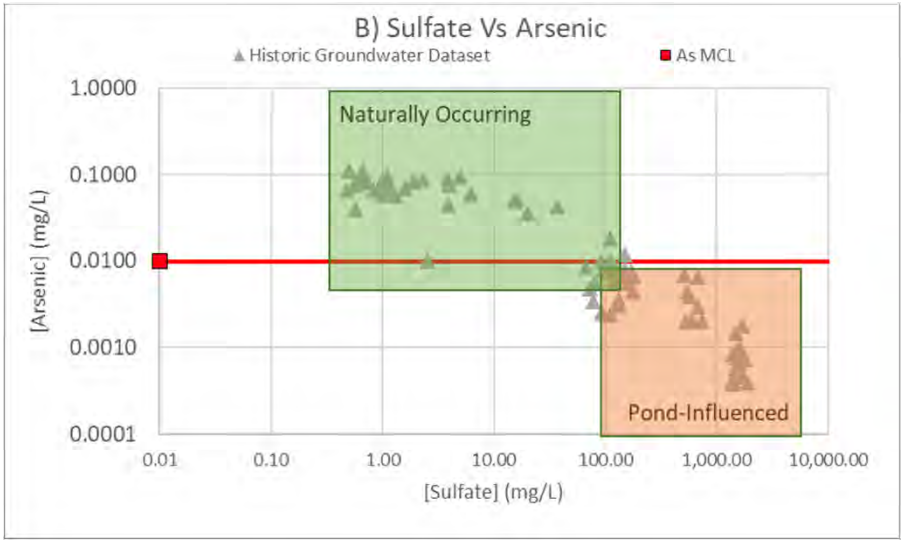
F.B. Culley Generating Station
East Ash Pond
Newburgh, Indiana

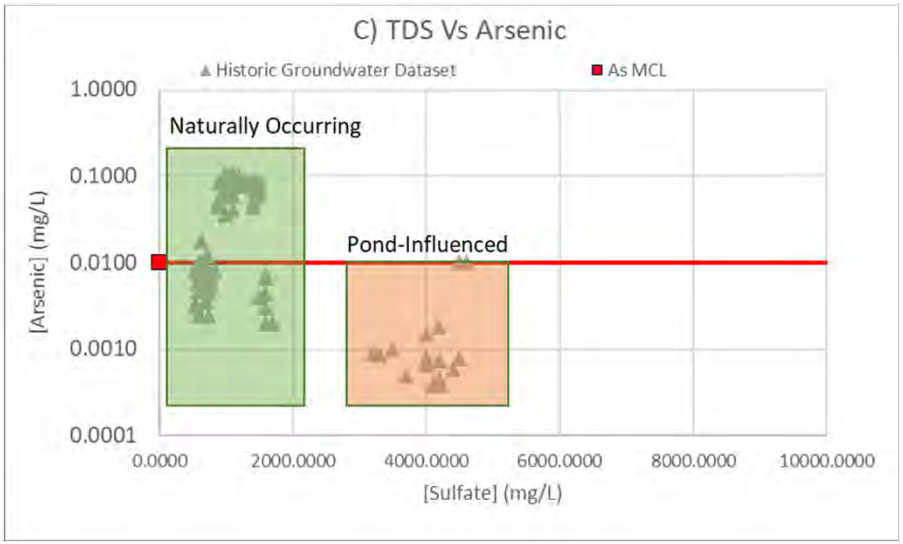
Bivariate Analysis: Arsenic Versus DOC (A), TOC (B), and Fe (C) in Groundwater

September 2019

FIGURE 5







Notes:

1) Dataset Used: All historic data available for CCR-AP-1, AP-7, AP-9, AP-2, AP-3, AP-4, AP-5, and AP-6

HALEY ALDRICH

F.B. Culley Generating Station
East Ash Pond
Newburgh, Indiana

Geochemical Differentiators for Arsenic

September 2019

FIGURE 6

APPENDIX A

Boring Logs

TEST BORING REPORT

Boring No. PW-1

Project	CCR Hydrogeologic Characterization, F.B. Culley Generating Station
Client	Southern Indiana Gas & Electric Company
Contractor	Stearns Drilling

File No. 42796-001
Sheet No. 1 of 2
Start 02 August 2017
Finish 02 August 2017
Driller Z.Vaughan
H&A Rep. S.Lewis
Elevation (est.)
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	-	-	-	Rig Make & Model: Geoprobe 8040DT
Inside Diameter (in.)	-	-	-	Bit Type:
Hammer Weight (lb)	-	-	-	Drill Mud: None
Hammer Fall (in.)	-	-	-	Casing: Steel
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0		S1 36"	0.0 3.0		ASH	-FILL- Loose, black and gray, coal ASH, MPS = 19mm, no structure, no odor, dry, interbedded layers of FGD sluge	5	5	15	30	35	10				
		S2 27"	3.0 8.0	3.0	FGD/ASH	Medium stiff, brownish tan and black, FGD SLUGE and coal ASH, MPS = 0.43 mm no structure, no odor, wet, clayey					30	70				
5				7.0	ASH	Medium stiff, black, coal ASH, MPS = 0.43 mm, no structure, no odor, wet					35	65				
		S3 60"	8.0 13.0													
10																
		S4 60"	13.0 18.0	13.0	ASH	Stiff, black, coal ASH, MPS = 0.43 mm, no structure, no odor, wet					45	55				
15																
				17.0	ASH	Medium stiff, black, coal ASH, MPS = 0.43 mm, no structure, no odor, wet, clayey					30	70				
		S5 60"	18.0 23.0	18.0	ASH	Stiff, black, coal ASH, MPS = 0.43 mm, thinly layered, no odor, wet					80	20				
20																

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft)	38
Rock Cored (ft)	-
Samples	8S

Boring No. PW-1

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

***Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. PW-1
File No. 42796-001
Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
20																
		S6 60"	23.0 28.0	23.0	ASH	Stiff, black, coal ASH, MPS = 0.43 mm, no structure, no odor, wet					30	70				
25																
		S7 60"	28.0 33.0	28.0		NO RECOVERY										
30																
		S8 60"	33.0 38.0	33.0	ASH	Simliar to S6					30	70				
35																
				37.0	CL	-ALLUVIUM-						100				
				38.0		Medium stiff, gray, CLAY (CL), MPS = clay, no structure, no odor, wet END OF BORING AT 38 FT										

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. PW-1

TEST BORING REPORT

Boring No. CCR-AP-6I

Project	Nature and Extent, F. B. Culley Generating Station
Client	Southern Indiana Gas & Electric Company
Contractor	ATC

File No. 129402-017
Sheet No. 1 of 3
Start November 15, 2018
Finish November 16, 2018
Driller Z. Vaughen
H&A Rep. S. Lewis
Elevation Datum 397.2
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S		Rig Make & Model: Geoprobe 8040DT
Inside Diameter (in.)	4.25	1 3/8		Bit Type: Cutting Head
Hammer Weight (lb)	-	140	-	Drill Mud: None
Hammer Fall (in.)	-	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: -

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Well Diagram	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0							Refer to Test Boring CCR-AP-6 for lithology from 0-38 ft.										
5																	
10																	
15																	
20																	
25																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
2/13/19	20.09				

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft) 75.0
Rock Cored (ft) -
Samples 8S

Boring No. CCR-AP-6I

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. CCR-AP-6

Project	CCR Hydrogeologic Characterization, F.B. Culley Generating Station
Client	Southern Indiana Gas & Electric Company
Contractor	Stearns Drilling

File No. 42796-001
Sheet No. 1 of 2
Start 08 March 2016
Finish 09 March 2016
Driller J. Gryska
H&A Rep. S. Lewis
Elevation 397.0 (est.)
Datum
Location N 969,122 E 2,883,285

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	-	S	-	Rig Make & Model: CME 850 XR Air Track
Inside Diameter (in.)	-	1 3/8	-	Bit Type:
Hammer Weight (lb)	-	140	-	Drill Mud: None
Hammer Fall (in.)	-	30	-	Casing: Auger
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Well Diagram	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0						ML	Brown/dark brown SILT -FILL-	-	-	-	-	-	-	-	-	-	-
	2 7 10 7	S1 18/24	3.5 5.5			ML	Very stiff bown SILT (ML), mps 19.0 mm, no odor, dry	-	5	-	-	10	85	-	-	-	-
5																	
	3 8 9 12	S2 20/24	8.5 10.5			ML	Very stiff olive brown SILT (ML), mps 2.0 mm, no odor, dry, wood fragments present	-	-	-	5	5	90	-	-	-	-
10																	
					383.5												
	2 3 3 4	S3 18/24	13.5 15.5		13.5	CL	Medium stiff olive gray lean CLAY with sand (CL), mps 2.0 mm, no odor, moist, rounded sand, black wood fragments present -FILL-	-	-	-	15	5	80	-	-	-	-
15																	
	1 1 3	S4 22/24	18.5 20.5			CL	Soft olive gray lean CLAY with sand (CL), mps 2.0 mm, no odor, wet, black wood fragments present, rounded sand	-	-	-	10	5	85	-	-	-	-
20																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 45.5
Rock Cored (ft) -
Samples 15S

Boring No. CCR-AP-6

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

***Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

TEST BORING REPORT

Boring No. CCR-AP-6
File No. 42796-001
Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Well Diagram	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
20	6																
	2 2 4 4	S5 22/24	23.5 25.5			CL	Medium stiff olive gray lean CLAY with sand (CL), mps 2.0 mm, no odor, moist, black wood fragments present, rounded sand	-	-	-	10	5	85	-	-	-	-
25					368.5												
	4 5 6 6	S6 18/24	28.5 30.5		28.5 367.5	SW-SC	Medium dense olive gray well graded SAND with clay and gravel (SW-SC), mps 19.0 mm, no odor, wet	15	15	20	20	10	20	-	-	-	-
30					29.5	SC	Medium dense olive gray clayey SAND (SC), no odor, wet, wood fragments present -ALLUVIUM-	-	-	-	10	60	30	-	-	-	-
	3 4 7 8	S7 12/24	33.5 35.5		363.0		*Drove with 3.0 in. spoon due to no recovery.	-	-	-	-	-	-	-	-	-	-
35					34.0	CL	Stiff olive gray lean CLAY with sand (CL), mps 2.0 mm, no odor, wet, wood fragments present -ALLUVIUM-	-	-	-	15	5	80	-	-	-	-
	2 2 2 3	S8 24/24	38.5 40.5			CL	Soft gray lean CLAY (CL), no odor, wet, wood fragments present	-	-	-	5	5	90	-	-	-	-
40																	
	1 3 2 3	S9 24/24	43.5 45.5			CL	Medium stiff gray sandy lean CLAY (CL), no odor, wet, wood fragments present	-	-	-		40	60	-	-	-	-
45					351.5 45.5		BOTTOM OF EXPLORATION 45.5 FT										

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. CCR-AP-6

TEST BORING REPORT

Boring No. CCR-AP-6I
File No. 129402-017
Sheet No. 2 of 3

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Well Diagram	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
25																	
30																	
35																	
						359.2											
40	3 1 2 4	S1 20	38.0 40.0	CL		38.0	Soft, gray CLAY (CL) with occasional small pockets of gray poorly-graded SAND (SP), mps 0.40 mm, laminated, no odor, moist						100				
						354.2											
	WOH WOH WOH WOH	S2 24	43.0 45.0	CL		43.0	Very soft, gray sandy CLAY (CL), mps 0.3 mm, no structure, no odor, wet, frequent black woody material					30	70				
45																	
						349.2											
	WOH 7 1 2	S3 24	48.0 50.0	CL		48.0	Very soft, brown-gray sandy CLAY (CL), mps 0.3 mm, no structure, no odor, wet, frequent mica, frequent black woody material					30	70				
50																	
	WOH 3 7 9	S4 24	53.0 55.0	CL			Stiff, brown-gray sandy CLAY (CL), mps 0.3 mm, stratified, no odor, wet, frequent mica, abundant black woody material					30	70				
						343.0											
				SM		54.2	Loose, brown-gray silty SAND with gravel (SM), mps 60 mm, no structure, no odor, wet, well rounded gravel and sand	15	15	15	20	15	20				
55																	
						339.2											
	3 6 8 8	S5 13	58.0 60.0	CL		58.0	Very soft, brown-gray sandy CLAY (CL), mps 0.3 mm, no structure, no odor, wet, frequent mica, frequent black woody material					30	70				
						338.2											
				CL		59.0	Stiff, brown-gray sandy CLAY (CL), mps 0.3 mm, stratified, no odor, wet, frequent mica, abundant black woody material					30	70				
60						337.2 60.0											

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. CCR-AP-6I

TEST BORING REPORT

Boring No. CCR-AP-6I
File No. 129402-017
Sheet No. 3 of 3

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Well Diagram	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
	8 9 12 13	S6 19	63.0 65.0	CL		333.2	Very stiff, gray and brown sandy CLAY (CL), mps 0.3 mm, stratified, no odor, wet					30	70				
65				SW-SM		64.0	Medium dense, brown well-graded SAND with silt and gravel (SW-SM), mps 35 mm, no structure, no odor, wet, well rounded gravel and sand	10	20	20	20	20	10				
	4 9 13 16	S7 12	68.0 70.0	SP		329.2 68.0	Medium dense, brown-gray poorly-graded SAND (SP), mps 25 mm, no structure, no odor, wet, well rounded gravel and sand	5	5	5	35	45	10				
70																	
	8 11 15 26	S8 14	73.0 75.0			322.2 75.0	BOTTOM OF EXPLORATION 75.0 FT										
75																	

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. CCR-AP-6I

TEST BORING REPORT

Boring No. CCR-AP-8I

Project	Nature and Extent, F. B. Culley Generating Station
Client	Southern Indiana Gas & Electric Company
Contractor	ATC

File No. 129402-017
Sheet No. 1 of 3
Start November 14, 2018
Finish November 15, 2018
Driller Z. Vaughen
H&A Rep. S. Lewis
Elevation Datum 393.9
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S		Rig Make & Model: Geoprobe 8040DT
Inside Diameter (in.)	4.25	1 3/8		Bit Type: Cutting Head
Hammer Weight (lb)	-	140	-	Drill Mud: None
Hammer Fall (in.)	-	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: -

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Well Diagram	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0							Refer to Test Boring CCR-AP-8 for lithology from 0-38 ft.										
5																	
10																	
15																	
20																	
25																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
2/13/19	16.79				

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 70.0
Rock Cored (ft) -
Samples 7S

Boring No. CCR-AP-8I

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. CCR-AP-8

Project	CCR Hydrogeologic Characterization, F.B. Culley Generating Station
Client	Southern Indiana Gas & Electric Company
Contractor	Stearns Drilling

File No. 42796-001
Sheet No. 1 of 2
Start 15 February 2017
Finish 15 February 2017
Driller W. Bates
H&A Rep. S.Lewis
Elevation 394.1 (est.)
Datum
Location
N 969,046
E 2,883,847

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	S	S	--	Rig Make & Model: Track
Inside Diameter (in.)	4.25	1 3/8	--	Bit Type:
Hammer Weight (lb)	-	140	-	Drill Mud: None
Hammer Fall (in.)	-	30	-	Casing: Auger
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Well Diagram	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0																	
	6 7 9 10	S1 18	3.5 5.5			ML	Very stiff, brown, SILT(ML), MPS = 19 mm, no structure, no odor, dry	-	10	-	-	5	85	-	-	L	-
					389.6 4.5	ML	-FILL-	-	-	-	-	5	95	-	-	L	-
5							Very stiff, brown, SILT(ML), MPS = 4 mm, no structure, no odor, dry										
							-FILL-										
	3 2 3 4	S2 16	8.5 10.5		385.6 8.5	CL	Stiff, grayish brown, lean CLAY (CL), MPS = < 0.08 mm, no structure, no odor, dry, rootlets present	-	-	-	-	-	100	-	-	M-H	-
10																	
					380.6 13.5	CL	Medium stiff, gray, lean CLAY (CL), MPS = < 0.08mm, no structure, no odor, moist	-	-	-	-	-	100	-	-	M-H	-
	3 2 3 4	S3 20	13.5 15.5														
15																	
					375.6 18.5	CL	Medium stiff, dark gray, lean CLAY (CL), MPS = < 0.08mm, no structure, no odor, moist, black wood fragments present	-	-	-	-	-	100	-	-	M-H	-
	3 3 4	S4 18	18.5 20.5														
20																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
2/16/17	16:00				Dry

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft)	45.5
Rock Cored (ft)	-
Samples	9S

Boring No. CCR-AP-8

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

***Note: Maximum particle size (mps) is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. CCR-AP-8
File No. 42796-001
Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Well Diagram	Stratum Change Elev/Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
20	5																
	2 2 3 4	S5 20	23.5 25.5		370.6 23.5	CL	Similar to S4, rootlets present	-	-	-	-	-	100	-	-	M-H	-
25																	
	1 2 3 3	S6 23	28.5 30.5		365.6 28.5	CL	Similar to S4	-	-	-	-	-	100	-	-	M-H	-
30																	
	2 2 3 5	S7 24	33.5 35.5		360.6 33.5	CL	Simlar to S4	-	-	-	-	-	100	-	-	M-H	-
35					358.1 36.0	CL	Medium Stiff, dark gray, sandy lean CLAY (CL), MPS = 0.43 mm,	-	-	-	-	-	30	70	-	-	M	-
					357.9 36.3	CL	interbedded, no odor, wet	-	-	-	-	-	100	-	-	M-H	-
							-ALLUVIUM-										
					355.6 38.5	CL	Medium stiff, gray, lean CLAY (CL), MPS = < 0.08mm, no structure, no odor, moist, black wood fragments present	-	-	-	-	-	100	-	-	M-H	-
	2 2 4 6	S8 24	38.5 40.5				-ALLUVIUM- Similar to S7										
40																	
	1 2 4 4	S9 24	43.5 45.5														
45					348.9 45.3	CL	Medium Stiff, gray, sandy lean CLAY (CL), MPS = 0.43,	-	-	-	-	-	30	70	-	-	M	-
					348.6 45.5		interbedded, no odor, wet END OF BORING AT 45.5 FT										

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. CCR-AP-8

TEST BORING REPORT

Boring No. CCR-AP-8I
File No. 129402-017
Sheet No. 2 of 3

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Well Diagram	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
25																	
30																	
35																	
						355.9											
	7 5 8 7	S1 12	38.0 40.0	CL		38.0	Stiff, gray lean CLAY (CL), mps < 0.075 mm, no structure, no odor, moist						100				
40																	
						350.9											
	3 4 5 7	S2 24	43.0 45.0	CL		43.0	Stiff, brown-gray lean CLAY (CL), mps < 0.075 mm, stratified, no odor, moist, frequent woody material						100				
45																	
	WOH WOH 3 3	S3 24	48.0 50.0	CL			Stiff, brown-gray lean CLAY (CL), mps < 0.075 mm, stratified, no odor, moist, abundant woody material						100				
50																	
	WOH WOH 3 3	S4 24	53.0 55.0			339.9											
				CL		54.0	Stiff, brown-gray lean CLAY (CL) with occasional gray poorly-graded SAND (SP) pockets, stratified, no odor, moist, abundant woody material						100				
55																	
						335.9	Note: Heaving sands at 58 ft. fill augers 5 ft.										
	2 WOH 1 WOH	S5 24	58.0 60.0	SP		58.0	Very loose, gray poorly-graded SAND (SP), mps 1.5 mm, no structure, no odor, wet				30	70					
						334.4											
60				SW		59.5	Very loose, gray well-graded SAND with gravel (SW), mps 60 mm, no structure, no odor, wet	20	20	20	10	30					

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. CCR-AP-8I

TEST BORING REPORT

Boring No. CCR-AP-8I
File No. 129402-017
Sheet No. 3 of 3

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Well Diagram	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
						330.9											
	5 3 10 13	S6 11	63.0 65.0	SP		63.0 328.9	Medium dense, gray poorly-graded SAND (SP), mps 1.5 mm, no structure, no odor, wet, frequent coal fragments, subrounded sand				30	70					
65				SP		65.0	Medium dense, gray poorly-graded SAND (SM), mps 1.5 mm, no structure, no odor, wet, frequent coal fragments, occasional highly weathered gray shale, frequent black woody material starting at 69.5 ft, subrounded sand				30	70					
	1 1 9 12	S7 13	68.0 70.0														
70						323.9 70.0	BOTTOM OF EXPLORATION 70.0 FT										

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. CCR-AP-8I

APPENDIX B

Laboratory Analytical Results

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: 180-68950-1
Client Project/Site: Vectren Groundwater and Soil Sampling

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

Attn: Sean Lewis

Authorized for release by:
8/21/2017 3:04:26 PM

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

Table of Contents

Job ID: 180-68950-1

Laboratory: TestAmerica Pittsburgh

Narrative

Job Narrative
180-68950-1

Comments
No additional comments.

Receipt
The samples were received on 8/4/2017 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.2º C and 1.4º C.

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

Metals
Method(s) 6010C: A deviation from the Standard Operating Procedure (SOP) occurred. Details are as follows: the laboratory control sample (LCS) for the associated samples was spiked at the ICP-MS level for arsenic (40ppb). The recovery in the LCS was acceptable, data for arsenic will be reported with this narrative.

Method(s) 6010C: The serial dilution performed for the following sample associated with prep batch 220230 was outside the control limits for iron: CCR-AP-8 (40-41) (180-68950-5)

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

General Chemistry
Method(s) SM 2540C: Due to the matrix, the initial volume(s) used for the following samples deviated from the standard procedure: SW-A (180-68950-6), SW-B (180-68950-7), SW-C (180-68950-8), SW-D (180-68950-9), PW-2-B (180-68950-13) and (180-68950-A-9 DU). The reporting limits (RLs) have been adjusted proportionately.

Method(s) SM 2540C: Due to the matrix, the initial volume(s) used for the following samples deviated from the standard procedure: PW-1-A (180-68950-10), PW-1-B (180-68950-11) and PW-2-A (180-68950-12). The reporting limits (RLs) have been adjusted proportionately.

Method(s) SM 5310C: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 180-219639 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

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

ASTM Leaching
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 Groundwater and Soil Sampling

TestAmerica Job ID: 180-68950-1

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.
F1	MS and/or MSD Recovery is outside acceptance limits.

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 Groundwater and Soil Sampling

TestAmerica Job ID: 180-68950-1

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
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	10-31-17
USDA	Federal		P330-16-00211	06-26-19
Utah	NELAP	8	PA001462015-4	05-31-18
Virginia	NELAP	3	460189	09-14-17
West Virginia DEP	State Program	3	142	01-31-18
Wisconsin	State Program	5	998027800	08-31-17

Laboratory: TestAmerica Denver

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	DoD ELAP		2907.01	10-31-17
A2LA	ISO/IEC 17025		2907.01	10-31-17
Alabama	State Program	4	40730	09-30-12 *
Alaska (UST)	State Program	10	UST-30	04-05-18
Arizona	State Program	9	AZ0713	12-20-17
Arkansas DEQ	State Program	6	88-0687	06-01-18
California	State Program	9	2513	01-08-18
Connecticut	State Program	1	PH-0686	09-30-18
Florida	NELAP	4	E87667	06-30-18
Georgia	State Program	4	N/A	01-08-18
Illinois	NELAP	5	200017	04-30-18
Iowa	State Program	7	370	12-01-18
Kansas	NELAP	7	E-10166	04-30-18
Louisiana	NELAP	6	02096	06-30-18
Maine	State Program	1	CO0002	03-03-19
Minnesota	NELAP	5	8-999-405	12-31-17
Nevada	State Program	9	CO0026	07-31-18
New Hampshire	NELAP	1	205310	04-28-18
New Jersey	NELAP	2	CO004	06-30-18
New York	NELAP	2	11964	04-01-18
North Carolina (WW/SW)	State Program	4	358	12-31-17
North Dakota	State Program	8	R-034	01-09-18
Oklahoma	State Program	6	8614	08-31-17
Oregon	NELAP	10	4025	01-08-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc. TestAmerica Job ID: 180-68950-1
Project/Site: Vectren Groundwater and Soil Sampling

Laboratory: TestAmerica Denver (Continued)

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
Pennsylvania	NELAP	3	68-00664	07-31-18
South Carolina	State Program	4	72002001	01-08-18
Texas	NELAP	6	T104704183-16-12	09-30-17
USDA	Federal		P330-16-00397	12-15-19
Utah	NELAP	8	CO00026	07-31-17 *
Virginia	NELAP	3	460232	06-14-18
Washington	State Program	10	C583	08-03-18
West Virginia DEP	State Program	3	354	11-30-17
Wisconsin	State Program	5	999615430	08-31-17
Wyoming (UST)	A2LA	8	2907.01	10-31-17

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Sample Summary

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

TestAmerica Job ID: 180-68950-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-68950-1	CCR-AP-2 (40-41)	Solid	08/01/17 09:00	08/04/17 09:45
180-68950-2	CCR-AP-3 (40-41)	Solid	08/01/17 11:55	08/04/17 09:45
180-68950-3	CCR-AP-4 (31-32)	Solid	08/01/17 15:55	08/04/17 09:45
180-68950-4	CCR-AP-6 (40-41)	Solid	08/01/17 13:25	08/04/17 09:45
180-68950-5	CCR-AP-8 (40-41)	Solid	08/01/17 10:40	08/04/17 09:45
180-68950-6	SW-A	Water	08/03/17 10:35	08/04/17 09:45
180-68950-7	SW-B	Water	08/03/17 09:20	08/04/17 09:45
180-68950-8	SW-C	Water	08/03/17 09:45	08/04/17 09:45
180-68950-9	SW-D	Water	08/03/17 10:15	08/04/17 09:45
180-68950-10	PW-1-A	Water	08/02/17 10:45	08/04/17 09:45
180-68950-11	PW-1-B	Water	08/02/17 12:25	08/04/17 09:45
180-68950-12	PW-2-A	Water	08/02/17 14:20	08/04/17 09:45
180-68950-13	PW-2-B	Water	08/03/17 08:31	08/04/17 09:45

Method Summary

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

TestAmerica Job ID: 180-68950-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL PIT
6010C	Metals (ICP)	SW846	TAL PIT
6020A	Metals (ICP/MS)	SW846	TAL PIT
Se Speciation	Selenium Speciation	NONE	TAL DEN
2540G	SM 2540G	SM22	TAL PIT
9034	Sulfide, Acid soluble and Insoluble (Titrimetric)	SW846	TAL PIT
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PIT
SM 5310C	TOC	SM	TAL PIT

Protocol References:

NONE = NONE

SM = "Standard Methods For The Examination Of Water And Wastewater",

SM22 = SM22

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

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

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 Groundwater and Soil Sampling

TestAmerica Job ID: 180-68950-1

Client Sample ID: CCR-AP-2 (40-41)

Date Collected: 08/01/17 09:00
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
ASTM Leach	Leach	D3987-85			100.30 g	2000 mL	219850	08/11/17 16:30	JPM	TAL PIT
ASTM Leach	Prep	3010A			50 mL	50 mL	220131	08/15/17 10:30	RJG	TAL PIT
ASTM Leach	Analysis	6010C		1			220293	08/16/17 07:46	RJG	TAL PIT
	Instrument ID: C									
ASTM Leach	Leach	D3987-85			100.30 g	2000 mL	219850	08/11/17 16:30	JPM	TAL PIT
ASTM Leach	Prep	3010A			50 mL	50 mL	220085	08/15/17 08:43	SES	TAL PIT
ASTM Leach	Analysis	6020A		1			220429	08/17/17 02:45	WTR	TAL PIT
	Instrument ID: A									
Total/NA	Analysis	2540G		1			219459	08/08/17 15:20	MTW	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-2 (40-41)

Date Collected: 08/01/17 09:00
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-1
Matrix: Solid
Percent Solids: 78.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.04 g	100 mL	220230	08/14/17 01:45	RJG	TAL PIT
Total/NA	Analysis	6010C		1			220293	08/16/17 11:47	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	3050B			1.04 g	100 mL	220008	08/14/17 11:49	WCT	TAL PIT
Total/NA	Analysis	6020A		1			220304	08/16/17 00:56	PFK	TAL PIT
	Instrument ID: M									
Total/NA	Prep	9030B			5.03 mL	50 mL	219405	08/08/17 12:50	JJZ	TAL PIT
Total/NA	Analysis	9034		1			219439	08/08/17 15:11	JJZ	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-3 (40-41)

Date Collected: 08/01/17 11:55
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
ASTM Leach	Leach	D3987-85			100.42 g	2000 mL	219850	08/11/17 16:30	JPM	TAL PIT
ASTM Leach	Prep	3010A			50 mL	50 mL	220131	08/15/17 10:30	RJG	TAL PIT
ASTM Leach	Analysis	6010C		1			220293	08/16/17 07:51	RJG	TAL PIT
	Instrument ID: C									
ASTM Leach	Leach	D3987-85			100.42 g	2000 mL	219850	08/11/17 16:30	JPM	TAL PIT
ASTM Leach	Prep	3010A			50 mL	50 mL	220085	08/15/17 08:43	SES	TAL PIT
ASTM Leach	Analysis	6020A		1			220429	08/17/17 02:48	WTR	TAL PIT
	Instrument ID: A									
Total/NA	Analysis	2540G		1			219459	08/08/17 15:20	MTW	TAL PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

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

TestAmerica Job ID: 180-68950-1

Client Sample ID: CCR-AP-3 (40-41)

Date Collected: 08/01/17 11:55
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-2

Matrix: Solid
Percent Solids: 78.5

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	220230	08/14/17 01:45	RJG	TAL PIT
Total/NA	Analysis	6010C		1			220293	08/16/17 11:53	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	3050B			1.02 g	100 mL	220008	08/14/17 11:49	WCT	TAL PIT
Total/NA	Analysis	6020A		1			220304	08/16/17 01:01	PFK	TAL PIT
	Instrument ID: M									
Total/NA	Prep	9030B			5.03 mL	50 mL	219405	08/08/17 12:50	JJZ	TAL PIT
Total/NA	Analysis	9034		1			219439	08/08/17 15:08	JJZ	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-4 (31-32)

Date Collected: 08/01/17 15:55
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-3

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
ASTM Leach	Leach	D3987-85			100.29 g	2000 mL	219850	08/11/17 16:30	JPM	TAL PIT
ASTM Leach	Prep	3010A			50 mL	50 mL	220131	08/15/17 10:30	RJG	TAL PIT
ASTM Leach	Analysis	6010C		1			220293	08/16/17 07:56	RJG	TAL PIT
	Instrument ID: C									
ASTM Leach	Leach	D3987-85			100.29 g	2000 mL	219850	08/11/17 16:30	JPM	TAL PIT
ASTM Leach	Prep	3010A			50 mL	50 mL	220085	08/15/17 08:43	SES	TAL PIT
ASTM Leach	Analysis	6020A		1			220429	08/17/17 02:50	WTR	TAL PIT
	Instrument ID: A									
Total/NA	Analysis	2540G		1			219459	08/08/17 15:20	MTW	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-4 (31-32)

Date Collected: 08/01/17 15:55
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-3

Matrix: Solid
Percent Solids: 78.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.99 g	100 mL	220230	08/14/17 01:45	RJG	TAL PIT
Total/NA	Analysis	6010C		1			220293	08/16/17 11:58	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	3050B			0.99 g	100 mL	220008	08/14/17 11:49	WCT	TAL PIT
Total/NA	Analysis	6020A		1			220304	08/16/17 01:05	PFK	TAL PIT
	Instrument ID: M									
Total/NA	Prep	9030B			5.02 mL	50 mL	219405	08/08/17 12:50	JJZ	TAL PIT
Total/NA	Analysis	9034		1			219439	08/08/17 15:05	JJZ	TAL PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

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

TestAmerica Job ID: 180-68950-1

Client Sample ID: CCR-AP-6 (40-41)

Date Collected: 08/01/17 13:25
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-4

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
ASTM Leach	Leach	D3987-85			100.33 g	2000 mL	219850	08/11/17 16:30	JPM	TAL PIT
ASTM Leach	Prep	3010A			50 mL	50 mL	220131	08/15/17 10:30	RJG	TAL PIT
ASTM Leach	Analysis	6010C		1			220293	08/16/17 08:02	RJG	TAL PIT
	Instrument ID: C									
ASTM Leach	Leach	D3987-85			100.33 g	2000 mL	219850	08/11/17 16:30	JPM	TAL PIT
ASTM Leach	Prep	3010A			50 mL	50 mL	220085	08/15/17 08:43	SES	TAL PIT
ASTM Leach	Analysis	6020A		1			220429	08/17/17 02:53	WTR	TAL PIT
	Instrument ID: A									
Total/NA	Analysis	2540G		1			219459	08/08/17 15:20	MTW	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-6 (40-41)

Date Collected: 08/01/17 13:25
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-4

Matrix: Solid
Percent Solids: 76.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.99 g	100 mL	220230	08/14/17 01:45	RJG	TAL PIT
Total/NA	Analysis	6010C		1			220293	08/16/17 12:03	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	3050B			0.99 g	100 mL	220008	08/14/17 11:49	WCT	TAL PIT
Total/NA	Analysis	6020A		1			220304	08/16/17 01:10	PFK	TAL PIT
	Instrument ID: M									
Total/NA	Prep	9030B			5.03 mL	50 mL	219405	08/08/17 12:50	JJZ	TAL PIT
Total/NA	Analysis	9034		1			219439	08/08/17 15:02	JJZ	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-8 (40-41)

Date Collected: 08/01/17 10:40
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-5

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
ASTM Leach	Leach	D3987-85			100.49 g	2000 mL	219850	08/11/17 16:30	JPM	TAL PIT
ASTM Leach	Prep	3010A			50 mL	50 mL	220131	08/15/17 10:30	RJG	TAL PIT
ASTM Leach	Analysis	6010C		1			220293	08/16/17 08:07	RJG	TAL PIT
	Instrument ID: C									
ASTM Leach	Leach	D3987-85			100.49 g	2000 mL	219850	08/11/17 16:30	JPM	TAL PIT
ASTM Leach	Prep	3010A			50 mL	50 mL	220085	08/15/17 08:43	SES	TAL PIT
ASTM Leach	Analysis	6020A		1			220429	08/17/17 03:01	WTR	TAL PIT
	Instrument ID: A									
Total/NA	Analysis	2540G		1			219459	08/08/17 15:20	MTW	TAL PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

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

TestAmerica Job ID: 180-68950-1

Client Sample ID: CCR-AP-8 (40-41)

Date Collected: 08/01/17 10:40
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-5
Matrix: Solid
Percent Solids: 78.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.97 g	100 mL	220230	08/14/17 01:45	RJG	TAL PIT
Total/NA	Analysis	6010C		1			220293	08/16/17 12:08	RJG	TAL PIT
	Instrument ID: C									
Total/NA	Prep	3050B			0.97 g	100 mL	220008	08/14/17 11:49	WCT	TAL PIT
Total/NA	Analysis	6020A		1			220304	08/16/17 01:15	PFK	TAL PIT
	Instrument ID: M									
Total/NA	Prep	9030B			5.01 mL	50 mL	219405	08/08/17 12:50	JJZ	TAL PIT
Total/NA	Analysis	9034		1			219439	08/08/17 14:59	JJZ	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: SW-A

Date Collected: 08/03/17 10:35
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		50			219430	08/08/17 18:51	CMR	TAL PIT
	Instrument ID: CHICS2000									
Dissolved	Prep	3005A			50 mL	50 mL	219388	08/08/17 08:28	SES	TAL PIT
Dissolved	Analysis	6020A		1			220148	08/15/17 01:23	WTR	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	219388	08/08/17 08:28	SES	TAL PIT
Total Recoverable	Analysis	6020A		1			220148	08/15/17 01:21	WTR	TAL PIT
	Instrument ID: A									
Dissolved	Analysis	Se Speciation		1	1 mL	1 mL	384144	08/14/17 13:02	LMT	TAL DEN
	Instrument ID: MT_024_Se									
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	219438	08/08/17 13:31	KXW	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 5310C		1			219639	08/09/17 17:54	CLL	TAL PIT
	Instrument ID: TOC1030									

Client Sample ID: SW-B

Date Collected: 08/03/17 09:20
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		50			219430	08/08/17 19:23	CMR	TAL PIT
	Instrument ID: CHICS2000									
Dissolved	Prep	3005A			50 mL	50 mL	219388	08/08/17 08:28	SES	TAL PIT
Dissolved	Analysis	6020A		1			220148	08/15/17 01:28	WTR	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	219388	08/08/17 08:28	SES	TAL PIT
Total Recoverable	Analysis	6020A		1			220148	08/15/17 01:26	WTR	TAL PIT
	Instrument ID: A									

Client Sample ID: SW-B

Lab Sample ID: 180-68950-7

Date Collected: 08/03/17 09:20

Matrix: Water

Date Received: 08/04/17 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	Se Speciation		1	1 mL	1 mL	384144	08/14/17 13:45	LMT	TAL DEN
	Instrument ID: MT_024_Se									
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	219438	08/08/17 13:31	KXW	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 5310C		1			219639	08/09/17 18:06	CLL	TAL PIT
	Instrument ID: TOC1030									

Client Sample ID: SW-C

Lab Sample ID: 180-68950-8

Date Collected: 08/03/17 09:45

Matrix: Water

Date Received: 08/04/17 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		250			219430	08/08/17 23:05	CMR	TAL PIT
	Instrument ID: CHICS2000									
Dissolved	Prep	3005A			50 mL	50 mL	219388	08/08/17 08:28	SES	TAL PIT
Dissolved	Analysis	6020A		1			220148	08/15/17 01:33	WTR	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	219388	08/08/17 08:28	SES	TAL PIT
Total Recoverable	Analysis	6020A		1			220148	08/15/17 01:31	WTR	TAL PIT
	Instrument ID: A									
Dissolved	Analysis	Se Speciation		1	1 mL	1 mL	384144	08/14/17 13:59	LMT	TAL DEN
	Instrument ID: MT_024_Se									
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	219438	08/08/17 13:31	KXW	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 5310C		1			220063	08/14/17 14:19	CLL	TAL PIT
	Instrument ID: TOC1030									

Client Sample ID: SW-D

Lab Sample ID: 180-68950-9

Date Collected: 08/03/17 10:15

Matrix: Water

Date Received: 08/04/17 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		50			219430	08/08/17 19:55	CMR	TAL PIT
	Instrument ID: CHICS2000									
Dissolved	Prep	3005A			50 mL	50 mL	219388	08/08/17 08:28	SES	TAL PIT
Dissolved	Analysis	6020A		1			220148	08/15/17 01:44	WTR	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	219388	08/08/17 08:28	SES	TAL PIT
Total Recoverable	Analysis	6020A		1			220148	08/15/17 01:36	WTR	TAL PIT
	Instrument ID: A									
Dissolved	Analysis	Se Speciation		1	1 mL	1 mL	384144	08/14/17 14:13	LMT	TAL DEN
	Instrument ID: MT_024_Se									

Lab Chronicle

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

TestAmerica Job ID: 180-68950-1

Client Sample ID: SW-D

Date Collected: 08/03/17 10:15
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	219438	08/08/17 13:31	KXW	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 5310C		1			219639	08/09/17 18:32	CLL	TAL PIT
	Instrument ID: TOC1030									

Client Sample ID: PW-1-A

Date Collected: 08/02/17 10:45
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-10

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		50			219430	08/08/17 20:26	CMR	TAL PIT
	Instrument ID: CHICS2000									
Dissolved	Prep	3005A			50 mL	50 mL	219532	08/09/17 08:36	SES	TAL PIT
Dissolved	Analysis	6020A		1			219796	08/10/17 19:15	JIS	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	219532	08/09/17 08:36	SES	TAL PIT
Total Recoverable	Analysis	6020A		1			219796	08/10/17 19:13	JIS	TAL PIT
	Instrument ID: A									
Dissolved	Analysis	Se Speciation		1	1 mL	1 mL	384144	08/14/17 14:27	LMT	TAL DEN
	Instrument ID: MT_024_Se									
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	219384	08/08/17 08:17	KXW	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 5310C		1			219639	08/09/17 18:44	CLL	TAL PIT
	Instrument ID: TOC1030									

Client Sample ID: PW-1-B

Date Collected: 08/02/17 12:25
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5			219430	08/08/17 21:14	CMR	TAL PIT
	Instrument ID: CHICS2000									
Total/NA	Analysis	9056A		50			219430	08/08/17 21:30	CMR	TAL PIT
	Instrument ID: CHICS2000									
Dissolved	Prep	3005A			50 mL	50 mL	219532	08/09/17 08:36	SES	TAL PIT
Dissolved	Analysis	6020A		1			219796	08/10/17 19:20	JIS	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	219532	08/09/17 08:36	SES	TAL PIT
Total Recoverable	Analysis	6020A		1			219796	08/10/17 19:18	JIS	TAL PIT
	Instrument ID: A									
Dissolved	Analysis	Se Speciation		1	1 mL	1 mL	384144	08/14/17 15:24	LMT	TAL DEN
	Instrument ID: MT_024_Se									

Client Sample ID: PW-1-B

Date Collected: 08/02/17 12:25
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-11
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	219384	08/08/17 08:17	KXW	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 5310C		1			219639	08/09/17 18:56	CLL	TAL PIT
	Instrument ID: TOC1030									

Client Sample ID: PW-2-A

Date Collected: 08/02/17 14:20
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-12
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		10			219430	08/08/17 22:18	CMR	TAL PIT
	Instrument ID: CHICS2000									
Total/NA	Analysis	9056A		100			219430	08/08/17 22:34	CMR	TAL PIT
	Instrument ID: CHICS2000									
Dissolved	Prep	3005A			50 mL	50 mL	219532	08/09/17 08:36	SES	TAL PIT
Dissolved	Analysis	6020A		1			219796	08/10/17 19:25	JIS	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	219532	08/09/17 08:36	SES	TAL PIT
Total Recoverable	Analysis	6020A		1			219796	08/10/17 19:23	JIS	TAL PIT
	Instrument ID: A									
Dissolved	Analysis	Se Speciation		1	1 mL	1 mL	384144	08/14/17 15:38	LMT	TAL DEN
	Instrument ID: MT_024_Se									
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	219384	08/08/17 08:17	KXW	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 5310C		1			219639	08/09/17 19:09	CLL	TAL PIT
	Instrument ID: TOC1030									

Client Sample ID: PW-2-B

Date Collected: 08/03/17 08:31
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-13
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5			219430	08/08/17 21:46	CMR	TAL PIT
	Instrument ID: CHICS2000									
Total/NA	Analysis	9056A		50			219430	08/08/17 22:02	CMR	TAL PIT
	Instrument ID: CHICS2000									
Dissolved	Prep	3005A			50 mL	50 mL	219532	08/09/17 08:36	SES	TAL PIT
Dissolved	Analysis	6020A		1			219796	08/10/17 19:36	JIS	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	219532	08/09/17 08:36	SES	TAL PIT
Total Recoverable	Analysis	6020A		1			219796	08/10/17 19:33	JIS	TAL PIT
	Instrument ID: A									

Lab Chronicle

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

TestAmerica Job ID: 180-68950-1

Client Sample ID: PW-2-B

Date Collected: 08/03/17 08:31
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-13

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	Se Speciation		1	1 mL	1 mL	384144	08/14/17 15:53	LMT	TAL DEN
	Instrument ID:	MT_024_Se								
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	219438	08/08/17 13:31	KXW	TAL PIT
	Instrument ID:	NOEQUIP								
Total/NA	Analysis	SM 5310C		1			219639	08/09/17 19:21	CLL	TAL PIT
	Instrument ID:	TOC1030								

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

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

Analyst References:

Lab: TAL DEN

Batch Type: Analysis

LMT = Lynn-Anne Trudell

Lab: TAL PIT

Batch Type: Leach

JPM = Jeremy Merriman

Batch Type: Prep

JJZ = Joseph Zubrow

RJG = Rob Good

SES = Samantha Strauser

WCT = William Tippins

Batch Type: Analysis

CLL = Cheryl Loheyde

CMR = Carl Reagle

JIS = John Shannon

JJZ = Joseph Zubrow

KXW = Kaitlyn White

MTW = Michael Wesoloski

PFK = Paul Kolarczyk

RJG = Rob Good

WTR = Bill Reinheimer

Client Sample ID: CCR-AP-2 (40-41)

Lab Sample ID: 180-68950-1

Date Collected: 08/01/17 09:00
Matrix: Solid
Date Received: 08/04/17 09:45

Method: 6010C - Metals (ICP) - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	4.1	ug/L		08/15/17 10:30	08/16/17 07:46	1
Iron	**71**	**J**	100	31	ug/L		08/15/17 10:30	08/16/17 07:46	1

Method: 6020A - Metals (ICP/MS) - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.32**	**J**	1.0	0.22	ug/L		08/15/17 08:43	08/17/17 02:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**21.7**		0.1	0.1	%			08/08/17 15:20	1
Percent Solids	**78.3**		0.1	0.1	%			08/08/17 15:20	1

Client Sample ID: CCR-AP-2 (40-41)

Lab Sample ID: 180-68950-1

Date Collected: 08/01/17 09:00
Matrix: Solid
Date Received: 08/04/17 09:45
Percent Solids: 78.3

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	**26000**		12	6.8	mg/Kg	☼	08/14/17 01:45	08/16/17 11:47	1
Arsenic	**7.7**		1.2	0.54	mg/Kg	☼	08/14/17 01:45	08/16/17 11:47	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**7.8**		0.12	0.025	mg/Kg	☼	08/14/17 11:49	08/16/17 00:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		38	13	mg/Kg	☼	08/08/17 12:50	08/08/17 15:11	1

Client Sample ID: CCR-AP-3 (40-41)

Lab Sample ID: 180-68950-2

Date Collected: 08/01/17 11:55
Matrix: Solid
Date Received: 08/04/17 09:45

Method: 6010C - Metals (ICP) - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	4.1	ug/L		08/15/17 10:30	08/16/17 07:51	1
Iron	**290**		100	31	ug/L		08/15/17 10:30	08/16/17 07:51	1

Method: 6020A - Metals (ICP/MS) - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.8**		1.0	0.22	ug/L		08/15/17 08:43	08/17/17 02:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**21.5**		0.1	0.1	%			08/08/17 15:20	1
Percent Solids	**78.5**		0.1	0.1	%			08/08/17 15:20	1

Client Sample ID: CCR-AP-3 (40-41)

Lab Sample ID: 180-68950-2
Date Collected: 08/01/17 11:55
Matrix: Solid
Date Received: 08/04/17 09:45
Percent Solids: 78.5

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	22000		12	6.9	mg/Kg	☼	08/14/17 01:45	08/16/17 11:53	1
Arsenic	12		1.2	0.55	mg/Kg	☼	08/14/17 01:45	08/16/17 11:53	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	12		0.12	0.025	mg/Kg	☼	08/14/17 11:49	08/16/17 01:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		38	13	mg/Kg	☼	08/08/17 12:50	08/08/17 15:08	1

Client Sample ID: CCR-AP-4 (31-32)

Lab Sample ID: 180-68950-3
Date Collected: 08/01/17 15:55
Matrix: Solid
Date Received: 08/04/17 09:45

Method: 6010C - Metals (ICP) - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	4.1	ug/L		08/15/17 10:30	08/16/17 07:56	1
Iron	ND		100	31	ug/L		08/15/17 10:30	08/16/17 07:56	1

Method: 6020A - Metals (ICP/MS) - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.2		1.0	0.22	ug/L		08/15/17 08:43	08/17/17 02:50	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	21.7		0.1	0.1	%			08/08/17 15:20	1
Percent Solids	78.3		0.1	0.1	%			08/08/17 15:20	1

Client Sample ID: CCR-AP-4 (31-32)

Lab Sample ID: 180-68950-3
Date Collected: 08/01/17 15:55
Matrix: Solid
Date Received: 08/04/17 09:45
Percent Solids: 78.3

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	24000		13	7.1	mg/Kg	☼	08/14/17 01:45	08/16/17 11:58	1
Arsenic	8.2		1.3	0.57	mg/Kg	☼	08/14/17 01:45	08/16/17 11:58	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	7.9		0.13	0.026	mg/Kg	☼	08/14/17 11:49	08/16/17 01:05	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		38	13	mg/Kg	☼	08/08/17 12:50	08/08/17 15:05	1

Client Sample ID: CCR-AP-6 (40-41)

Lab Sample ID: 180-68950-4
Date Collected: 08/01/17 13:25
Matrix: Solid
Date Received: 08/04/17 09:45

Method: 6010C - Metals (ICP) - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	4.1	ug/L		08/15/17 10:30	08/16/17 08:02	1
Iron	**440**		100	31	ug/L		08/15/17 10:30	08/16/17 08:02	1

Method: 6020A - Metals (ICP/MS) - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.0**		1.0	0.22	ug/L		08/15/17 08:43	08/17/17 02:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**23.4**		0.1	0.1	%			08/08/17 15:20	1
Percent Solids	**76.6**		0.1	0.1	%			08/08/17 15:20	1

Client Sample ID: CCR-AP-6 (40-41)

Lab Sample ID: 180-68950-4
Date Collected: 08/01/17 13:25
Matrix: Solid
Date Received: 08/04/17 09:45
Percent Solids: 76.6

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	**25000**		13	7.3	mg/Kg	☼	08/14/17 01:45	08/16/17 12:03	1
Arsenic	**8.4**		1.3	0.58	mg/Kg	☼	08/14/17 01:45	08/16/17 12:03	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**8.7**		0.13	0.027	mg/Kg	☼	08/14/17 11:49	08/16/17 01:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		39	13	mg/Kg	☼	08/08/17 12:50	08/08/17 15:02	1

Client Sample ID: CCR-AP-8 (40-41)

Lab Sample ID: 180-68950-5
Date Collected: 08/01/17 10:40
Matrix: Solid
Date Received: 08/04/17 09:45

Method: 6010C - Metals (ICP) - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	4.1	ug/L		08/15/17 10:30	08/16/17 08:07	1
Iron	**32**	**J**	100	31	ug/L		08/15/17 10:30	08/16/17 08:07	1

Method: 6020A - Metals (ICP/MS) - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**1.7**		1.0	0.22	ug/L		08/15/17 08:43	08/17/17 03:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**21.8**		0.1	0.1	%			08/08/17 15:20	1
Percent Solids	**78.2**		0.1	0.1	%			08/08/17 15:20	1

Client Sample ID: CCR-AP-8 (40-41)

Lab Sample ID: 180-68950-5
Date Collected: 08/01/17 10:40
Matrix: Solid
Date Received: 08/04/17 09:45
Percent Solids: 78.2

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	27000		13	7.3	mg/Kg	☼	08/14/17 01:45	08/16/17 12:08	1
Arsenic	8.5		1.3	0.58	mg/Kg	☼	08/14/17 01:45	08/16/17 12:08	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	8.0		0.13	0.027	mg/Kg	☼	08/14/17 11:49	08/16/17 01:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		38	13	mg/Kg	☼	08/08/17 12:50	08/08/17 14:59	1

Client Sample ID: SW-A

Lab Sample ID: 180-68950-6
Date Collected: 08/03/17 10:35
Matrix: Water
Date Received: 08/04/17 09:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	800		50	36	mg/L			08/08/17 18:51	50
Sulfate	1100		50	19	mg/L			08/08/17 18:51	50

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.5		1.0	0.22	ug/L		08/08/17 08:28	08/15/17 01:21	1
Iron	470		50	20	ug/L		08/08/17 08:28	08/15/17 01:21	1
Manganese	5600		5.0	1.3	ug/L		08/08/17 08:28	08/15/17 01:21	1
Molybdenum	33		5.0	0.59	ug/L		08/08/17 08:28	08/15/17 01:21	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.7		1.0	0.22	ug/L		08/08/17 08:28	08/15/17 01:23	1
Iron	ND		50	20	ug/L		08/08/17 08:28	08/15/17 01:23	1
Manganese	5600		5.0	1.3	ug/L		08/08/17 08:28	08/15/17 01:23	1
Molybdenum	35		5.0	0.59	ug/L		08/08/17 08:28	08/15/17 01:23	1

Method: Se Speciation - Selenium Speciation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	1.8	J	2.0	0.79	ug/L			08/14/17 13:02	1
Arsenic (V)	1.3	J F1	2.0	0.75	ug/L			08/14/17 13:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	3700		40	40	mg/L			08/08/17 13:31	1
Total Organic Carbon - Duplicates	5.1		1.0	0.51	mg/L			08/09/17 17:54	1

Client Sample ID: SW-B

Lab Sample ID: 180-68950-7
Date Collected: 08/03/17 09:20
Matrix: Water
Date Received: 08/04/17 09:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	810		50	36	mg/L			08/08/17 19:23	50

Client Sample ID: SW-B

Lab Sample ID: 180-68950-7
Matrix: Water
Date Collected: 08/03/17 09:20
Date Received: 08/04/17 09:45

Method: 9056A - Anions, Ion Chromatography (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1200		50	19	mg/L			08/08/17 19:23	50

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.2		1.0	0.22	ug/L		08/08/17 08:28	08/15/17 01:26	1
Iron	290		50	20	ug/L		08/08/17 08:28	08/15/17 01:26	1
Manganese	6200		5.0	1.3	ug/L		08/08/17 08:28	08/15/17 01:26	1
Molybdenum	35		5.0	0.59	ug/L		08/08/17 08:28	08/15/17 01:26	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.9		1.0	0.22	ug/L		08/08/17 08:28	08/15/17 01:28	1
Iron	ND		50	20	ug/L		08/08/17 08:28	08/15/17 01:28	1
Manganese	5900		5.0	1.3	ug/L		08/08/17 08:28	08/15/17 01:28	1
Molybdenum	35		5.0	0.59	ug/L		08/08/17 08:28	08/15/17 01:28	1

Method: Se Speciation - Selenium Speciation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	1.2	J	2.0	0.79	ug/L			08/14/17 13:45	1
Arsenic (V)	1.5	J	2.0	0.75	ug/L			08/14/17 13:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	3500		40	40	mg/L			08/08/17 13:31	1
Total Organic Carbon - Duplicates	5.3		1.0	0.51	mg/L			08/09/17 18:06	1

Client Sample ID: SW-C

Lab Sample ID: 180-68950-8
Matrix: Water
Date Collected: 08/03/17 09:45
Date Received: 08/04/17 09:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3500		250	180	mg/L			08/08/17 23:05	250
Sulfate	5000		250	95	mg/L			08/08/17 23:05	250

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.4		1.0	0.22	ug/L		08/08/17 08:28	08/15/17 01:31	1
Iron	2200		50	20	ug/L		08/08/17 08:28	08/15/17 01:31	1
Manganese	31000		5.0	1.3	ug/L		08/08/17 08:28	08/15/17 01:31	1
Molybdenum	78		5.0	0.59	ug/L		08/08/17 08:28	08/15/17 01:31	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.3		1.0	0.22	ug/L		08/08/17 08:28	08/15/17 01:33	1
Iron	44	J	50	20	ug/L		08/08/17 08:28	08/15/17 01:33	1
Manganese	34000		5.0	1.3	ug/L		08/08/17 08:28	08/15/17 01:33	1
Molybdenum	81		5.0	0.59	ug/L		08/08/17 08:28	08/15/17 01:33	1

Client Sample ID: SW-C

Lab Sample ID: 180-68950-8
Matrix: Water
Date Collected: 08/03/17 09:45
Date Received: 08/04/17 09:45

Method: Se Speciation - Selenium Speciation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	1.2	J	2.0	0.79	ug/L			08/14/17 13:59	1
Arsenic (V)	1.0	J	2.0	0.75	ug/L			08/14/17 13:59	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	17000		100	100	mg/L			08/08/17 13:31	1
Total Organic Carbon - Duplicates	19		1.0	0.51	mg/L			08/14/17 14:19	1

Client Sample ID: SW-D

Lab Sample ID: 180-68950-9
Matrix: Water
Date Collected: 08/03/17 10:15
Date Received: 08/04/17 09:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	810		50	36	mg/L			08/08/17 19:55	50
Sulfate	1200		50	19	mg/L			08/08/17 19:55	50

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.1		1.0	0.22	ug/L		08/08/17 08:28	08/15/17 01:36	1
Iron	1700		50	20	ug/L		08/08/17 08:28	08/15/17 01:36	1
Manganese	6200		5.0	1.3	ug/L		08/08/17 08:28	08/15/17 01:36	1
Molybdenum	37		5.0	0.59	ug/L		08/08/17 08:28	08/15/17 01:36	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.8		1.0	0.22	ug/L		08/08/17 08:28	08/15/17 01:44	1
Iron	ND		50	20	ug/L		08/08/17 08:28	08/15/17 01:44	1
Manganese	6100		5.0	1.3	ug/L		08/08/17 08:28	08/15/17 01:44	1
Molybdenum	38		5.0	0.59	ug/L		08/08/17 08:28	08/15/17 01:44	1

Method: Se Speciation - Selenium Speciation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	ND		2.0	0.79	ug/L			08/14/17 14:13	1
Arsenic (V)	0.81	J	2.0	0.75	ug/L			08/14/17 14:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	3500		40	40	mg/L			08/08/17 13:31	1
Total Organic Carbon - Duplicates	5.1		1.0	0.51	mg/L			08/09/17 18:32	1

Client Sample ID: PW-1-A

Lab Sample ID: 180-68950-10
Matrix: Water
Date Collected: 08/02/17 10:45
Date Received: 08/04/17 09:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	570		50	36	mg/L			08/08/17 20:26	50
Sulfate	1100		50	19	mg/L			08/08/17 20:26	50

Client Sample ID: PW-1-A

Lab Sample ID: 180-68950-10
Matrix: Water
Date Collected: 08/02/17 10:45
Date Received: 08/04/17 09:45

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	36		1.0	0.22	ug/L		08/09/17 08:36	08/10/17 19:13	1
Iron	5000		50	20	ug/L		08/09/17 08:36	08/10/17 19:13	1
Manganese	650		5.0	1.3	ug/L		08/09/17 08:36	08/10/17 19:13	1
Molybdenum	1900		5.0	0.59	ug/L		08/09/17 08:36	08/10/17 19:13	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	8.8		1.0	0.22	ug/L		08/09/17 08:36	08/10/17 19:15	1
Iron	ND		50	20	ug/L		08/09/17 08:36	08/10/17 19:15	1
Manganese	ND		5.0	1.3	ug/L		08/09/17 08:36	08/10/17 19:15	1
Molybdenum	1900		5.0	0.59	ug/L		08/09/17 08:36	08/10/17 19:15	1

Method: Se Speciation - Selenium Speciation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	ND		2.0	0.79	ug/L			08/14/17 14:27	1
Arsenic (V)	4.1		2.0	0.75	ug/L			08/14/17 14:27	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	3200		40	40	mg/L			08/08/17 08:17	1
Total Organic Carbon - Duplicates	2.0		1.0	0.51	mg/L			08/09/17 18:44	1

Client Sample ID: PW-1-B

Lab Sample ID: 180-68950-11
Matrix: Water
Date Collected: 08/02/17 12:25
Date Received: 08/04/17 09:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	340		5.0	3.6	mg/L			08/08/17 21:14	5
Sulfate	990		50	19	mg/L			08/08/17 21:30	50

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	230		1.0	0.22	ug/L		08/09/17 08:36	08/10/17 19:18	1
Iron	ND		50	20	ug/L		08/09/17 08:36	08/10/17 19:18	1
Manganese	6.3		5.0	1.3	ug/L		08/09/17 08:36	08/10/17 19:18	1
Molybdenum	9500		5.0	0.59	ug/L		08/09/17 08:36	08/10/17 19:18	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	220		1.0	0.22	ug/L		08/09/17 08:36	08/10/17 19:20	1
Iron	ND		50	20	ug/L		08/09/17 08:36	08/10/17 19:20	1
Manganese	6.4		5.0	1.3	ug/L		08/09/17 08:36	08/10/17 19:20	1
Molybdenum	9500		5.0	0.59	ug/L		08/09/17 08:36	08/10/17 19:20	1

Method: Se Speciation - Selenium Speciation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	8.8		2.0	0.79	ug/L			08/14/17 15:24	1
Arsenic (V)	120		2.0	0.75	ug/L			08/14/17 15:24	1

Client Sample ID: PW-1-B

Lab Sample ID: 180-68950-11
Matrix: Water
Date Collected: 08/02/17 12:25
Date Received: 08/04/17 09:45

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2700		20	20	mg/L			08/08/17 08:17	1
Total Organic Carbon - Duplicates	4.2		1.0	0.51	mg/L			08/09/17 18:56	1

Client Sample ID: PW-2-A

Lab Sample ID: 180-68950-12
Matrix: Water
Date Collected: 08/02/17 14:20
Date Received: 08/04/17 09:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	760		10	7.1	mg/L			08/08/17 22:18	10
Sulfate	3300		100	38	mg/L			08/08/17 22:34	100

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	87		1.0	0.22	ug/L		08/09/17 08:36	08/10/17 19:23	1
Iron	120000		50	20	ug/L		08/09/17 08:36	08/10/17 19:23	1
Manganese	22000		5.0	1.3	ug/L		08/09/17 08:36	08/10/17 19:23	1
Molybdenum	81		5.0	0.59	ug/L		08/09/17 08:36	08/10/17 19:23	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	7.1		1.0	0.22	ug/L		08/09/17 08:36	08/10/17 19:25	1
Iron	42000		50	20	ug/L		08/09/17 08:36	08/10/17 19:25	1
Manganese	7500		5.0	1.3	ug/L		08/09/17 08:36	08/10/17 19:25	1
Molybdenum	310		5.0	0.59	ug/L		08/09/17 08:36	08/10/17 19:25	1

Method: Se Speciation - Selenium Speciation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	ND		2.0	0.79	ug/L			08/14/17 15:38	1
Arsenic (V)	1.7	J	2.0	0.75	ug/L			08/14/17 15:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	6400		40	40	mg/L			08/08/17 08:17	1
Total Organic Carbon - Duplicates	13		1.0	0.51	mg/L			08/09/17 19:09	1

Client Sample ID: PW-2-B

Lab Sample ID: 180-68950-13
Matrix: Water
Date Collected: 08/03/17 08:31
Date Received: 08/04/17 09:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	170		5.0	3.6	mg/L			08/08/17 21:46	5
Sulfate	1600		50	19	mg/L			08/08/17 22:02	50

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	260		1.0	0.22	ug/L		08/09/17 08:36	08/10/17 19:33	1
Iron	ND		50	20	ug/L		08/09/17 08:36	08/10/17 19:33	1
Manganese	140		5.0	1.3	ug/L		08/09/17 08:36	08/10/17 19:33	1
Molybdenum	7600		5.0	0.59	ug/L		08/09/17 08:36	08/10/17 19:33	1

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

TestAmerica Job ID: 180-68950-1

Client Sample ID: PW-2-B
Date Collected: 08/03/17 08:31
Date Received: 08/04/17 09:45

Lab Sample ID: 180-68950-13
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	280		1.0	0.22	ug/L		08/09/17 08:36	08/10/17 19:36	1
Iron	ND		50	20	ug/L		08/09/17 08:36	08/10/17 19:36	1
Manganese	140		5.0	1.3	ug/L		08/09/17 08:36	08/10/17 19:36	1
Molybdenum	8900		5.0	0.59	ug/L		08/09/17 08:36	08/10/17 19:36	1

Method: Se Speciation - Selenium Speciation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	31		2.0	0.79	ug/L			08/14/17 15:53	1
Arsenic (V)	110		2.0	0.75	ug/L			08/14/17 15:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	3300		20	20	mg/L			08/08/17 13:31	1
Total Organic Carbon - Duplicates	7.7		1.0	0.51	mg/L			08/09/17 19:21	1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 180-219430/6
Matrix: Water
Analysis Batch: 219430

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.71	mg/L			08/08/17 14:21	1
Sulfate	ND		1.0	0.38	mg/L			08/08/17 14:21	1

Lab Sample ID: LCS 180-219430/5
Matrix: Water
Analysis Batch: 219430

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	25.0	24.4		mg/L		98	80 - 120
Sulfate	25.0	21.5		mg/L		86	80 - 120

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 180-220131/1-A
Matrix: Solid
Analysis Batch: 220293

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 220131

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	4.1	ug/L		08/15/17 10:30	08/16/17 07:26	1
Iron	ND		100	31	ug/L		08/15/17 10:30	08/16/17 07:26	1

Lab Sample ID: LCS 180-220131/2-A
Matrix: Solid
Analysis Batch: 220293

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 220131

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	500	507		ug/L		101	80 - 120
Iron	1000	1020		ug/L		102	80 - 120

Lab Sample ID: LCSD 180-220131/3-A
Matrix: Solid
Analysis Batch: 220293

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 220131

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	500	523		ug/L		105	80 - 120	3	20
Iron	1000	1050		ug/L		105	80 - 120	3	20

Lab Sample ID: MB 180-220230/1-A
Matrix: Solid
Analysis Batch: 220293

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 220230

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0	0.44	mg/Kg		08/14/17 01:45	08/16/17 11:37	1
Iron	ND		10	5.5	mg/Kg		08/14/17 01:45	08/16/17 11:37	1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 180-220230/2-A
Matrix: Solid
Analysis Batch: 220293

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 220230

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	4.00	4.24		mg/Kg		106	80 - 120
Iron	100	111		mg/Kg		111	80 - 120

Lab Sample ID: LB 180-219850/1-C
Matrix: Solid
Analysis Batch: 220293

Client Sample ID: Method Blank
Prep Type: ASTM Leach
Prep Batch: 220131

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		10	4.1	ug/L		08/15/17 10:30	08/16/17 07:41	1
Iron	ND		100	31	ug/L		08/15/17 10:30	08/16/17 07:41	1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 180-220008/1-A
Matrix: Solid
Analysis Batch: 220304

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 220008

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.10	0.020	mg/Kg		08/14/17 11:49	08/15/17 23:52	1

Lab Sample ID: LCS 180-220008/2-A
Matrix: Solid
Analysis Batch: 220304

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 220008

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	4.00	4.00		mg/Kg		100	80 - 120

Lab Sample ID: MB 180-220085/1-A
Matrix: Solid
Analysis Batch: 220429

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 220085

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0	0.22	ug/L		08/15/17 08:43	08/17/17 02:37	1

Lab Sample ID: LCS 180-220085/2-A
Matrix: Solid
Analysis Batch: 220429

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 220085

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	40.0	37.7		ug/L		94	80 - 120

Lab Sample ID: LCSD 180-220085/3-A
Matrix: Solid
Analysis Batch: 220429

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 220085

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	40.0	37.2		ug/L		93	80 - 120	1	20

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

Lab Sample ID: MB 180-219388/1-A
Matrix: Water
Analysis Batch: 220148

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 219388

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0	0.22	ug/L		08/08/17 08:28	08/15/17 00:24	1
Iron	ND		50	20	ug/L		08/08/17 08:28	08/15/17 00:24	1
Manganese	ND		5.0	1.3	ug/L		08/08/17 08:28	08/15/17 00:24	1
Molybdenum	ND		5.0	0.59	ug/L		08/08/17 08:28	08/15/17 00:24	1

Lab Sample ID: LCS 180-219388/2-A
Matrix: Water
Analysis Batch: 220148

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 219388

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	40.0	36.2		ug/L		90	80 - 120
Iron	1000	1050		ug/L		105	80 - 120
Manganese	500	507		ug/L		101	80 - 120
Molybdenum	1000	961		ug/L		96	80 - 120

Lab Sample ID: MB 180-219532/1-A
Matrix: Water
Analysis Batch: 219796

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 219532

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0	0.22	ug/L		08/09/17 08:36	08/10/17 18:47	1
Iron	ND		50	20	ug/L		08/09/17 08:36	08/10/17 18:47	1
Manganese	ND		5.0	1.3	ug/L		08/09/17 08:36	08/10/17 18:47	1
Molybdenum	ND		5.0	0.59	ug/L		08/09/17 08:36	08/10/17 18:47	1

Lab Sample ID: LCS 180-219532/2-A
Matrix: Water
Analysis Batch: 219796

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 219532

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	40.0	37.0		ug/L		93	80 - 120
Iron	1000	1080		ug/L		108	80 - 120
Manganese	500	528		ug/L		106	80 - 120
Molybdenum	1000	972		ug/L		97	80 - 120

Lab Sample ID: LB 180-219850/1-B
Matrix: Solid
Analysis Batch: 220429

Client Sample ID: Method Blank
Prep Type: ASTM Leach
Prep Batch: 220085

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0	0.22	ug/L		08/15/17 08:43	08/17/17 02:35	1

Method: Se Speciation - Selenium Speciation

Lab Sample ID: MB 280-384144/4
Matrix: Water
Analysis Batch: 384144

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	ND		2.0	0.79	ug/L			08/14/17 12:34	1
Arsenic (V)	ND		2.0	0.75	ug/L			08/14/17 12:34	1

Lab Sample ID: LCS 280-384144/5
Matrix: Water
Analysis Batch: 384144

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic (III)			50.0	40.9		ug/L		82	50 - 150		
Arsenic (V)			50.0	27.0		ug/L		54	50 - 150		

Lab Sample ID: 180-68950-6 MS
Matrix: Water
Analysis Batch: 384144

Client Sample ID: SW-A
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic (III)	1.8	J	50.0	42.3		ug/L		81	50 - 150		
Arsenic (V)	1.3	J F1	50.0	22.9	F1	ug/L		43	50 - 150		

Lab Sample ID: 180-68950-6 MSD
Matrix: Water
Analysis Batch: 384144

Client Sample ID: SW-A
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic (III)	1.8	J	50.0	41.1		ug/L		78	50 - 150	3	50
Arsenic (V)	1.3	J F1	50.0	23.2	F1	ug/L		44	50 - 150	1	50

Method: 2540G - SM 2540G

Lab Sample ID: 180-68950-1 DU
Matrix: Solid
Analysis Batch: 219459

Client Sample ID: CCR-AP-2 (40-41)
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Moisture	21.7			21.9		%				1	20
Percent Solids	78.3			78.1		%				0.3	20

Method: 9034 - Sulfide, Acid soluble and Insoluble (Titrimetric)

Lab Sample ID: MB 180-219405/2-A
Matrix: Solid
Analysis Batch: 219439

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 219405

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		30	10	mg/Kg		08/08/17 12:50	08/08/17 14:48	1

Method: 9034 - Sulfide, Acid soluble and Insoluble (Titrimetric) (Continued)

Lab Sample ID: LCS 180-219405/1-A
Matrix: Solid
Analysis Batch: 219439

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 219405

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	202	196		mg/Kg		97	85 - 115

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 180-219384/2
Matrix: Water
Analysis Batch: 219384

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			08/08/17 08:17	1

Lab Sample ID: LCS 180-219384/1
Matrix: Water
Analysis Batch: 219384

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	458	442		mg/L		97	80 - 120

Lab Sample ID: MB 180-219438/2
Matrix: Water
Analysis Batch: 219438

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			08/08/17 13:31	1

Lab Sample ID: LCS 180-219438/1
Matrix: Water
Analysis Batch: 219438

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	458	462		mg/L		101	80 - 120

Lab Sample ID: 180-68950-9 DU
Matrix: Water
Analysis Batch: 219438

Client Sample ID: SW-D
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	3500		3400		mg/L		4	10

Method: SM 5310C - TOC

Lab Sample ID: MB 180-219639/31
Matrix: Water
Analysis Batch: 219639

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	ND		1.0	0.51	mg/L			08/09/17 15:48	1

Method: SM 5310C - TOC (Continued)

Lab Sample ID: LCS 180-219639/29
Matrix: Water
Analysis Batch: 219639

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	20.0	19.9		mg/L		100	85 - 115

Lab Sample ID: LCSD 180-219639/30
Matrix: Water
Analysis Batch: 219639

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	20.0	20.0		mg/L		100	85 - 115	0	20

Lab Sample ID: MB 180-220063/6
Matrix: Water
Analysis Batch: 220063

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	ND		1.0	0.51	mg/L			08/14/17 13:04	1

Lab Sample ID: LCS 180-220063/4
Matrix: Water
Analysis Batch: 220063

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	20.0	19.4		mg/L		97	85 - 115

Lab Sample ID: LCSD 180-220063/5
Matrix: Water
Analysis Batch: 220063

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	20.0	19.6		mg/L		98	85 - 115	1	20

HPLC/IC

Analysis Batch: 219430

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-6	SW-A	Total/NA	Water	9056A	
180-68950-7	SW-B	Total/NA	Water	9056A	
180-68950-8	SW-C	Total/NA	Water	9056A	
180-68950-9	SW-D	Total/NA	Water	9056A	
180-68950-10	PW-1-A	Total/NA	Water	9056A	
180-68950-11	PW-1-B	Total/NA	Water	9056A	
180-68950-11	PW-1-B	Total/NA	Water	9056A	
180-68950-12	PW-2-A	Total/NA	Water	9056A	
180-68950-12	PW-2-A	Total/NA	Water	9056A	
180-68950-13	PW-2-B	Total/NA	Water	9056A	
180-68950-13	PW-2-B	Total/NA	Water	9056A	
MB 180-219430/6	Method Blank	Total/NA	Water	9056A	
LCS 180-219430/5	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 219388

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-6	SW-A	Dissolved	Water	3005A	
180-68950-6	SW-A	Total Recoverable	Water	3005A	
180-68950-7	SW-B	Dissolved	Water	3005A	
180-68950-7	SW-B	Total Recoverable	Water	3005A	
180-68950-8	SW-C	Dissolved	Water	3005A	
180-68950-8	SW-C	Total Recoverable	Water	3005A	
180-68950-9	SW-D	Dissolved	Water	3005A	
180-68950-9	SW-D	Total Recoverable	Water	3005A	
MB 180-219388/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-219388/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 219532

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-10	PW-1-A	Dissolved	Water	3005A	
180-68950-10	PW-1-A	Total Recoverable	Water	3005A	
180-68950-11	PW-1-B	Dissolved	Water	3005A	
180-68950-11	PW-1-B	Total Recoverable	Water	3005A	
180-68950-12	PW-2-A	Dissolved	Water	3005A	
180-68950-12	PW-2-A	Total Recoverable	Water	3005A	
180-68950-13	PW-2-B	Dissolved	Water	3005A	
180-68950-13	PW-2-B	Total Recoverable	Water	3005A	
MB 180-219532/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-219532/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 219796

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-10	PW-1-A	Dissolved	Water	6020A	219532
180-68950-10	PW-1-A	Total Recoverable	Water	6020A	219532
180-68950-11	PW-1-B	Dissolved	Water	6020A	219532
180-68950-11	PW-1-B	Total Recoverable	Water	6020A	219532
180-68950-12	PW-2-A	Dissolved	Water	6020A	219532
180-68950-12	PW-2-A	Total Recoverable	Water	6020A	219532

Metals (Continued)

Analysis Batch: 219796 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-13	PW-2-B	Dissolved	Water	6020A	219532
180-68950-13	PW-2-B	Total Recoverable	Water	6020A	219532
MB 180-219532/1-A	Method Blank	Total Recoverable	Water	6020A	219532
LCS 180-219532/2-A	Lab Control Sample	Total Recoverable	Water	6020A	219532

Leach Batch: 219850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-1	CCR-AP-2 (40-41)	ASTM Leach	Solid	D3987-85	
180-68950-2	CCR-AP-3 (40-41)	ASTM Leach	Solid	D3987-85	
180-68950-3	CCR-AP-4 (31-32)	ASTM Leach	Solid	D3987-85	
180-68950-4	CCR-AP-6 (40-41)	ASTM Leach	Solid	D3987-85	
180-68950-5	CCR-AP-8 (40-41)	ASTM Leach	Solid	D3987-85	
LB 180-219850/1-B	Method Blank	ASTM Leach	Solid	D3987-85	
LB 180-219850/1-C	Method Blank	ASTM Leach	Solid	D3987-85	

Prep Batch: 220008

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-1	CCR-AP-2 (40-41)	Total/NA	Solid	3050B	
180-68950-2	CCR-AP-3 (40-41)	Total/NA	Solid	3050B	
180-68950-3	CCR-AP-4 (31-32)	Total/NA	Solid	3050B	
180-68950-4	CCR-AP-6 (40-41)	Total/NA	Solid	3050B	
180-68950-5	CCR-AP-8 (40-41)	Total/NA	Solid	3050B	
MB 180-220008/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 180-220008/2-A	Lab Control Sample	Total/NA	Solid	3050B	

Prep Batch: 220085

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-1	CCR-AP-2 (40-41)	ASTM Leach	Solid	3010A	219850
180-68950-2	CCR-AP-3 (40-41)	ASTM Leach	Solid	3010A	219850
180-68950-3	CCR-AP-4 (31-32)	ASTM Leach	Solid	3010A	219850
180-68950-4	CCR-AP-6 (40-41)	ASTM Leach	Solid	3010A	219850
180-68950-5	CCR-AP-8 (40-41)	ASTM Leach	Solid	3010A	219850
LB 180-219850/1-B	Method Blank	ASTM Leach	Solid	3010A	219850
MB 180-220085/1-A	Method Blank	Total/NA	Solid	3010A	
LCS 180-220085/2-A	Lab Control Sample	Total/NA	Solid	3010A	
LCSD 180-220085/3-A	Lab Control Sample Dup	Total/NA	Solid	3010A	

Prep Batch: 220131

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-1	CCR-AP-2 (40-41)	ASTM Leach	Solid	3010A	219850
180-68950-2	CCR-AP-3 (40-41)	ASTM Leach	Solid	3010A	219850
180-68950-3	CCR-AP-4 (31-32)	ASTM Leach	Solid	3010A	219850
180-68950-4	CCR-AP-6 (40-41)	ASTM Leach	Solid	3010A	219850
180-68950-5	CCR-AP-8 (40-41)	ASTM Leach	Solid	3010A	219850
LB 180-219850/1-C	Method Blank	ASTM Leach	Solid	3010A	219850
MB 180-220131/1-A	Method Blank	Total/NA	Solid	3010A	
LCS 180-220131/2-A	Lab Control Sample	Total/NA	Solid	3010A	
LCSD 180-220131/3-A	Lab Control Sample Dup	Total/NA	Solid	3010A	

Metals (Continued)

Analysis Batch: 220148

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-6	SW-A	Dissolved	Water	6020A	219388
180-68950-6	SW-A	Total Recoverable	Water	6020A	219388
180-68950-7	SW-B	Dissolved	Water	6020A	219388
180-68950-7	SW-B	Total Recoverable	Water	6020A	219388
180-68950-8	SW-C	Dissolved	Water	6020A	219388
180-68950-8	SW-C	Total Recoverable	Water	6020A	219388
180-68950-9	SW-D	Dissolved	Water	6020A	219388
180-68950-9	SW-D	Total Recoverable	Water	6020A	219388
MB 180-219388/1-A	Method Blank	Total Recoverable	Water	6020A	219388
LCS 180-219388/2-A	Lab Control Sample	Total Recoverable	Water	6020A	219388

Prep Batch: 220230

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-1	CCR-AP-2 (40-41)	Total/NA	Solid	3050B	
180-68950-2	CCR-AP-3 (40-41)	Total/NA	Solid	3050B	
180-68950-3	CCR-AP-4 (31-32)	Total/NA	Solid	3050B	
180-68950-4	CCR-AP-6 (40-41)	Total/NA	Solid	3050B	
180-68950-5	CCR-AP-8 (40-41)	Total/NA	Solid	3050B	
MB 180-220230/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 180-220230/2-A	Lab Control Sample	Total/NA	Solid	3050B	

Analysis Batch: 220293

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-1	CCR-AP-2 (40-41)	ASTM Leach	Solid	6010C	220131
180-68950-1	CCR-AP-2 (40-41)	Total/NA	Solid	6010C	220230
180-68950-2	CCR-AP-3 (40-41)	ASTM Leach	Solid	6010C	220131
180-68950-2	CCR-AP-3 (40-41)	Total/NA	Solid	6010C	220230
180-68950-3	CCR-AP-4 (31-32)	ASTM Leach	Solid	6010C	220131
180-68950-3	CCR-AP-4 (31-32)	Total/NA	Solid	6010C	220230
180-68950-4	CCR-AP-6 (40-41)	ASTM Leach	Solid	6010C	220131
180-68950-4	CCR-AP-6 (40-41)	Total/NA	Solid	6010C	220230
180-68950-5	CCR-AP-8 (40-41)	ASTM Leach	Solid	6010C	220131
180-68950-5	CCR-AP-8 (40-41)	Total/NA	Solid	6010C	220230
LB 180-219850/1-C	Method Blank	ASTM Leach	Solid	6010C	220131
MB 180-220131/1-A	Method Blank	Total/NA	Solid	6010C	220131
MB 180-220230/1-A	Method Blank	Total/NA	Solid	6010C	220230
LCS 180-220131/2-A	Lab Control Sample	Total/NA	Solid	6010C	220131
LCS 180-220230/2-A	Lab Control Sample	Total/NA	Solid	6010C	220230
LCSD 180-220131/3-A	Lab Control Sample Dup	Total/NA	Solid	6010C	220131

Analysis Batch: 220304

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-1	CCR-AP-2 (40-41)	Total/NA	Solid	6020A	220008
180-68950-2	CCR-AP-3 (40-41)	Total/NA	Solid	6020A	220008
180-68950-3	CCR-AP-4 (31-32)	Total/NA	Solid	6020A	220008
180-68950-4	CCR-AP-6 (40-41)	Total/NA	Solid	6020A	220008
180-68950-5	CCR-AP-8 (40-41)	Total/NA	Solid	6020A	220008
MB 180-220008/1-A	Method Blank	Total/NA	Solid	6020A	220008
LCS 180-220008/2-A	Lab Control Sample	Total/NA	Solid	6020A	220008

Metals (Continued)

Analysis Batch: 220429

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-1	CCR-AP-2 (40-41)	ASTM Leach	Solid	6020A	220085
180-68950-2	CCR-AP-3 (40-41)	ASTM Leach	Solid	6020A	220085
180-68950-3	CCR-AP-4 (31-32)	ASTM Leach	Solid	6020A	220085
180-68950-4	CCR-AP-6 (40-41)	ASTM Leach	Solid	6020A	220085
180-68950-5	CCR-AP-8 (40-41)	ASTM Leach	Solid	6020A	220085
LB 180-219850/1-B	Method Blank	ASTM Leach	Solid	6020A	220085
MB 180-220085/1-A	Method Blank	Total/NA	Solid	6020A	220085
LCS 180-220085/2-A	Lab Control Sample	Total/NA	Solid	6020A	220085
LCSD 180-220085/3-A	Lab Control Sample Dup	Total/NA	Solid	6020A	220085

Analysis Batch: 384144

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-6	SW-A	Dissolved	Water	Se Speciation	
180-68950-7	SW-B	Dissolved	Water	Se Speciation	
180-68950-8	SW-C	Dissolved	Water	Se Speciation	
180-68950-9	SW-D	Dissolved	Water	Se Speciation	
180-68950-10	PW-1-A	Dissolved	Water	Se Speciation	
180-68950-11	PW-1-B	Dissolved	Water	Se Speciation	
180-68950-12	PW-2-A	Dissolved	Water	Se Speciation	
180-68950-13	PW-2-B	Dissolved	Water	Se Speciation	
MB 280-384144/4	Method Blank	Total/NA	Water	Se Speciation	
LCS 280-384144/5	Lab Control Sample	Total/NA	Water	Se Speciation	
180-68950-6 MS	SW-A	Dissolved	Water	Se Speciation	
180-68950-6 MSD	SW-A	Dissolved	Water	Se Speciation	

General Chemistry

Analysis Batch: 219384

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-10	PW-1-A	Total/NA	Water	SM 2540C	
180-68950-11	PW-1-B	Total/NA	Water	SM 2540C	
180-68950-12	PW-2-A	Total/NA	Water	SM 2540C	
MB 180-219384/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-219384/1	Lab Control Sample	Total/NA	Water	SM 2540C	

Prep Batch: 219405

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-1	CCR-AP-2 (40-41)	Total/NA	Solid	9030B	
180-68950-2	CCR-AP-3 (40-41)	Total/NA	Solid	9030B	
180-68950-3	CCR-AP-4 (31-32)	Total/NA	Solid	9030B	
180-68950-4	CCR-AP-6 (40-41)	Total/NA	Solid	9030B	
180-68950-5	CCR-AP-8 (40-41)	Total/NA	Solid	9030B	
MB 180-219405/2-A	Method Blank	Total/NA	Solid	9030B	
LCS 180-219405/1-A	Lab Control Sample	Total/NA	Solid	9030B	

Analysis Batch: 219438

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-6	SW-A	Total/NA	Water	SM 2540C	
180-68950-7	SW-B	Total/NA	Water	SM 2540C	
180-68950-8	SW-C	Total/NA	Water	SM 2540C	

General Chemistry (Continued)

Analysis Batch: 219438 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-9	SW-D	Total/NA	Water	SM 2540C	
180-68950-13	PW-2-B	Total/NA	Water	SM 2540C	
MB 180-219438/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-219438/1	Lab Control Sample	Total/NA	Water	SM 2540C	
180-68950-9 DU	SW-D	Total/NA	Water	SM 2540C	

Analysis Batch: 219439

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-1	CCR-AP-2 (40-41)	Total/NA	Solid	9034	219405
180-68950-2	CCR-AP-3 (40-41)	Total/NA	Solid	9034	219405
180-68950-3	CCR-AP-4 (31-32)	Total/NA	Solid	9034	219405
180-68950-4	CCR-AP-6 (40-41)	Total/NA	Solid	9034	219405
180-68950-5	CCR-AP-8 (40-41)	Total/NA	Solid	9034	219405
MB 180-219405/2-A	Method Blank	Total/NA	Solid	9034	219405
LCS 180-219405/1-A	Lab Control Sample	Total/NA	Solid	9034	219405

Analysis Batch: 219459

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-1	CCR-AP-2 (40-41)	Total/NA	Solid	2540G	
180-68950-2	CCR-AP-3 (40-41)	Total/NA	Solid	2540G	
180-68950-3	CCR-AP-4 (31-32)	Total/NA	Solid	2540G	
180-68950-4	CCR-AP-6 (40-41)	Total/NA	Solid	2540G	
180-68950-5	CCR-AP-8 (40-41)	Total/NA	Solid	2540G	
180-68950-1 DU	CCR-AP-2 (40-41)	Total/NA	Solid	2540G	

Analysis Batch: 219639

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-6	SW-A	Total/NA	Water	SM 5310C	
180-68950-7	SW-B	Total/NA	Water	SM 5310C	
180-68950-9	SW-D	Total/NA	Water	SM 5310C	
180-68950-10	PW-1-A	Total/NA	Water	SM 5310C	
180-68950-11	PW-1-B	Total/NA	Water	SM 5310C	
180-68950-12	PW-2-A	Total/NA	Water	SM 5310C	
180-68950-13	PW-2-B	Total/NA	Water	SM 5310C	
MB 180-219639/31	Method Blank	Total/NA	Water	SM 5310C	
LCS 180-219639/29	Lab Control Sample	Total/NA	Water	SM 5310C	
LCSD 180-219639/30	Lab Control Sample Dup	Total/NA	Water	SM 5310C	

Analysis Batch: 220063

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-68950-8	SW-C	Total/NA	Water	SM 5310C	
MB 180-220063/6	Method Blank	Total/NA	Water	SM 5310C	
LCS 180-220063/4	Lab Control Sample	Total/NA	Water	SM 5310C	
LCSD 180-220063/5	Lab Control Sample Dup	Total/NA	Water	SM 5310C	

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

Chain of Custody Record

180-68950 Chain of Custody

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Sean Lewis	Lab PM: Bortot, Veronica	COC No: 180-38481-8387.1
Client Contact: Sean Lewis	Phone: 864-395-0326	E-Mail: veronica.bortot@testamericainc.com	Page: Page 1 of 2
Company: Haley & Aldrich, Inc.			Job #:
Address: 400 Augusta Street Suite 130	Due Date Requested:		
City: Greenville	TAT Requested (days): Standard		
State, Zip: SC, 29601			
Phone:	PO #: 129420-005		
Email: slewis@haleyaldrich.com	WO #:		
Project Name: Vectren Groundwater and Soil Sampling	Project #: 18017692		
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	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)	6010C, 6020A	9034_Calc, Moisture	5310C - TOC - Duplicate	6020A - As, Fe, Mn, Mo by ICP-MS	6020A - As, Fe, Mn, Mo Dissolved (field filtered	9056A_ORGFM_28D - Chloride and Sulfate	2540C_Calcd - Solids, Total Dissolved (TDS)	Se_SPEC - As (III) and As (V), Dissolved (field fi	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	S	D	D	N	N	N		
CCR-AP-2 (40-41)	8/1/17	0900	G	Solid	N	N	X	X							3	Soil samples will remain on hold, pending groundwater sample results
CCR-AP-3 (40-41)	8/1/17	1155	G	Solid	N	N	X	X								
CCR-AP-4 (31-32)	8/1/17	1555	G	Solid	N	N	X	X								
CCR-AP-6 (40-41)	8/1/17	1325	G	Solid	N	N	X	X								
CCR-AP-8 (40-41)	8/1/17	1040	G	Solid	N	N	X	X								
SW-A	8/3/17	1035	G	Water	Y	N			X	X	X	X	X	X		* For PW-2A prepare sample with 1.0 µm nominal pore size filter disk for analysis of Total metals by EPA Method 6020A.
SW-B	8/3/17	0920	G	Water	Y	N			X	X	X	X	X	X		
SW-C	8/3/17	0945	G	Water	Y	N			X	X	X	X	X	X		
SW-D	8/3/17	1015	G	Water	Y	N			X	X	X	X	X	X		
PW-1-A	8/2/17	1045	G	Water	Y	N			X	X	X	X	X	X		
PW-1-B	8/2/17	1225	G	Water	Y	N			X	X	X	X	X	X		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

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)

Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Sean Lewis	8/3/17 1330		[signature]	8/4/17 0945	
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:

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	Sampler:	Lab PM: Bortot, Veronica	Carrier Tracking No(s):	COC No: 180-38481-8387.2
Client Contact: Sean Lewis	Phone:	E-Mail: veronica.bortot@testamericainc.com		Page: Page 2 of 2
Company: Haley & Aldrich, Inc.				Job #:
Address: 400 Augusta Street Suite 130	Due Date Requested:			
City: Greenville	TAT Requested (days):			
State, Zip: SC, 29601				
Phone:	PO #: 129420-005			
Email: slewis@haleyaldrich.com	WO #:			
Project Name: Vectren Groundwater and Soil Sampling	Project #: 18017692			
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	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)	6010C, 6020A	9034_Calc, Moisture	5310C - TOC - Duplicate	6020A - As, Fe, Mn, Mo by ICP-MS	6020A - As, Fe, Mn, Mo Dissolved (field filtered	9056A_ORGFM_28D - Chloride and Sulfate	2540C_Calcd - Solids, Total Dissolved (TDS)	Se_SPEC - As (III) and As (V), Dissolved (field fi	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	S	D	D	N	N	N		
PW-2-A	8/2/17	1420	G	Water	Y	N			X	X	X	X	X	X		
PW-2-B	8/3/17	0831	G	Water	Y	N			X	X	X	X	X	X		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

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)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 8/4/17 0945	Company
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:

8/21/2017

UPS Next Day Air®
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Shipping Document

See instructions on back. Visit UPS.com® or call 1-800-PICK-UPS® (800-742-5877) for additional information and Tariff/Terms and Conditions.

TRACKING NUMBER 1Z 376 1R0 22 1000 046 5

1 SHIPMENT FROM

SHIPPER'S UPS ACCOUNT NO. 3761R0

REFERENCE NUMBER 129420-005

NAME Sean Lewis TELEPHONE 864-214-8750

COMPANY HALEY & ALDRICH INC

STREET ADDRESS 400 AUGUSTA ST RM 130

CITY AND STATE GREENVILLE ZIP CODE SC 29601 3552

2 EXTREMELY URGENT DELIVERY TO

NAME Sample Receiving TELEPHONE (412) 963-7058

COMPANY Test America Pittsburgh

Uncorrected temp 1.4 °C

Thermometer ID 12

CF 0 Initials TS

PT-WI-SR-001 effective 7/26/13

UPS Next Day Air®
UPS Worldwide Express®
Shipping Document

See instructions on back. Visit UPS.com® or call 1-800-PICK-UPS® (800-742-5877) for additional information and Tariff/Terms and Conditions.

TRACKING NUMBER 1Z 376 1R0 22 1000 045 6

1 SHIPMENT FROM

SHIPPER'S UPS ACCOUNT NO. 3761R0

REFERENCE NUMBER 129420-005

NAME Sean Lewis TELEPHONE 864-214-8750

COMPANY HALEY & ALDRICH INC

STREET ADDRESS 400 AUGUSTA ST RM 130

CITY AND STATE GREENVILLE ZIP CODE SC 29601 3552

2 EXTREMELY URGENT DELIVERY TO

NAME Sample receiving TELEPHONE (412) 963-7058

COMPANY Test America Pittsburgh

DEPT./FLR. Residential

Uncorrected temp 0.2 °C

Thermometer ID 12

CF 0 Initials TS

PT-WI-SR-001 effective 7/26/13

3 WEIGHT LTR

5 TYPE OF SERVICE
☑ NEXT DAY AIR ☐ EXPRESS (INT'L) $
FOR INTERNATIONAL SHIPMENTS $ CUSTOMS VALUE ☐ DOCUMENTS ONLY

6 OPTIONAL SERVICES
☐ SATURDAY PICKUP See instructions. ☐ SATURDAY DELIVERY See instructions. $
☐ DECLARED VALUE FOR CARRIAGE For declared value over $100, see instructions. $ AMOUNT $
☐ C.O.D. If C.O.D. enter amount to be collected and attach completed UPS C.O.D. tag to package. $ AMOUNT $

7 ADDITIONAL HANDLING CHARGE ☐ An Additional Handling Charge applies for certain items. See instructions. $

TOTAL CHARGES $

8 METHOD OF PAYMENT
BILL SHIPPER'S ACCOUNT NUMBER IN SECTION 1 ☐
BILL RECEIVER ☐ BILL THIRD PARTY ☐ DOMESTIC ONLY CREDIT CARD ☐ American Express Diner's Club MasterCard Visa
RECORD ACCOUNT NO. IN SECTION 9 ☐ X ☐
CHEC

9 RECEIVER'S/THIRD PARTY'S UPS ACCT. NO. OR MAJOR CREDIT CARD NO.
015643

THIRD PARTY'S COMPANY NAME HALEY & ALDRICH,INC.

STREET ADDRESS 465 MEDFORD ST RM: 2200

CITY AND STATE RLESTOWN MA ZIP CODE 02129

UPS to act as forwarding agent for export control and customs purposes. Shipper certifies that these commodities, te United States, were exported in accordance with the Export Administration Regulations. Diversion contrary to law i

'S IRE X Sean Lewis

is are subject to the terms contained in the UPS Tariff/Terms and Service, which are available at UPS.com and local UPS offices. DATE OF 8/

1202609 6/14 RRD

180-68950 Waybill

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: 180-295256.1
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 #: 180-68950-1
Address: 4955 Yarrow Street, ,	Due Date Requested: 8/16/2017			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: Vectren Groundwater and Soil Sampling	Project #: 18017692			
Site:	SSOW#:			

Analysis Requested

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:

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)	Se_SPEC/FIELD_FLTRD As (III) and As (V), Dissolved (field fi	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
SW-A (180-68950-6)	8/3/17	10:35 Eastern		Water			X	1	
SW-B (180-68950-7)	8/3/17	09:20 Eastern		Water			X	1	
SW-C (180-68950-8)	8/3/17	09:45 Eastern		Water			X	1	
SW-D (180-68950-9)	8/3/17	10:15 Eastern		Water			X	1	
PW-1-A (180-68950-10)	8/2/17	10:45 Eastern		Water			X	1	
PW-1-B (180-68950-11)	8/2/17	12:25 Eastern		Water			X	1	
PW-2-A (180-68950-12)	8/2/17	14:20 Eastern		Water			X	1	
PW-2-B (180-68950-13)	8/3/17	08:31 Eastern		Water			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	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:

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	8-7-17 1700		Reed Reed	8-8-17 0850	TAO
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: 2.6 IR#7 +0.1 transfer IR7 8-8-17

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 180-68950-1

Login Number: 68950
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	

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 180-68950-1

Login Number: 68950
List Number: 2
Creator: Pottruff, Reed W

List Source: TestAmerica Denver
List Creation: 08/08/17 12:48 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
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?	N/A	Received project as a subcontract.
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.	N/A	
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").	N/A	
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: 180-69382-2
Client Project/Site: CCR Groundwater Monitoring FB Culley

For:
Vectren Corporation
PO BOX 209
Evansville, Indiana 47702

Attn: Lisa Messinger

Veronica Bortot

Authorized for release by:
9/18/2017 11:28:13 AM

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.

Table of Contents

Case Narrative

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring FB Culley

TestAmerica Job ID: 180-69382-2

Job ID: 180-69382-2

Laboratory: TestAmerica Pittsburgh

Narrative

Job Narrative
180-69382-2

Comments
No additional comments.

Receipt
The samples were received on 8/16/2017 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.8º C.

RAD
Method(s) PrecSep_0: Radium 228 Prep Batch 160-323471
Insufficient sample volume was available to perform a sample duplicate (DU). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.
CCR-AP-8 (180-69382-1)

Method(s) PrecSep_0: Radium 228 Prep Batch 160-323471
The following sample was reduced due to limited volume.

CCR-AP-8 (180-69382-1)

Method(s) PrecSep_0: Radium 228 Prep Batch 160-323579
The following sample was reduced due to limited volume. The sample was also murky and gray in color due to heavy amounts of sediment.

CCR-AP-9 (180-69382-2)

Method(s) PrecSep-21: Radium 226 Prep Batch 160-323456
Insufficient sample volume was available to perform a sample duplicate (DU). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.
CCR-AP-8 (180-69382-1)

Method(s) PrecSep-21: Radium 226 Prep Batch 160-323456
the following sample was reduced due to limited volume.

CCR-AP-8 (180-69382-1)

Method(s) PrecSep-21: Radium 226 Prep Batch 160-323575
The following sample was reduced due to limited volume. The sample was also murky and gray in color due to heavy amounts of sediment.

CCR-AP-9 (180-69382-2)

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

Definitions/Glossary

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring FB Culley

TestAmerica Job ID: 180-69382-2

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

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: Vectren Corporation
Project/Site: CCR Groundwater Monitoring FB Culley

TestAmerica Job ID: 180-69382-2

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	09-14-17 *
West Virginia DEP	State Program	3	142	01-31-18
Wisconsin	State Program	5	998027800	08-31-18

Laboratory: TestAmerica St. Louis

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
Alaska	State Program	10	MO00054	06-30-18
California	State Program	9	2886	03-31-18 *
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-18
Illinois	NELAP	5	200023	11-30-17
Iowa	State Program	7	373	02-01-18
Kansas	NELAP	7	E-10236	10-31-17 *
Kentucky (DW)	State Program	4	90125	12-31-17
L-A-B	DoD ELAP		L2305	04-06-19
Louisiana	NELAP	6	04080	06-30-18
Louisiana (DW)	NELAP	6	LA170011	12-31-17
Maryland	State Program	3	310	09-30-18
Missouri	State Program	7	780	06-30-18
Nevada	State Program	9	MO000542017-1	07-31-18
New Jersey	NELAP	2	MO002	06-30-18
New York	NELAP	2	11616	03-31-18
North Dakota	State Program	8	R207	06-30-17 *
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-18
Pennsylvania	NELAP	3	68-00540	02-21-18
South Carolina	State Program	4	85002001	06-30-17 *
Texas	NELAP	6	T104704193-17-11	07-31-18
US Fish & Wildlife	Federal		058448	08-31-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring FB Culley

TestAmerica Job ID: 180-69382-2

Laboratory: TestAmerica St. Louis (Continued)

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
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-18
Virginia	NELAP	3	460230	06-14-18
Washington	State Program	10	C592	08-30-18
West Virginia DEP	State Program	3	381	08-31-18

Sample Summary

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring FB Culley

TestAmerica Job ID: 180-69382-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-69382-1	CCR-AP-8	Water	08/15/17 12:00	08/16/17 09:00
180-69382-2	CCR-AP-9	Water	08/15/17 12:40	08/16/17 09:00

Method Summary

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring FB Culley

TestAmerica Job ID: 180-69382-2

Method	Method Description	Protocol	Laboratory
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL

Protocol References:

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

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Lab Chronicle

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring FB Culley

TestAmerica Job ID: 180-69382-2

Client Sample ID: CCR-AP-8

Date Collected: 08/15/17 12:00
Date Received: 08/16/17 09:00

Lab Sample ID: 180-69382-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			750.88 mL	1.0 g	323456	08/22/17 08:55	LDE	TAL SL
Total/NA	Analysis	9315		1	1.0 mL	1.0 mL	327005	09/13/17 06:16	RTM	TAL SL
	Instrument ID: GFPCPURPLE									
Total/NA	Prep	PrecSep_0			750.88 mL	1.0 g	323471	08/22/17 09:25	LDE	TAL SL
Total/NA	Analysis	9320		1			325012	08/30/17 13:52	RTM	TAL SL
	Instrument ID: GFPCPURPLE									
Total/NA	Analysis	Ra226_Ra228		1			327331	09/14/17 15:15	RTM	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-9

Date Collected: 08/15/17 12:40
Date Received: 08/16/17 09:00

Lab Sample ID: 180-69382-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			749.12 mL	1.0 g	323575	08/23/17 07:47	LDE	TAL SL
Total/NA	Analysis	9315		1			327140	09/14/17 09:24	RTM	TAL SL
	Instrument ID: GFPCORANGE									
Total/NA	Prep	PrecSep_0			749.12 mL	1.0 g	323579	08/23/17 08:07	LDE	TAL SL
Total/NA	Analysis	9320		1			325254	08/31/17 10:53	ALD	TAL SL
	Instrument ID: GFPCORANGE									
Total/NA	Analysis	Ra226_Ra228		1			327331	09/14/17 15:15	RTM	TAL SL
	Instrument ID: NOEQUIP									

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Analyst References:

Lab: TAL SL

Batch Type: Prep

LDE = Larissa Ehlert

Batch Type: Analysis

ALD = Amanda Dick

RTM = Rachel Mueller

Client Sample ID: CCR-AP-8

Date Collected: 08/15/17 12:00
Date Received: 08/16/17 09:00

Lab Sample ID: 180-69382-1
Matrix: Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.513		0.135	0.143	1.00	0.103	pCi/L	08/22/17 08:55	09/13/17 06:16	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*08/22/17 08:55*	*09/13/17 06:16*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.316	U	0.304	0.305	1.00	0.492	pCi/L	08/22/17 09:25	08/30/17 13:52	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*08/22/17 09:25*	*08/30/17 13:52*	*1*
Y Carrier	*89.0*		*40 - 110*	*08/22/17 09:25*	*08/30/17 13:52*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.829		0.333	0.337	5.00	0.492	pCi/L		09/14/17 15:15	1

Client Sample ID: CCR-AP-9

Date Collected: 08/15/17 12:40
Date Received: 08/16/17 09:00

Lab Sample ID: 180-69382-2
Matrix: Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.68		0.264	0.304	1.00	0.104	pCi/L	08/23/17 07:47	09/14/17 09:24	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*83.5*		*40 - 110*	*08/23/17 07:47*	*09/14/17 09:24*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.45		0.463	0.482	1.00	0.631	pCi/L	08/23/17 08:07	08/31/17 10:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*83.5*		*40 - 110*	*08/23/17 08:07*	*08/31/17 10:53*	*1*
Y Carrier	*88.2*		*40 - 110*	*08/23/17 08:07*	*08/31/17 10:53*	*1*

Client Sample Results

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring FB Culley

TestAmerica Job ID: 180-69382-2

Client Sample ID: CCR-AP-9
Date Collected: 08/15/17 12:40
Date Received: 08/16/17 09:00

Lab Sample ID: 180-69382-2
Matrix: Water

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	3.13		0.533	0.570	5.00	0.631	pCi/L		09/14/17 15:15	1

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-323456/1-A
Matrix: Water
Analysis Batch: 327005

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 323456

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.01009	U	0.0485	0.0485	1.00	0.0976	pCi/L	08/22/17 08:55	09/13/17 06:16	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*104*		*40 - 110*	*08/22/17 08:55*	*09/13/17 06:16*	*1*

Lab Sample ID: LCS 160-323456/2-A
Matrix: Water
Analysis Batch: 327005

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 323456

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-226			12.8	11.59		1.20	1.00	0.0845	pCi/L	91	68 - 137		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*107*		*40 - 110*

Lab Sample ID: LCSD 160-323456/3-A
Matrix: Water
Analysis Batch: 327005

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 323456

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226			12.8	12.31		1.26	1.00	0.0983	pCi/L	96	68 - 137	0.29	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*104*		*40 - 110*

Lab Sample ID: MB 160-323575/1-A
Matrix: Water
Analysis Batch: 327140

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 323575

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.03629	U	0.0475	0.0476	1.00	0.0789	pCi/L	08/23/17 07:47	09/14/17 09:24	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.5*		*40 - 110*	*08/23/17 07:47*	*09/14/17 09:24*	*1*

Lab Sample ID: LCS 160-323575/2-A
Matrix: Water
Analysis Batch: 327140

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 323575

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-226			9.60	10.38		1.08	1.00	0.0938	pCi/L	108	68 - 137		

Method: 9315 - Radium-226 (GFPC) (Continued)

Lab Sample ID: LCS 160-323575/2-A
Matrix: Water
Analysis Batch: 327140

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 323575

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	91.7		40 - 110

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-323471/1-A
Matrix: Water
Analysis Batch: 325012

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 323471

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.07831	U	0.252	0.252	1.00	0.439	pCi/L	08/22/17 09:25	08/30/17 13:52	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	104		40 - 110	08/22/17 09:25	08/30/17 13:52	1
Y Carrier	87.5		40 - 110	08/22/17 09:25	08/30/17 13:52	1

Lab Sample ID: LCS 160-323471/2-A
Matrix: Water
Analysis Batch: 325012

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 323471

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			17.3	17.89		1.90	1.00	0.451	pCi/L	103	56 - 140		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	107		40 - 110
Y Carrier	89.0		40 - 110

Lab Sample ID: LCSD 160-323471/3-A
Matrix: Water
Analysis Batch: 325012

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 323471

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228			17.3	18.70		2.00	1.00	0.460	pCi/L	108	56 - 140	0.21	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	104		40 - 110
Y Carrier	83.7		40 - 110

Lab Sample ID: MB 160-323579/1-A
Matrix: Water
Analysis Batch: 325254

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 323579

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.6516		0.282	0.288	1.00	0.406	pCi/L	08/23/17 08:07	08/31/17 10:53	1

QC Sample Results

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring FB Culley

TestAmerica Job ID: 180-69382-2

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	88.5		40 - 110	08/23/17 08:07	08/31/17 10:53	1
Y Carrier	88.2		40 - 110	08/23/17 08:07	08/31/17 10:53	1

Lab Sample ID: LCS 160-323579/2-A
Matrix: Water
Analysis Batch: 325254

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 323579

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			13.0	13.50		1.46	1.00	0.336	pCi/L	104	56 - 140		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	91.7		40 - 110
Y Carrier	91.2		40 - 110

QC Association Summary

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring FB Culley

TestAmerica Job ID: 180-69382-2

Rad

Prep Batch: 323456

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-69382-1	CCR-AP-8	Total/NA	Water	PrecSep-21	
MB 160-323456/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-323456/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-323456/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 323471

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-69382-1	CCR-AP-8	Total/NA	Water	PrecSep_0	
MB 160-323471/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-323471/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-323471/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Prep Batch: 323575

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-69382-2	CCR-AP-9	Total/NA	Water	PrecSep-21	
MB 160-323575/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-323575/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 323579

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-69382-2	CCR-AP-9	Total/NA	Water	PrecSep_0	
MB 160-323579/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-323579/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

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

Chain of Custody Record

COLUMBUS
240507

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: J. Winsett	Lab PM: Bortot, Veronica	Carrier Tracking No(s):	COC No: 180-39023-8128.1
Client Contact: Lisa Messinger	Phone: (812) 228-9422	E-Mail: veronica.bortot@testamericainc.com		Page: Page 1 of 1
Company: Vectren Corporation		Analysis Requested		Job #: ATC: 170400367
Address: PO BOX 209	Due Date Requested:			Preservation Codes:
City: Evansville	TAT Requested (days):			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)
State, Zip: IN, 47702				
Phone:	PO #: Purchase Order Requested			Other:
Email: lmessinger@vectren.com	WO #:			
Project Name: CCR Groundwater Monitoring Fb Culley	Project #: 18016014			
Site: FB Culley	SSOW#:			

Sample Identification	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)	9040C, 9056A_ORGFM_28D	6010C, 6020A, 7470A	2540C_Calcd - Local Method	9316_Ra226, 9320_Ra228	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	N	D		
CCR-AP-8	8/15/17	1200	G	Water			1	1	1	1		
CCR-AP-9	8/15/17	1240	G	Water								

180-69382 Chain of Custody

COLUMBUS
240507

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☒ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

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)

Special Instructions/QC Requirements:

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

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Jacob Winsett	8/15/17 3:00 pm	ATC	Fed Ex	8/15/17	Fed Ex
2						
3					8/16/17 0900	TAPT

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

9/18/2017

ORIGIN ID:EVVA (812) 477-1176
BRIAN KLEEMAN

6149 WEDEKING AVENUE
BUILDING D, SUITE 2
EVANSVILLE, IN 47715
UNITED STATES US

SHIP DATE: 15AUG17
ACTWGT: 40.00 LB
CAD: 10699842/INET3920
DIMS: 23x13x13 IN

BILL SENDER

TO **VERONICA BORTOT**
TESTAMERICA
301 ALPHA DRIVE
PITTSBURGH PA 15238
(412) 963-7058
INV:
DEPT:

549J/57/E/104C

180-69382 Waybill

FedEx Express

J172817062901uv

TRK# 0201 **7799 9809 7683**

WED - 16 AUG 3:00P
STANDARD OVERNIGHT

NA AGCA

15238
PIT
PA-US

Uncorrected temp 3.8 °C
Thermometer ID NZ
CF +1.0 Initials TM

PT-WI-SR-001 effective 7/26/13

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

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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: 180-296967.1
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 #: 180-69382-2
Address: 13715 Rider Trail North,	Due Date Requested: 9/18/2017			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: CCR Groundwater Monitoring FB Culley	Project #: 18016014			
Site:	SSOW#:			

Analysis Requested

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:

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)	Ra226Ra228_GFPC	9315_Ra226/PrecSep_21 Standard Target List	9320_Ra228/PrecSep_0 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
CCR-AP-8 (180-69382-1)	8/15/17	12:00 Eastern		Water			X	X	X	1	
CCR-AP-9 (180-69382-2)	8/15/17	12:40 Eastern		Water			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	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: 8/17/17 1700	Company TAP	Received by:	Date/Time: 8.18.17 0850	Company TASR
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:

9/18/2017

Login Sample Receipt Checklist

Client: Vectren Corporation

Job Number: 180-69382-2

Login Number: 69382
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	

Login Sample Receipt Checklist

Client: Vectren Corporation

Job Number: 180-69382-2

Login Number: 69382
List Number: 2
Creator: Clarke, Jill C

List Source: TestAmerica St. Louis
List Creation: 08/18/17 11:38 AM

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.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	18.0
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	Added nitric acid, lot # 929870, to Sample # 1. Corrected pH to < 2.
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").	N/A	
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: 180-84236-1
Client Project/Site: Vectren ASD Sampling - FB Culley

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

Attn: Sean Lewis

Authorized for release by:
1/31/2019 2:19:10 PM

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

PA Lab ID: 02-00416

Table of Contents

Job ID: 180-84236-1

Laboratory: TestAmerica Pittsburgh

Narrative

Job Narrative
180-84236-1

Comments
No additional comments.

Receipt
The samples were received on 11/21/2018 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 2.7º C, 3.7º C, 4.9º C and 5.5º C.

Receipt Exceptions

One of the total TOC vials was received broken. CCR-AP-5 (180-84236-2).

GC Semi VOA
Method(s) Lloyd Kahn: Please note that the reporting limit for Lloyd Kahn TOC analysis is a nominal value and does not reflect adjustments in sample mass processed on an individual basis.

CCR-AP-8I (68-70) (180-84236-10), CCR-AP-6I (68-70) (180-84236-11), HASB-1 (35-38) (180-84236-12), (LCS 180-263935/28), (MB 180-263935/27), (240-104562-Q-2), (240-104562-B-2 DU), (240-104562-B-2 MS) and (240-104562-B-2 MSD)

Method(s) Lloyd Kahn: A deviation from the Standard Operating Procedure (SOP) occurred. Details are as follows: Due to an autosampler malfunction the CCV that normally starts the sequence was not injected. The passing LCS is analyzed before any samples so analyst believes this should suffice for a standard starting the sequence. The other CCVs in the sequence also pass proving the calibration curve still is effective.

Method(s) Lloyd Kahn: The matrix spike / matrix spike duplicate (MS/MSD) precision for analytical batch 180-264051 was outside control limits. Sample non-homogeneity is suspected. Analyst notes that the sample in the MSD jar had a different color and general appearance to the original and MS samples.

Method(s) Lloyd Kahn: Please note that the reporting limit for Lloyd Kahn TOC analysis is a nominal value and does not reflect adjustments in sample mass processed on an individual basis.

CCR-AP-8I (68-70) (180-84236-10), CCR-AP-6I (68-70) (180-84236-11), HASB-1 (35-38) (180-84236-12), (240-104562-P-2), (240-104562-B-2 DU), (240-104562-B-2 MS) and (240-104562-B-2 MSD)

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

Metals
Method(s) 6020A: The following sample was diluted to bring the concentration of manganese within the calibration range: CCR-AP-2 (180-84236-1). Elevated reporting limits (RLs) are provided.

Method(s) 7470A: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 180-263760, 180-263760 and 180-263948.

Method(s) 7470A: The continuing calibration verification (CCV) associated with batch 180-264124 recovered above the upper control limit for Mercury. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method(s) Se Speciation
No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
Method(s) SM 5310C: The RPD between the duplicate analyses was >10%. The difference between the results was less than the reporting limit, therefore the results are reported with this NCM

Job ID: 180-84236-1 (Continued)

Laboratory: TestAmerica Pittsburgh (Continued)

HASB-1 (180-84236-9)

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

TCLP
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 ASD Sampling - FB Culley

TestAmerica Job ID: 180-84236-1

Qualifiers

HPLC/IC

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.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
F1	MS and/or MSD Recovery is outside acceptance limits.

General Chemistry

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 - FB Culley

TestAmerica Job ID: 180-84236-1

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	12-31-19
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	01-31-20
Wisconsin	State Program	5	998027800	08-31-19

Laboratory: TestAmerica Denver

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	DoD ELAP		2907.01	10-31-19
A2LA	ISO/IEC 17025		2907.01	10-31-19
Alabama	State Program	4	40730	09-30-12 *
Alaska (UST)	State Program	10	UST-30	02-28-19
Arizona	State Program	9	AZ0713	12-20-19
Arkansas DEQ	State Program	6	88-0687	06-01-19
California	State Program	9	2513	01-18-19 *
Connecticut	State Program	1	PH-0686	09-30-20
Florida	NELAP	4	E87667	06-30-19
Georgia	State Program	4	N/A	01-08-20
Illinois	NELAP	5	200017	04-30-19
Iowa	State Program	7	370	12-01-20
Kansas	NELAP	7	E-10166	04-30-19
Louisiana	NELAP	6	02096	06-30-19
Maine	State Program	1	CO0002	03-03-19
Minnesota	NELAP	5	8-999-405	12-31-19
Nevada	State Program	9	CO0026	07-31-19
New Hampshire	NELAP	1	205310	04-28-19
New Jersey	NELAP	2	CO004	06-30-19
New York	NELAP	2	11964	04-01-19
North Carolina (WW/SW)	State Program	4	358	12-31-19
North Dakota	State Program	8	R-034	01-08-19 *
Oklahoma	State Program	6	8614	08-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc. TestAmerica Job ID: 180-84236-1
Project/Site: Vectren ASD Sampling - FB Culley

Laboratory: TestAmerica Denver (Continued)

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
Pennsylvania	NELAP	3	68-00664	07-31-19
South Carolina	State Program	4	72002001	01-08-19 *
Texas	NELAP	6	T104704183-18-15	09-30-19
US Fish & Wildlife	Federal			07-31-19
USDA	Federal			03-26-21
Utah	NELAP	8	CO00026	07-31-19
Virginia	NELAP	3	460232	06-14-19
Washington	State Program	10	C583	08-03-19
West Virginia DEP	State Program	3	354	01-31-19
Wisconsin	State Program	5	999615430	08-31-19 *
Wyoming (UST)	A2LA	8	2907.01	10-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Sample Summary

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

TestAmerica Job ID: 180-84236-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-84236-1	CCR-AP-2	Water	11/15/18 09:25	11/21/18 10:00
180-84236-2	CCR-AP-5	Water	11/15/18 11:46	11/21/18 10:00
180-84236-3	CCR-AP-4	Water	11/15/18 15:00	11/21/18 10:00
180-84236-4	CCR-AP-8	Water	11/16/18 09:02	11/21/18 10:00
180-84236-5	CCR-AP-3	Water	11/16/18 10:37	11/21/18 10:00
180-84236-6	CCR-AP-6	Water	11/17/18 10:01	11/21/18 10:00
180-84236-7	CCR-AP-6I	Water	11/17/18 14:27	11/21/18 10:00
180-84236-8	CCR-AP-8I	Water	11/17/18 15:47	11/21/18 10:00
180-84236-9	HASB-1	Water	11/17/18 16:36	11/21/18 10:00
180-84236-10	CCR-AP-8I (68-70)	Solid	11/15/18 09:10	11/21/18 10:00
180-84236-11	CCR-AP-6I (68-70)	Solid	11/16/18 09:25	11/21/18 10:00
180-84236-12	HASB-1 (35-38)	Solid	11/16/18 15:50	11/21/18 10:00

Method Summary

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

TestAmerica Job ID: 180-84236-1

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 7470A	Mercury (CVAA)	SW846	TAL PIT
EPA 7471B	Mercury (CVAA)	SW846	TAL PIT
Se Speciation	Selenium Speciation	None	TAL DEN
2540G	SM 2540G	SM22	TAL PIT
EPA 350.1	Nitrogen, Ammonia	EPA	TAL PIT
EPA-Lloyd Kahn	Organic Carbon, Total (TOC)	EPA	TAL PIT
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PIT
SM 5310C	Organic Carbon, Dissolved (DOC)	SM	TAL PIT
SM 5310C	Total Organic Carbon	SM	TAL PIT
SM2320 B	Alkalinity, Total	SM18	TAL PIT
1312	SPLP Extraction	SW846	TAL PIT
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	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
Distill/Ammonia	Distillation, Ammonia	None	TAL PIT
EPA 1312	SPLP Extraction	SW846	TAL PIT

Protocol References:

EPA = US Environmental Protection Agency
None = None
SM = "Standard Methods For The Examination Of Water And Wastewater"
SM18 = "Standard Methods For The Examination Of Water And Wastewater", 18th Edition, 1992.
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 DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
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 - FB Culley

TestAmerica Job ID: 180-84236-1

Client Sample ID: CCR-AP-2

Date Collected: 11/15/18 09:25
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	EPA 9056A		1			264318	12/03/18 07:04	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	EPA 9056A		1			264317	12/03/18 07:39	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total/NA	Analysis	EPA 9056A		10			264317	12/03/18 07:55	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Dissolved	Prep	3005A			50.0 mL	50.0 mL	263656	11/23/18 13:00	RSK	TAL PIT
Dissolved	Analysis	EPA 6020A		1			263680	11/24/18 11:57	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50.0 mL	50.0 mL	263656	11/23/18 13:00	RSK	TAL PIT
Total Recoverable	Analysis	EPA 6020A		10			263680	11/24/18 10:33	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50.0 mL	50.0 mL	263656	11/23/18 13:00	RSK	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			263680	11/24/18 11:50	RSK	TAL PIT
	Instrument ID: A									
Dissolved	Prep	7470A			50 mL	50 mL	263719	11/26/18 09:55	RJR	TAL PIT
Dissolved	Analysis	EPA 7470A		1			263824	11/27/18 07:47	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Prep	7470A			50 mL	50 mL	263721	11/26/18 09:58	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			263824	11/27/18 08:18	RJR	TAL PIT
	Instrument ID: HGY									
Dissolved	Analysis	Se Speciation		1	1 mL	1 mL	439085	11/28/18 17:34	LMT	TAL DEN
	Instrument ID: MT_024_Se									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	263522	11/21/18 11:00	JAS	TAL PIT
	Instrument ID: NOEQUIP									
Dissolved	Analysis	SM 5310C		1			263820	11/27/18 07:45	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM 5310C		1			263767	11/26/18 12:53	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM2320 B		1	50 mL	50 mL	263870	11/28/18 05:15	CLL	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-5

Date Collected: 11/15/18 11:46
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	EPA 9056A		1			264318	12/03/18 08:24	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	EPA 9056A		1			264317	12/03/18 08:42	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Dissolved	Prep	3005A			50.0 mL	50.0 mL	263658	11/23/18 13:30	RSK	TAL PIT

Lab Chronicle

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

TestAmerica Job ID: 180-84236-1

Client Sample ID: CCR-AP-5

Date Collected: 11/15/18 11:46
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	EPA 6020A		1			263793	11/24/18 13:44	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50.0 mL	50.0 mL	263658	11/23/18 13:30	RSK	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			263793	11/24/18 13:41	RSK	TAL PIT
	Instrument ID: A									
Dissolved	Prep	7470A			50 mL	50 mL	263719	11/26/18 09:55	RJR	TAL PIT
Dissolved	Analysis	EPA 7470A		1			263824	11/27/18 07:48	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Prep	7470A			50 mL	50 mL	263721	11/26/18 09:58	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			263824	11/27/18 08:20	RJR	TAL PIT
	Instrument ID: HGY									
Dissolved	Analysis	Se Speciation		1	1 mL	1 mL	439085	11/28/18 17:47	LMT	TAL DEN
	Instrument ID: MT_024_Se									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	263522	11/21/18 11:00	JAS	TAL PIT
	Instrument ID: NOEQUIP									
Dissolved	Analysis	SM 5310C		1			263820	11/27/18 07:57	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM 5310C		1			263767	11/26/18 13:06	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM2320 B		1	50 mL	50 mL	263870	11/28/18 05:15	CLL	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-4

Date Collected: 11/15/18 15:00
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	EPA 9056A		1			264318	12/03/18 07:20	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	EPA 9056A		1			264317	12/03/18 08:10	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Dissolved	Prep	3005A			50.0 mL	50.0 mL	263658	11/23/18 13:30	RSK	TAL PIT
Dissolved	Analysis	EPA 6020A		1			263793	11/24/18 13:50	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50.0 mL	50.0 mL	263658	11/23/18 13:30	RSK	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			263793	11/24/18 13:47	RSK	TAL PIT
	Instrument ID: A									
Dissolved	Prep	7470A			50 mL	50 mL	263719	11/26/18 09:55	RJR	TAL PIT
Dissolved	Analysis	EPA 7470A		1			263824	11/27/18 07:50	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Prep	7470A			50 mL	50 mL	263721	11/26/18 09:58	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			263824	11/27/18 08:23	RJR	TAL PIT
	Instrument ID: HGY									

Lab Chronicle

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

TestAmerica Job ID: 180-84236-1

Client Sample ID: CCR-AP-4

Date Collected: 11/15/18 15:00
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	Se Speciation		1	1 mL	1 mL	439085	11/28/18 18:00	LMT	TAL DEN
	Instrument ID: MT_024_Se									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	263522	11/21/18 11:00	JAS	TAL PIT
	Instrument ID: NOEQUIP									
Dissolved	Analysis	SM 5310C		1			263820	11/27/18 08:10	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM 5310C		1			263767	11/26/18 13:18	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM2320 B		1	50 mL	50 mL	263870	11/28/18 05:15	CLL	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-8

Date Collected: 11/16/18 09:02
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	EPA 9056A		1			264318	12/03/18 07:36	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	EPA 9056A		1			264317	12/03/18 08:26	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Dissolved	Prep	3005A			50.0 mL	50.0 mL	263658	11/23/18 13:30	RSK	TAL PIT
Dissolved	Analysis	EPA 6020A		1			263793	11/24/18 13:57	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50.0 mL	50.0 mL	263658	11/23/18 13:30	RSK	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			263793	11/24/18 13:54	RSK	TAL PIT
	Instrument ID: A									
Dissolved	Prep	7470A			50 mL	50 mL	263719	11/26/18 09:55	RJR	TAL PIT
Dissolved	Analysis	EPA 7470A		1			263824	11/27/18 07:51	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Prep	7470A			50 mL	50 mL	263721	11/26/18 09:58	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			263824	11/27/18 08:24	RJR	TAL PIT
	Instrument ID: HGY									
Dissolved	Analysis	Se Speciation		1	1 mL	1 mL	439085	11/28/18 18:14	LMT	TAL DEN
	Instrument ID: MT_024_Se									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	263522	11/21/18 11:00	JAS	TAL PIT
	Instrument ID: NOEQUIP									
Dissolved	Analysis	SM 5310C		1			263820	11/27/18 08:22	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM 5310C		1			263767	11/26/18 13:30	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM2320 B		1	50 mL	50 mL	263925	11/28/18 09:11	CLL	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-3

Lab Sample ID: 180-84236-5

Date Collected: 11/16/18 10:37

Matrix: Water

Date Received: 11/21/18 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	EPA 9056A		1			264318	12/03/18 07:52	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	EPA 9056A		1			264317	12/03/18 10:15	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Dissolved	Prep	3005A			50.0 mL	50.0 mL	263658	11/23/18 13:30	RSK	TAL PIT
Dissolved	Analysis	EPA 6020A		1			263793	11/24/18 14:04	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50.0 mL	50.0 mL	263658	11/23/18 13:30	RSK	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			263793	11/24/18 14:00	RSK	TAL PIT
	Instrument ID: A									
Dissolved	Prep	7470A			50 mL	50 mL	263719	11/26/18 09:55	RJR	TAL PIT
Dissolved	Analysis	EPA 7470A		1			263824	11/27/18 07:52	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Prep	7470A			50 mL	50 mL	263721	11/26/18 09:58	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			263824	11/27/18 08:25	RJR	TAL PIT
	Instrument ID: HGY									
Dissolved	Analysis	Se Speciation		1	1 mL	1 mL	439085	11/28/18 18:27	LMT	TAL DEN
	Instrument ID: MT_024_Se									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	263522	11/21/18 11:00	JAS	TAL PIT
	Instrument ID: NOEQUIP									
Dissolved	Analysis	SM 5310C		1			263820	11/27/18 08:34	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM 5310C		1			263767	11/26/18 13:43	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM2320 B		1	50 mL	50 mL	263925	11/28/18 09:11	CLL	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-6

Lab Sample ID: 180-84236-6

Date Collected: 11/17/18 10:01

Matrix: Water

Date Received: 11/21/18 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	EPA 9056A		1			264318	12/03/18 08:08	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	EPA 9056A		1			264317	12/03/18 10:31	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Dissolved	Prep	3005A			50.0 mL	50.0 mL	263658	11/23/18 13:30	RSK	TAL PIT
Dissolved	Analysis	EPA 6020A		1			263793	11/24/18 14:17	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50.0 mL	50.0 mL	263658	11/23/18 13:30	RSK	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			263793	11/24/18 14:14	RSK	TAL PIT
	Instrument ID: A									
Dissolved	Prep	7470A			50 mL	50 mL	263719	11/26/18 09:55	RJR	TAL PIT

Lab Chronicle

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

TestAmerica Job ID: 180-84236-1

Client Sample ID: CCR-AP-6

Date Collected: 11/17/18 10:01
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	EPA 7470A		1			263824	11/27/18 07:55	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Prep	7470A			50 mL	50 mL	263721	11/26/18 09:58	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			263824	11/27/18 08:26	RJR	TAL PIT
	Instrument ID: HGY									
Dissolved	Analysis	Se Speciation		1	1 mL	1 mL	439085	11/28/18 19:06	LMT	TAL DEN
	Instrument ID: MT_024_Se									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	263522	11/21/18 11:00	JAS	TAL PIT
	Instrument ID: NOEQUIP									
Dissolved	Analysis	SM 5310C		1			263820	11/27/18 09:12	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM 5310C		1			263767	11/26/18 13:55	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM2320 B		1	50 mL	50 mL	263925	11/28/18 09:11	CLL	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-6I

Date Collected: 11/17/18 14:27
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	EPA 9056A		1			264318	12/03/18 09:51	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	EPA 9056A		1			264317	12/03/18 10:46	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total/NA	Analysis	EPA 9056A		10			264317	12/03/18 11:01	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Dissolved	Prep	3005A			50.0 mL	50.0 mL	263658	11/23/18 13:30	RSK	TAL PIT
Dissolved	Analysis	EPA 6020A		1			263793	11/24/18 14:23	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50.0 mL	50.0 mL	263658	11/23/18 13:30	RSK	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			263793	11/24/18 14:20	RSK	TAL PIT
	Instrument ID: A									
Dissolved	Prep	7470A			50 mL	50 mL	263719	11/26/18 09:55	RJR	TAL PIT
Dissolved	Analysis	EPA 7470A		1			263824	11/27/18 07:56	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Prep	7470A			50 mL	50 mL	263721	11/26/18 09:58	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			263824	11/27/18 08:27	RJR	TAL PIT
	Instrument ID: HGY									
Dissolved	Analysis	Se Speciation		1	1 mL	1 mL	439085	11/28/18 19:46	LMT	TAL DEN
	Instrument ID: MT_024_Se									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	263522	11/21/18 11:00	JAS	TAL PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

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

TestAmerica Job ID: 180-84236-1

Client Sample ID: CCR-AP-6I

Date Collected: 11/17/18 14:27
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	SM 5310C		1			263820	11/27/18 09:25	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM 5310C		1			263767	11/26/18 14:33	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM2320 B		1	50 mL	50 mL	263870	11/28/18 05:15	CLL	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-8I

Date Collected: 11/17/18 15:47
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	EPA 9056A		1			264318	12/03/18 10:07	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	EPA 9056A		1			264317	12/03/18 11:17	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total/NA	Analysis	EPA 9056A		10			264317	12/03/18 11:32	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Dissolved	Prep	3005A			50.0 mL	50.0 mL	263658	11/23/18 13:30	RSK	TAL PIT
Dissolved	Analysis	EPA 6020A		1			263793	11/24/18 14:30	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50.0 mL	50.0 mL	263658	11/23/18 13:30	RSK	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			263793	11/24/18 14:27	RSK	TAL PIT
	Instrument ID: A									
Dissolved	Prep	7470A			50 mL	50 mL	263719	11/26/18 09:55	RJR	TAL PIT
Dissolved	Analysis	EPA 7470A		1			263824	11/27/18 07:57	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Prep	7470A			50 mL	50 mL	263721	11/26/18 09:58	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			263824	11/27/18 08:29	RJR	TAL PIT
	Instrument ID: HGY									
Dissolved	Analysis	Se Speciation		1	1 mL	1 mL	439085	11/28/18 19:59	LMT	TAL DEN
	Instrument ID: MT_024_Se									
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	263522	11/21/18 11:00	JAS	TAL PIT
	Instrument ID: NOEQUIP									
Dissolved	Analysis	SM 5310C		1			263820	11/27/18 09:38	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM 5310C		1			263767	11/26/18 14:45	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM2320 B		1	50 mL	50 mL	263870	11/28/18 05:15	CLL	TAL PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

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

TestAmerica Job ID: 180-84236-1

Client Sample ID: HASB-1

Date Collected: 11/17/18 16:36
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	EPA 9056A		1			264318	12/03/18 10:23	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	EPA 9056A		1			264317	12/03/18 11:47	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Dissolved	Prep	3005A			50.0 mL	50.0 mL	263658	11/23/18 13:30	RSK	TAL PIT
Dissolved	Analysis	EPA 6020A		1			263793	11/24/18 14:36	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50.0 mL	50.0 mL	263658	11/23/18 13:30	RSK	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			263793	11/24/18 14:33	RSK	TAL PIT
	Instrument ID: A									
Dissolved	Prep	7470A			50 mL	50 mL	263719	11/26/18 09:55	RJR	TAL PIT
Dissolved	Analysis	EPA 7470A		1			263824	11/27/18 07:59	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Prep	7470A			50 mL	50 mL	263721	11/26/18 09:58	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			263824	11/27/18 08:30	RJR	TAL PIT
	Instrument ID: HGY									
Dissolved	Analysis	Se Speciation		1	1 mL	1 mL	439085	11/28/18 20:13	LMT	TAL DEN
	Instrument ID: MT_024_Se									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	263522	11/21/18 11:00	JAS	TAL PIT
	Instrument ID: NOEQUIP									
Dissolved	Analysis	SM 5310C		1			263820	11/27/18 09:51	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM 5310C		1			263767	11/26/18 14:57	CLL	TAL PIT
	Instrument ID: TOC1030									
Total/NA	Analysis	SM2320 B		1	50 mL	50 mL	263870	11/28/18 05:15	CLL	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-8I (68-70)

Date Collected: 11/15/18 09:10
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-10

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP	Leach	1312			25 g	500 mL	263846	11/27/18 12:25	TAH	TAL PIT
SPLP	Analysis	EPA 9056A		1			263887	11/28/18 11:24	MJH	TAL PIT
	Instrument ID: CHIC2100A									
SPLP East	Leach	EPA 1312			100 g	2000 mL	263760	11/26/18 14:25	TAH	TAL PIT
SPLP East	Prep	3010A			50 mL	50 mL	263844	11/27/18 12:10	NAM	TAL PIT
SPLP East	Analysis	6020A		1			264025	11/28/18 10:44	RSK	TAL PIT
	Instrument ID: A									
SPLP East	Leach	EPA 1312			100 g	2000 mL	263760	11/26/18 14:25	TAH	TAL PIT
SPLP East	Prep	7470A			50 mL	50 mL	263948	11/28/18 11:06	KA	TAL PIT
SPLP East	Analysis	7470A		1			264124	11/29/18 15:05	KA	TAL PIT
	Instrument ID: HGY									

Lab Chronicle

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

TestAmerica Job ID: 180-84236-1

Client Sample ID: CCR-AP-8I (68-70)

Date Collected: 11/15/18 09:10
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-10

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1			263619	11/23/18 08:06	AVS	TAL PIT
	Instrument ID: NOEQUIP									
SPLP East	Leach	EPA 1312			100 g	2000 mL	263760	11/26/18 14:25	TAH	TAL PIT
SPLP East	Prep	Distill/Ammonia			50 mL	50 mL	263861	11/27/18 13:31	TAM	TAL PIT
SPLP East	Analysis	EPA 350.1		1			264014	11/28/18 17:57	BSH	TAL PIT
	Instrument ID: ASTORIA1									
SPLP East	Leach	EPA 1312			100 g	2000 mL	263760	11/26/18 14:25	TAH	TAL PIT
SPLP East	Analysis	SM2320 B		1	50 mL	50 mL	263868	11/28/18 05:00	CLL	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-8I (68-70)

Date Collected: 11/15/18 09:10
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-10

Matrix: Solid
Percent Solids: 85.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.99 g	100 mL	263578	11/21/18 14:04	NAM	TAL PIT
Total/NA	Analysis	EPA 6020A		1	1.0 mL	1.0 mL	264070	11/28/18 19:53	WTR	TAL PIT
	Instrument ID: M									
Total/NA	Prep	3050B			0.99 g	100 mL	263578	11/21/18 14:04	NAM	TAL PIT
Total/NA	Analysis	EPA 6020A		1			264192	11/28/18 19:53	WTR	TAL PIT
	Instrument ID: M									
Total/NA	Prep	7471B			0.59 g	100 mL	263884	11/27/18 17:18	KA	TAL PIT
Total/NA	Analysis	EPA 7471B		1			264013	11/28/18 14:51	KA	TAL PIT
	Instrument ID: HGZ									
Total/NA	Analysis	EPA-Lloyd Kahn		1			264051	11/28/18 15:03	JBF	TAL PIT
	Instrument ID: FLASHEA									

Client Sample ID: CCR-AP-6I (68-70)

Date Collected: 11/16/18 09:25
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-11

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP	Leach	1312			25 g	500 mL	263846	11/27/18 12:25	TAH	TAL PIT
SPLP	Analysis	EPA 9056A		1			263887	11/28/18 11:39	MJH	TAL PIT
	Instrument ID: CHIC2100A									
SPLP East	Leach	EPA 1312			100 g	2000 mL	263760	11/26/18 14:25	TAH	TAL PIT
SPLP East	Prep	3010A			50 mL	50 mL	263844	11/27/18 12:10	NAM	TAL PIT
SPLP East	Analysis	6020A		1			264025	11/28/18 10:47	RSK	TAL PIT
	Instrument ID: A									
SPLP East	Leach	EPA 1312			100 g	2000 mL	263760	11/26/18 14:25	TAH	TAL PIT
SPLP East	Prep	7470A			50 mL	50 mL	263948	11/28/18 11:06	KA	TAL PIT
SPLP East	Analysis	7470A		1			264124	11/29/18 15:07	KA	TAL PIT
	Instrument ID: HGY									

Lab Chronicle

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

TestAmerica Job ID: 180-84236-1

Client Sample ID: CCR-AP-6I (68-70)

Date Collected: 11/16/18 09:25
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-11

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1			263619	11/23/18 08:06	AVS	TAL PIT
	Instrument ID: NOEQUIP									
SPLP East	Leach	EPA 1312			100 g	2000 mL	263760	11/26/18 14:25	TAH	TAL PIT
SPLP East	Prep	Distill/Ammonia			50 mL	50 mL	263861	11/27/18 13:31	TAM	TAL PIT
SPLP East	Analysis	EPA 350.1		1			264014	11/28/18 17:59	BSH	TAL PIT
	Instrument ID: ASTORIA1									
SPLP East	Leach	EPA 1312			100 g	2000 mL	263760	11/26/18 14:25	TAH	TAL PIT
SPLP East	Analysis	SM2320 B		1	50 mL	50 mL	263868	11/28/18 05:00	CLL	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-6I (68-70)

Date Collected: 11/16/18 09:25
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-11

Matrix: Solid
Percent Solids: 88.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.96 g	100 mL	263578	11/21/18 14:04	NAM	TAL PIT
Total/NA	Analysis	EPA 6020A		1	1.0 mL	1.0 mL	264070	11/28/18 19:58	WTR	TAL PIT
	Instrument ID: M									
Total/NA	Prep	3050B			0.96 g	100 mL	263578	11/21/18 14:04	NAM	TAL PIT
Total/NA	Analysis	EPA 6020A		1			264192	11/28/18 19:58	WTR	TAL PIT
	Instrument ID: M									
Total/NA	Prep	7471B			0.60 g	100 mL	263885	11/27/18 17:20	KA	TAL PIT
Total/NA	Analysis	EPA 7471B		1			264013	11/28/18 15:07	KA	TAL PIT
	Instrument ID: HGZ									
Total/NA	Analysis	EPA-Lloyd Kahn		1			264051	11/28/18 15:13	JBF	TAL PIT
	Instrument ID: FLASHEA									

Client Sample ID: HASB-1 (35-38)

Date Collected: 11/16/18 15:50
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-12

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP	Leach	1312			25 g	500 mL	263846	11/27/18 12:25	TAH	TAL PIT
SPLP	Analysis	EPA 9056A		1			264016	11/29/18 06:58	MJH	TAL PIT
	Instrument ID: CHICS2100B									
SPLP East	Leach	EPA 1312			100 g	2000 mL	263760	11/26/18 14:26	TAH	TAL PIT
SPLP East	Prep	3010A			50 mL	50 mL	263844	11/27/18 12:10	NAM	TAL PIT
SPLP East	Analysis	6020A		1			264025	11/28/18 10:50	RSK	TAL PIT
	Instrument ID: A									
SPLP East	Leach	EPA 1312			100 g	2000 mL	263760	11/26/18 14:26	TAH	TAL PIT
SPLP East	Prep	7470A			50 mL	50 mL	263948	11/28/18 11:06	KA	TAL PIT
SPLP East	Analysis	7470A		1			264124	11/29/18 15:08	KA	TAL PIT
	Instrument ID: HGY									

Lab Chronicle

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

TestAmerica Job ID: 180-84236-1

Client Sample ID: HASB-1 (35-38)

Date Collected: 11/16/18 15:50
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-12

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1			263619	11/23/18 08:06	AVS	TAL PIT
	Instrument ID: NOEQUIP									
SPLP East	Leach	EPA 1312			100 g	2000 mL	263760	11/26/18 14:26	TAH	TAL PIT
SPLP East	Prep	Distill/Ammonia			50 mL	50 mL	263861	11/27/18 13:31	TAM	TAL PIT
SPLP East	Analysis	EPA 350.1		1			264014	11/28/18 18:00	BSH	TAL PIT
	Instrument ID: ASTORIA1									
SPLP East	Leach	EPA 1312			100 g	2000 mL	263760	11/26/18 14:26	TAH	TAL PIT
SPLP East	Analysis	SM2320 B		1	50 mL	50 mL	263868	11/28/18 05:00	CLL	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: HASB-1 (35-38)

Date Collected: 11/16/18 15:50
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-12

Matrix: Solid
Percent Solids: 91.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.01 g	100 mL	263578	11/21/18 14:04	NAM	TAL PIT
Total/NA	Analysis	EPA 6020A		1	1.0 mL	1.0 mL	264070	11/28/18 20:03	WTR	TAL PIT
	Instrument ID: M									
Total/NA	Prep	3050B			1.01 g	100 mL	263578	11/21/18 14:04	NAM	TAL PIT
Total/NA	Analysis	EPA 6020A		1			264192	11/28/18 20:03	WTR	TAL PIT
	Instrument ID: M									
Total/NA	Prep	7471B			0.59 g	100 mL	263885	11/27/18 17:20	KA	TAL PIT
Total/NA	Analysis	EPA 7471B		1			264013	11/28/18 15:08	KA	TAL PIT
	Instrument ID: HGZ									
Total/NA	Analysis	EPA-Lloyd Kahn		1			264051	11/28/18 15:24	JBF	TAL PIT
	Instrument ID: FLASHEA									

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

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

Analyst References:

Lab: TAL DEN

Batch Type: Analysis

LMT = Lynn-Anne Trudell

Lab: TAL PIT

Batch Type: Leach

TAH = Todd Harteis

Batch Type: Prep

KA = Kayla Kalamasz

NAM = Nicole Marfisi

RJR = Ron Rosenbaum

RSK = Robert Kurtz

TAM = Tessa Mastalski

Batch Type: Analysis

AVS = Abbey Smith

BSH = Brandon Hough

CLL = Cheryl Loheyde

JAS = Joshua Schmidt

JBF = Joshua Fritsch

KA = Kayla Kalamasz

MJH = Matthew Hartman

RJR = Ron Rosenbaum

RSK = Robert Kurtz

WTR = Bill Reinheimer

Client Sample ID: CCR-AP-2

Date Collected: 11/15/18 09:25
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-1

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	160		1.0	0.71	mg/L			12/03/18 07:39	1
Sulfate	450		10	3.8	mg/L			12/03/18 07:55	10
Fluoride	0.32		0.10	0.026	mg/L			12/03/18 07:39	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.35		0.10	0.026	mg/L			12/03/18 07:04	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.2		1.0	0.32	ug/L		11/23/18 13:00	11/24/18 11:50	1
Barium	43	B	10	0.37	ug/L		11/23/18 13:00	11/24/18 11:50	1
Beryllium	ND		1.0	0.057	ug/L		11/23/18 13:00	11/24/18 11:50	1
Cadmium	0.15	J	1.0	0.13	ug/L		11/23/18 13:00	11/24/18 11:50	1
Chromium	1.9	J	2.0	0.63	ug/L		11/23/18 13:00	11/24/18 11:50	1
Cobalt	8.4		0.50	0.075	ug/L		11/23/18 13:00	11/24/18 11:50	1
Iron	700		50	14	ug/L		11/23/18 13:00	11/24/18 11:50	1
Manganese	27000		50	14	ug/L		11/23/18 13:00	11/24/18 10:33	10
Molybdenum	0.91	J	5.0	0.47	ug/L		11/23/18 13:00	11/24/18 11:50	1
Lead	0.53	J	1.0	0.094	ug/L		11/23/18 13:00	11/24/18 11:50	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:00	11/24/18 11:50	1
Selenium	ND		5.0	0.81	ug/L		11/23/18 13:00	11/24/18 11:50	1
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:00	11/24/18 11:50	1
Lithium	ND		5.0	2.6	ug/L		11/23/18 13:00	11/24/18 11:50	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.98	J	1.0	0.32	ug/L		11/23/18 13:00	11/24/18 11:57	1
Barium	39	B	10	0.37	ug/L		11/23/18 13:00	11/24/18 11:57	1
Beryllium	ND		1.0	0.057	ug/L		11/23/18 13:00	11/24/18 11:57	1
Cadmium	ND		1.0	0.13	ug/L		11/23/18 13:00	11/24/18 11:57	1
Chromium	1.3	J	2.0	0.63	ug/L		11/23/18 13:00	11/24/18 11:57	1
Cobalt	8.4		0.50	0.075	ug/L		11/23/18 13:00	11/24/18 11:57	1
Iron	61		50	14	ug/L		11/23/18 13:00	11/24/18 11:57	1
Lead	ND		1.0	0.094	ug/L		11/23/18 13:00	11/24/18 11:57	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:00	11/24/18 11:57	1
Selenium	ND		5.0	0.81	ug/L		11/23/18 13:00	11/24/18 11:57	1
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:00	11/24/18 11:57	1
Lithium	ND		5.0	2.6	ug/L		11/23/18 13:00	11/24/18 11:57	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:58	11/27/18 08:18	1

Method: EPA 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:55	11/27/18 07:47	1

Method: Se Speciation - Selenium Speciation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	3.1		2.0	0.79	ug/L			11/28/18 17:34	1

Client Sample ID: CCR-AP-2

Lab Sample ID: 180-84236-1
Date Collected: 11/15/18 09:25
Matrix: Water
Date Received: 11/21/18 10:00

Method: Se Speciation - Selenium Speciation - Dissolved (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (V)	2.1		2.0	0.75	ug/L			11/28/18 17:34	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1500		10	10	mg/L			11/21/18 11:00	1
Total Organic Carbon - Duplicates	3.0		1.0	0.51	mg/L			11/26/18 12:53	1
Total Alkalinity as CaCO3 to pH 4.5	590		5.0	5.0	mg/L			11/28/18 05:15	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	3.5		1.0	0.51	mg/L			11/27/18 07:45	1

Client Sample ID: CCR-AP-5

Lab Sample ID: 180-84236-2
Date Collected: 11/15/18 11:46
Matrix: Water
Date Received: 11/21/18 10:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3.0		1.0	0.71	mg/L			12/03/18 08:42	1
Sulfate	150		1.0	0.38	mg/L			12/03/18 08:42	1
Fluoride	1.4		0.10	0.026	mg/L			12/03/18 08:42	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.5		0.10	0.026	mg/L			12/03/18 08:24	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.7		1.0	0.32	ug/L		11/23/18 13:30	11/24/18 13:41	1
Barium	50		10	0.37	ug/L		11/23/18 13:30	11/24/18 13:41	1
Beryllium	0.081	J	1.0	0.057	ug/L		11/23/18 13:30	11/24/18 13:41	1
Cadmium	0.23	J	1.0	0.13	ug/L		11/23/18 13:30	11/24/18 13:41	1
Chromium	4.1		2.0	0.63	ug/L		11/23/18 13:30	11/24/18 13:41	1
Cobalt	0.52		0.50	0.075	ug/L		11/23/18 13:30	11/24/18 13:41	1
Iron	1200		50	14	ug/L		11/23/18 13:30	11/24/18 13:41	1
Manganese	32		5.0	1.4	ug/L		11/23/18 13:30	11/24/18 13:41	1
Molybdenum	9.4		5.0	0.47	ug/L		11/23/18 13:30	11/24/18 13:41	1
Lead	1.6		1.0	0.094	ug/L		11/23/18 13:30	11/24/18 13:41	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:30	11/24/18 13:41	1
Selenium	1.7	J	5.0	0.81	ug/L		11/23/18 13:30	11/24/18 13:41	1
Thallium	0.066	J	1.0	0.063	ug/L		11/23/18 13:30	11/24/18 13:41	1
Lithium	8.5		5.0	2.6	ug/L		11/23/18 13:30	11/24/18 13:41	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.7		1.0	0.32	ug/L		11/23/18 13:30	11/24/18 13:44	1
Barium	35		10	0.37	ug/L		11/23/18 13:30	11/24/18 13:44	1
Beryllium	ND		1.0	0.057	ug/L		11/23/18 13:30	11/24/18 13:44	1
Cadmium	ND		1.0	0.13	ug/L		11/23/18 13:30	11/24/18 13:44	1
Chromium	1.6	J	2.0	0.63	ug/L		11/23/18 13:30	11/24/18 13:44	1

Client Sample ID: CCR-AP-5

Lab Sample ID: 180-84236-2
Matrix: Water
Date Collected: 11/15/18 11:46
Date Received: 11/21/18 10:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.076	J	0.50	0.075	ug/L		11/23/18 13:30	11/24/18 13:44	1
Iron	22	J	50	14	ug/L		11/23/18 13:30	11/24/18 13:44	1
Lead	0.098	J	1.0	0.094	ug/L		11/23/18 13:30	11/24/18 13:44	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:30	11/24/18 13:44	1
Selenium	1.7	J	5.0	0.81	ug/L		11/23/18 13:30	11/24/18 13:44	1
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:30	11/24/18 13:44	1
Lithium	7.4		5.0	2.6	ug/L		11/23/18 13:30	11/24/18 13:44	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:58	11/27/18 08:20	1

Method: EPA 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:55	11/27/18 07:48	1

Method: Se Speciation - Selenium Speciation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	1.2	J	2.0	0.79	ug/L			11/28/18 17:47	1
Arsenic (V)	1.7	J	2.0	0.75	ug/L			11/28/18 17:47	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	310		10	10	mg/L			11/21/18 11:00	1
Total Organic Carbon - Duplicates	3.0		1.0	0.51	mg/L			11/26/18 13:06	1
Total Alkalinity as CaCO3 to pH 4.5	130		5.0	5.0	mg/L			11/28/18 05:15	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	3.7		1.0	0.51	mg/L			11/27/18 07:57	1

Client Sample ID: CCR-AP-4

Lab Sample ID: 180-84236-3
Matrix: Water
Date Collected: 11/15/18 15:00
Date Received: 11/21/18 10:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	28		1.0	0.71	mg/L			12/03/18 08:10	1
Sulfate	8.9		1.0	0.38	mg/L			12/03/18 08:10	1
Fluoride	0.34		0.10	0.026	mg/L			12/03/18 08:10	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.41		0.10	0.026	mg/L			12/03/18 07:20	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	88		1.0	0.32	ug/L		11/23/18 13:30	11/24/18 13:47	1
Barium	580		10	0.37	ug/L		11/23/18 13:30	11/24/18 13:47	1
Beryllium	0.18	J	1.0	0.057	ug/L		11/23/18 13:30	11/24/18 13:47	1

Client Sample ID: CCR-AP-4

Date Collected: 11/15/18 15:00
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-3

Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.13	ug/L		11/23/18 13:30	11/24/18 13:47	1
Chromium	**6.2**		2.0	0.63	ug/L		11/23/18 13:30	11/24/18 13:47	1
Cobalt	**3.0**		0.50	0.075	ug/L		11/23/18 13:30	11/24/18 13:47	1
Iron	**81000**		50	14	ug/L		11/23/18 13:30	11/24/18 13:47	1
Manganese	**800**		5.0	1.4	ug/L		11/23/18 13:30	11/24/18 13:47	1
Molybdenum	**0.76**	**J**	5.0	0.47	ug/L		11/23/18 13:30	11/24/18 13:47	1
Lead	**2.9**		1.0	0.094	ug/L		11/23/18 13:30	11/24/18 13:47	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:30	11/24/18 13:47	1
Selenium	**1.1**	**J**	5.0	0.81	ug/L		11/23/18 13:30	11/24/18 13:47	1
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:30	11/24/18 13:47	1
Lithium	**6.2**		5.0	2.6	ug/L		11/23/18 13:30	11/24/18 13:47	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**83**		1.0	0.32	ug/L		11/23/18 13:30	11/24/18 13:50	1
Barium	**540**		10	0.37	ug/L		11/23/18 13:30	11/24/18 13:50	1
Beryllium	ND		1.0	0.057	ug/L		11/23/18 13:30	11/24/18 13:50	1
Cadmium	ND		1.0	0.13	ug/L		11/23/18 13:30	11/24/18 13:50	1
Chromium	**1.9**	**J**	2.0	0.63	ug/L		11/23/18 13:30	11/24/18 13:50	1
Cobalt	**1.3**		0.50	0.075	ug/L		11/23/18 13:30	11/24/18 13:50	1
Iron	**76000**		50	14	ug/L		11/23/18 13:30	11/24/18 13:50	1
Lead	ND		1.0	0.094	ug/L		11/23/18 13:30	11/24/18 13:50	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:30	11/24/18 13:50	1
Selenium	**1.0**	**J**	5.0	0.81	ug/L		11/23/18 13:30	11/24/18 13:50	1
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:30	11/24/18 13:50	1
Lithium	**3.9**	**J**	5.0	2.6	ug/L		11/23/18 13:30	11/24/18 13:50	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:58	11/27/18 08:23	1

Method: EPA 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:55	11/27/18 07:50	1

Method: Se Speciation - Selenium Speciation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	**5.2**		2.0	0.79	ug/L			11/28/18 18:00	1
Arsenic (V)	**0.76**	**J**	2.0	0.75	ug/L			11/28/18 18:00	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**880**		10	10	mg/L			11/21/18 11:00	1
Total Organic Carbon - Duplicates	**26**		1.0	0.51	mg/L			11/26/18 13:18	1
Total Alkalinity as CaCO3 to pH 4.5	**960**		5.0	5.0	mg/L			11/28/18 05:15	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	**27**		1.0	0.51	mg/L			11/27/18 08:10	1

Client Sample ID: CCR-AP-8

Date Collected: 11/16/18 09:02
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-4

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**16**		1.0	0.71	mg/L			12/03/18 08:26	1
Sulfate	**1.1**		1.0	0.38	mg/L			12/03/18 08:26	1
Fluoride	**0.25**		0.10	0.026	mg/L			12/03/18 08:26	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**0.34**		0.10	0.026	mg/L			12/03/18 07:36	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**100**		1.0	0.32	ug/L		11/23/18 13:30	11/24/18 13:54	1
Barium	**580**		10	0.37	ug/L		11/23/18 13:30	11/24/18 13:54	1
Beryllium	ND		1.0	0.057	ug/L		11/23/18 13:30	11/24/18 13:54	1
Cadmium	ND		1.0	0.13	ug/L		11/23/18 13:30	11/24/18 13:54	1
Chromium	**2.4**		2.0	0.63	ug/L		11/23/18 13:30	11/24/18 13:54	1
Cobalt	**5.9**		0.50	0.075	ug/L		11/23/18 13:30	11/24/18 13:54	1
Iron	**100000**		50	14	ug/L		11/23/18 13:30	11/24/18 13:54	1
Manganese	**6400**		5.0	1.4	ug/L		11/23/18 13:30	11/24/18 13:54	1
Molybdenum	**9.5**		5.0	0.47	ug/L		11/23/18 13:30	11/24/18 13:54	1
Lead	**0.50**	**J**	1.0	0.094	ug/L		11/23/18 13:30	11/24/18 13:54	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:30	11/24/18 13:54	1
Selenium	**1.9**	**J**	5.0	0.81	ug/L		11/23/18 13:30	11/24/18 13:54	1
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:30	11/24/18 13:54	1
Lithium	ND		5.0	2.6	ug/L		11/23/18 13:30	11/24/18 13:54	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**80**		1.0	0.32	ug/L		11/23/18 13:30	11/24/18 13:57	1
Barium	**460**		10	0.37	ug/L		11/23/18 13:30	11/24/18 13:57	1
Beryllium	ND		1.0	0.057	ug/L		11/23/18 13:30	11/24/18 13:57	1
Cadmium	ND		1.0	0.13	ug/L		11/23/18 13:30	11/24/18 13:57	1
Chromium	**1.6**	**J**	2.0	0.63	ug/L		11/23/18 13:30	11/24/18 13:57	1
Cobalt	**5.2**		0.50	0.075	ug/L		11/23/18 13:30	11/24/18 13:57	1
Iron	**88000**		50	14	ug/L		11/23/18 13:30	11/24/18 13:57	1
Lead	ND		1.0	0.094	ug/L		11/23/18 13:30	11/24/18 13:57	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:30	11/24/18 13:57	1
Selenium	**1.9**	**J**	5.0	0.81	ug/L		11/23/18 13:30	11/24/18 13:57	1
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:30	11/24/18 13:57	1
Lithium	ND		5.0	2.6	ug/L		11/23/18 13:30	11/24/18 13:57	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:58	11/27/18 08:24	1

Method: EPA 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:55	11/27/18 07:51	1

Method: Se Speciation - Selenium Speciation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	**6.7**		2.0	0.79	ug/L			11/28/18 18:14	1

Client Sample ID: CCR-AP-8

Lab Sample ID: 180-84236-4
Date Collected: 11/16/18 09:02
Matrix: Water
Date Received: 11/21/18 10:00

Method: Se Speciation - Selenium Speciation - Dissolved (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (V)	0.86	J	2.0	0.75	ug/L			11/28/18 18:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1200		10	10	mg/L			11/21/18 11:00	1
Total Organic Carbon - Duplicates	41		1.0	0.51	mg/L			11/26/18 13:30	1
Total Alkalinity as CaCO3 to pH 4.5	1300		5.0	5.0	mg/L			11/28/18 09:11	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	58		1.0	0.51	mg/L			11/27/18 08:22	1

Client Sample ID: CCR-AP-3

Lab Sample ID: 180-84236-5
Date Collected: 11/16/18 10:37
Matrix: Water
Date Received: 11/21/18 10:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	26		1.0	0.71	mg/L			12/03/18 10:15	1
Sulfate	0.65	J	1.0	0.38	mg/L			12/03/18 10:15	1
Fluoride	0.37		0.10	0.026	mg/L			12/03/18 10:15	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.44		0.10	0.026	mg/L			12/03/18 07:52	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	76		1.0	0.32	ug/L		11/23/18 13:30	11/24/18 14:00	1
Barium	450		10	0.37	ug/L		11/23/18 13:30	11/24/18 14:00	1
Beryllium	ND		1.0	0.057	ug/L		11/23/18 13:30	11/24/18 14:00	1
Cadmium	ND		1.0	0.13	ug/L		11/23/18 13:30	11/24/18 14:00	1
Chromium	2.9		2.0	0.63	ug/L		11/23/18 13:30	11/24/18 14:00	1
Cobalt	5.5		0.50	0.075	ug/L		11/23/18 13:30	11/24/18 14:00	1
Iron	54000		50	14	ug/L		11/23/18 13:30	11/24/18 14:00	1
Manganese	950		5.0	1.4	ug/L		11/23/18 13:30	11/24/18 14:00	1
Molybdenum	10		5.0	0.47	ug/L		11/23/18 13:30	11/24/18 14:00	1
Lead	0.18	J	1.0	0.094	ug/L		11/23/18 13:30	11/24/18 14:00	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:30	11/24/18 14:00	1
Selenium	2.1	J	5.0	0.81	ug/L		11/23/18 13:30	11/24/18 14:00	1
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:30	11/24/18 14:00	1
Lithium	ND		5.0	2.6	ug/L		11/23/18 13:30	11/24/18 14:00	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	70		1.0	0.32	ug/L		11/23/18 13:30	11/24/18 14:04	1
Barium	380		10	0.37	ug/L		11/23/18 13:30	11/24/18 14:04	1
Beryllium	ND		1.0	0.057	ug/L		11/23/18 13:30	11/24/18 14:04	1
Cadmium	ND		1.0	0.13	ug/L		11/23/18 13:30	11/24/18 14:04	1
Chromium	2.2		2.0	0.63	ug/L		11/23/18 13:30	11/24/18 14:04	1

Client Sample ID: CCR-AP-3

Lab Sample ID: 180-84236-5
Matrix: Water
Date Collected: 11/16/18 10:37
Date Received: 11/21/18 10:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	5.0		0.50	0.075	ug/L		11/23/18 13:30	11/24/18 14:04	1
Iron	50000		50	14	ug/L		11/23/18 13:30	11/24/18 14:04	1
Lead	ND		1.0	0.094	ug/L		11/23/18 13:30	11/24/18 14:04	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:30	11/24/18 14:04	1
Selenium	2.1	J	5.0	0.81	ug/L		11/23/18 13:30	11/24/18 14:04	1
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:30	11/24/18 14:04	1
Lithium	ND		5.0	2.6	ug/L		11/23/18 13:30	11/24/18 14:04	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:58	11/27/18 08:25	1

Method: EPA 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:55	11/27/18 07:52	1

Method: Se Speciation - Selenium Speciation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	5.0	F1	2.0	0.79	ug/L			11/28/18 18:27	1
Arsenic (V)	1.2	J F1	2.0	0.75	ug/L			11/28/18 18:27	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	990		10	10	mg/L			11/21/18 11:00	1
Total Organic Carbon - Duplicates	49		1.0	0.51	mg/L			11/26/18 13:43	1
Total Alkalinity as CaCO3 to pH 4.5	1100		5.0	5.0	mg/L			11/28/18 09:11	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	75		1.0	0.51	mg/L			11/27/18 08:34	1

Client Sample ID: CCR-AP-6

Lab Sample ID: 180-84236-6
Matrix: Water
Date Collected: 11/17/18 10:01
Date Received: 11/21/18 10:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	43		1.0	0.71	mg/L			12/03/18 10:31	1
Sulfate	1.6		1.0	0.38	mg/L			12/03/18 10:31	1
Fluoride	0.44		0.10	0.026	mg/L			12/03/18 10:31	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.59		0.10	0.026	mg/L			12/03/18 08:08	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	110		1.0	0.32	ug/L		11/23/18 13:30	11/24/18 14:14	1
Barium	580		10	0.37	ug/L		11/23/18 13:30	11/24/18 14:14	1
Beryllium	0.083	J	1.0	0.057	ug/L		11/23/18 13:30	11/24/18 14:14	1

Client Sample ID: CCR-AP-6

Date Collected: 11/17/18 10:01
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-6

Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.13	ug/L		11/23/18 13:30	11/24/18 14:14	1
Chromium	**4.8**		2.0	0.63	ug/L		11/23/18 13:30	11/24/18 14:14	1
Cobalt	**4.4**		0.50	0.075	ug/L		11/23/18 13:30	11/24/18 14:14	1
Iron	**44000**		50	14	ug/L		11/23/18 13:30	11/24/18 14:14	1
Manganese	**840**		5.0	1.4	ug/L		11/23/18 13:30	11/24/18 14:14	1
Molybdenum	**27**		5.0	0.47	ug/L		11/23/18 13:30	11/24/18 14:14	1
Lead	**2.2**		1.0	0.094	ug/L		11/23/18 13:30	11/24/18 14:14	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:30	11/24/18 14:14	1
Selenium	**1.6**	**J**	5.0	0.81	ug/L		11/23/18 13:30	11/24/18 14:14	1
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:30	11/24/18 14:14	1
Lithium	**3.5**	**J**	5.0	2.6	ug/L		11/23/18 13:30	11/24/18 14:14	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**110**		1.0	0.32	ug/L		11/23/18 13:30	11/24/18 14:17	1
Barium	**560**		10	0.37	ug/L		11/23/18 13:30	11/24/18 14:17	1
Beryllium	ND		1.0	0.057	ug/L		11/23/18 13:30	11/24/18 14:17	1
Cadmium	ND		1.0	0.13	ug/L		11/23/18 13:30	11/24/18 14:17	1
Chromium	**1.5**	**J**	2.0	0.63	ug/L		11/23/18 13:30	11/24/18 14:17	1
Cobalt	**3.2**		0.50	0.075	ug/L		11/23/18 13:30	11/24/18 14:17	1
Iron	**42000**		50	14	ug/L		11/23/18 13:30	11/24/18 14:17	1
Lead	ND		1.0	0.094	ug/L		11/23/18 13:30	11/24/18 14:17	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:30	11/24/18 14:17	1
Selenium	**1.6**	**J**	5.0	0.81	ug/L		11/23/18 13:30	11/24/18 14:17	1
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:30	11/24/18 14:17	1
Lithium	ND		5.0	2.6	ug/L		11/23/18 13:30	11/24/18 14:17	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:58	11/27/18 08:26	1

Method: EPA 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:55	11/27/18 07:55	1

Method: Se Speciation - Selenium Speciation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	**14**		2.0	0.79	ug/L			11/28/18 19:06	1
Arsenic (V)	**2.2**		2.0	0.75	ug/L			11/28/18 19:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1000**		10	10	mg/L			11/21/18 11:00	1
Total Organic Carbon - Duplicates	**68**		1.0	0.51	mg/L			11/26/18 13:55	1
Total Alkalinity as CaCO3 to pH 4.!	**1000**		5.0	5.0	mg/L			11/28/18 09:11	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	**51**		1.0	0.51	mg/L			11/27/18 09:12	1

Client Sample ID: CCR-AP-6I

Date Collected: 11/17/18 14:27
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-7

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	120		1.0	0.71	mg/L			12/03/18 10:46	1
Sulfate	790		10	3.8	mg/L			12/03/18 11:01	10
Fluoride	0.13		0.10	0.026	mg/L			12/03/18 10:46	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.14		0.10	0.026	mg/L			12/03/18 09:51	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.7		1.0	0.32	ug/L		11/23/18 13:30	11/24/18 14:20	1
Barium	110		10	0.37	ug/L		11/23/18 13:30	11/24/18 14:20	1
Beryllium	ND		1.0	0.057	ug/L		11/23/18 13:30	11/24/18 14:20	1
Cadmium	0.15	J	1.0	0.13	ug/L		11/23/18 13:30	11/24/18 14:20	1
Chromium	2.0		2.0	0.63	ug/L		11/23/18 13:30	11/24/18 14:20	1
Cobalt	1.7		0.50	0.075	ug/L		11/23/18 13:30	11/24/18 14:20	1
Iron	1200		50	14	ug/L		11/23/18 13:30	11/24/18 14:20	1
Manganese	8600		5.0	1.4	ug/L		11/23/18 13:30	11/24/18 14:20	1
Molybdenum	630		5.0	0.47	ug/L		11/23/18 13:30	11/24/18 14:20	1
Lead	0.84	J	1.0	0.094	ug/L		11/23/18 13:30	11/24/18 14:20	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:30	11/24/18 14:20	1
Selenium	ND		5.0	0.81	ug/L		11/23/18 13:30	11/24/18 14:20	1
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:30	11/24/18 14:20	1
Lithium	43		5.0	2.6	ug/L		11/23/18 13:30	11/24/18 14:20	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.9		1.0	0.32	ug/L		11/23/18 13:30	11/24/18 14:23	1
Barium	100		10	0.37	ug/L		11/23/18 13:30	11/24/18 14:23	1
Beryllium	ND		1.0	0.057	ug/L		11/23/18 13:30	11/24/18 14:23	1
Cadmium	0.14	J	1.0	0.13	ug/L		11/23/18 13:30	11/24/18 14:23	1
Chromium	1.3	J	2.0	0.63	ug/L		11/23/18 13:30	11/24/18 14:23	1
Cobalt	1.2		0.50	0.075	ug/L		11/23/18 13:30	11/24/18 14:23	1
Iron	110		50	14	ug/L		11/23/18 13:30	11/24/18 14:23	1
Lead	ND		1.0	0.094	ug/L		11/23/18 13:30	11/24/18 14:23	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:30	11/24/18 14:23	1
Selenium	ND		5.0	0.81	ug/L		11/23/18 13:30	11/24/18 14:23	1
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:30	11/24/18 14:23	1
Lithium	41		5.0	2.6	ug/L		11/23/18 13:30	11/24/18 14:23	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:58	11/27/18 08:27	1

Method: EPA 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:55	11/27/18 07:56	1

Method: Se Speciation - Selenium Speciation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	5.0		2.0	0.79	ug/L			11/28/18 19:46	1

Client Sample ID: CCR-AP-6I

Date Collected: 11/17/18 14:27
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-7
Matrix: Water

Method: Se Speciation - Selenium Speciation - Dissolved (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (V)	1.9	J	2.0	0.75	ug/L			11/28/18 19:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1500		10	10	mg/L			11/21/18 11:00	1
Total Organic Carbon - Duplicates	2.9		1.0	0.51	mg/L			11/26/18 14:33	1
Total Alkalinity as CaCO3 to pH 4.5	130		5.0	5.0	mg/L			11/28/18 05:15	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	4.6		1.0	0.51	mg/L			11/27/18 09:25	1

Client Sample ID: CCR-AP-8I

Date Collected: 11/17/18 15:47
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-8
Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	300		10	7.1	mg/L			12/03/18 11:32	10
Sulfate	1000		10	3.8	mg/L			12/03/18 11:32	10
Fluoride	0.26		0.10	0.026	mg/L			12/03/18 11:17	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.27		0.10	0.026	mg/L			12/03/18 10:07	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.0		1.0	0.32	ug/L		11/23/18 13:30	11/24/18 14:27	1
Barium	300		10	0.37	ug/L		11/23/18 13:30	11/24/18 14:27	1
Beryllium	0.078	J	1.0	0.057	ug/L		11/23/18 13:30	11/24/18 14:27	1
Cadmium	ND		1.0	0.13	ug/L		11/23/18 13:30	11/24/18 14:27	1
Chromium	2.9		2.0	0.63	ug/L		11/23/18 13:30	11/24/18 14:27	1
Cobalt	1.6		0.50	0.075	ug/L		11/23/18 13:30	11/24/18 14:27	1
Iron	20000		50	14	ug/L		11/23/18 13:30	11/24/18 14:27	1
Manganese	3200		5.0	1.4	ug/L		11/23/18 13:30	11/24/18 14:27	1
Molybdenum	360		5.0	0.47	ug/L		11/23/18 13:30	11/24/18 14:27	1
Lead	1.0		1.0	0.094	ug/L		11/23/18 13:30	11/24/18 14:27	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:30	11/24/18 14:27	1
Selenium	ND		5.0	0.81	ug/L		11/23/18 13:30	11/24/18 14:27	1
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:30	11/24/18 14:27	1
Lithium	440		5.0	2.6	ug/L		11/23/18 13:30	11/24/18 14:27	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.3		1.0	0.32	ug/L		11/23/18 13:30	11/24/18 14:30	1
Barium	280		10	0.37	ug/L		11/23/18 13:30	11/24/18 14:30	1
Beryllium	ND		1.0	0.057	ug/L		11/23/18 13:30	11/24/18 14:30	1
Cadmium	ND		1.0	0.13	ug/L		11/23/18 13:30	11/24/18 14:30	1
Chromium	1.3	J	2.0	0.63	ug/L		11/23/18 13:30	11/24/18 14:30	1

Client Sample ID: CCR-AP-8I

Date Collected: 11/17/18 15:47
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-8
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.88		0.50	0.075	ug/L		11/23/18 13:30	11/24/18 14:30	1
Iron	18000		50	14	ug/L		11/23/18 13:30	11/24/18 14:30	1
Lead	ND		1.0	0.094	ug/L		11/23/18 13:30	11/24/18 14:30	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:30	11/24/18 14:30	1
Selenium	ND		5.0	0.81	ug/L		11/23/18 13:30	11/24/18 14:30	1
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:30	11/24/18 14:30	1
Lithium	420		5.0	2.6	ug/L		11/23/18 13:30	11/24/18 14:30	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:58	11/27/18 08:29	1

Method: EPA 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:55	11/27/18 07:57	1

Method: Se Speciation - Selenium Speciation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	1.2	J	2.0	0.79	ug/L			11/28/18 19:59	1
Arsenic (V)	1.4	J	2.0	0.75	ug/L			11/28/18 19:59	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2200		20	20	mg/L			11/21/18 11:00	1
Total Organic Carbon - Duplicates	3.4		1.0	0.51	mg/L			11/26/18 14:45	1
Total Alkalinity as CaCO3 to pH 4.5	220		5.0	5.0	mg/L			11/28/18 05:15	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	3.9		1.0	0.51	mg/L			11/27/18 09:38	1

Client Sample ID: HASB-1

Date Collected: 11/17/18 16:36
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-9
Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.5		1.0	0.71	mg/L			12/03/18 11:47	1
Sulfate	110		1.0	0.38	mg/L			12/03/18 11:47	1
Fluoride	0.47		0.10	0.026	mg/L			12/03/18 11:47	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.47		0.10	0.026	mg/L			12/03/18 10:23	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	6.1		1.0	0.32	ug/L		11/23/18 13:30	11/24/18 14:33	1
Barium	130		10	0.37	ug/L		11/23/18 13:30	11/24/18 14:33	1
Beryllium	0.83	J	1.0	0.057	ug/L		11/23/18 13:30	11/24/18 14:33	1

Client Sample ID: HASB-1
Date Collected: 11/17/18 16:36
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-9
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.25	J	1.0	0.13	ug/L		11/23/18 13:30	11/24/18 14:33	1
Chromium	18		2.0	0.63	ug/L		11/23/18 13:30	11/24/18 14:33	1
Cobalt	5.2		0.50	0.075	ug/L		11/23/18 13:30	11/24/18 14:33	1
Iron	11000		50	14	ug/L		11/23/18 13:30	11/24/18 14:33	1
Manganese	750		5.0	1.4	ug/L		11/23/18 13:30	11/24/18 14:33	1
Molybdenum	38		5.0	0.47	ug/L		11/23/18 13:30	11/24/18 14:33	1
Lead	5.6		1.0	0.094	ug/L		11/23/18 13:30	11/24/18 14:33	1
Antimony	2.3		2.0	1.1	ug/L		11/23/18 13:30	11/24/18 14:33	1
Selenium	1.4	J	5.0	0.81	ug/L		11/23/18 13:30	11/24/18 14:33	1
Thallium	0.24	J	1.0	0.063	ug/L		11/23/18 13:30	11/24/18 14:33	1
Lithium	64		5.0	2.6	ug/L		11/23/18 13:30	11/24/18 14:33	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.4		1.0	0.32	ug/L		11/23/18 13:30	11/24/18 14:36	1
Barium	81		10	0.37	ug/L		11/23/18 13:30	11/24/18 14:36	1
Beryllium	ND		1.0	0.057	ug/L		11/23/18 13:30	11/24/18 14:36	1
Cadmium	ND		1.0	0.13	ug/L		11/23/18 13:30	11/24/18 14:36	1
Chromium	1.4	J	2.0	0.63	ug/L		11/23/18 13:30	11/24/18 14:36	1
Cobalt	0.59		0.50	0.075	ug/L		11/23/18 13:30	11/24/18 14:36	1
Iron	99		50	14	ug/L		11/23/18 13:30	11/24/18 14:36	1
Lead	ND		1.0	0.094	ug/L		11/23/18 13:30	11/24/18 14:36	1
Antimony	2.1		2.0	1.1	ug/L		11/23/18 13:30	11/24/18 14:36	1
Selenium	ND		5.0	0.81	ug/L		11/23/18 13:30	11/24/18 14:36	1
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:30	11/24/18 14:36	1
Lithium	48		5.0	2.6	ug/L		11/23/18 13:30	11/24/18 14:36	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:58	11/27/18 08:30	1

Method: EPA 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:55	11/27/18 07:59	1

Method: Se Speciation - Selenium Speciation - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	2.6		2.0	0.79	ug/L			11/28/18 20:13	1
Arsenic (V)	0.90	J	2.0	0.75	ug/L			11/28/18 20:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	730		10	10	mg/L			11/21/18 11:00	1
Total Organic Carbon - Duplicates	1.4		1.0	0.51	mg/L			11/26/18 14:57	1
Total Alkalinity as CaCO3 to pH 4.5	570		5.0	5.0	mg/L			11/28/18 05:15	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	1.7		1.0	0.51	mg/L			11/27/18 09:51	1

Client Sample ID: CCR-AP-8I (68-70)

Lab Sample ID: 180-84236-10
Matrix: Solid
Date Collected: 11/15/18 09:10
Date Received: 11/21/18 10:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	7.3		1.0	0.71	mg/L			11/28/18 11:24	1
Fluoride	0.51		0.10	0.026	mg/L			11/28/18 11:24	1
Sulfate	5.7		1.0	0.38	mg/L			11/28/18 11:24	1
Nitrate as N	0.034	J	0.10	0.023	mg/L			11/28/18 11:24	1

Method: 6020A - SPLP Metals - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.0	1.1	ug/L		11/27/18 12:10	11/28/18 10:44	1
Arsenic	3.7		1.0	0.32	ug/L		11/27/18 12:10	11/28/18 10:44	1
Barium	24		10	0.37	ug/L		11/27/18 12:10	11/28/18 10:44	1
Beryllium	0.15	J	1.0	0.057	ug/L		11/27/18 12:10	11/28/18 10:44	1
Cadmium	ND		1.0	0.13	ug/L		11/27/18 12:10	11/28/18 10:44	1
Chromium	9.3	B	2.0	0.63	ug/L		11/27/18 12:10	11/28/18 10:44	1
Cobalt	1.2		0.50	0.075	ug/L		11/27/18 12:10	11/28/18 10:44	1
Lead	2.2		1.0	0.094	ug/L		11/27/18 12:10	11/28/18 10:44	1
Lithium	4.8	J	5.0	2.6	ug/L		11/27/18 12:10	11/28/18 10:44	1
Molybdenum	160		5.0	0.47	ug/L		11/27/18 12:10	11/28/18 10:44	1
Selenium	ND		5.0	0.81	ug/L		11/27/18 12:10	11/28/18 10:44	1
Thallium	ND		1.0	0.063	ug/L		11/27/18 12:10	11/28/18 10:44	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		11/28/18 11:06	11/29/18 15:05	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	14.8		0.1	0.1	%			11/23/18 08:06	1
Percent Solids	85.2		0.1	0.1	%			11/23/18 08:06	1

General Chemistry - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia, distilled	ND		0.10	0.046	mg/L		11/27/18 13:31	11/28/18 17:57	1
Total Alkalinity as CaCO3 to pH 4.5	44		5.0	5.0	mg/L			11/28/18 05:00	1
Bicarbonate Alkalinity as CaCO3	28		5.0	5.0	mg/L			11/28/18 05:00	1
Carbonate Alkalinity as CaCO3	16		5.0	5.0	mg/L			11/28/18 05:00	1
Phenolphthalein Alkalinity	8.0		5.0	5.0	mg/L			11/28/18 05:00	1

Client Sample ID: CCR-AP-8I (68-70)

Lab Sample ID: 180-84236-10
Matrix: Solid
Date Collected: 11/15/18 09:10
Date Received: 11/21/18 10:00
Percent Solids: 85.2

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.24	0.073	mg/Kg	☼	11/21/18 14:04	11/28/18 19:53	1
Arsenic	3.3		0.12	0.031	mg/Kg	☼	11/21/18 14:04	11/28/18 19:53	1
Barium	8.0		1.2	0.068	mg/Kg	☼	11/21/18 14:04	11/28/18 19:53	1
Beryllium	0.13		0.12	0.0089	mg/Kg	☼	11/21/18 14:04	11/28/18 19:53	1
Cadmium	0.040	J	0.12	0.020	mg/Kg	☼	11/21/18 14:04	11/28/18 19:53	1
Chromium	4.7		0.24	0.078	mg/Kg	☼	11/21/18 14:04	11/28/18 19:53	1
Cobalt	2.5		0.059	0.0098	mg/Kg	☼	11/21/18 14:04	11/28/18 19:53	1

Client Sample ID: CCR-AP-8I (68-70)

Lab Sample ID: 180-84236-10
Date Collected: 11/15/18 09:10
Matrix: Solid
Date Received: 11/21/18 10:00
Percent Solids: 85.2

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	2.6		0.12	0.041	mg/Kg	☼	11/21/18 14:04	11/28/18 19:53	1
Lithium	2.0		0.59	0.33	mg/Kg	☼	11/21/18 14:04	11/28/18 19:53	1
Molybdenum	12		0.59	0.073	mg/Kg	☼	11/21/18 14:04	11/28/18 19:53	1
Selenium	0.089	J	0.59	0.071	mg/Kg	☼	11/21/18 14:04	11/28/18 19:53	1
Thallium	0.035	J	0.12	0.015	mg/Kg	☼	11/21/18 14:04	11/28/18 19:53	1

Method: EPA 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.039	0.017	mg/Kg	☼	11/27/18 17:18	11/28/18 14:51	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	6400		1200	880	mg/Kg	☼		11/28/18 15:03	1

Client Sample ID: CCR-AP-6I (68-70)

Lab Sample ID: 180-84236-11
Date Collected: 11/16/18 09:25
Matrix: Solid
Date Received: 11/21/18 10:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.3		1.0	0.71	mg/L			11/28/18 11:39	1
Fluoride	0.35		0.10	0.026	mg/L			11/28/18 11:39	1
Sulfate	8.9		1.0	0.38	mg/L			11/28/18 11:39	1
Nitrate as N	0.034	J	0.10	0.023	mg/L			11/28/18 11:39	1

Method: 6020A - SPLP Metals - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.0	1.1	ug/L		11/27/18 12:10	11/28/18 10:47	1
Arsenic	6.1		1.0	0.32	ug/L		11/27/18 12:10	11/28/18 10:47	1
Barium	19		10	0.37	ug/L		11/27/18 12:10	11/28/18 10:47	1
Beryllium	0.26	J	1.0	0.057	ug/L		11/27/18 12:10	11/28/18 10:47	1
Cadmium	ND		1.0	0.13	ug/L		11/27/18 12:10	11/28/18 10:47	1
Chromium	12	B	2.0	0.63	ug/L		11/27/18 12:10	11/28/18 10:47	1
Cobalt	3.1		0.50	0.075	ug/L		11/27/18 12:10	11/28/18 10:47	1
Lead	3.9		1.0	0.094	ug/L		11/27/18 12:10	11/28/18 10:47	1
Lithium	5.1		5.0	2.6	ug/L		11/27/18 12:10	11/28/18 10:47	1
Molybdenum	47		5.0	0.47	ug/L		11/27/18 12:10	11/28/18 10:47	1
Selenium	ND		5.0	0.81	ug/L		11/27/18 12:10	11/28/18 10:47	1
Thallium	ND		1.0	0.063	ug/L		11/27/18 12:10	11/28/18 10:47	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		11/28/18 11:06	11/29/18 15:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	11.8		0.1	0.1	%			11/23/18 08:06	1
Percent Solids	88.2		0.1	0.1	%			11/23/18 08:06	1

Client Sample ID: CCR-AP-6I (68-70)

Lab Sample ID: 180-84236-11
Matrix: Solid
Date Collected: 11/16/18 09:25
Date Received: 11/21/18 10:00

General Chemistry - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia, distilled	ND		0.10	0.046	mg/L		11/27/18 13:31	11/28/18 17:59	1
Total Alkalinity as CaCO3 to pH 4.!	28		5.0	5.0	mg/L			11/28/18 05:00	1
Bicarbonate Alkalinity as CaCO3	10		5.0	5.0	mg/L			11/28/18 05:00	1
Carbonate Alkalinity as CaCO3	18		5.0	5.0	mg/L			11/28/18 05:00	1
Phenolphthalein Alkalinity	9.0		5.0	5.0	mg/L			11/28/18 05:00	1

Client Sample ID: CCR-AP-6I (68-70)

Lab Sample ID: 180-84236-11
Matrix: Solid
Date Collected: 11/16/18 09:25
Date Received: 11/21/18 10:00
Percent Solids: 88.2

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.24	0.073	mg/Kg	☼	11/21/18 14:04	11/28/18 19:58	1
Arsenic	3.3		0.12	0.031	mg/Kg	☼	11/21/18 14:04	11/28/18 19:58	1
Barium	18		1.2	0.067	mg/Kg	☼	11/21/18 14:04	11/28/18 19:58	1
Beryllium	0.14		0.12	0.0089	mg/Kg	☼	11/21/18 14:04	11/28/18 19:58	1
Cadmium	0.060	J	0.12	0.020	mg/Kg	☼	11/21/18 14:04	11/28/18 19:58	1
Chromium	4.9		0.24	0.078	mg/Kg	☼	11/21/18 14:04	11/28/18 19:58	1
Cobalt	4.0		0.059	0.0098	mg/Kg	☼	11/21/18 14:04	11/28/18 19:58	1
Lead	2.8		0.12	0.041	mg/Kg	☼	11/21/18 14:04	11/28/18 19:58	1
Lithium	2.3		0.59	0.33	mg/Kg	☼	11/21/18 14:04	11/28/18 19:58	1
Molybdenum	3.1		0.59	0.073	mg/Kg	☼	11/21/18 14:04	11/28/18 19:58	1
Selenium	ND		0.59	0.071	mg/Kg	☼	11/21/18 14:04	11/28/18 19:58	1
Thallium	0.039	J	0.12	0.015	mg/Kg	☼	11/21/18 14:04	11/28/18 19:58	1

Method: EPA 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.037	0.016	mg/Kg	☼	11/27/18 17:20	11/28/18 15:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	3600		1100	850	mg/Kg	☼		11/28/18 15:13	1

Client Sample ID: HASB-1 (35-38)

Lab Sample ID: 180-84236-12
Matrix: Solid
Date Collected: 11/16/18 15:50
Date Received: 11/21/18 10:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.8		1.0	0.71	mg/L			11/29/18 06:58	1
Fluoride	0.86		0.10	0.026	mg/L			11/29/18 06:58	1
Sulfate	30		1.0	0.38	mg/L			11/29/18 06:58	1
Nitrate as N	0.031	J	0.10	0.023	mg/L			11/29/18 06:58	1

Method: 6020A - SPLP Metals - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	5.3		2.0	1.1	ug/L		11/27/18 12:10	11/28/18 10:50	1
Arsenic	1.9		1.0	0.32	ug/L		11/27/18 12:10	11/28/18 10:50	1
Barium	9.1	J	10	0.37	ug/L		11/27/18 12:10	11/28/18 10:50	1
Beryllium	ND		1.0	0.057	ug/L		11/27/18 12:10	11/28/18 10:50	1

Client Sample ID: HASB-1 (35-38)

Lab Sample ID: 180-84236-12
Matrix: Solid
Date Collected: 11/16/18 15:50
Date Received: 11/21/18 10:00

Method: 6020A - SPLP Metals - SPLP East (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.0	0.13	ug/L		11/27/18 12:10	11/28/18 10:50	1
Chromium	4.6	B	2.0	0.63	ug/L		11/27/18 12:10	11/28/18 10:50	1
Cobalt	0.099	J	0.50	0.075	ug/L		11/27/18 12:10	11/28/18 10:50	1
Lead	0.31	J	1.0	0.094	ug/L		11/27/18 12:10	11/28/18 10:50	1
Lithium	8.8		5.0	2.6	ug/L		11/27/18 12:10	11/28/18 10:50	1
Molybdenum	210		5.0	0.47	ug/L		11/27/18 12:10	11/28/18 10:50	1
Selenium	37		5.0	0.81	ug/L		11/27/18 12:10	11/28/18 10:50	1
Thallium	ND		1.0	0.063	ug/L		11/27/18 12:10	11/28/18 10:50	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		11/28/18 11:06	11/29/18 15:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	8.7		0.1	0.1	%			11/23/18 08:06	1
Percent Solids	91.3		0.1	0.1	%			11/23/18 08:06	1

General Chemistry - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia, distilled	0.079	J	0.10	0.046	mg/L		11/27/18 13:31	11/28/18 18:00	1
Total Alkalinity as CaCO3 to pH 4.5	76		5.0	5.0	mg/L			11/28/18 05:00	1
Bicarbonate Alkalinity as CaCO3	62		5.0	5.0	mg/L			11/28/18 05:00	1
Carbonate Alkalinity as CaCO3	14		5.0	5.0	mg/L			11/28/18 05:00	1
Phenolphthalein Alkalinity	7.0		5.0	5.0	mg/L			11/28/18 05:00	1

Client Sample ID: HASB-1 (35-38)

Lab Sample ID: 180-84236-12
Matrix: Solid
Date Collected: 11/16/18 15:50
Date Received: 11/21/18 10:00
Percent Solids: 91.3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.96		0.22	0.067	mg/Kg	☼	11/21/18 14:04	11/28/18 20:03	1
Arsenic	18		0.11	0.028	mg/Kg	☼	11/21/18 14:04	11/28/18 20:03	1
Barium	32		1.1	0.062	mg/Kg	☼	11/21/18 14:04	11/28/18 20:03	1
Beryllium	0.93		0.11	0.0081	mg/Kg	☼	11/21/18 14:04	11/28/18 20:03	1
Cadmium	3.5		0.11	0.018	mg/Kg	☼	11/21/18 14:04	11/28/18 20:03	1
Chromium	29		0.22	0.072	mg/Kg	☼	11/21/18 14:04	11/28/18 20:03	1
Cobalt	13		0.054	0.0090	mg/Kg	☼	11/21/18 14:04	11/28/18 20:03	1
Lead	23		0.11	0.038	mg/Kg	☼	11/21/18 14:04	11/28/18 20:03	1
Lithium	21		0.54	0.30	mg/Kg	☼	11/21/18 14:04	11/28/18 20:03	1
Molybdenum	25		0.54	0.067	mg/Kg	☼	11/21/18 14:04	11/28/18 20:03	1
Selenium	9.8		0.54	0.065	mg/Kg	☼	11/21/18 14:04	11/28/18 20:03	1
Thallium	1.1		0.11	0.014	mg/Kg	☼	11/21/18 14:04	11/28/18 20:03	1

Method: EPA 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.064		0.037	0.016	mg/Kg	☼	11/27/18 17:20	11/28/18 15:08	1

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

TestAmerica Job ID: 180-84236-1

Client Sample ID: HASB-1 (35-38)
Date Collected: 11/16/18 15:50
Date Received: 11/21/18 10:00

Lab Sample ID: 180-84236-12
Matrix: Solid
Percent Solids: 91.3

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	200000		1100	820	mg/Kg	☼		11/28/18 15:24	1

Method: EPA 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 180-263887/6
Matrix: Solid
Analysis Batch: 263887

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.71	mg/L			11/28/18 05:40	1
Fluoride	ND		0.10	0.026	mg/L			11/28/18 05:40	1
Sulfate	ND		1.0	0.38	mg/L			11/28/18 05:40	1
Nitrate as N	ND		0.10	0.023	mg/L			11/28/18 05:40	1

Lab Sample ID: LCS 180-263887/5
Matrix: Solid
Analysis Batch: 263887

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	25.0	25.0		mg/L		100	80 - 120
Fluoride	1.25	1.33		mg/L		106	80 - 120
Sulfate	25.0	24.8		mg/L		99	80 - 120
Nitrate as N	1.25	1.23		mg/L		98	80 - 120

Lab Sample ID: MB 180-264016/6
Matrix: Solid
Analysis Batch: 264016

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.71	mg/L			11/29/18 05:55	1
Fluoride	ND		0.10	0.026	mg/L			11/29/18 05:55	1
Sulfate	ND		1.0	0.38	mg/L			11/29/18 05:55	1
Nitrate as N	ND		0.10	0.023	mg/L			11/29/18 05:55	1

Lab Sample ID: LCS 180-264016/5
Matrix: Solid
Analysis Batch: 264016

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	25.0	25.8		mg/L		103	80 - 120
Fluoride	1.25	1.35		mg/L		108	80 - 120
Sulfate	25.0	25.7		mg/L		103	80 - 120
Nitrate as N	1.25	1.25		mg/L		100	80 - 120

Lab Sample ID: MB 180-264317/6
Matrix: Water
Analysis Batch: 264317

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.71	mg/L			12/03/18 06:02	1
Sulfate	ND		1.0	0.38	mg/L			12/03/18 06:02	1
Fluoride	ND		0.10	0.026	mg/L			12/03/18 06:02	1

Method: EPA 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 180-264317/5
Matrix: Water
Analysis Batch: 264317

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	25.0	25.1		mg/L		101	80 - 120
Sulfate	25.0	25.0		mg/L		100	80 - 120
Fluoride	1.25	1.34		mg/L		107	80 - 120

Lab Sample ID: MB 180-264318/6
Matrix: Water
Analysis Batch: 264318

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			12/03/18 06:15	1

Lab Sample ID: LCS 180-264318/5
Matrix: Water
Analysis Batch: 264318

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	1.25	1.36		mg/L		109	80 - 120

Lab Sample ID: 180-84236-2 MS
Matrix: Water
Analysis Batch: 264318

Client Sample ID: CCR-AP-5
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	1.5		1.25	2.78		mg/L		103	80 - 120

Lab Sample ID: 180-84236-2 MSD
Matrix: Water
Analysis Batch: 264318

Client Sample ID: CCR-AP-5
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	1.5		1.25	2.76		mg/L		101	80 - 120	1	15

Lab Sample ID: LB 180-263846/1-A
Matrix: Solid
Analysis Batch: 263887

Client Sample ID: Method Blank
Prep Type: SPLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.71	mg/L			11/28/18 11:09	1
Fluoride	ND		0.10	0.026	mg/L			11/28/18 11:09	1
Sulfate	ND		1.0	0.38	mg/L			11/28/18 11:09	1
Nitrate as N	ND		0.10	0.023	mg/L			11/28/18 11:09	1

Method: 6020A - SPLP Metals

Lab Sample ID: MB 180-263844/1-A
Matrix: Solid
Analysis Batch: 264025

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 263844

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0	0.32	ug/L		11/27/18 12:10	11/28/18 10:17	1
Barium	ND		10	0.37	ug/L		11/27/18 12:10	11/28/18 10:17	1
Beryllium	ND		1.0	0.057	ug/L		11/27/18 12:10	11/28/18 10:17	1
Cadmium	ND		1.0	0.13	ug/L		11/27/18 12:10	11/28/18 10:17	1
Chromium	0.998	J	2.0	0.63	ug/L		11/27/18 12:10	11/28/18 10:17	1
Cobalt	ND		0.50	0.075	ug/L		11/27/18 12:10	11/28/18 10:17	1
Lead	ND		1.0	0.094	ug/L		11/27/18 12:10	11/28/18 10:17	1
Molybdenum	ND		5.0	0.47	ug/L		11/27/18 12:10	11/28/18 10:17	1
Antimony	ND		2.0	1.1	ug/L		11/27/18 12:10	11/28/18 10:17	1
Selenium	ND		5.0	0.81	ug/L		11/27/18 12:10	11/28/18 10:17	1
Thallium	ND		1.0	0.063	ug/L		11/27/18 12:10	11/28/18 10:17	1
Lithium	ND		5.0	2.6	ug/L		11/27/18 12:10	11/28/18 10:17	1

Lab Sample ID: LCS 180-263844/2-A
Matrix: Solid
Analysis Batch: 264025

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 263844

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	40.0	38.1		ug/L		95	80 - 120
Barium	2000	2140		ug/L		107	80 - 120
Beryllium	50.0	44.5		ug/L		89	80 - 120
Cadmium	50.0	55.8		ug/L		112	80 - 120
Chromium	200	211		ug/L		105	80 - 120
Cobalt	500	483		ug/L		97	80 - 120
Lead	20.0	22.0		ug/L		110	80 - 120
Molybdenum	1000	1080		ug/L		108	80 - 120
Antimony	500	550		ug/L		110	80 - 120
Selenium	10.0	9.46		ug/L		95	80 - 120
Thallium	50.0	56.4		ug/L		113	80 - 120
Lithium	50.0	45.5		ug/L		91	80 - 120

Lab Sample ID: LCSD 180-263844/3-A
Matrix: Solid
Analysis Batch: 264025

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 263844

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	40.0	37.8		ug/L		95	80 - 120	1	20
Barium	2000	2090		ug/L		105	80 - 120	2	20
Beryllium	50.0	46.5		ug/L		93	80 - 120	4	20
Cadmium	50.0	55.0		ug/L		110	80 - 120	1	20
Chromium	200	208		ug/L		104	80 - 120	1	20
Cobalt	500	487		ug/L		97	80 - 120	1	20
Lead	20.0	21.9		ug/L		109	80 - 120	0	20
Molybdenum	1000	1070		ug/L		107	80 - 120	1	20
Antimony	500	539		ug/L		108	80 - 120	2	20
Selenium	10.0	9.32		ug/L		93	80 - 120	2	20
Thallium	50.0	55.8		ug/L		112	80 - 120	1	20
Lithium	50.0	47.6		ug/L		95	80 - 120	4	20

Method: 6020A - SPLP Metals (Continued)

Lab Sample ID: LB 180-263760/1-C
Matrix: Solid
Analysis Batch: 264025

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 263844

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0	0.32	ug/L		11/27/18 12:10	11/28/18 10:20	1
Barium	ND		10	0.37	ug/L		11/27/18 12:10	11/28/18 10:20	1
Beryllium	ND		1.0	0.057	ug/L		11/27/18 12:10	11/28/18 10:20	1
Cadmium	ND		1.0	0.13	ug/L		11/27/18 12:10	11/28/18 10:20	1
Chromium	ND		2.0	0.63	ug/L		11/27/18 12:10	11/28/18 10:20	1
Cobalt	ND		0.50	0.075	ug/L		11/27/18 12:10	11/28/18 10:20	1
Lead	ND		1.0	0.094	ug/L		11/27/18 12:10	11/28/18 10:20	1
Molybdenum	ND		5.0	0.47	ug/L		11/27/18 12:10	11/28/18 10:20	1
Antimony	ND		2.0	1.1	ug/L		11/27/18 12:10	11/28/18 10:20	1
Selenium	ND		5.0	0.81	ug/L		11/27/18 12:10	11/28/18 10:20	1
Thallium	ND		1.0	0.063	ug/L		11/27/18 12:10	11/28/18 10:20	1
Lithium	ND		5.0	2.6	ug/L		11/27/18 12:10	11/28/18 10:20	1

Method: 7470A - SPLP Mercury

Lab Sample ID: MB 180-263948/1-A
Matrix: Solid
Analysis Batch: 264124

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 263948

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/28/18 11:06	11/29/18 14:52	1

Lab Sample ID: LCS 180-263948/2-A
Matrix: Solid
Analysis Batch: 264124

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 263948

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 180-263948/3-A
Matrix: Solid
Analysis Batch: 264124

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 263948

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury			2.50	2.52		ug/L		101	80 - 120	2	20

Lab Sample ID: LB 180-263760/1-F
Matrix: Solid
Analysis Batch: 264124

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 263948

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/28/18 11:06	11/29/18 14:55	1

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

Lab Sample ID: MB 180-263578/1-A
Matrix: Solid
Analysis Batch: 264070

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 263578

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.10	0.026	mg/Kg		11/21/18 14:04	11/28/18 18:54	1
Barium	ND		1.0	0.057	mg/Kg		11/21/18 14:04	11/28/18 18:54	1
Beryllium	ND		0.10	0.0075	mg/Kg		11/21/18 14:04	11/28/18 18:54	1
Cadmium	ND		0.10	0.017	mg/Kg		11/21/18 14:04	11/28/18 18:54	1
Chromium	ND		0.20	0.066	mg/Kg		11/21/18 14:04	11/28/18 18:54	1
Cobalt	ND		0.050	0.0083	mg/Kg		11/21/18 14:04	11/28/18 18:54	1
Lead	ND		0.10	0.035	mg/Kg		11/21/18 14:04	11/28/18 18:54	1
Molybdenum	ND		0.50	0.062	mg/Kg		11/21/18 14:04	11/28/18 18:54	1
Antimony	ND		0.20	0.062	mg/Kg		11/21/18 14:04	11/28/18 18:54	1
Selenium	ND		0.50	0.060	mg/Kg		11/21/18 14:04	11/28/18 18:54	1
Thallium	ND		0.10	0.013	mg/Kg		11/21/18 14:04	11/28/18 18:54	1
Lithium	ND		0.50	0.28	mg/Kg		11/21/18 14:04	11/28/18 18:54	1

Lab Sample ID: LCS 180-263578/2-A
Matrix: Solid
Analysis Batch: 264070

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 263578

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	4.00	3.90		mg/Kg		97	80 - 120
Barium	200	179		mg/Kg		90	80 - 120
Beryllium	5.00	4.58		mg/Kg		92	80 - 120
Cadmium	5.00	5.21		mg/Kg		104	80 - 120
Chromium	20.0	21.8		mg/Kg		109	80 - 120
Cobalt	50.0	52.9		mg/Kg		106	80 - 120
Lead	2.00	2.17		mg/Kg		109	80 - 120
Molybdenum	100	102		mg/Kg		102	80 - 120
Antimony	50.0	48.9		mg/Kg		98	80 - 120
Selenium	1.00	1.15		mg/Kg		115	80 - 120
Thallium	5.00	5.15		mg/Kg		103	80 - 120
Lithium	5.00	4.85		mg/Kg		97	80 - 120

Lab Sample ID: MB 180-263656/1-A
Matrix: Water
Analysis Batch: 263680

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 263656

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0	0.32	ug/L		11/23/18 13:00	11/24/18 10:14	1
Barium	0.950	J	10	0.37	ug/L		11/23/18 13:00	11/24/18 10:14	1
Beryllium	ND		1.0	0.057	ug/L		11/23/18 13:00	11/24/18 10:14	1
Cadmium	ND		1.0	0.13	ug/L		11/23/18 13:00	11/24/18 10:14	1
Chromium	ND		2.0	0.63	ug/L		11/23/18 13:00	11/24/18 10:14	1
Cobalt	ND		0.50	0.075	ug/L		11/23/18 13:00	11/24/18 10:14	1
Iron	ND		50	14	ug/L		11/23/18 13:00	11/24/18 10:14	1
Manganese	ND		5.0	1.4	ug/L		11/23/18 13:00	11/24/18 10:14	1
Lead	ND		1.0	0.094	ug/L		11/23/18 13:00	11/24/18 10:14	1
Molybdenum	ND		5.0	0.47	ug/L		11/23/18 13:00	11/24/18 10:14	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:00	11/24/18 10:14	1
Selenium	ND		5.0	0.81	ug/L		11/23/18 13:00	11/24/18 10:14	1

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

Lab Sample ID: MB 180-263656/1-A
Matrix: Water
Analysis Batch: 263680

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 263656

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:00	11/24/18 10:14	1
Lithium	ND		5.0	2.6	ug/L		11/23/18 13:00	11/24/18 10:14	1

Lab Sample ID: LCS 180-263656/2-A
Matrix: Water
Analysis Batch: 263680

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 263656

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	40.0	39.6		ug/L		99	80 - 120
Barium	2000	2010		ug/L		100	80 - 120
Beryllium	50.0	51.1		ug/L		102	80 - 120
Cadmium	50.0	52.2		ug/L		104	80 - 120
Chromium	200	207		ug/L		103	80 - 120
Cobalt	500	479		ug/L		96	80 - 120
Iron	1000	1080		ug/L		108	80 - 120
Manganese	500	510		ug/L		102	80 - 120
Lead	20.0	20.6		ug/L		103	80 - 120
Molybdenum	1000	1040		ug/L		104	80 - 120
Antimony	500	506		ug/L		101	80 - 120
Selenium	10.0	9.99		ug/L		100	80 - 120
Thallium	50.0	51.0		ug/L		102	80 - 120
Lithium	50.0	47.5		ug/L		95	80 - 120

Lab Sample ID: MB 180-263658/1-A
Matrix: Water
Analysis Batch: 263793

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 263658

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.0	0.32	ug/L		11/23/18 13:30	11/24/18 13:34	1
Barium	ND		10	0.37	ug/L		11/23/18 13:30	11/24/18 13:34	1
Beryllium	ND		1.0	0.057	ug/L		11/23/18 13:30	11/24/18 13:34	1
Cadmium	ND		1.0	0.13	ug/L		11/23/18 13:30	11/24/18 13:34	1
Chromium	ND		2.0	0.63	ug/L		11/23/18 13:30	11/24/18 13:34	1
Cobalt	ND		0.50	0.075	ug/L		11/23/18 13:30	11/24/18 13:34	1
Iron	ND		50	14	ug/L		11/23/18 13:30	11/24/18 13:34	1
Manganese	ND		5.0	1.4	ug/L		11/23/18 13:30	11/24/18 13:34	1
Lead	ND		1.0	0.094	ug/L		11/23/18 13:30	11/24/18 13:34	1
Molybdenum	ND		5.0	0.47	ug/L		11/23/18 13:30	11/24/18 13:34	1
Antimony	ND		2.0	1.1	ug/L		11/23/18 13:30	11/24/18 13:34	1
Selenium	ND		5.0	0.81	ug/L		11/23/18 13:30	11/24/18 13:34	1
Thallium	ND		1.0	0.063	ug/L		11/23/18 13:30	11/24/18 13:34	1
Lithium	ND		5.0	2.6	ug/L		11/23/18 13:30	11/24/18 13:34	1

Lab Sample ID: LCS 180-263658/2-A
Matrix: Water
Analysis Batch: 263793

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 263658

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	40.0	37.6		ug/L		94	80 - 120

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

Lab Sample ID: LCS 180-263658/2-A
Matrix: Water
Analysis Batch: 263793

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 263658

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	2000	1940		ug/L		97	80 - 120
Beryllium	50.0	50.7		ug/L		101	80 - 120
Cadmium	50.0	50.1		ug/L		100	80 - 120
Chromium	200	198		ug/L		99	80 - 120
Cobalt	500	469		ug/L		94	80 - 120
Iron	1000	1010		ug/L		101	80 - 120
Manganese	500	483		ug/L		97	80 - 120
Lead	20.0	19.7		ug/L		99	80 - 120
Molybdenum	1000	995		ug/L		100	80 - 120
Antimony	500	483		ug/L		97	80 - 120
Selenium	10.0	9.32		ug/L		93	80 - 120
Thallium	50.0	48.3		ug/L		97	80 - 120
Lithium	50.0	48.8		ug/L		98	80 - 120

Method: EPA 7470A - Mercury (CVAA)

Lab Sample ID: MB 180-263719/1-A
Matrix: Water
Analysis Batch: 263824

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 263719

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.123	J	0.20	0.065	ug/L		11/26/18 09:55	11/27/18 07:28	1

Lab Sample ID: LCS 180-263719/2-A
Matrix: Water
Analysis Batch: 263824

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 263719

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2.50	2.61		ug/L		104	80 - 120

Lab Sample ID: MB 180-263721/1-A
Matrix: Water
Analysis Batch: 263824

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 263721

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.065	ug/L		11/26/18 09:58	11/27/18 08:00	1

Lab Sample ID: LCS 180-263721/2-A
Matrix: Water
Analysis Batch: 263824

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 263721

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2.50	2.51		ug/L		101	80 - 120

Method: EPA 7471B - Mercury (CVAA)

Lab Sample ID: MB 180-263884/1-A
Matrix: Solid
Analysis Batch: 264013

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 263884

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.033	0.014	mg/Kg		11/27/18 17:18	11/28/18 14:26	1

Lab Sample ID: LCS 180-263884/2-A
Matrix: Solid
Analysis Batch: 264013

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 263884

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.417	0.434		mg/Kg		104	80 - 120

Lab Sample ID: MB 180-263885/1-A
Matrix: Solid
Analysis Batch: 264013

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 263885

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.033	0.014	mg/Kg		11/27/18 17:20	11/28/18 14:54	1

Lab Sample ID: LCS 180-263885/2-A
Matrix: Solid
Analysis Batch: 264013

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 263885

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.417	0.430		mg/Kg		103	80 - 120

Method: Se Speciation - Selenium Speciation

Lab Sample ID: MB 280-439085/4
Matrix: Water
Analysis Batch: 439085

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (III)	ND		2.0	0.79	ug/L			11/28/18 17:08	1
Arsenic (V)	ND		2.0	0.75	ug/L			11/28/18 17:08	1

Lab Sample ID: LCS 280-439085/5
Matrix: Water
Analysis Batch: 439085

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic (III)	50.0	70.5		ug/L		141	50 - 150
Arsenic (V)	50.0	34.0		ug/L		68	50 - 150

Lab Sample ID: 180-84236-5 MS
Matrix: Water
Analysis Batch: 439085

Client Sample ID: CCR-AP-3
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic (III)	5.0	F1	50.0	88.0	F1	ug/L		166	50 - 150
Arsenic (V)	1.2	J F1	50.0	16.2	F1	ug/L		30	50 - 150

Method: Se Speciation - Selenium Speciation (Continued)

Lab Sample ID: 180-84236-5 MSD
Matrix: Water
Analysis Batch: 439085

Client Sample ID: CCR-AP-3
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic (III)	5.0	F1	50.0	89.4	F1	ug/L		169	50 - 150	2	50
Arsenic (V)	1.2	J F1	50.0	14.2	F1	ug/L		26	50 - 150	13	50

Method: EPA 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 180-263861/6-A
Matrix: Solid
Analysis Batch: 264014

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 263861

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia, distilled	ND		0.10	0.046	mg/L		11/27/18 13:31	11/28/18 17:40	1

Lab Sample ID: LCS 180-263861/7-A
Matrix: Solid
Analysis Batch: 264014

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 263861

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia, distilled	2.00	1.95		mg/L		98	90 - 110

Lab Sample ID: LB 180-263760/1-D
Matrix: Solid
Analysis Batch: 264014

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 263861

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia, distilled	ND		0.10	0.046	mg/L		11/27/18 13:31	11/28/18 17:52	1

Method: EPA-Lloyd Kahn - Organic Carbon, Total (TOC)

Lab Sample ID: MB 180-264051/3
Matrix: Solid
Analysis Batch: 264051

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	ND		1000	750	mg/Kg			11/28/18 13:52	1

Lab Sample ID: LCS 180-264051/4
Matrix: Solid
Analysis Batch: 264051

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	37800	31700		mg/Kg		84	75 - 125

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 180-263522/2
Matrix: Water
Analysis Batch: 263522

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			11/21/18 11:00	1

Lab Sample ID: LCS 180-263522/1
Matrix: Water
Analysis Batch: 263522

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	729	698		mg/L		96	80 - 120

Lab Sample ID: 180-84236-1 DU
Matrix: Water
Analysis Batch: 263522

Client Sample ID: CCR-AP-2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	1500		1510		mg/L		1	10

Method: SM 5310C - Total Organic Carbon

Lab Sample ID: MB 180-263767/6
Matrix: Water
Analysis Batch: 263767

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	ND		1.0	0.51	mg/L			11/26/18 12:41	1

Lab Sample ID: LCS 180-263767/4
Matrix: Water
Analysis Batch: 263767

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	20.0	18.9		mg/L		94	85 - 115

Lab Sample ID: LCSD 180-263767/5
Matrix: Water
Analysis Batch: 263767

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	20.0	18.8		mg/L		94	85 - 115	0	20

Method: SM 5310C - Organic Carbon, Dissolved (DOC)

Lab Sample ID: MB 180-263820/6
Matrix: Water
Analysis Batch: 263820

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon - Duplicate	ND		1.0	0.51	mg/L			11/27/18 07:32	1

Method: SM 5310C - Organic Carbon, Dissolved (DOC) (Continued)

Lab Sample ID: LCS 180-263820/4
Matrix: Water
Analysis Batch: 263820

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon - Duplicate	20.0	19.5		mg/L		98	85 - 115

Lab Sample ID: LCSD 180-263820/5
Matrix: Water
Analysis Batch: 263820

Client Sample ID: Lab Control Sample Dup
Prep Type: Dissolved

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dissolved Organic Carbon - Duplicate	20.0	19.5		mg/L		98	85 - 115	0	20

Method: SM2320 B - Alkalinity, Total

Lab Sample ID: MB 180-263868/3
Matrix: Solid
Analysis Batch: 263868

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5	ND		5.0	5.0	mg/L			11/28/18 05:00	1
Bicarbonate Alkalinity as CaCO3	ND		5.0	5.0	mg/L			11/28/18 05:00	1
Carbonate Alkalinity as CaCO3	ND		5.0	5.0	mg/L			11/28/18 05:00	1
Phenolphthalein Alkalinity	ND		5.0	5.0	mg/L			11/28/18 05:00	1

Lab Sample ID: LCS 180-263868/1
Matrix: Solid
Analysis Batch: 263868

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity as CaCO3 to pH 4.5	250	258		mg/L		103	90 - 110

Lab Sample ID: LCSD 180-263868/2
Matrix: Solid
Analysis Batch: 263868

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Alkalinity as CaCO3 to pH 4.5	250	260		mg/L		104	90 - 110	1	20

Lab Sample ID: MB 180-263870/2
Matrix: Water
Analysis Batch: 263870

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5	ND		5.0	5.0	mg/L			11/28/18 05:15	1

Method: SM2320 B - Alkalinity, Total (Continued)

Lab Sample ID: LCS 180-263870/1
Matrix: Water
Analysis Batch: 263870

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity as CaCO3 to pH 4.5	250	260		mg/L		104	90 - 110

Lab Sample ID: MB 180-263925/2
Matrix: Water
Analysis Batch: 263925

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5	ND		5.0	5.0	mg/L			11/28/18 09:11	1

Lab Sample ID: LCS 180-263925/1
Matrix: Water
Analysis Batch: 263925

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity as CaCO3 to pH 4.5	1000	1080		mg/L		108	90 - 110

Lab Sample ID: 180-84236-4 DU
Matrix: Water
Analysis Batch: 263925

Client Sample ID: CCR-AP-8
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Alkalinity as CaCO3 to pH 4.5	1300		1310		mg/L		0.7	20

Lab Sample ID: LB 180-263760/1-A
Matrix: Solid
Analysis Batch: 263868

Client Sample ID: Method Blank
Prep Type: SPLP East

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5	ND		5.0	5.0	mg/L			11/28/18 05:00	1
Bicarbonate Alkalinity as CaCO3	ND		5.0	5.0	mg/L			11/28/18 05:00	1
Carbonate Alkalinity as CaCO3	ND		5.0	5.0	mg/L			11/28/18 05:00	1
Phenolphthalein Alkalinity	ND		5.0	5.0	mg/L			11/28/18 05:00	1

HPLC/IC

Leach Batch: 263846

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	SPLP	Solid	1312	
180-84236-11	CCR-AP-6I (68-70)	SPLP	Solid	1312	
180-84236-12	HASB-1 (35-38)	SPLP	Solid	1312	
LB 180-263846/1-A	Method Blank	SPLP	Solid	1312	

Analysis Batch: 263887

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	SPLP	Solid	EPA 9056A	263846
180-84236-11	CCR-AP-6I (68-70)	SPLP	Solid	EPA 9056A	263846
LB 180-263846/1-A	Method Blank	SPLP	Solid	EPA 9056A	263846
MB 180-263887/6	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-263887/5	Lab Control Sample	Total/NA	Solid	EPA 9056A	

Analysis Batch: 264016

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-12	HASB-1 (35-38)	SPLP	Solid	EPA 9056A	263846
MB 180-264016/6	Method Blank	Total/NA	Solid	EPA 9056A	
LCS 180-264016/5	Lab Control Sample	Total/NA	Solid	EPA 9056A	

Analysis Batch: 264317

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-1	CCR-AP-2	Total/NA	Water	EPA 9056A	
180-84236-1	CCR-AP-2	Total/NA	Water	EPA 9056A	
180-84236-2	CCR-AP-5	Total/NA	Water	EPA 9056A	
180-84236-3	CCR-AP-4	Total/NA	Water	EPA 9056A	
180-84236-4	CCR-AP-8	Total/NA	Water	EPA 9056A	
180-84236-5	CCR-AP-3	Total/NA	Water	EPA 9056A	
180-84236-6	CCR-AP-6	Total/NA	Water	EPA 9056A	
180-84236-7	CCR-AP-6I	Total/NA	Water	EPA 9056A	
180-84236-7	CCR-AP-6I	Total/NA	Water	EPA 9056A	
180-84236-8	CCR-AP-8I	Total/NA	Water	EPA 9056A	
180-84236-8	CCR-AP-8I	Total/NA	Water	EPA 9056A	
180-84236-9	HASB-1	Total/NA	Water	EPA 9056A	
MB 180-264317/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-264317/5	Lab Control Sample	Total/NA	Water	EPA 9056A	

Analysis Batch: 264318

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-1	CCR-AP-2	Dissolved	Water	EPA 9056A	
180-84236-2	CCR-AP-5	Dissolved	Water	EPA 9056A	
180-84236-3	CCR-AP-4	Dissolved	Water	EPA 9056A	
180-84236-4	CCR-AP-8	Dissolved	Water	EPA 9056A	
180-84236-5	CCR-AP-3	Dissolved	Water	EPA 9056A	
180-84236-6	CCR-AP-6	Dissolved	Water	EPA 9056A	
180-84236-7	CCR-AP-6I	Dissolved	Water	EPA 9056A	
180-84236-8	CCR-AP-8I	Dissolved	Water	EPA 9056A	
180-84236-9	HASB-1	Dissolved	Water	EPA 9056A	
MB 180-264318/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-264318/5	Lab Control Sample	Total/NA	Water	EPA 9056A	
180-84236-2 MS	CCR-AP-5	Dissolved	Water	EPA 9056A	
180-84236-2 MSD	CCR-AP-5	Dissolved	Water	EPA 9056A	

Metals

Prep Batch: 263578

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	Total/NA	Solid	3050B	
180-84236-11	CCR-AP-6I (68-70)	Total/NA	Solid	3050B	
180-84236-12	HASB-1 (35-38)	Total/NA	Solid	3050B	
MB 180-263578/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 180-263578/2-A	Lab Control Sample	Total/NA	Solid	3050B	

Prep Batch: 263656

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-1	CCR-AP-2	Dissolved	Water	3005A	
180-84236-1	CCR-AP-2	Total Recoverable	Water	3005A	
MB 180-263656/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-263656/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 263658

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-2	CCR-AP-5	Dissolved	Water	3005A	
180-84236-2	CCR-AP-5	Total Recoverable	Water	3005A	
180-84236-3	CCR-AP-4	Dissolved	Water	3005A	
180-84236-3	CCR-AP-4	Total Recoverable	Water	3005A	
180-84236-4	CCR-AP-8	Dissolved	Water	3005A	
180-84236-4	CCR-AP-8	Total Recoverable	Water	3005A	
180-84236-5	CCR-AP-3	Dissolved	Water	3005A	
180-84236-5	CCR-AP-3	Total Recoverable	Water	3005A	
180-84236-6	CCR-AP-6	Dissolved	Water	3005A	
180-84236-6	CCR-AP-6	Total Recoverable	Water	3005A	
180-84236-7	CCR-AP-6I	Dissolved	Water	3005A	
180-84236-7	CCR-AP-6I	Total Recoverable	Water	3005A	
180-84236-8	CCR-AP-8I	Dissolved	Water	3005A	
180-84236-8	CCR-AP-8I	Total Recoverable	Water	3005A	
180-84236-9	HASB-1	Dissolved	Water	3005A	
180-84236-9	HASB-1	Total Recoverable	Water	3005A	
MB 180-263658/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-263658/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 263680

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-1	CCR-AP-2	Dissolved	Water	EPA 6020A	263656
180-84236-1	CCR-AP-2	Total Recoverable	Water	EPA 6020A	263656
180-84236-1	CCR-AP-2	Total Recoverable	Water	EPA 6020A	263656
MB 180-263656/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	263656
LCS 180-263656/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	263656

Prep Batch: 263719

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-1	CCR-AP-2	Dissolved	Water	7470A	
180-84236-2	CCR-AP-5	Dissolved	Water	7470A	
180-84236-3	CCR-AP-4	Dissolved	Water	7470A	
180-84236-4	CCR-AP-8	Dissolved	Water	7470A	
180-84236-5	CCR-AP-3	Dissolved	Water	7470A	
180-84236-6	CCR-AP-6	Dissolved	Water	7470A	
180-84236-7	CCR-AP-6I	Dissolved	Water	7470A	

Metals (Continued)

Prep Batch: 263719 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-8	CCR-AP-8I	Dissolved	Water	7470A	
180-84236-9	HASB-1	Dissolved	Water	7470A	
MB 180-263719/1-A	Method Blank	Total/NA	Water	7470A	
LCS 180-263719/2-A	Lab Control Sample	Total/NA	Water	7470A	

Prep Batch: 263721

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-1	CCR-AP-2	Total/NA	Water	7470A	
180-84236-2	CCR-AP-5	Total/NA	Water	7470A	
180-84236-3	CCR-AP-4	Total/NA	Water	7470A	
180-84236-4	CCR-AP-8	Total/NA	Water	7470A	
180-84236-5	CCR-AP-3	Total/NA	Water	7470A	
180-84236-6	CCR-AP-6	Total/NA	Water	7470A	
180-84236-7	CCR-AP-6I	Total/NA	Water	7470A	
180-84236-8	CCR-AP-8I	Total/NA	Water	7470A	
180-84236-9	HASB-1	Total/NA	Water	7470A	
MB 180-263721/1-A	Method Blank	Total/NA	Water	7470A	
LCS 180-263721/2-A	Lab Control Sample	Total/NA	Water	7470A	

Leach Batch: 263760

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	SPLP East	Solid	EPA 1312	
180-84236-11	CCR-AP-6I (68-70)	SPLP East	Solid	EPA 1312	
180-84236-12	HASB-1 (35-38)	SPLP East	Solid	EPA 1312	
LB 180-263760/1-C	Method Blank	SPLP East	Solid	EPA 1312	
LB 180-263760/1-F	Method Blank	SPLP East	Solid	EPA 1312	

Analysis Batch: 263793

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-2	CCR-AP-5	Dissolved	Water	EPA 6020A	263658
180-84236-2	CCR-AP-5	Total Recoverable	Water	EPA 6020A	263658
180-84236-3	CCR-AP-4	Dissolved	Water	EPA 6020A	263658
180-84236-3	CCR-AP-4	Total Recoverable	Water	EPA 6020A	263658
180-84236-4	CCR-AP-8	Dissolved	Water	EPA 6020A	263658
180-84236-4	CCR-AP-8	Total Recoverable	Water	EPA 6020A	263658
180-84236-5	CCR-AP-3	Dissolved	Water	EPA 6020A	263658
180-84236-5	CCR-AP-3	Total Recoverable	Water	EPA 6020A	263658
180-84236-6	CCR-AP-6	Dissolved	Water	EPA 6020A	263658
180-84236-6	CCR-AP-6	Total Recoverable	Water	EPA 6020A	263658
180-84236-7	CCR-AP-6I	Dissolved	Water	EPA 6020A	263658
180-84236-7	CCR-AP-6I	Total Recoverable	Water	EPA 6020A	263658
180-84236-8	CCR-AP-8I	Dissolved	Water	EPA 6020A	263658
180-84236-8	CCR-AP-8I	Total Recoverable	Water	EPA 6020A	263658
180-84236-9	HASB-1	Dissolved	Water	EPA 6020A	263658
180-84236-9	HASB-1	Total Recoverable	Water	EPA 6020A	263658
MB 180-263658/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	263658
LCS 180-263658/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	263658

Analysis Batch: 263824

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-1	CCR-AP-2	Dissolved	Water	EPA 7470A	263719

Metals (Continued)

Analysis Batch: 263824 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-1	CCR-AP-2	Total/NA	Water	EPA 7470A	263721
180-84236-2	CCR-AP-5	Dissolved	Water	EPA 7470A	263719
180-84236-2	CCR-AP-5	Total/NA	Water	EPA 7470A	263721
180-84236-3	CCR-AP-4	Dissolved	Water	EPA 7470A	263719
180-84236-3	CCR-AP-4	Total/NA	Water	EPA 7470A	263721
180-84236-4	CCR-AP-8	Dissolved	Water	EPA 7470A	263719
180-84236-4	CCR-AP-8	Total/NA	Water	EPA 7470A	263721
180-84236-5	CCR-AP-3	Dissolved	Water	EPA 7470A	263719
180-84236-5	CCR-AP-3	Total/NA	Water	EPA 7470A	263721
180-84236-6	CCR-AP-6	Dissolved	Water	EPA 7470A	263719
180-84236-6	CCR-AP-6	Total/NA	Water	EPA 7470A	263721
180-84236-7	CCR-AP-6I	Dissolved	Water	EPA 7470A	263719
180-84236-7	CCR-AP-6I	Total/NA	Water	EPA 7470A	263721
180-84236-8	CCR-AP-8I	Dissolved	Water	EPA 7470A	263719
180-84236-8	CCR-AP-8I	Total/NA	Water	EPA 7470A	263721
180-84236-9	HASB-1	Dissolved	Water	EPA 7470A	263719
180-84236-9	HASB-1	Total/NA	Water	EPA 7470A	263721
MB 180-263719/1-A	Method Blank	Total/NA	Water	EPA 7470A	263719
MB 180-263721/1-A	Method Blank	Total/NA	Water	EPA 7470A	263721
LCS 180-263719/2-A	Lab Control Sample	Total/NA	Water	EPA 7470A	263719
LCS 180-263721/2-A	Lab Control Sample	Total/NA	Water	EPA 7470A	263721

Prep Batch: 263844

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	SPLP East	Solid	3010A	263760
180-84236-11	CCR-AP-6I (68-70)	SPLP East	Solid	3010A	263760
180-84236-12	HASB-1 (35-38)	SPLP East	Solid	3010A	263760
LB 180-263760/1-C	Method Blank	SPLP East	Solid	3010A	263760
MB 180-263844/1-A	Method Blank	Total/NA	Solid	3010A	
LCS 180-263844/2-A	Lab Control Sample	Total/NA	Solid	3010A	
LCSD 180-263844/3-A	Lab Control Sample Dup	Total/NA	Solid	3010A	

Prep Batch: 263884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	Total/NA	Solid	7471B	
MB 180-263884/1-A	Method Blank	Total/NA	Solid	7471B	
LCS 180-263884/2-A	Lab Control Sample	Total/NA	Solid	7471B	

Prep Batch: 263885

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-11	CCR-AP-6I (68-70)	Total/NA	Solid	7471B	
180-84236-12	HASB-1 (35-38)	Total/NA	Solid	7471B	
MB 180-263885/1-A	Method Blank	Total/NA	Solid	7471B	
LCS 180-263885/2-A	Lab Control Sample	Total/NA	Solid	7471B	

Prep Batch: 263948

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	SPLP East	Solid	7470A	263760
180-84236-11	CCR-AP-6I (68-70)	SPLP East	Solid	7470A	263760
180-84236-12	HASB-1 (35-38)	SPLP East	Solid	7470A	263760
LB 180-263760/1-F	Method Blank	SPLP East	Solid	7470A	263760

Metals (Continued)

Prep Batch: 263948 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 180-263948/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 180-263948/2-A	Lab Control Sample	Total/NA	Solid	7470A	
LCSD 180-263948/3-A	Lab Control Sample Dup	Total/NA	Solid	7470A	

Analysis Batch: 264013

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	Total/NA	Solid	EPA 7471B	263884
180-84236-11	CCR-AP-6I (68-70)	Total/NA	Solid	EPA 7471B	263885
180-84236-12	HASB-1 (35-38)	Total/NA	Solid	EPA 7471B	263885
MB 180-263884/1-A	Method Blank	Total/NA	Solid	EPA 7471B	263884
MB 180-263885/1-A	Method Blank	Total/NA	Solid	EPA 7471B	263885
LCS 180-263884/2-A	Lab Control Sample	Total/NA	Solid	EPA 7471B	263884
LCS 180-263885/2-A	Lab Control Sample	Total/NA	Solid	EPA 7471B	263885

Analysis Batch: 264025

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	SPLP East	Solid	6020A	263844
180-84236-11	CCR-AP-6I (68-70)	SPLP East	Solid	6020A	263844
180-84236-12	HASB-1 (35-38)	SPLP East	Solid	6020A	263844
LB 180-263760/1-C	Method Blank	SPLP East	Solid	6020A	263844
MB 180-263844/1-A	Method Blank	Total/NA	Solid	6020A	263844
LCS 180-263844/2-A	Lab Control Sample	Total/NA	Solid	6020A	263844
LCSD 180-263844/3-A	Lab Control Sample Dup	Total/NA	Solid	6020A	263844

Analysis Batch: 264070

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	Total/NA	Solid	EPA 6020A	263578
180-84236-11	CCR-AP-6I (68-70)	Total/NA	Solid	EPA 6020A	263578
180-84236-12	HASB-1 (35-38)	Total/NA	Solid	EPA 6020A	263578
MB 180-263578/1-A	Method Blank	Total/NA	Solid	EPA 6020A	263578
LCS 180-263578/2-A	Lab Control Sample	Total/NA	Solid	EPA 6020A	263578

Analysis Batch: 264124

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	SPLP East	Solid	7470A	263948
180-84236-11	CCR-AP-6I (68-70)	SPLP East	Solid	7470A	263948
180-84236-12	HASB-1 (35-38)	SPLP East	Solid	7470A	263948
LB 180-263760/1-F	Method Blank	SPLP East	Solid	7470A	263948
MB 180-263948/1-A	Method Blank	Total/NA	Solid	7470A	263948
LCS 180-263948/2-A	Lab Control Sample	Total/NA	Solid	7470A	263948
LCSD 180-263948/3-A	Lab Control Sample Dup	Total/NA	Solid	7470A	263948

Analysis Batch: 264192

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	Total/NA	Solid	EPA 6020A	263578
180-84236-11	CCR-AP-6I (68-70)	Total/NA	Solid	EPA 6020A	263578
180-84236-12	HASB-1 (35-38)	Total/NA	Solid	EPA 6020A	263578
MB 180-263578/1-A	Method Blank	Total/NA	Solid	EPA 6020A	263578
LCS 180-263578/2-A	Lab Control Sample	Total/NA	Solid	EPA 6020A	263578

Metals (Continued)

Analysis Batch: 439085

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-1	CCR-AP-2	Dissolved	Water	Se Speciation	
180-84236-2	CCR-AP-5	Dissolved	Water	Se Speciation	
180-84236-3	CCR-AP-4	Dissolved	Water	Se Speciation	
180-84236-4	CCR-AP-8	Dissolved	Water	Se Speciation	
180-84236-5	CCR-AP-3	Dissolved	Water	Se Speciation	
180-84236-6	CCR-AP-6	Dissolved	Water	Se Speciation	
180-84236-7	CCR-AP-6I	Dissolved	Water	Se Speciation	
180-84236-8	CCR-AP-8I	Dissolved	Water	Se Speciation	
180-84236-9	HASB-1	Dissolved	Water	Se Speciation	
MB 280-439085/4	Method Blank	Total/NA	Water	Se Speciation	
LCS 280-439085/5	Lab Control Sample	Total/NA	Water	Se Speciation	
180-84236-5 MS	CCR-AP-3	Dissolved	Water	Se Speciation	
180-84236-5 MSD	CCR-AP-3	Dissolved	Water	Se Speciation	

General Chemistry

Analysis Batch: 263522

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-1	CCR-AP-2	Total/NA	Water	SM 2540C	
180-84236-2	CCR-AP-5	Total/NA	Water	SM 2540C	
180-84236-3	CCR-AP-4	Total/NA	Water	SM 2540C	
180-84236-4	CCR-AP-8	Total/NA	Water	SM 2540C	
180-84236-5	CCR-AP-3	Total/NA	Water	SM 2540C	
180-84236-6	CCR-AP-6	Total/NA	Water	SM 2540C	
180-84236-7	CCR-AP-6I	Total/NA	Water	SM 2540C	
180-84236-8	CCR-AP-8I	Total/NA	Water	SM 2540C	
180-84236-9	HASB-1	Total/NA	Water	SM 2540C	
MB 180-263522/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-263522/1	Lab Control Sample	Total/NA	Water	SM 2540C	
180-84236-1 DU	CCR-AP-2	Total/NA	Water	SM 2540C	

Analysis Batch: 263619

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	Total/NA	Solid	2540G	
180-84236-11	CCR-AP-6I (68-70)	Total/NA	Solid	2540G	
180-84236-12	HASB-1 (35-38)	Total/NA	Solid	2540G	

Leach Batch: 263760

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	SPLP East	Solid	EPA 1312	
180-84236-11	CCR-AP-6I (68-70)	SPLP East	Solid	EPA 1312	
180-84236-12	HASB-1 (35-38)	SPLP East	Solid	EPA 1312	
LB 180-263760/1-A	Method Blank	SPLP East	Solid	EPA 1312	
LB 180-263760/1-D	Method Blank	SPLP East	Solid	EPA 1312	

Analysis Batch: 263767

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-1	CCR-AP-2	Total/NA	Water	SM 5310C	
180-84236-2	CCR-AP-5	Total/NA	Water	SM 5310C	
180-84236-3	CCR-AP-4	Total/NA	Water	SM 5310C	

General Chemistry (Continued)

Analysis Batch: 263767 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-4	CCR-AP-8	Total/NA	Water	SM 5310C	
180-84236-5	CCR-AP-3	Total/NA	Water	SM 5310C	
180-84236-6	CCR-AP-6	Total/NA	Water	SM 5310C	
180-84236-7	CCR-AP-6I	Total/NA	Water	SM 5310C	
180-84236-8	CCR-AP-8I	Total/NA	Water	SM 5310C	
180-84236-9	HASB-1	Total/NA	Water	SM 5310C	
MB 180-263767/6	Method Blank	Total/NA	Water	SM 5310C	
LCS 180-263767/4	Lab Control Sample	Total/NA	Water	SM 5310C	
LCSD 180-263767/5	Lab Control Sample Dup	Total/NA	Water	SM 5310C	

Analysis Batch: 263820

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-1	CCR-AP-2	Dissolved	Water	SM 5310C	
180-84236-2	CCR-AP-5	Dissolved	Water	SM 5310C	
180-84236-3	CCR-AP-4	Dissolved	Water	SM 5310C	
180-84236-4	CCR-AP-8	Dissolved	Water	SM 5310C	
180-84236-5	CCR-AP-3	Dissolved	Water	SM 5310C	
180-84236-6	CCR-AP-6	Dissolved	Water	SM 5310C	
180-84236-7	CCR-AP-6I	Dissolved	Water	SM 5310C	
180-84236-8	CCR-AP-8I	Dissolved	Water	SM 5310C	
180-84236-9	HASB-1	Dissolved	Water	SM 5310C	
MB 180-263820/6	Method Blank	Dissolved	Water	SM 5310C	
LCS 180-263820/4	Lab Control Sample	Dissolved	Water	SM 5310C	
LCSD 180-263820/5	Lab Control Sample Dup	Dissolved	Water	SM 5310C	

Prep Batch: 263861

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	SPLP East	Solid	Distill/Ammonia	263760
180-84236-11	CCR-AP-6I (68-70)	SPLP East	Solid	Distill/Ammonia	263760
180-84236-12	HASB-1 (35-38)	SPLP East	Solid	Distill/Ammonia	263760
LB 180-263760/1-D	Method Blank	SPLP East	Solid	Distill/Ammonia	263760
MB 180-263861/6-A	Method Blank	Total/NA	Solid	Distill/Ammonia	
LCS 180-263861/7-A	Lab Control Sample	Total/NA	Solid	Distill/Ammonia	

Analysis Batch: 263868

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	SPLP East	Solid	SM2320 B	263760
180-84236-11	CCR-AP-6I (68-70)	SPLP East	Solid	SM2320 B	263760
180-84236-12	HASB-1 (35-38)	SPLP East	Solid	SM2320 B	263760
LB 180-263760/1-A	Method Blank	SPLP East	Solid	SM2320 B	263760
MB 180-263868/3	Method Blank	Total/NA	Solid	SM2320 B	
LCS 180-263868/1	Lab Control Sample	Total/NA	Solid	SM2320 B	
LCSD 180-263868/2	Lab Control Sample Dup	Total/NA	Solid	SM2320 B	

Analysis Batch: 263870

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-1	CCR-AP-2	Total/NA	Water	SM2320 B	
180-84236-2	CCR-AP-5	Total/NA	Water	SM2320 B	
180-84236-3	CCR-AP-4	Total/NA	Water	SM2320 B	
180-84236-7	CCR-AP-6I	Total/NA	Water	SM2320 B	
180-84236-8	CCR-AP-8I	Total/NA	Water	SM2320 B	

General Chemistry (Continued)

Analysis Batch: 263870 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-9	HASB-1	Total/NA	Water	SM2320 B	
MB 180-263870/2	Method Blank	Total/NA	Water	SM2320 B	
LCS 180-263870/1	Lab Control Sample	Total/NA	Water	SM2320 B	

Analysis Batch: 263925

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-4	CCR-AP-8	Total/NA	Water	SM2320 B	
180-84236-5	CCR-AP-3	Total/NA	Water	SM2320 B	
180-84236-6	CCR-AP-6	Total/NA	Water	SM2320 B	
MB 180-263925/2	Method Blank	Total/NA	Water	SM2320 B	
LCS 180-263925/1	Lab Control Sample	Total/NA	Water	SM2320 B	
180-84236-4 DU	CCR-AP-8	Total/NA	Water	SM2320 B	

Analysis Batch: 264014

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	SPLP East	Solid	EPA 350.1	263861
180-84236-11	CCR-AP-6I (68-70)	SPLP East	Solid	EPA 350.1	263861
180-84236-12	HASB-1 (35-38)	SPLP East	Solid	EPA 350.1	263861
LB 180-263760/1-D	Method Blank	SPLP East	Solid	EPA 350.1	263861
MB 180-263861/6-A	Method Blank	Total/NA	Solid	EPA 350.1	263861
LCS 180-263861/7-A	Lab Control Sample	Total/NA	Solid	EPA 350.1	263861

Analysis Batch: 264051

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-84236-10	CCR-AP-8I (68-70)	Total/NA	Solid	EPA-Lloyd Kahn	
180-84236-11	CCR-AP-6I (68-70)	Total/NA	Solid	EPA-Lloyd Kahn	
180-84236-12	HASB-1 (35-38)	Total/NA	Solid	EPA-Lloyd Kahn	
MB 180-264051/3	Method Blank	Total/NA	Solid	EPA-Lloyd Kahn	
LCS 180-264051/4	Lab Control Sample	Total/NA	Solid	EPA-Lloyd Kahn	

Chain of Custody Record

273727

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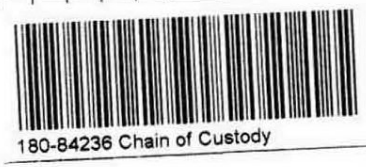
TAL-8210 (0713)

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

Client Contact	Project Manager: C. Horch	Site Contact: S. Lewis	Date: 11/19/18	COC No:
Company Name: Haley Aldrich	Tel/Fax:	Lab Contact: Veronica Berlet	Carrier: UPS	1 of 1 COCs
Address: 400 Augusta St, Suite 130	Analysis Turnaround Time			Sampler:
City/State/Zip: Greenville, SC 29601	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: 864-395-0326	TAT if different from Below _____			Walk-in Client:
Fax:	☒ 2 weeks			Lab Sampling:
Project Name: Vectren ASD	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
PO # 129420-001	☐ 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)	Cl, SO4, F, Alkalinity	Dissolved F	App IV, Fl, Mn	Dissolved App IV + Fl	Dissolved TOC	Total TOC	As speciation	TDS	App IV total	App IV dissolved SPLP	App IV TOC	Cl, SO4, Nitrate via SPLP	Ammonia, sulfide SPLP	Alkalinity SPLP	Sample Specific Notes:
CCR-AP-2	11/15/18	925	G	GW	10	Y	N	X	X	X	X	X	X	X	X							-
CCR-AP-5	11/15/18	1146	G	GW	10	Y	N	X	X	X	X	X	X	X	X							
CCR-AP-4	11/15/18	1500	G	GW	10	Y	N	X	X	X	X	X	X	X	X							
CCR-AP-8	11/16/18	902	G	GW	10	Y	N	X	X	X	X	X	X	X	X							
CCR-AP-3	11/16/18	1037	G	GW	10	Y	N	X	X	X	X	X	X	X	X							
CCR-AP-6	11/17/18	1001	G	GW	10	Y	N	X	X	X	X	X	X	X	X							
CCR-AP-6I	11/17/18	1427	G	GW	10	Y	N	X	X	X	X	X	X	X	X							
CCR-AP-8I	11/17/18	1547	G	GW	10	Y	N	X	X	X	X	X	X	X	X							
HASB-1	11/17/18	1636	G	GW	10	Y	N	X	X	X	X	X	X	X	X							
CCR-AP-8I (68-70)	11/15/18	910	G	S	4	N	N									X	X	X	X	X	X	
CCR-AP-6I (68-70)	11/16/18	925	G	S	4	N	N									X	X	X	X	X	X	
HASB-1 (35-38)	11/16/18	1550	G	S	4	N	N									X	X	X	X	X	X	
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____								1	1	4	4	3	3	1	1	1	1	1	1	1	1	



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

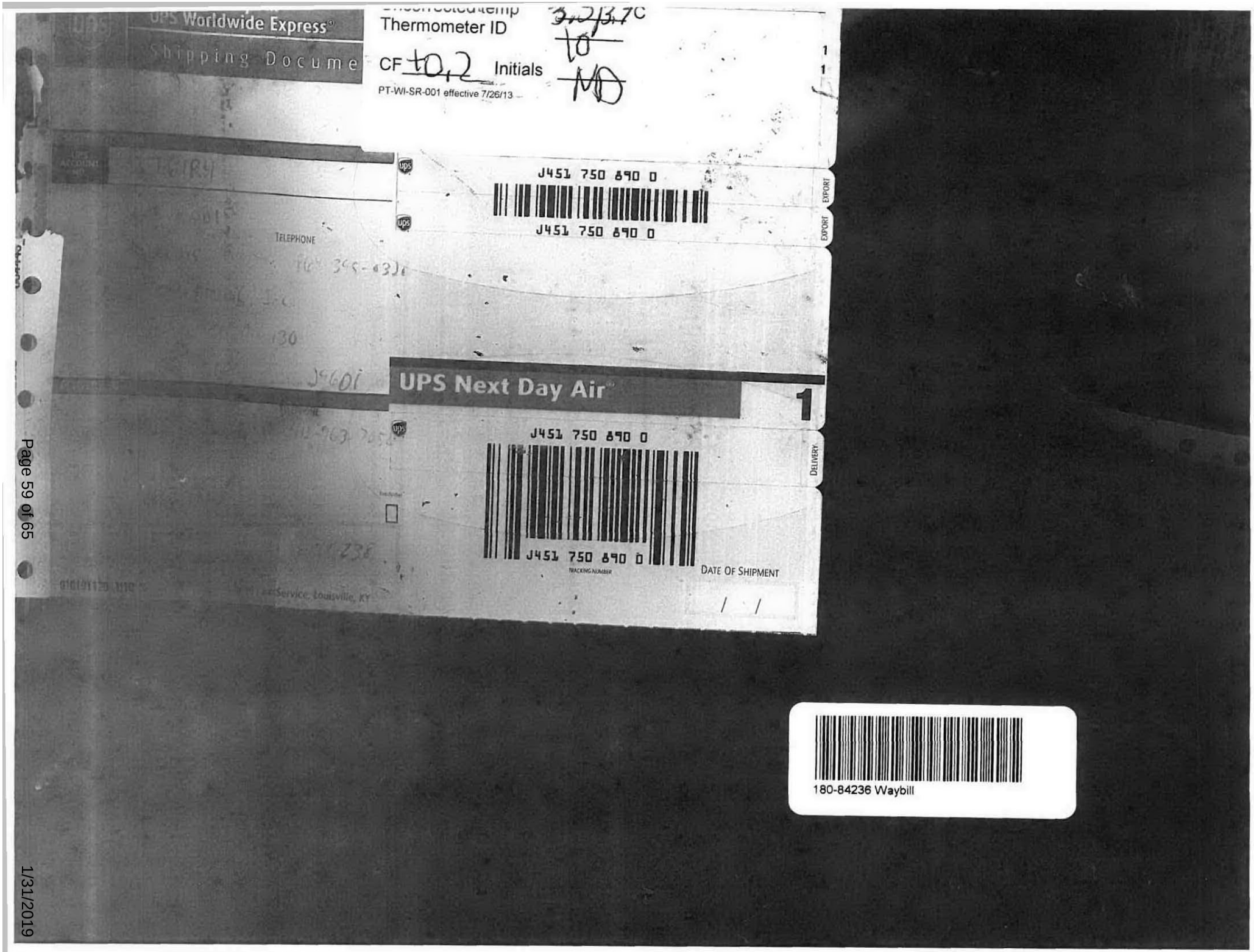
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ 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:
Sean Lewis	Haley and Aldrich	11/19/18 0910		DA PitT	11/21/18 900
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
nquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time: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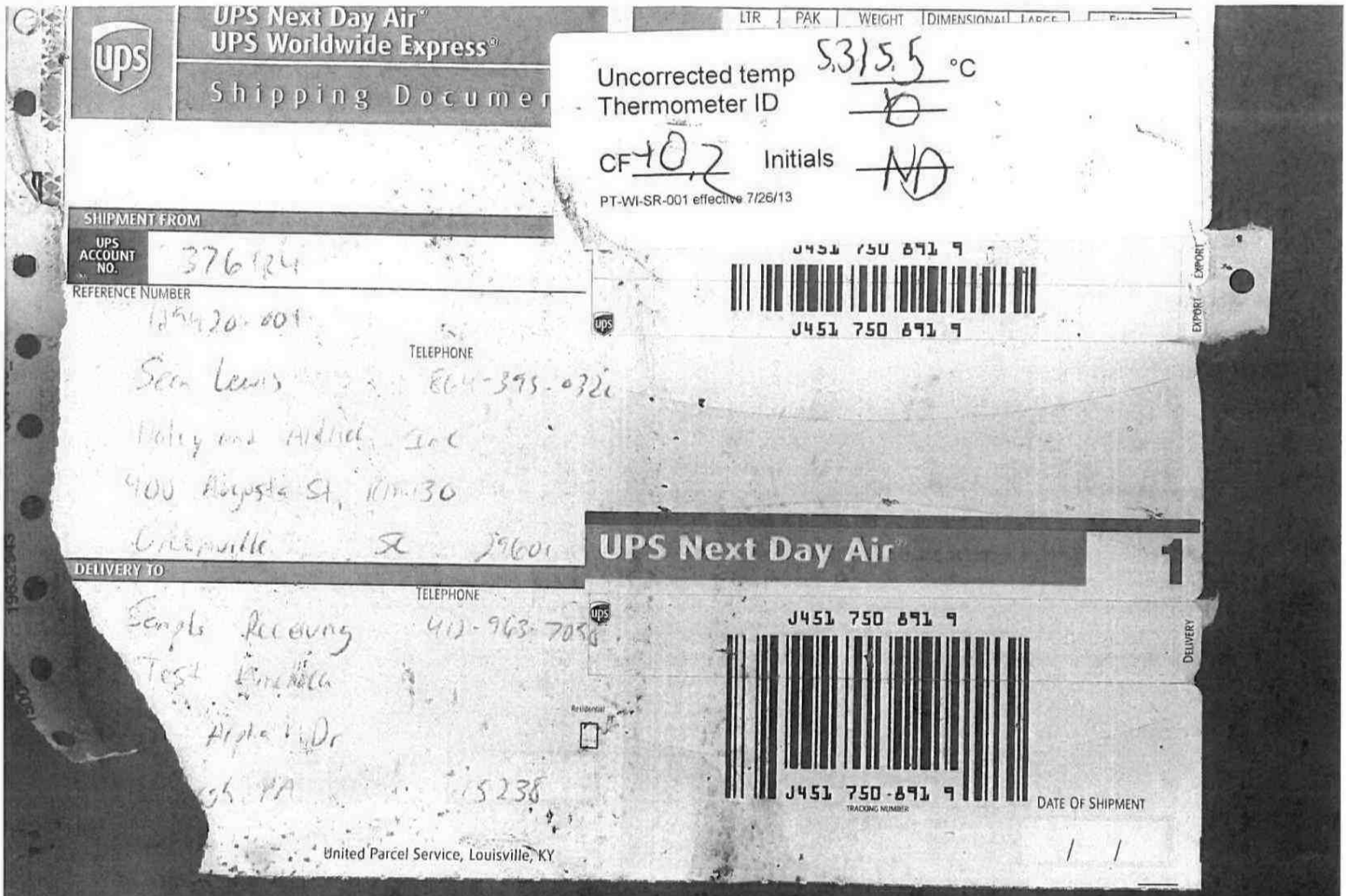
/ /
180-84236 Waybill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UPS Worldwide Express®
Shipping Documer
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CF 10.2 Initials ND
PT-WI-SR-001 effective 7/26/13
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REFERENCE NUMBER
TELEPHONE
Sean Lewis 864-395-0326
Haley and Aldrich, Inc
400 Augusta St, Ste 30
Greenville SC 29601
DELIVERY TO
TELEPHONE
Sample Receiving
Test America
Alpha Dr
PA 15238
Residential
J451 750 891 9
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UPS Next Day Air
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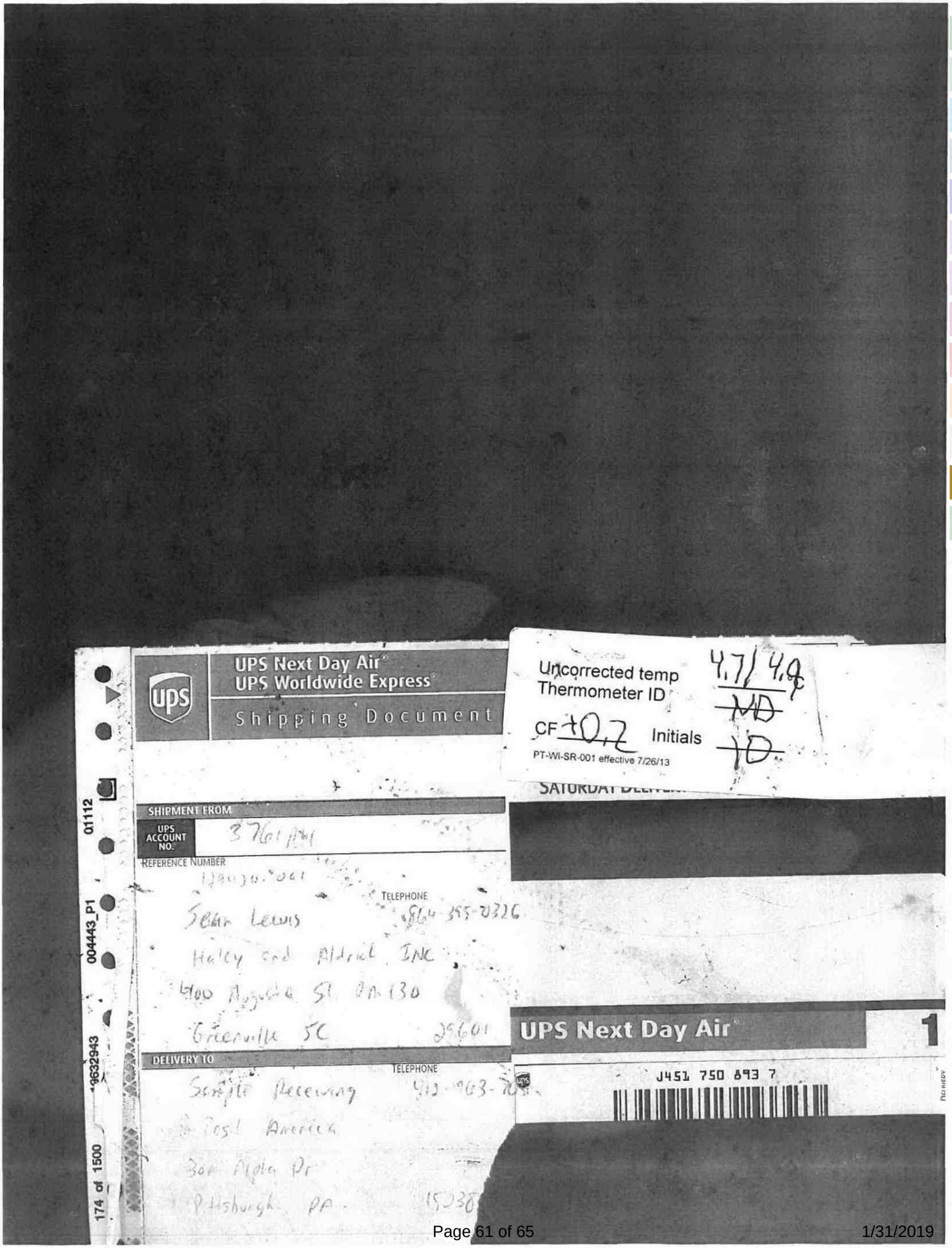
DELIVERY
J451 750-891 9
TRACKING NUMBER
DATE OF SHIPMENT
/ /
United Parcel Service, Louisville, KY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SHIPMENT FROM
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REFERENCE NUMBER
TELEPHONE
Sean Lewis 864 355-0326
Haley and Aldrich INC
400 Augusta St Rm 130
Greenville SC 29601
DELIVERY TO
TELEPHONE
Sample Receiving 412-963-7
Test America
Bay Alpha Dr
Pittsburgh PA 15238
UPS Next Day Air
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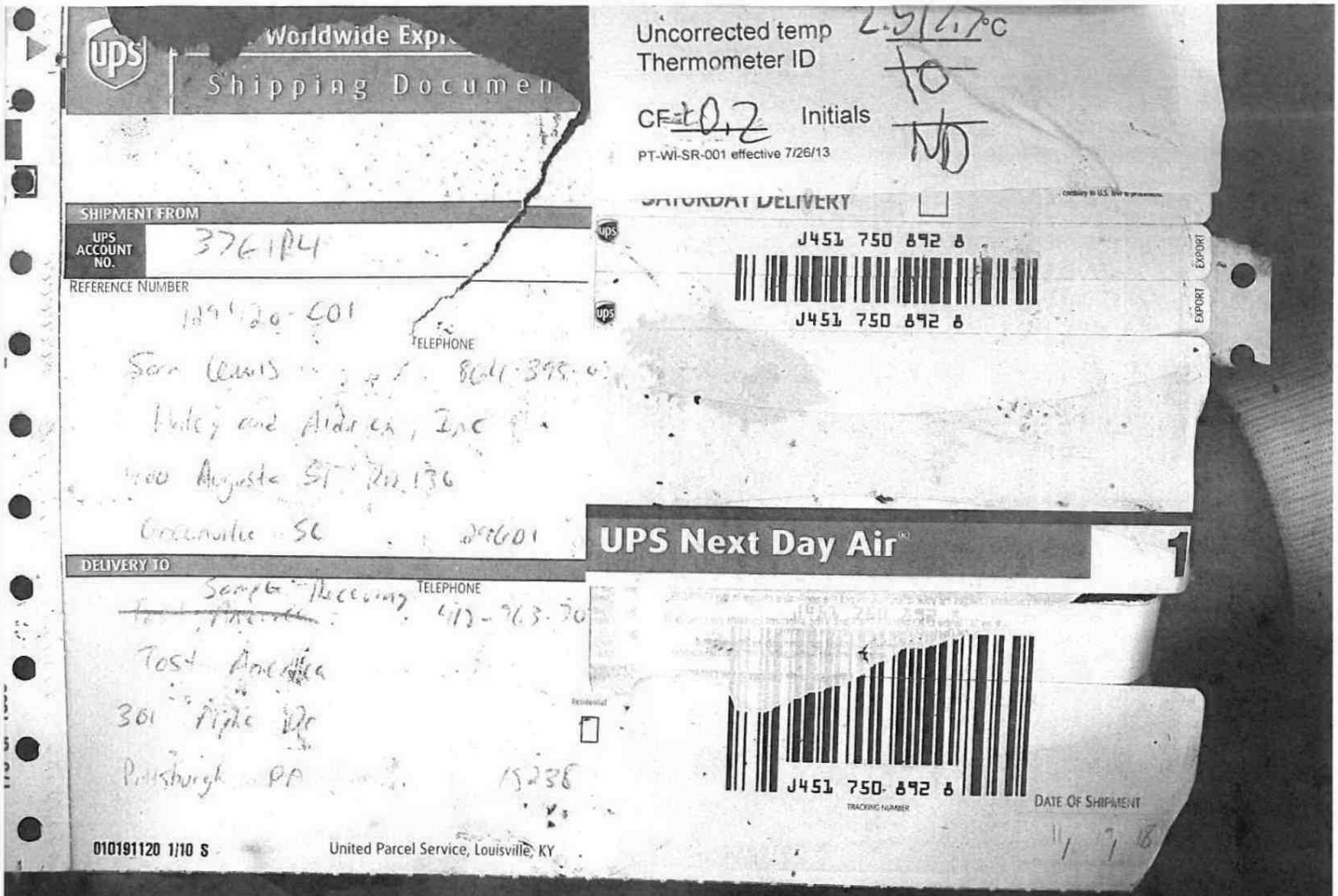
01112
004443_P1
1632943
174 of 1500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SATURDAY DELIVERY
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J451 750 892 8
EXPORT
EXPORT
SHIPMENT FROM
UPS ACCOUNT NO. 376184
REFERENCE NUMBER
191120-001
TELEPHONE
Sara Lewis 864-398-0
Haley and Aldrich, Inc
400 Augusta ST Ste 136
Greenville SC 29601
DELIVERY TO
Sample Receiving TELEPHONE 412-963-30
Test America
301 Fifth Dr
Pittsburgh PA 15238
Residential
UPS Next Day Air
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J451 750 892 8
TRACKING NUMBER
DATE OF SHIPMENT
11/7/18
010191120 1/10 S
United Parcel Service, Louisville, KY

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: 180-348338.1
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 #: 180-84236-1
Address: 4955 Yarrow Street, ,	Due Date Requested: 12/4/2018			
City: Arvada	TAT Requested (days):			
State, Zip: CO, 80002				
Phone: 303-736-0100(Tel) 303-431-7171(Fax)	PO #:			
Email:	WO #:			
Project Name: Vectren ASD Sampling - FB Culley	Project #: 18019698			
Site:	SSOW#:			

Analysis Requested

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:

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)	Se_SPEC/FIELD_FLTRD As (III) and As (V), Dissolved (field fi	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
CCR-AP-2 (180-84236-1)	11/15/18	09:25 Eastern		Water			X	1	
CCR-AP-5 (180-84236-2)	11/15/18	11:46 Eastern		Water			X	1	
CCR-AP-4 (180-84236-3)	11/15/18	15:00 Eastern		Water			X	1	
CCR-AP-8 (180-84236-4)	11/16/18	09:02 Eastern		Water			X	1	
CCR-AP-3 (180-84236-5)	11/16/18	10:37 Eastern		Water			X	1	
CCR-AP-6 (180-84236-6)	11/17/18	10:01 Eastern		Water			X	1	
CCR-AP-6I (180-84236-7)	11/17/18	14:27 Eastern		Water			X	1	
CCR-AP-8I (180-84236-8)	11/17/18	15:47 Eastern		Water			X	1	
HASB-1 (180-84236-9)	11/17/18	16:36 Eastern		Water			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	*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
	11/16/18 1700	TA PGH		11/17/18 0945	TADEN
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: -0.1, 1.8

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 180-84236-1

Login Number: 84236
List Number: 1
Creator: Say, Thomas C

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	

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 180-84236-1

Login Number: 84236
List Number: 2
Creator: Diffendall, Jessica L

List Source: TestAmerica Denver
List Creation: 11/27/18 01:35 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
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?	N/A	
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.	N/A	
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").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

APPENDIX C

Certification Statement

HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44121
216.739.0555

13 September 2019
File No. 129420-014

SUBJECT: F.B. Culley Generating Station Arsenic Alternate Source Demonstration for the East Ash Pond, Southern Indiana Gas and Electric Company (SIGECO)

Pursuant to 40 CFR §257.95(g)(3)(ii), Haley & Aldrich, Inc. conducted an alternate source evaluation to demonstrate that a source other than the East Ash Pond caused a statistically significant level above the groundwater protection standard (GWPS) during assessment monitoring for this unit. 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 CCR unit East Ash Pond is the cause of the statistically significant levels of arsenic identified above the GWPS during assessment monitoring of this Unit. The source of the elevated levels of arsenic found in the CCR groundwater compliance wells is the reductive dissolution of naturally occurring arsenic in soil and not arsenic related to the East Ash Pond.

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

HALEY & ALDRICH, INC.

Signed:_____
Certifying Engineer

Print Name:	Steven F. Putrich, P.E.
Date:	13 September 2019
Indiana License No.:	PE11200566
Title:	Vice President
Company:	Haley & Aldrich, Inc.

APPENDIX B

60 Day CMA Extension Demonstration

HALEY ALDRICH

HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44131
216.739.0555

MEMORANDUM

July 2019
Project No. 129420-017

SUBJECT: **Demonstration for 60-Day Extension – Corrective Measures Assessment (CMA)**
Southern Indiana Gas and Electric Company (SIGECO)
East Ash Pond
F. B. Culley Generating Station (FBC); Warrick County, Indiana

Pursuant to 40 CFR §257.96(a) (CCR Rule Assessment of Corrective Measures), I certify that SIGECO has demonstrated the need for additional time beyond the period of 90 days to complete the assessment of corrective measures due to site-specific conditions and the evaluation of remedial treatment alternatives in support of an informed CMA process.

In the case of the assessment of corrective measures for the FBC East Ash Pond, the site has complex hydrogeology. Receipt of analytical data by certified analytical laboratories has also been delayed due to overwhelming numbers of CCR samples submitted for analysis. SIGECO is also in the process of reviewing possible groundwater remedies and is having ongoing discussions with third-party experts regarding potential closure strategies, including beneficial reuse as well as implementation of critical steps in the groundwater treatment and remedy assessment process. Based on these site-specific conditions and related groundwater treatment alternatives evaluations in support of the CMA by SIGECO, the CCR Rule allows for a 60-day extension to complete the CMA process.

This certification as submitted, is to the best of my knowledge, accurate and complete.

Signed: _____

Certifying Engineer

Print Name:	Steven F. Putrich, P.E.
Indiana License No.:	PE11200566
Title:	CCR Practice Lead, Senior Consulting Engineer
Company:	Haley & Aldrich, Inc.

Professional Engineer's Seal