HALEY ALDRICH

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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

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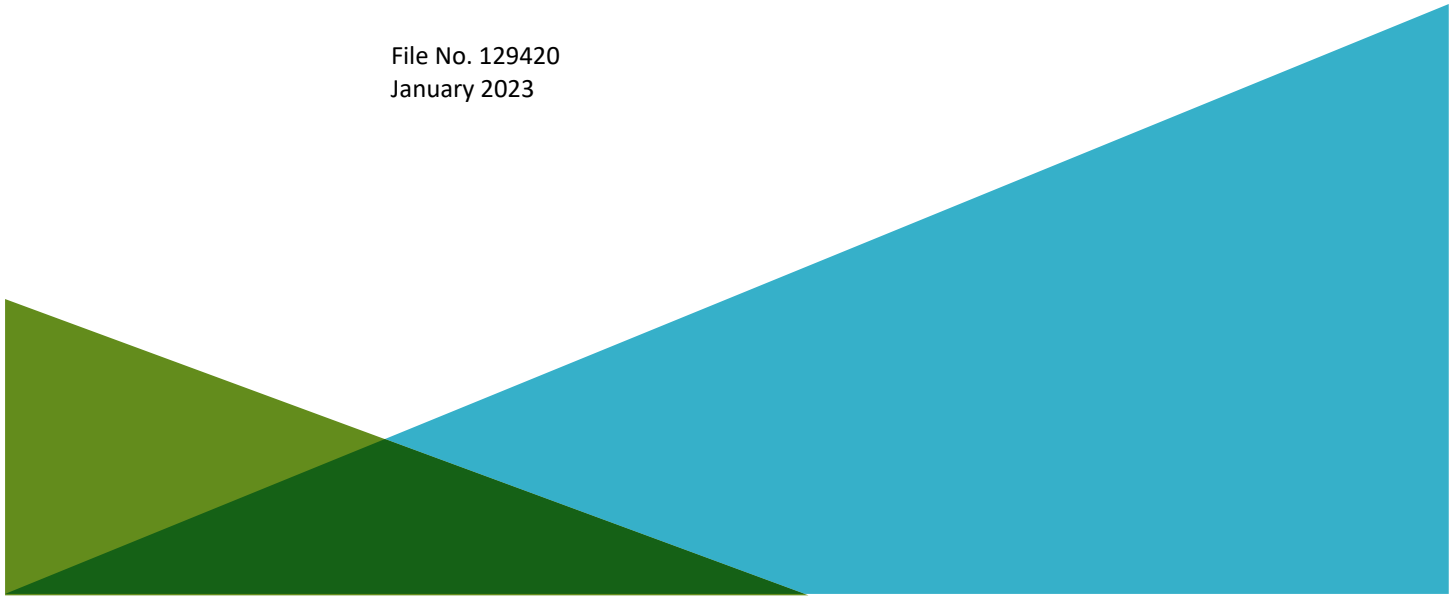

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1. Annual Groundwater Monitoring Report Summary

1.1 CODE OF FEDERAL REGULATIONS TITLE 40 (40 CFR) § 257.90(e)(6) SUMMARY

A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit. At a minimum, the summary must specify all of the following:

1.1.1 40 CFR § 257.90(e)(6)(i) – Status of Monitoring Program at Start of Reporting Period

At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

At the start of the current annual reporting period (1 January 2022), the East Ash Pond (EAP) at F.B. Culley (FBC) Generating Station was operating under an assessment monitoring program in compliance with Code of Federal Regulations Title 40 (40 CFR) § 257.95.

1.1.2 40 CFR § 257.90(e)(6)(ii) – Status of Monitoring Program at End of Reporting Period

At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

At the end of the current annual reporting period (31 December 2022), the EAP was operating under an assessment monitoring program in compliance with 40 CFR § 257.95.

1.1.3 40 CFR § 257.90(e)(6)(iii) – Statistically Significant Increases

If it was determined that there was a statistically significant increase over background for one or more constituents listed in appendix III to this part pursuant to § 257.94(e):

1.1.3.1 40 CFR § 257.90(e)(6)(iii)(A)

Identify those constituents listed in appendix III to this part and the names of the monitoring wells associated with such an increase; and

The EAP was operating under an assessment monitoring program throughout 2022; therefore, no statistical evaluations were conducted on Appendix III constituents in 2022.

1.1.3.2 40 CFR § 257.90(e)(6)(iii)(B)

Provide the date when the assessment monitoring program was initiated for the CCR unit.

An assessment monitoring program was established on 15 August 2018 for the EAP to meet the requirements of 40 CFR § 257.95. The EAP has remained in assessment monitoring since that time.

1.1.4 40 CFR § 257.90(e)(6)(iv) – Statistically Significant Levels

If it was determined that there was a statistically significant level above the groundwater protection standard for one or more constituents listed in appendix IV to this part pursuant to § 257.95(g) include all of the following:

1.1.4.1 40 CFR § 257.90(e)(6)(iv)(A) – Statistically Significant Level Constituents

Identify those constituents listed in appendix IV to this part and the names of the monitoring wells associated with such an increase;

Statistical analyses of Appendix IV constituents were completed in 2022 following the November 2022 and May 2022 semiannual assessment monitoring events as described in § 257.93(h)(2) and statistically significant levels (SSLs) of molybdenum were identified downgradient of the EAP at monitoring well CCR-AP-5. A summary of statistical analysis is provided as Appendix A.

1.1.4.2 40 CFR § 257.90(e)(6)(iv)(B) – Initiation of the Assessment of Corrective Measures

Provide the date when the assessment of corrective measures was initiated for the CCR unit;

Assessment of corrective measures was initiated on 15 May 2019 for the EAP.

1.1.4.3 40 CFR § 257.90(e)(6)(iv)(C) – Assessment of Corrective Measures Public Meeting

Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and

The public was given the opportunity to comment on the assessment of corrective measures prepared for the EAP during a public meeting held on 18 October 2021.

1.1.4.4 40 CFR § 257.90(e)(6)(iv)(D) – Completion of the Assessment of Corrective Measures

Provide the date when the assessment of corrective measures was completed for the CCR unit.

The assessment of corrective measures was completed on 13 September 2019 and placed into the facility's Operating Record, posted to the publicly available website, and the notification sent to the state agency.

1.1.5 40 CFR § 257.90(e)(6)(v) – Selection of Remedy

Whether a remedy was selected pursuant to § 257.97 during the current annual reporting period, and if so, the date of remedy selection; and

The selection of remedy required under § 257.97 was ongoing in 2022 for molybdenum at the EAP. A summary of actions completed associated with selection of remedy are provided in the March 2022 and September 2022 Semi-annual Remedy Selection Progress Reports. An aquifer characterization study was

performed between 19 October 2022 and 22 October 2022 to calculate aquifer properties that will inform the planning and design of pond closure and groundwater corrective action. Nine groundwater observation wells and one pumping well were installed to facilitate the test. In total, nineteen groundwater wells were instrumented with data logging pressure transducers to monitor baseline conditions, groundwater level change during the test, and groundwater level recovery after the test. Before beginning the 72-hour constant head pumping test, a step drawdown test was completed to determine a sustainable pumping rate. Results of the step drawdown test indicated a sustainable pumping rate of 12 gallons per minute. A summary of aquifer performance test results is provided as Appendix B.

1.1.6 40 CFR § 257.90(e)(6)(vi) – Remedial Activities

Whether remedial activities were initiated or are ongoing pursuant to § 257.98 during the current annual reporting period.

Remedial activities were not initiated in 2022; therefore, no demonstration or certification is applicable for this unit at this time.

1.2 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 EAP at FBC is subject to the groundwater monitoring and corrective action requirements described under 40 CFR § 257.90 through § 257.98 (Rule). The remainder of this document addresses the specific requirements for the Owner/Operator to prepare an Annual Groundwater Monitoring and Corrective Action Report per § 257.90(e).

1.3 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 (Annual Report) documents the activities completed in 2022 for the EAP as required by the Rule. Semiannual 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. Field forms for the groundwater sampling events are provided in Appendix C. Laboratory analytical reports are provided in Appendix D.

1.3.1 Status of the Groundwater Monitoring Program

Following completion of the Assessment of Corrective Measures in September 2019, annual and semi-annual groundwater sampling continued in May 2022 and November 2022 as outlined in § 257.95(b) and 257.95(d)(1). Statistical analyses of Appendix IV constituents were completed within 90-days following completion of the sampling and analysis events as described in § 257.93(h)(2) and SSLs of molybdenum continue to be observed downgradient of the EAP consistent with previous results. In addition, the selection of remedy required under § 257.97 was ongoing in 2022.

1.3.2 Key Actions Completed

The following key actions were completed in 2022:

- Per the requirements of 257.93(c) of the Rule, static water level measurements were collected during each sampling event to evaluate groundwater flow direction and rate.
- Completed statistical analyses of assessment monitoring results to evaluate potential SSLs.
- Prepared 2021 Annual Report including:
  - Pursuant to § 257.105(h)(1), the 2021 Annual Report was placed in the facility's operating record;
  - Pursuant to § 257.106(h)(1), the notification was sent to the relevant State Director and/or Tribal authority within 30 days of the 2021 Annual Report being placed in the facility's operating record [§ 257.106(d)];
  - Pursuant to § 257.107(h)(1), the 2021 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)];
- Collected and analyzed two rounds of groundwater samples in accordance with § 257.95.
- Prepared semiannual selection of remedy progress reports in March 2022 and September 2022 in accordance with § 257.97(a) to document progress. These semiannual progress reports were placed in the operating record as required by § 257.105(h)(12) and posted on the facility's publicly available website as required by § 257.107(h)(9).
- Completed an aquifer performance test to refine aquifer parameter estimates and inform pond closure and corrective measures design. A summary of aquifer performance test results is provided as Appendix B.

1.3.3 Problems Encountered

No problems were encountered during the 2022 reporting period.

1.3.4 Actions to Resolve Problems

No actions were taken as there were no problems encountered during the 2022 reporting period.

1.3.5 Project Key Activities for Upcoming Year

Key activities to be completed in 2023 include the following:

- Evaluate if further characterization of the hydrogeologic conditions downgradient of the EAP is warranted to support remedy selection.
- Continue semiannual groundwater monitoring in accordance with § 257.95.
- Complete statistical analyses of the semiannual groundwater sampling results as required by § 257.93(h)(2).
- As soon as feasible select a remedy that, at a minimum, meets the standards outlined in § 257.97(b) and considers the evaluation factors in § 257.97(c).
  - As part of the selected remedy the Southern Indiana Gas and Electric Company 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).
- Following remedy selection initiate remedial activities and implement the corrective action groundwater monitoring program as outlined in § 257.98.

1.4 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:

1.4.1 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. Groundwater elevation contours for the May 2022 event are presented as Figure 2. Groundwater elevation contours created for the November 2022 event are presented as Figure 3.

1.4.2 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;

Nine observation wells and a pumping well were installed to complete an aquifer performance test. Groundwater monitoring well construction details of the existing monitoring well network and aquifer performance test wells for the EAP is provided for reference as Table 1. On 28 January 2022, CCR-AP-10 was decommissioned by a licensed Indiana well driller due to insufficient groundwater yield for sampling.

1.4.3 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 2 of this report.

1.4.4 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

Statistical analysis was completed within 90-days following completion of the semi-annual sampling events as described in § 257.93(h)(2) and the SSLs of molybdenum continue to be observed downgradient of the EAP consistent with previous results. As a result, the monitoring program did not change, and the EAP remained in assessment monitoring throughout 2023. Statistical analysis for the November 2022 sampling event is ongoing and will be completed within 90 days after sampling and analysis to determine if a statistically significant increase over background has occurred.

1.4.5 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 of groundwater monitoring results in the operating record, and an evaluation of alternate sources was discussed in prior annual reports.

TABLES

TABLE 1

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)	Top of Riser Elevation* (ft)	Surface Grout (ft bgs)	Bentonite (ft bgs)	Sand Pack (ft bgs)	Screen Zone (ft bgs)	Top of Screen (ft)	Bottom of Screen (ft)	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	383.50	373.50	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	409.50	399.50	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	385.58	375.58	10	2	Active
CCR-AP-2	East Ash Pond	December 2015	2884168.88	969117.46	394.40	394.02	1.0-30.5	30.5-32.5	32.5-45.0	36.00 - 46.00	358.40	348.40	10	2	Active
CCR-AP-3	East Ash Pond	December 2015	2883542.17	969007.88	395.00	394.55	1.0-31.0	31.0-32.8	32.8-45.0	35.00 - 45.00	360.00	350.00	10	2	Active
CCR-AP-4	East Ash Pond	December 2015	2883281.67	969641.72	395.40	394.98	1.0-19.7	19.7-22.5	23.0-35.5	25.50 - 35.50	369.90	359.90	10	2	Active
CCR-AP-5	East Ash Pond	December 2015	2884016.86	969379.74	394.90	394.38	1.0-28.6	28.6-30.6	30.6-44.0	34.00 - 44.00	360.90	350.90	10	2	Active
CCR-AP-5I	East Ash Pond	January 2019	2884022.40	969377.37	394.90	394.59	1.0-71.2	71.2-73.0	73.0-86.0	75.30 - 85.30	319.60	309.29	10	2	Active
CCR-AP-6	East Ash Pond	March 2016	2883285.02	969122.07	397.10	396.75	1.0-31.5	31.5-33.0	33.5-45.5	35.50 - 45.50	361.60	351.60	10	2	Active
CCR-AP-6I	East Ash Pond	November 2018	2883289.37	969119.68	397.20	396.88	1.0-60.7	60.7-62.7	62.7-64.7	64.70 - 74.70	332.50	322.18	10	2	Active
CCR-AP-8	East Ash Pond	February 2017	2883846.86	969045.93	394.00	393.68	1.0-31.5	31.5-33.0	33.5-45.5	35.50 - 45.50	358.50	348.50	10	2	Active
CCR-AP-8I	East Ash Pond	November 2018	2883853.30	969046.82	393.80	393.46	1.0-53.7	53.7-56.7	56.7-69.0	58.70 - 68.70	334.76	324.76	10	2	Active
CCR-AP-10	East Ash Pond	January 2019	2883772.84	969536.11	--	402.40	1.0-36.5	36.5-38.0	38.0-50.5	40.20 - 50.20	362.20	352.20	10	2	Abandoned
CCR-AP-11	East Ash Pond	January 2019	2884485.51	969352.71	--	385.10	1.0-40.0	40.0-41.8	41.8-54.7	44.40 - 54.40	340.70	330.70	10	2	Active
2022 Aquifer Performance Test Wells															
CCR-PW-1	East Ash Pond	July 2022	2883797.21	969046.55	394.80	394.40	4.0-37.0	37.0-43.0	43.0-70.0	50 - 70	344.80	324.80	20	16	N/A
CCR-OW-1	East Ash Pond	June 2022	2883701.02	969027.17	395.00	394.62	0.0-1.5	-	1.5-48.0	36 - 46	359.00	349.00	10	2	N/A
CCR-OW-1I	East Ash Pond	June 2022	2883704.95	969027.17	394.90	394.44	0.0-1.5	1.5-58.0	58.0-70.4	60 - 70	334.90	324.90	10	2	N/A
CCR-OW-2	East Ash Pond	June 2022	2883773.63	969041.30	394.40	393.97	0.0-1.5	1.5-33.0	33.0-46.0	34 - 44	360.40	350.40	10	2	N/A
CCR-OW-2I	East Ash Pond	July 2022	2883777.40	969042.58	394.20	394.08	0.0-1.5	1.5-54.0	54.0-66.0	56 - 66	338.20	328.20	10	2	N/A
CCR-OW-3	East Ash Pond	June 2022	2883807.86	969047.93	393.90	393.69	0.0-1.5	1.5-34.0	34.0-47.0	35 - 45	358.90	348.90	10	2	N/A
CCR-OW-3I	East Ash Pond	June 2022	2883811.66	969048.75	394.00	393.61	0.0-1.5	1.5-57.0	57.0-70.0	58 - 68	336.00	326.00	10	2	N/A
CCR-OW-4	East Ash Pond	June 2022	2883872.53	969059.36	394.10	393.77	0.0-1.5	1.5-34.0	34.0-47.0	36 - 46	358.10	348.10	10	2	N/A
CCR-OW-4I	East Ash Pond	June 2022	2883876.12	969059.67	394.10	393.86	0.0-1.5	1.5-55.0	55.0-69.0	58 - 68	336.10	326.10	10	2	N/A
CCR-OW-5I	East Ash Pond	July 2022	2883799.69	969110.80	392.00	391.65	0.0-1.5	1.5-51.0	51.0-63.0	58 - 63	334.00	329.00	5	2	N/A

NOTES:

bgs = below ground surface

--- = was not surveyed

ft = feet

in = inches

Datum of Elevations in NAVD 88

*Elevations measured on 12 September and 26 October 2022 - background wells were not resurveyed

TABLE 2
SUMMARY OF GROUNDWATER QUALITY DATA
F.B. CULLEY GENERATING STATION
NEWBURGH, INDIANA

Location Group	Action Level	Background					
Location Name	Maximum	CCR-AP-1R	CCR-AP-1R	CCR-AP-7	CCR-AP-7	CCR-AP-9	CCR-AP-9
Sample Name	Contaminant	CCR-AP-1R-20220510	CCR-AP-1R-20221129	CCR-AP-7-20220503	CCR-AP-7-20221122	CCR-AP-9-20220509	CCR-AP-9-20221129
Sample Date	Level/ Regional	05/10/2022	11/29/2022	05/03/2022	11/22/2022	05/09/2022	11/29/2022
Lab Sample ID	Screening	180-138040-1	180-148606-1	180-137587-10	180-148407-25	180-138040-10	180-148606-11
Detection Monitoring - EPA Appendix III Constituents (mg/L)							
Boron, Total	NA	**0.69 J+**	**0.65**	**0.066 J**	**0.049 J-**	**0.47 J+**	**0.38**
Calcium, Total	NA	**79**	**70**	**94**	**110**	**130**	**160**
Chloride (mg/L)	NA	**17**	**17**	**22**	**30**	**10**	**11**
Fluoride (mg/L)	4	**0.48**	**0.47**	**0.72**	**0.48**	**0.26**	**0.39**
pH (lab) (pH units)	NA	**7.6 J**	**7.9 J**	**7.6 J**	**7.7 J**	**7.3 J**	**7.7 J**
Sulfate (mg/L)	NA	**210**	**250**	**86**	**76**	**100**	**120**
Total Dissolved Solids (TDS) (mg/L)	NA	**890**	**930**	**510**	**580**	**650**	**830**
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)							
Antimony, Total	0.006	**0.0041**	**0.0014 J**	0.002 U	0.002 U	**0.0075**	**0.0012 J**
Arsenic, Total	0.01	**0.034**	**0.018**	**0.00066 J**	**0.004 J**	**0.0085**	**0.013**
Barium, Total	2	**0.32**	**0.27**	**0.076**	**0.1**	**0.27**	**0.39**
Beryllium, Total	0.004	**0.0053**	**0.004**	0.001 U	0.001 U	**0.0009 J**	**0.0018**
Cadmium, Total	0.005	**0.00043 J**	**0.00028 J**	0.001 U	0.001 U	0.001 U	**0.0002 J**
Chromium, Total	0.1	**0.11**	**0.088**	0.002 U	0.005 U	**0.02**	**0.045**
Cobalt, Total	NA	**0.08**	**0.044**	0.0005 U	**0.00087 J**	**0.014**	**0.019**
Fluoride (mg/L)	4	**0.48**	**0.47**	**0.72**	**0.48**	**0.26**	**0.39**
Lead, Total	0.015	**0.078**	**0.056**	0.001 U	**0.00082 J**	**0.014**	**0.024**
Lithium, Total	NA	**0.15**	**0.13**	**0.0072**	**0.007 J**	**0.042**	**0.064**
Mercury, Total	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum, Total	NA	**0.023**	**0.0093**	**0.0014 J**	**0.0014 J**	**0.0029 J**	**0.0037 J**
Selenium, Total	0.05	**0.0024 J**	**0.0021 J**	0.005 U	0.005 U	0.005 U	**0.001 J**
Thallium, Total	0.002	**0.00056 J**	**0.00054 J**	0.001 U	0.001 U	0.001 U	0.001 U
Radiological (pCi/L)							
Radium-226	NA	2.69 U ± 1.17	**3.05 ± 0.683**	1 U ± 0.276	**0.25 ± 0.133**	1 U ± 0.539	**6.01 ± 1.13**
Radium-228	NA	**4.24 ± 2.05**	**5.5 J ± 1.9**	1 U ± 0.286	1 U ± 0.543	1 U ± 1.06	1 U ± 1.8
Radium-226 & 228	5	**6.92 J+ ± 2.36**	**8.55 J ± 2.02**	5 U ± 0.397	5 U ± 0.559	5 U ± 1.19	**8.41 J ± 2.13**
Field Parameters							
Temperature (Deg C)	NA	**18.01**	**12.61**	**17.96**	**14.34**	**17.03**	**11.65**
Dissolved Oxygen, Field (mg/L)	NA	**6.13**	**4.89**	**0.31**	**0.68**	**4.47**	**2.74**
Conductivity, Field (mS/cm)	NA	**1.2901**	**1.4637**	**0.79971**	**0.661**	**0.98318**	**1.12**
Oxidation Reduction Potential (ORP), Field (mv)	NA	**79.5**	**-0.6**	**-53.7**	**-48**	**11.8**	**-7.9**
Turbidity, Field (NTU)	NA	**5247**	**303.17**	**48.91**	**18.2**	**830.14**	**202.98**
pH, Field (SU)	NA	**7.72**	**7.64**	**7.03**	**7.1**	**7.14**	**6.94**

ABBREVIATIONS AND NOTES:

CCR: Coal Combustion Residuals.
mg/L: milligram per liter.
pCi/L: picoCurie per liter.
Deg C: Degrees Celcius
U: Result is less than sample detection limit
J: Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value
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 2
SUMMARY OF GROUNDWATER QUALITY DATA
F.B. CULLEY GENERATING STATION
NEWBURGH, INDIANA

Location Group	Action Level	Downgradient						
Location Name	Maximum	CCR-AP-2	CCR-AP-2	CCR-AP-3	CCR-AP-3	CCR-AP-4R	CCR-AP-4R	CCR-AP-5
Sample Name	Contaminant	CCR-AP-2-20220509	CCR-AP-2-20221129	CCR-AP-3-20220509	CCR-AP-3R-20221129	CCR-AP-4R-20220509	CCR-AP-4R-20221129	CCR-AP-5-20220510
Sample Date	Level/ Regional	05/09/2022	11/29/2022	05/09/2022	11/29/2022	05/09/2022	11/29/2022	05/10/2022
Lab Sample ID	Screening	180-138040-2	180-148606-2	180-138040-3	180-148606-3	180-138040-4	180-148606-4	180-138040-5
Detection Monitoring - EPA Appendix III Constituents (mg/L)								
Boron, Total	NA	**6.9**	**6.2**	**0.19 J+**	**0.15**	0.12 U	**0.092**	**1.5**
Calcium, Total	NA	**190**	**180**	**190**	**180**	**150**	**170**	**130**
Chloride (mg/L)	NA	**190**	**240**	**26**	**27**	**20**	**20**	**25**
Fluoride (mg/L)	4	**0.63**	**0.55**	**0.53**	**0.21**	**0.31**	**0.39**	**2.3**
pH (lab) (pH units)	NA	**6.8 J**	**6.9 J**	**7.1 J**	**7.4 J**	**6.6 J**	**7 J**	**7.5 J**
Sulfate (mg/L)	NA	**240**	**310**	**3.9**	**1.3**	**2.3**	**19**	**270**
Total Dissolved Solids (TDS) (mg/L)	NA	**1100**	**1300**	**950**	**1000**	**810**	**830**	**580**
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)								
Antimony, Total	0.006	**0.0021**	**0.0079**	0.002 U	**0.0021**	0.002 U	**0.028**	0.002 U
Arsenic, Total	0.01	**0.016**	**0.013**	**0.085**	**0.073**	**0.12**	**0.16**	**0.008**
Barium, Total	2	**0.22**	**0.23**	**0.46**	**0.4**	**0.57**	**0.89**	**0.029**
Beryllium, Total	0.004	**0.0017**	**0.0013**	0.001 U	0.001 U	0.001 U	**0.0013**	0.001 U
Cadmium, Total	0.005	**0.00086 J**	**0.0007 J**	0.001 U	0.001 U	0.001 U	**0.00079 J**	0.001 U
Chromium, Total	0.1	**0.033**	**0.035**	**0.0033**	**0.0028 J**	**0.0034**	**0.04**	0.002 U
Cobalt, Total	NA	**0.032**	**0.021**	**0.0069**	**0.004**	**0.0024**	**0.02**	**0.00044 J**
Fluoride (mg/L)	4	**0.63**	**0.55**	**0.53**	**0.21**	**0.31**	**0.39**	**2.3**
Lead, Total	0.015	**0.03**	**0.019**	**0.0016**	**0.0013**	**0.0038**	**0.041**	**0.00028 J**
Lithium, Total	NA	**0.021**	**0.028**	0.005 U	**0.0022 J**	**0.0028 J**	**0.025**	**0.009**
Mercury, Total	0.002	**0.00015 J**	**0.00017 J**	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum, Total	NA	**0.0043 J**	**0.0067**	**0.014**	**0.0066**	**0.00071 J**	**0.01**	**0.046**
Selenium, Total	0.05	**0.0019 J**	**0.0026 J**	**0.0018 J**	**0.0019 J**	0.005 U	**0.002 J**	**0.0029 J**
Thallium, Total	0.002	**0.0005 J**	**0.00086 J**	0.001 U	0.001 U	0.001 U	**0.00047 J**	0.001 U
Radiological (pCi/L)								
Radium-226	NA	1.3 U ± 0.712	**1.09 ± 0.57**	1 U ± 0.524	**1.26 ± 0.548**	1.05 U ± 0.742	**0.636 ± 0.247**	0.864 U ± 0.452
Radium-228	NA	**1.15 ± 0.686**	1 U ± 1.61	1 U ± 0.731	**3.6 ± 2.13**	**1.55 ± 0.736**	**2.18 ± 1.03**	1 U ± 0.349
Radium-226 & 228	5	**2.45 J+ ± 0.989**	5 UJ ± 1.71	5 U ± 0.899	**4.87 ± 2.2**	**2.61 J+ ± 1.05**	**2.82 ± 1.06**	1.33 UJ ± 0.571
Field Parameters								
Temperature (Deg C)	NA	**18.59**	**11.7**	**18.35**	**17.53**	**17.98**	**16.02**	**28.1**
Dissolved Oxygen, Field (mg/L)	NA	**4.89**	**2.03**	**2.86**	**0.81**	**2.09**	**4.07**	**1.11**
Conductivity, Field (mS/cm)	NA	**1.56**	**2.09**	**1.696**	**1.8544**	**1.39**	**1.66**	**0.75**
Oxidation Reduction Potential (ORP), Field (mv)	NA	**55.1**	**11.7**	**-125**	**-110.2**	**-96.5**	**-63**	**-64.6**
Turbidity, Field (NTU)	NA	**1069**	**186**	**200.79**	**41.98**	**325.1**	**114.09**	**7.37**
pH, Field (SU)	NA	**6.68**	**6.5**	**7.02**	**7.02**	**6.56**	**6.8**	**7.24**

ABBREVIATIONS AND NOTES:
CCR: Coal Combustion Residuals.
mg/L: milligram per liter.
pCi/L: picoCurie per liter.
Deg C: Degrees Celcius
U: Result is less than sample detection limit
J: Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value
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 2
SUMMARY OF GROUNDWATER QUALITY DATA
F.B. CULLEY GENERATING STATION
NEWBURGH, INDIANA

Location Group	Action Level	Downgradient						
Location Name	Maximum	CCR-AP-5	CCR-AP-5	CCR-AP-5	CCR-AP-6	CCR-AP-6	CCR-AP-8	CCR-AP-8
Sample Name	Contaminant	BLIND DUPLICATE-20220510	CCR-AP-5-20221129	DUP-1-20221129	CCR-AP-6-20220509	CCR-AP-6-20221129	CCR-AP-8-20220510	CCR-AP-8-20221129
Sample Date	Level/ Regional	05/10/2022	11/29/2022	11/29/2022	05/09/2022	11/29/2022	05/10/2022	11/29/2022
Lab Sample ID	Screening	180-138040-11	180-148606-5	180-148606-13	180-138040-6	180-148606-7	180-138040-8	180-148606-9
Detection Monitoring - EPA Appendix III Constituents (mg/L)								
Boron, Total	NA	**1.5**	**11**	**10**	**0.69 J+**	**0.64**	0.1 U	**0.05**
Calcium, Total	NA	**140**	**260**	**250**	**190**	**430**	**250**	**190**
Chloride (mg/L)	NA	**27**	**140**	**130**	**42**	**42**	**15**	**18**
Fluoride (mg/L)	4	**2.3**	**2**	**1.9**	**0.69**	**0.48**	**0.42**	**0.36**
pH (lab) (pH units)	NA	**7.5 J**	**7.6 J**	**7.6 J**	**7.2 J**	**7.6 J**	**7 J**	**7.3 J**
Sulfate (mg/L)	NA	**270**	**630**	**600**	**13**	**15**	**32**	**10**
Total Dissolved Solids (TDS) (mg/L)	NA	**590**	**1500**	**1500**	**970**	**1000**	**1100**	**1100**
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)								
Antimony, Total	0.006	0.002 U	**0.0047**	**0.0046**	0.002 U	**0.018**	**0.00085 J**	**0.0046**
Arsenic, Total	0.01	**0.0085**	**0.024**	**0.025**	**0.1**	**0.12**	**0.11**	**0.1**
Barium, Total	2	**0.033**	**0.15**	**0.15**	**0.51**	**0.69**	**0.5**	**0.37**
Beryllium, Total	0.004	0.001 U	0.001 U	0.001 U	0.001 U	**0.00096 J**	0.001 U	0.001 U
Cadmium, Total	0.005	0.001 U	**0.0008 J**	**0.00079 J**	0.001 U	**0.0011**	0.001 U	**0.00064 J**
Chromium, Total	0.1	**0.0015 J**	**0.027**	**0.029**	**0.0019 J**	**0.043**	0.002 U	**0.014**
Cobalt, Total	NA	**0.00045 J**	**0.0041**	**0.004**	**0.0034**	**0.019**	**0.0031**	**0.008**
Fluoride (mg/L)	4	**2.3**	**2**	**1.9**	**0.69**	**0.48**	**0.42**	**0.36**
Lead, Total	0.015	**0.00039 J**	**0.0082**	**0.0085**	**0.00078 J**	**0.041**	**0.00027 J**	**0.0061**
Lithium, Total	NA	**0.0098**	**0.069**	**0.069**	**0.0014 J**	**0.018**	0.005 U	**0.0067 J**
Mercury, Total	0.002	0.0002 U	**0.0009**	**0.001**	0.0002 U	**0.00017 J**	0.0002 U	**0.00026**
Molybdenum, Total	NA	**0.048**	**0.24**	**0.23**	**0.023**	**0.037**	**0.0029 J**	**0.029**
Selenium, Total	0.05	**0.0031 J**	**0.0073**	**0.0072**	**0.0011 J**	**0.003 J**	**0.0014 J**	**0.0051**
Thallium, Total	0.002	0.001 U	**0.00027 J**	**0.00023 J**	0.001 U	0.001 U	0.001 U	0.001 U
Radiological (pCi/L)								
Radium-226	NA	0.464 U ± 0.271	**2.08 ± 0.757**	**4.19 ± 0.897**	**0.91 ± 0.467**	**0.699 ± 0.267**	**0.899 ± 0.396**	**0.557 ± 0.235**
Radium-228	NA	1 U ± 0.307	1 U ± 1.75	1 U ± 1.66	1 U ± 0.593	**2 ± 1.04**	**0.637 ± 0.395**	1 U ± 0.792
Radium-226 & 228	5	0.556 UJ ± 0.409	5 UJ ± 1.91	**5.74 J ± 1.89**	**1.56 J ± 0.755**	**2.7 ± 1.07**	**1.54 ± 0.559**	5 UJ ± 0.826
Field Parameters								
Temperature (Deg C)	NA	**28.1**	**16.46**	**16.46**	**18.52**	**16.92**	**20.96**	**16.14**
Dissolved Oxygen, Field (mg/L)	NA	**1.11**	**1.99**	**1.99**	**2.75**	**1.46**	**0.54**	**0.95**
Conductivity, Field (mS/cm)	NA	**0.75**	**1.98**	**1.98**	**1.71**	**1.8**	**1.93**	**1.83**
Oxidation Reduction Potential (ORP), Field (mv)	NA	**-64.6**	**-83**	**-83**	**-140.2**	**-113.9**	**-142.7**	**-116.5**
Turbidity, Field (NTU)	NA	**7.37**	**93.41**	**93.41**	**226.12**	**181.4**	**8.43**	**14.21**
pH, Field (SU)	NA	**7.24**	**7.3**	**7.3**	**7.19**	**7.13**	**6.63**	**6.95**

ABBREVIATIONS AND NOTES:

CCR: Coal Combustion Residuals.
mg/L: milligram per liter.
pCi/L: picoCurie per liter.
Deg C: Degrees Celcius
U: Result is less than sample detection limit
J: Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value
USEPA: United States Environmental Protection Agency.
Results in **bold** are detected.

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

TABLE 2
SUMMARY OF GROUNDWATER QUALITY DATA
F.B. CULLEY GENERATING STATION
NEWBURGH, INDIANA

Location Group	Action Level	Nature & Extent							
Location Name	Maximum	CCR-AP-5I	CCR-AP-5I	CCR-AP-6I	CCR-AP-6I	CCR-AP-8I	CCR-AP-8I	CCR-AP-11	CCR-AP-11
Sample Name	Contaminant	CCR-AP-5I-20220506	CCR-AP-5I-20221129	CCR-AP-6I-20220510	CCR-AP-6I-20221130	CCR-AP-8I-20220510	CCR-AP-8I-20221130	CCR-AP-11-20220505	CCR-AP-11-20221129
Sample Date	Level/ Regional	05/06/2022	11/29/2022	05/10/2022	11/30/2022	05/10/2022	11/30/2022	05/05/2022	11/29/2022
Lab Sample ID	Screening	180-137837-2	180-148606-6	180-138040-7	180-148606-8	180-138040-9	180-148606-10	180-137837-3	180-148606-12
Detection Monitoring - EPA Appendix III Constituents (mg/L)									
Boron, Total	NA	**12**	**11**	**20**	**18**	**13**	**12**	**0.39 J+**	**0.21**
Calcium, Total	NA	**210**	**230**	**520**	**540**	**440**	**410**	**73**	**110**
Chloride (mg/L)	NA	**210**	**280**	**180**	**260**	**430**	**560**	**14**	**24**
Fluoride (mg/L)	4	**1.1**	**0.58**	**0.12 J**	**0.12 J**	**0.33**	**0.21 J**	**0.53**	**0.37**
pH (lab) (pH units)	NA	**7.3 J**	**7.4 J**	**7.2 J**	**7.7 J**	**6.8 J**	**7.3 J**	**6.3 J**	**7 J**
Sulfate (mg/L)	NA	**460**	**660**	**1300**	**1500**	**900**	**1100**	**320**	**450**
Total Dissolved Solids (TDS) (mg/L)	NA	**1300**	**1700**	**2600**	**2600**	**2600**	**2800**	**910**	**860**
Assessment Monitoring - EPA Appendix IV Constituents (mg/L)									
Antimony, Total	0.006	**0.0017 J**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic, Total	0.01	**0.0052**	0.005 U	**0.0041**	**0.0032 J**	**0.0018**	**0.0017 J**	**0.019**	**0.044**
Barium, Total	2	**0.064**	**0.051**	**0.031**	**0.035**	**0.22**	**0.19**	**0.1**	**0.2**
Beryllium, Total	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium, Total	0.005	**0.0007 J**	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chromium, Total	0.1	**0.0053**	0.005 U	0.002 U	0.005 U	0.002 U	0.005 U	0.002 U	0.005 U
Cobalt, Total	NA	**0.0034**	**0.0005 J**	**0.002**	**0.0018**	0.0005 U	0.001 U	**0.029**	**0.037**
Fluoride (mg/L)	4	**1.1**	**0.58**	**0.12 J**	**0.12 J**	**0.33**	**0.21 J**	**0.53**	**0.37**
Lead, Total	0.015	**0.0024**	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	**0.00097 J**
Lithium, Total	NA	**0.023**	**0.035**	**0.052**	**0.058**	**0.4**	**0.42**	0.005 U	**0.0049 J**
Mercury, Total	0.002	**0.0002**	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum, Total	NA	**0.0084**	**0.0024 J**	**0.71**	**0.66**	**0.51**	**0.33**	**0.0015 J**	0.005 U
Selenium, Total	0.05	**0.0014 J**	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Thallium, Total	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Radiological (pCi/L)									
Radium-226	NA	**0.813 ± 0.51**	**0.316 ± 0.128**	1 U ± 0.238	**0.193 ± 0.0916**	**1.7 J ± 0.479**	**1.35 ± 0.253**	**1.27 ± 0.521**	**0.223 ± 0.129**
Radium-228	NA	1 U ± 0.537	**1.14 ± 0.534**	**0.481 ± 0.272**	**1.06 ± 0.49**	**1.88 ± 0.551**	**2.05 ± 0.578**	1 U ± 0.325	1 U ± 0.379
Radium-226 & 228	5	**1.36 J ± 0.741**	**1.45 ± 0.549**	**0.75 J ± 0.361**	**1.25 ± 0.498**	**3.58 J ± 0.73**	**3.41 ± 0.631**	**1.51 J ± 0.614**	5 UJ ± 0.4
Field Parameters									
Temperature (Deg C)	NA	**17.1**	**15.55**	**19.3**	**17.99**	**24.29**	**16.98**	**15.91**	**15.89**
Dissolved Oxygen, Field (mg/L)	NA	**0.46**	**2.06**	**0.49**	**0.05**	**1.27**	**0.01**	**1.34**	**2.11**
Conductivity, Field (mS/cm)	NA	**1.8888**	**2.36**	**2.9926**	**3.12**	**3.5712**	**3.88**	**1.418**	**0.57**
Oxidation Reduction Potential (ORP), Field (mv)	NA	**-74.6**	**-37.7**	**-57.3**	**84.6**	**-97.5**	**-105**	**-66.8**	**-78.2**
Turbidity, Field (NTU)	NA	**24.18**	**5.65**	**0.53**	**0**	**71.67**	**0**	**127.2**	**18.47**
pH, Field (SU)	NA	**6.84**	**6.98**	**7.04**	**6.96**	**6.68**	**6.98**	**6.4**	**6.7**

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mg/L: milligram per liter.
pCi/L: picoCurie per liter.
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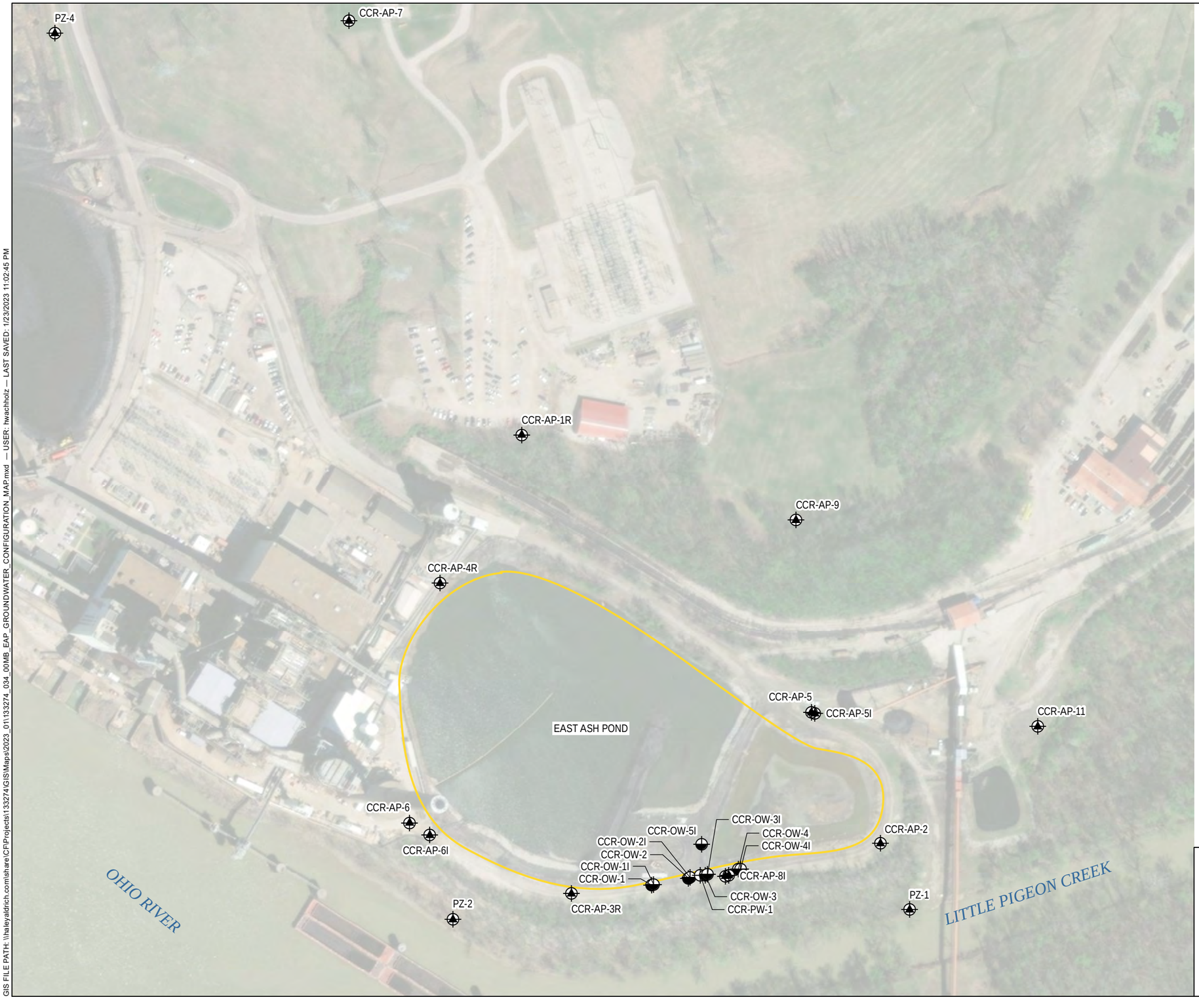
https://www.epa.gov/coalash/coal-ash-rule

FIGURES



LEGEND

- CCR MONITORING WELL
- OBSERVATION WELL
- PRODUCTION WELL
- EAST ASH POND

NOTES

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

N

0 200 400
SCALE IN FEET

HALEY ALDRICH

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

GROUNDWATER MONITORING WELL LOCATIONS

JANUARY 2023

FIGURE 1

GIS FILE PATH: \\haleyaldrich.com\share\CPProjects\133274\GIS\Maps\2023_01\133274_034_00MB_EAP_GROUNDWATER_CONFIGURATION_MAP.mxd — USER: hwachholz — LAST SAVED: 1/23/2023 11:02:45 PM

PZ-4
392.00

CCR-AP-7
428.51

420

410

400

390

380

360

370

20 FT/YR

50 FT/YR

40 FT/YR

CCR-AP-1R
384.10

CCR-AP-9
387.64

CCR-AP-4R
384.99

CCR-AP-5
383.41

CCR-AP-5I
382.46

CCR-AP-11
370.83

EAST ASH POND

CCR-AP-6
357.92

CCR-AP-6I
358.14

CCR-AP-2
361.68

CCR-AP-8
365.98

CCR-AP-8I
358.50

CCR-AP-3R
363.19

OHIO RIVER

LITTLE PIGEON CREEK

LEGEND

- CCR MONITORING WELL
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER ELEVATION CONTOUR, 10-FT INTERVAL, DASHED WHERE INFERRED
- EAST ASH POND

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL (FT-MSL) TO GROUND SURFACE

3. PZ-2 AND PZ-1 NOT USED TO GENERATE WATER TABLE CONFIGURATION

4. WATER TABLE MEASUREMENTS COLLECTED ON 5 MAY 2022 BY ATC GROUP SERVICES, LLC

5. APPROXIMATE GROUNDWATER FLOW RATE CALCULATED USING V = KI/N N_E WHERE
V= GROUNDWATER FLOW VELOCITY IN FEET/YEAR
K = HORIZONTAL HYDRAULIC CONDUCTIVITY IN FEET/DAY
I = HORIZONTAL GROUNDWATER GRADIENT IN FEET/FOOT
N_E = ASSUMED EFFECTIVE POROSITY

6. AERIAL IMAGERY SOURCE: ESRI

N

0 200 400
SCALE IN FEET

HALEY ALDRICH

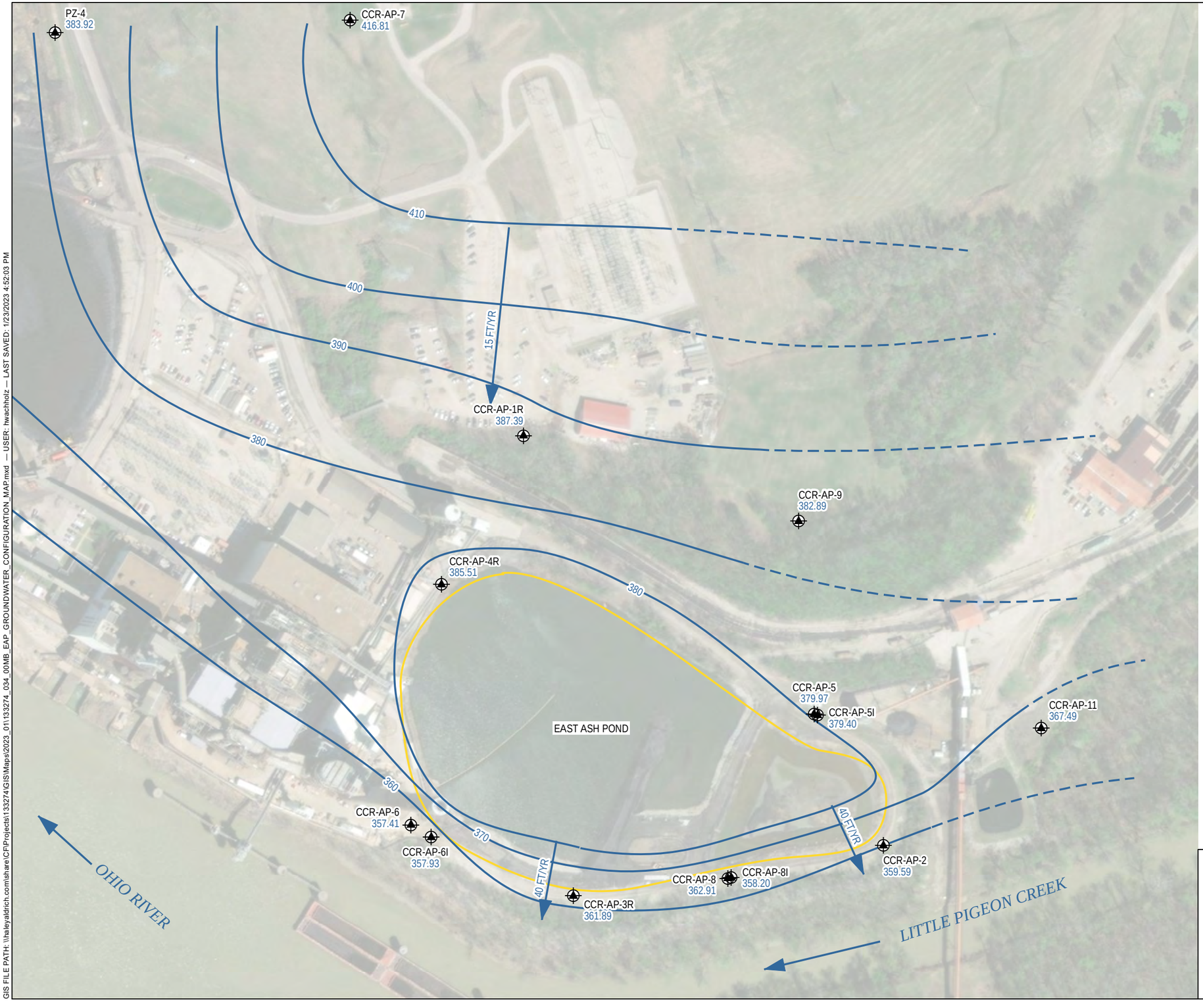
SOUTHERN INDIANA GAS AND ELECTRIC COMPANY
F.B. CULLEY GENERATING STATION
NEWBURGH, INDIANA

GROUNDWATER CONFIGURATION MAP - MAY 2022

JANUARY 2023

FIGURE 2

GIS FILE PATH: \\haleyaldrich.com\share\CFPProjects\133274\GIS\Maps\2023_01\133274_034_00MB_EAP_GROUNDWATER_CONFIGURATION_MAP.mxd — USER: hwachholz — LAST SAVED: 1/23/2023 4:52:03 PM



LEGEND

- CCR MONITORING WELL
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER ELEVATION CONTOUR, 10-FT INTERVAL, DASHED WHERE INFERRED
- EAST ASH POND

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL (FT-MSL) TO GROUND SURFACE
3. PZ-2 AND PZ-1 NOT USED TO GENERATE WATER TABLE CONFIGURATION
4. WATER TABLE MEASUREMENTS COLLECTED ON 28 NOVEMBER 2022 BY ATC GROUP SERVICES, LLC
5. APPROXIMATE GROUNDWATER FLOW RATE CALCULATED USING V = KI/N N_E WHERE
V= GROUNDWATER FLOW VELOCITY IN FEET/YEAR
K = HORIZONTAL HYDRAULIC CONDUCTIVITY IN FEET/DAY
I = HORIZONTAL GROUNDWATER GRADIENT IN FEET/FOOT
N_E = ASSUMED EFFECTIVE POROSITY
6. AERIAL IMAGERY SOURCE: ESRI

N

0 200 400
SCALE IN FEET

HALEY ALDRICH

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

GROUNDWATER CONFIGURATION MAP - NOVEMBER 2022

JANUARY 2023

FIGURE 3

GIS FILE PATH: \\haleyaldrich.com\share\CP\Projects\133274\GIS\Maps\2023_01\133274_034_00\MB_EAP_GROUNDWATER_CONFIGURATION_MAP.mxd — USER: hwachholz — LAST SAVED: 1/23/2023 4:52:03 PM

APPENDIX A
Summary of Statistical Analysis

HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44131
216.739.0555

TECHNICAL MEMORANDUM

29 March 2022
File No. 129420

TO: Southern Indiana Gas and Electric Company

FROM: Haley & Aldrich, Inc.
Todd Plating, Sr. Project Manager
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SUBJECT: Statistical Evaluation of the November 2021 Semi-annual Groundwater Assessment Monitoring Data
Southern Indiana Gas and Electric Company
East Ash Pond
F.B. Culley Generating Station; Warrick County, Indiana

Pursuant to Title 40 Code of Federal Regulations (40 CFR) § 257.93 and § 257.95 (Rule), this memorandum summarizes the statistical evaluation of the analytical results for the May 2022 semi-annual assessment monitoring event for the F.B. Culley Generating Station (FBC) East Ash Pond (EAP). Haley & Aldrich, Inc. (Haley & Aldrich) completed this statistical evaluation to determine if Appendix IV groundwater monitoring constituents have been detected in downgradient wells at statistically significant levels (SSL) greater than Groundwater Protection Standards (GWPS), consistent with the requirements in 40 CFR § 257.95.

Methods used during this statistical analysis are described in the *Statistical Data Analysis Plan for the F.B. Culley Generating Station* (Haley & Aldrich, 2017). A summary of how applicable performance standards described in § 257.93 (g) were achieved include:

- § 257.93 (g) (1) - Data set distribution was evaluated using basic summary statistics, graphical methods, and the Shapiro-Wilks Test of Normality. Parametric methods were used where normal distributions were identified. Those data sets were evaluated for outliers using box plots, Dixon's test and Rosner's test. Outlier identification and data set distribution groups are summarized in Table I.
- § 257.93 (g) (2) – Not applicable
- § 257.93 (g) (3) – Not applicable

- § 257.93 (g) (4) – Levels of confidence and additional supporting information for the use of tolerance intervals and prediction limits are included in Table I.
- § 257.93 (g) (5) – Non-detect values were accounted for by simple substitution, where the detection limit replaced the non-detect result. Non-detect values are identified and summarized in Table I.
- § 257.93 (g) (6) – Time series plots for groundwater monitoring wells included in this evaluation were reviewed to identify potential seasonal variability. No additional statistics to account for seasonality of spatial variability were necessary.

Data from the groundwater sampling event for the downgradient monitoring wells (CCR-AP-2 through CCR-AP-6 and CCR-AP-8) were compared to the GWPS established from the background dataset for the upgradient monitoring wells (CCR-AP-1R, CCR-AP-7, and CCR-AP-9) for detected Appendix IV constituents. GWPS for each of the Appendix IV constituents have been set equal to the highest value of the maximum contaminant level, regional screening level, or background concentration. The results of the assessment monitoring statistical evaluation are discussed below and provided in Table I.

Development of GWPS

The Rule provides four specific options for statistical evaluation of groundwater quality data collected at a coal combustion residual (CCR) unit (40 CFR §257.93(f) (1-4)). Haley & Aldrich certified the tolerance limit (TL) as the statistical method used for developing background concentration for the GWPS on 14 January 2019. As noted above, the GWPS for each of the Appendix IV constituents have been set equal to the highest value of the maximum contaminant level (MCL), regional screening level (RSL), or background concentration. The most recent groundwater sampling result from each compliance well was compared to the GWPS to determine if additional statistical testing is warranted.

STATISTICAL EVALUATION

An interwell statistical evaluation was used to identify SSLs. An interwell evaluation compares the most recent values from downgradient compliance wells to a background dataset composed of upgradient well data. Because the CCR unit is in assessment monitoring, no statistical evaluations were conducted on Appendix III (detection monitoring) constituents.

The parametric TL method was used to complete statistical evaluations of the referenced dataset. The TL procedure is one in which a concentration limit for each constituent is established from the distribution of the background data, with a minimum 95 percent confidence level. The upper endpoint of a tolerance interval is called the UTL. Depending on the data distribution, parametric or non-parametric TL procedures are used to evaluate groundwater monitoring data using this method. Parametric TLs utilize normally distributed data or data normalized via a transformation of the sample background data used to construct the limit. If the data are non-normal and a transformation is not indicated, non-parametric procedures (order statistics or bootstrap methods) are used to calculate the TL. If all the background data are non-detect, a maximum reporting limit may serve as an appropriate UTL.

These statistical evaluations were conducted using the background dataset for all detected Appendix IV constituents using parametric TL. If an Appendix IV constituent concentration from the November 2021 sampling event was greater than the GWPS, the lower confidence limit (LCL) for the downgradient well constituent was used to evaluate if an SSL was indicated. The LCL is the lower end of the confidence interval range, which is an estimated concentration range intended to contain the true mean or median of the population from which the sample is drawn. The confidence interval range is designed to locate the true population mean or median with a high degree of statistical confidence, or conversely, with a low probability of error.

The UTLs were calculated from the background well dataset using Chemstat software after testing for outlier sample results that would warrant removal from the dataset based on likely error in sampling or measurement. Both visual and statistical outlier tests for the background data were performed using Chemstat and U.S. Environmental Protection Agency's ProUCL 5.1 software, and a visual inspection of the data was performed using box plots and distribution plots for the downgradient sample data. No sample data were identified as outliers that warranted removal from the dataset.

BACKGROUND DISTRIBUTIONS

The groundwater analytical results for each sampling event from the background sample locations were combined to calculate the UTL for each detected Appendix IV constituent. The variability and distribution of the pooled dataset was evaluated to determine the method for UTL calculation. The background concentrations were periodically updated per the document *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, March 2009* (Unified Guidance).

TREND SUMMARY

Mann Kendall trend analyses were performed on data sets of sufficient sample size. Results of the trend analysis are included on Table I. In summary, approximately 74 percent of trends analyzed are identified as stable or decreasing. Increasing trends were identified for the following SSL:

- Molybdenum at CCR-AP-2 and CCR-AP-6

RESULTS OF APPENDIX IV DOWNGRADIENT STATISTICAL COMPARISONS

The sample concentrations from the downgradient wells for each of the detected Appendix IV constituents from the November 2021 assessment monitoring event were compared to their respective GWPS (Table I). A sample concentration greater than the GWPS is considered to represent an SSL. Based on previous compliance sampling events and statistical evaluations, interwell comparisons were utilized for all downgradient wells and constituents. Based on previous compliance sampling events and statistical evaluations, interwell comparisons were used to evaluate constituents not subject to an Alternative Source Demonstration (ASD) in downgradient monitoring wells. Because a successful ASD

was completed for arsenic, an intrawell statistical analysis was used to evaluate that constituent. The results of the statistical analyses conducted for those detected Appendix IV constituents confirm that molybdenum remains the only constituent present at SSLs above GWPS downgradient of the EAP.

Attachments:

Table I – Summary of Assessment Monitoring Statistical Evaluation – November 2021

TABLE

TABLE I
F.B. Culley EAP Generating Station
Assessment Monitoring Statistical Analysis Summary
Prepared: March 25, 2022

										MCL Comparison						Inter-well Analysis					Intra-well Analysis		GWPS		
Location Id	Frequency of Detection	Percent Non-Detects	Maximum Detect	Variance	Standard Deviation	Coefficient of Variance	CCR MCL/RSL	Report Result Unit	Detection Exceedances (Y/N)	Number of Detection Exceedances	Number of Non-Detection Exceedances	Outlier Presence	Outlier Removed	Trend	Distribution Group	November 2021 Concentration (mg/L)	Detect?	Lower Confidence Level (LCL)	Upper Tolerance Limit (mg/L)	SSI (Exceedance above Background at Individual Well)	Upper Prediction Limits (ug/L)	SSI (Exceedance above Background at Individual Well)	Groundwater Protection Standard (Higher of MCL/RSL or Upper Tolerance Limit) mg/L	Exceedance above GWPS at Individual Well	SSL
CCR Appendix-IV: Antimony, Total (mg/L)																									
CCR-AP-1R	11/17	35%	0.0026	0.00004045	0.00636	1.542	0.006	mg/L	N	0	3	N	N	Stable											
CCR-AP-7	3/19	84%	0.00083	3.136E-07	0.00056	0.3166	0.006	mg/L	N	0	0	Y	N	Stable	Non-parametric				0.02				0.020		
CCR-AP-9	12/17	29%	0.0079	0.00004051	0.006365	1.391	0.006	mg/L	Y	1	3	Y	N	Stable											
CCR-AP-2	8/17	53%	0.0021	0.00002587	0.005086	1.397	0.006	mg/L	N	0	3	Y	N	Stable		0.00087	Y			N				N	No
CCR-AP-3	2/17	88%	0.00058	0.000000269	0.0005186	0.2854	0.006	mg/L	N	0	0	Y	N	Stable		0.002	N			N				N	No
CCR-AP-4R	4/17	76%	0.002	0.000004259	0.002064	0.9194	0.006	mg/L	N	0	1	Y	N	Stable		0.002	Y			N				N	No
CCR-AP-5	3/17	82%	0.00063	0.00002012	0.004486	1.618	0.006	mg/L	N	0	1	Y	N	Stable		0.00063	Y			N				N	No
CCR-AP-6	9/17	47%	0.0014	0.000004888	0.002211	1.217	0.006	mg/L	N	0	1	Y	N	Stable		0.002	N			N				N	No
CCR-AP-8	11/17	35%	0.0018	4.339E-07	0.0006587	0.5173	0.006	mg/L	N	0	0	N	N	Stable		0.002	N			N				N	No
CCR Appendix-IV: Arsenic, Total (mg/L)																									
CCR-AP-1R	17/17	0%	0.038	0.0001518	0.01232	0.7739	0.01	mg/L	Y	8	0	N	N	Increase											
CCR-AP-7	19/19	0%	0.018	0.0000175	0.004183	0.6375	0.01	mg/L	Y	2	0	N	N	Stable	Non-parametric				0.038				0.038		
CCR-AP-9	17/17	0%	0.032	0.00004581	0.006768	0.6407	0.01	mg/L	Y	4	0	Y	N	Stable											
CCR-AP-2	17/17	0%	0.032	0.0000803	0.008961	0.7881	0.01	mg/L	Y	8	0	N	N	Increase	Normal	0.011	Y			N	0.044	N		N	No
CCR-AP-3	17/17	0%	0.095	0.00007822	0.008844	0.1175	0.01	mg/L	Y	17	0	N	N	Stable	Normal	0.08	Y			Y	0.107	N		N	No
CCR-AP-4R	17/17	0%	0.33	0.007601	0.08718	0.7947	0.01	mg/L	Y	17	0	Y	N	Increase	Log-transformed	0.33	Y			Y	0.650	N		N	No
CCR-AP-5	15/17	12%	0.0039	0.000005411	0.002326	1.438	0.01	mg/L	N	0	0	Y	N	Stable	Non-parametric	0.0039	Y			N	0.010	N		N	No
CCR-AP-6	17/17	0%	0.12	0.0005111	0.02261	0.2473	0.01	mg/L	Y	17	0	N	N	Increase	Normal	0.1	Y			Y	0.173	N		N	No
CCR-AP-8	17/17	0%	0.12	0.0004957	0.02226	0.2523	0.01	mg/L	Y	17	0	N	N	Increase	Normal	0.1	Y			Y	0.168	N		N	No
CCR Appendix-IV: Barium, Total (mg/L)																									
CCR-AP-1R	17/17	0%	0.59	0.03061	0.175	0.7689	2	mg/L	N	0	0	N	N	Increase											
CCR-AP-7	19/19	0%	0.19	0.0007055	0.02656	0.197	2	mg/L	N	0	0	N	N	Stable	Non-parametric				0.720				2.000		
CCR-AP-9	17/17	0%	0.72	0.01678	0.1295	0.4431	2	mg/L	N	0	0	Y	N	Increase											
CCR-AP-2	17/17	0%	0.52	0.0182	0.1349	0.6664	2	mg/L	N	0	0	N	N	Increase		0.14	Y			N				N	No
CCR-AP-3	17/17	0%	0.49	0.0009809	0.03132	0.07293	2	mg/L	N	0	0	N	N	Stable		0.41	Y			N				N	No
CCR-AP-4R	17/17	0%	1.4	0.06777	0.2603	0.3735	2	mg/L	N	0	0	N	N	Stable		1.4	Y			Y				N	No
CCR-AP-5	17/17	0%	0.092	0.0003282	0.01812	0.3835	2	mg/L	N	0	0	Y	N	Stable		0.092	Y			N				N	No
CCR-AP-6	17/17	0%	0.69	0.003393	0.05825	0.09864	2	mg/L	N	0	0	N	N	Stable		0.53	Y			N				N	No
CCR-AP-8	17/17	0%	0.68	0.004049	0.06363	0.1104	2	mg/L	N	0	0	N	N	Stable		0.43	Y			N				N	No
CCR Appendix-IV: Beryllium, Total (mg/L)																									
CCR-AP-1R	17/17	0%	0.0066	0.000005538	0.002353	0.9369	0.004	mg/L	Y	6	0	Y	N	Increase											
CCR-AP-7	7/19	63%	0.00075	0.000000156	0.000395	0.5459	0.004	mg/L	N	0	0	N	N	Stable	Non-parametric				0.010				0.010		
CCR-AP-9	16/17	6%	0.0041	0.000005556	0.002357	1.551	0.004	mg/L	Y	1	1	Y	N	Increase											
CCR-AP-2	17/17	0%	0.0077	0.000003124	0.001768	1.073	0.004	mg/L	Y	1	0	N	N	Increase		0.00091	Y			N				N	No
CCR-AP-3	0/17	100%		0	0	0	0.004	mg/L	N	0	0	NA	NA	NA	NA	0.001	N			N				N	No
CCR-AP-4R	13/17	24%	0.0017	1.989E-07	0.000446	0.7033	0.004	mg/L	N	0	0	N	N	Stable		0.0017	Y			N				N	No
CCR-AP-5	5/17	71%	0.00096	0.000005026	0.002242	1.631	0.004	mg/L	N	0	1	Y	N	Stable		0.001	N			N				N	No
CCR-AP-6	12/17	29%	0.00069	0.000001283	0.001133	1.453	0.004	mg/L	N	0	1	Y	N	Stable		0.001	N			N				N	No
CCR-AP-8	6/17	65%	0.00039	1.374E-07	0.0003706	0.5033	0.004	mg/L	N	0	0	N	N	Stable		0.001	N			N				N	No
CCR Appendix-IV: Cadmium, Total (mg/L)																									
CCR-AP-1R	5/17	71%	0.00087	0.00001058	0.003252	1.256	0.005	mg/L	N	0	2	N	N	Stable											
CCR-AP-7	2/19	89%	0.00032	5.984E-08	0.0002446	0.2662	0.005	mg/L	N	0	0	Y	N	Stable	Non-parametric				0.010				0.010		
CCR-AP-9	10/17	41%	0.0004	0.00001143	0.003381	1.66	0.005	mg/L	N	0	2	Y	N	Increasing											
CCR-AP-2	14/17	18%	0.0066	0.00000786	0.002804	1.289	0.005	mg/L	Y	1	1	Y	N	Increase		0.00059	Y			N				N	No
CCR-AP-3	0/17	100%		0	0	0	0.005	mg/L	N	0	0	N	N	NA		0.001	N			N				N	No
CCR-AP-4R	8/17	53%	0.00071	0.00000125	0.001118	1.23	0.005	mg/L	N	0	0	N	N	Stable		0.00071	Y			N				N	No
CCR-AP-5	13/17	24%	0.0012	0.000005369	0.002317	2.102	0.005	mg/L	N	0	1	Y	N	Stable		0.001	N			N				N	No
CCR-AP-6	11/17	35%	0.0006	1.184E-07	0.0003441	0.5938	0.005	mg/L	N	0	0	N	N	Stable		0.001	N			N				N	No
CCR-AP-8	4/17	76%	0.00028	1.148E-07	0.0003388	0.4141	0.005	mg/L	N	0	0	N	N	Stable		0.001	N			N				N	No
CCR Appendix-IV: Chromium, Total (mg/L)																									
CCR-AP-1R	17/17	0%	0.16	0.002654	0.05151	0.9665	0.1	mg/L	Y	4	0	N	N	Increase											
CCR-AP-7	11/19	42%	0.019	0.00001674	0.004092	1.17	0.1	mg/L	N	0	0	N	N	Stable	Non-parametric				0.160				0.160		
CCR-AP-9	17/17	0%	0.15	0.001152	0.03394	1.31	0.1	mg/L	Y	1	0	N	N	Increase											
CCR-AP-2	17/17	0%	0.082	0.000586	0.02421	0.7859	0.1	mg/L	N	0	0	N	N	Increase		0.024	Y			N				N	No
CCR-AP-3	13/17	24%	0.0041	4.913E-07	0.0007009	0.2972	0.1	mg/L	N	0	0	N	N	Stable		0.002	N			N				N	No
CCR-AP-4R	15/17	12%	0.058	0.0002046	0.0143	1.195	0.1	mg/L	N	0	0	N	N	Stable		0.058	Y			N				N	No
CCR-AP-5	1/17	94%	0.0016	0.00001916	0.004377	1.439	0.1	mg/L	N	0	0	Y	N	NA		0.002	N			N				N	No
CCR-AP-6	16/17	6%	0.031	0.00007997	0.008942	0.6823	0.1	mg/L	N	0	0	N	N	Increase		0.002	N			N				N	No
CCR-AP-8	16/17	6%	0.012	0.000007442	0.002728	0.6663	0.1	mg/L	N	0	0	N	N	Stable		0.0029	Y			N				N	No

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Assessment Monitoring Statistical Analysis Summary
Prepared: March 25, 2022

										MCL Comparison						Inter-well Analysis					Intra-well Analysis		GWPS		
Location Id	Frequency of Detection	Percent Non-Detects	Maximum Detect	Variance	Standard Deviation	Coefficient of Variance	CCR MCL/RSL	Report Result Unit	Detection Exceedances (Y/N)	Number of Detection Exceedances	Number of Non-Detection Exceedances	Outlier Presence	Outlier Removed	Trend	Distribution Group	November 2021 Concentration (mg/L)	Detect?	Lower Confidence Level (LCL)	Upper Tolerance Limit (mg/L)	SSI (Exceedance above Background at Individual Well)	Upper Prediction Limits (ug/L)	SSI (Exceedance above Background at Individual Well)	Groundwater Protection Standard (Higher of MCL/RSL or Upper Tolerance Limit) mg/L	Exceedance above GWPS at Individual Well	SSL
CCR Appendix-IV: Cobalt, Total (mg/L)																									
CCR-AP-1R	17/17	0%	0.081	0.0007061	0.02657	0.9302	0.006	mg/L	Y	14	0	N	N	Increase											
CCR-AP-7	19/19	0%	0.015	0.00001225	0.0035	1.378	0.006	mg/L	Y	1	0	N	N	Decrease	Non-parametric				0.081				0.081		
CCR-AP-9	17/17	0%	0.047	0.00008437	0.009185	0.6052	0.006	mg/L	Y	17	0	N	N	Increase											
CCR-AP-2	17/17	0%	0.038	0.00007935	0.008908	0.4291	0.006	mg/L	Y	17	0	N	N	Increase		0.018	Y			N				N	No
CCR-AP-3	17/17	0%	0.0094	0.00000205	0.001432	0.2394	0.006	mg/L	Y	7	0	N	N	Decrease		0.0044	Y			N				N	No
CCR-AP-4R	17/17	0%	0.021	0.00002532	0.005032	0.723	0.006	mg/L	Y	9	0	N	N	Stable		0.021	Y			N				N	No
CCR-AP-5	17/17	0%	0.007	0.000005385	0.002321	0.582	0.006	mg/L	Y	6	0	N	N	Decrease		0.0014	Y			N				N	No
CCR-AP-6	17/17	0%	0.018	0.00001429	0.00378	0.4227	0.006	mg/L	Y	13	0	N	N	Increase		0.0039	Y			N				N	No
CCR-AP-8	17/17	0%	0.017	0.00001091	0.003304	0.3363	0.006	mg/L	Y	15	0	N	N	Decrease		0.012	Y			N				N	No
CCR Appendix-III: Fluoride (mg/L)																									
CCR-AP-1R	17/17	0%	3.24	0.036048	0.37972	0.7196	4	mg/L	N	0	0	Y	N	Stable											
CCR-AP-7	19/19	0%	2.28	0.039492	0.39744	1.378	4	mg/L	N	0	0	N	N	Stable	Normal				0.610				4.000		
CCR-AP-9	17/17	0%	1.68	0.017476	0.2644	0.8028	4	mg/L	N	0	0	Y	N	Stable											
CCR-AP-2	17/17	0%	2.76	0.0662	0.5144	1.6348	4	mg/L	N	0	0	N	N	Stable		0.69	Y			Y				N	No
CCR-AP-3	16/17	6%	3.72	0.1456	0.7632	1.7868	4	mg/L	N	0	0	N	N	Stable		0.57	Y			N				N	No
CCR-AP-4R	16/17	6%	2.56	0.05576	0.4724	1.266	4	mg/L	N	0	0	N	N	Stable		0.52	Y			N				N	No
CCR-AP-5	17/17	0%	6	0.25152	1.0032	0.8712	4	mg/L	N	0	0	N	N	Stable		1.5	Y			Y				N	No
CCR-AP-6	17/17	0%	2.68	0.06076	0.4932	0.9896	4	mg/L	N	0	0	N	N	Stable		0.64	Y			Y				N	No
CCR-AP-8	16/17	6%	2.04	0.04672	0.4324	1.5376	4	mg/L	N	0	0	N	N	Stable		0.41	Y			N				N	No
CCR Appendix-IV: Lead, Total (mg/L)																									
CCR-AP-1R	17/17	0%	0.094	0.0008857	0.02976	0.9376	0.015	mg/L	Y	8	0	N	N	Increase											
CCR-AP-7	13/19	32%	0.02	0.00002296	0.004791	1.444	0.015	mg/L	Y	1	0	N	N	Stable	Non-parametric				0.094				0.094		
CCR-AP-9	17/17	0%	0.041	0.00008497	0.009218	0.7505	0.015	mg/L	Y	4	0	N	N	Increase											
CCR-AP-2	17/17	0%	0.051	0.0002483	0.01576	0.7787	0.015	mg/L	Y	9	0	N	N	Increase		0.017	Y			N				N	No
CCR-AP-3	13/17	24%	0.0014	1.094E-07	0.0003307	0.4658	0.015	mg/L	N	0	0	N	N	Stable		0.00021	Y			N				N	No
CCR-AP-4R	17/17	0%	0.047	0.0001301	0.01141	1.187	0.015	mg/L	Y	3	0	N	N	Stable		0.047	Y			N				N	No
CCR-AP-5	4/17	76%	0.0011	0.000005038	0.002245	1.619	0.015	mg/L	N	0	0	Y	N	Stable		0.00018	Y			N				N	No
CCR-AP-6	17/17	0%	0.024	0.00004495	0.006704	0.7242	0.015	mg/L	Y	3	0	N	N	Increase		0.00039	Y			N				N	No
CCR-AP-8	17/17	0%	0.0076	0.000002677	0.001636	0.775	0.015	mg/L	N	0	0	N	N	Stable		0.0014	Y			N				N	No
CCR Appendix-IV: Lithium, Total (mg/L)																									
CCR-AP-1R	17/17	0%	0.23	0.003399	0.0583	0.6581	0.04	mg/L	Y	14	0	N	N	Increase											
CCR-AP-7	19/19	0%	0.039	0.00005068	0.007119	0.4926	0.04	mg/L	N	0	0	Y	N	Decrease	Non-parametric				0.230				0.230		
CCR-AP-9	17/17	0%	0.12	0.0004719	0.02172	0.4565	0.04	mg/L	Y	8	0	Y	N	Increase											
CCR-AP-2	12/17	29%	0.069	0.002983	0.05462	1.127	0.04	mg/L	Y	3	5	Y	N	Stable		0.018	Y			N				N	No
CCR-AP-3	0/17	100%		0.0005282	0.02298	0.7928	0.04	mg/L	N	0	9	Y	N	NA		0.005	N			N				N	No
CCR-AP-4R	11/17	35%	0.047	0.0004007	0.02002	0.8382	0.04	mg/L	Y	1	5	N	N	Stable		0.019	Y			N				N	No
CCR-AP-5	17/17	0%	0.15	0.001538	0.03922	0.3821	0.04	mg/L	Y	15	0	N	N	Decrease		0.035	Y			N				N	No
CCR-AP-6	7/17	59%	0.016	0.003339	0.05778	1.436	0.04	mg/L	N	0	8	N	N	Stable		0.005	N			N				N	No
CCR-AP-8	4/17	76%	0.014	0.0005094	0.02257	0.839	0.04	mg/L	N	0	8	N	N	Stable		0.005	N			N				N	No
CCR Appendix-IV: Mercury, Total (mg/L)																									
CCR-AP-1R	0/16	100%		2.036E-07	0.0004512	1.362	0.002	mg/L	N	0	1	NA	NA	NA											
CCR-AP-7	0/16	100%		0	0	0	0.002	mg/L	N	0	0	NA	NA	NA	Non-parametric				0.0020				0.002		
CCR-AP-9	0/16	100%		0	0	0	0.002	mg/L	N	0	0	NA	NA	NA											
CCR-AP-2	3/16	81%	0.00038	2.273E-09	0.00004768	0.2298	0.002	mg/L	N	0	0	NA	NA	NA		0.0002	N			N				N	No
CCR-AP-3	0/16	100%		0	0	0	0.002	mg/L	N	0	0	NA	NA	NA		0.0002	N			N				N	No
CCR-AP-4R	0/16	100%		2.5E-09	0.00005	0.2353	0.002	mg/L	N	0	0	NA	NA	NA		0.0002	N			N				N	No
CCR-AP-5	0/16	100%		0	0	0	0.002	mg/L	N	0	0	NA	NA	NA		0.0002	N			N				N	No
CCR-AP-6	0/16	100%		0	0	0	0.002	mg/L	N	0	0	NA	NA	NA		0.0002	N			N				N	No
CCR-AP-8	0/16	100%		0	0	0	0.002	mg/L	N	0	0	NA	NA	NA		0.0002	N			N				N	No
CCR Appendix-IV: Molybdenum, Total (mg/L)																									
CCR-AP-1R	17/17	0%	0.015	0.000007938	0.002817	0.3094	0.1	mg/L	N	0	0	N	N	Stable											
CCR-AP-7	19/19	0%	0.013	0.00001036	0.003219	0.7934	0.1	mg/L	N	0	0	N	N	Decrease	Non-parametric				0.050				0.100		
CCR-AP-9	16/17	6%	0.012	0.0001226	0.01107	1.306	0.1	mg/L	N	0	0	N	N	Decrease											
CCR-AP-2	17/17	0%	0.0078	0.000005802	0.002409	0.6174	0.1	mg/L	N	0	0	N	N	Increase		0.0037	Y			N				N	No
CCR-AP-3	17/17	0%	0.014	0.000004857	0.002204	0.206	0.1	mg/L	N	0	0	N	N	Decrease		0.0065	Y			N				N	No
CCR-AP-4R	15/17	12%	0.0096	0.000004821	0.002196	0.8019	0.1	mg/L	N	0	0	N	N	Decrease		0.0096	Y			N				N	No
CCR-AP-5	17/17	0%	0.53	0.01071	0.1035	0.3182	0.1	mg/L	Y	17	0	N	N	Stable	Normal	0.15	Y			Y				Y	Yes
CCR-AP-6	17/17	0%	0.033	0.00002343	0.004841	0.1941	0.1	mg/L	N	0	0	N	N	Increase		0.018	Y			N				N	No
CCR-AP-8	17/17	0%	0.023	0.0000117	0.00342	0.2364	0.1	mg/L	N	0	0	N	N	Decrease		0.02	Y			N				N	No

TABLE I
F.B. Culley EAP Generating Station
Assessment Monitoring Statistical Analysis Summary
Prepared: March 25, 2022

										MCL Comparison						Inter-well Analysis					Intra-well Analysis		GWPS		
Location Id	Frequency of Detection	Percent Non-Detects	Maximum Detect	Variance	Standard Deviation	Coefficient of Variance	CCR MCL/RSL	Report Result Unit	Detection Exceedances (Y/N)	Number of Detection Exceedances	Number of Non-Detection Exceedances	Outlier Presence	Outlier Removed	Trend	Distribution Group	November 2021 Concentration (mg/L)	Detect?	Lower Confidence Level (LCL)	Upper Tolerance Limit (mg/L)	SSI (Exceedance above Background at Individual Well)	Upper Prediction Limits (ug/L)	SSI (Exceedance above Background at Individual Well)	Groundwater Protection Standard (Higher of MCL/RSL or Upper Tolerance Limit) mg/L	Exceedance above GWPS at Individual Well	SSL
CCR Appendix-IV: Radium-226 & 228 (mg/L)																									
CCR-AP-1R	14/17	18%	7.53	4.879	2.209	0.5315	5	mg/L	Y	14	2	N	N	Stable											
CCR-AP-7	15/19	21%	1.72	3.064	1.75	0.9888	5	mg/L	Y	6	4	N	N	Stable	Non-parametric				12.600				12.600		
CCR-AP-9	16/17	6%	12.6	6.658	2.58	0.7566	5	mg/L	Y	16	1	N	N	Stable											
CCR-AP-2	14/17	18%	5.38	2.547	1.596	0.6878	5	mg/L	Y	11	1	N	N	Stable		5.53	N			N				N	No
CCR-AP-3	14/17	18%	2.24	1.284	1.133	0.6423	5	mg/L	Y	12	2	N	N	Stable		3.95	N			N				N	No
CCR-AP-4R	17/17	0%	30	46.15	6.794	1.741	5	mg/L	Y	17	0	Y	N	Stable		30	Y	1.43		Y				N	No[1]
CCR-AP-5	12/17	29%	1.21	2.966	1.722	1.092	5	mg/L	Y	2	3	Y	N	Stable		2.81	N			N				N	No
CCR-AP-6	14/17	18%	10.2	5.32	2.306	0.8182	5	mg/L	Y	15	2	Y	N	Increase		3.21	N			N				N	No
CCR-AP-8	14/17	18%	2.32	1.618	1.272	0.6426	5	mg/L	Y	13	2	N	N	Stable		2.88	N			N				N	No
CCR Appendix-IV: Selenium, Total (mg/L)																									
CCR-AP-1R	5/17	71%	0.025	0.00027	0.01643	1.169	0.05	mg/L	N	0	2	N	N	Stable											
CCR-AP-7	3/17	82%	0.0028	0.000002339	0.001529	0.3519	0.05	mg/L	N	0	0	Y	N	Stable	Non-parametric				0.050				0.050		
CCR-AP-9	5/17	71%	0.0099	0.0001553	0.01246	1.269	0.05	mg/L	N	0	1	N	N	Stable											
CCR-AP-2	10/17	41%	0.026	0.0001652	0.01285	1.294	0.05	mg/L	N	0	1	Y	N	Stable		0.005	N			N				N	No
CCR-AP-3	16/17	6%	0.0068	0.000002111	0.001453	0.6463	0.05	mg/L	N	0	0	N	N	Stable		0.0017	Y			N				N	No
CCR-AP-4R	9/17	47%	0.031	0.0000486	0.006972	1.435	0.05	mg/L	N	0	0	N	N	Stable		0.0018	Y			N				N	No
CCR-AP-5	3/17	82%	0.007	0.0001218	0.01104	1.49	0.05	mg/L	N	0	1	N	N	NA		0.005	N			N				N	No
CCR-AP-6	13/17	24%	0.0053	0.00003189	0.005647	1.459	0.05	mg/L	N	0	0	N	N	Increase		0.0019	Y			N				N	No
CCR-AP-8	14/17	18%	0.007	0.000002781	0.001668	0.6032	0.05	mg/L	N	0	0	N	N	Stable		0.0017	Y			N				N	No
CCR Appendix-IV: Thallium, Total (mg/L)																									
CCR-AP-1R	13/17	24%	0.0027	0.000001505	0.001227	1.195	0.002	mg/L	Y	1	1	N	N	Increase											
CCR-AP-7	4/19	79%	0.00061	0.000000121	0.0003479	0.4172	0.002	mg/L	N	0	0	N	N	Stable	Non-parametric				0.010				0.010		
CCR-AP-9	9/17	47%	0.00098	0.000006231	0.002496	1.797	0.002	mg/L	N	0	2	N	N	Increase											
CCR-AP-2	14/17	18%	0.0076	0.000004006	0.002002	1.651	0.002	mg/L	Y	1	1	N	N	Increase		0.00038	Y			N				N	No
CCR-AP-3	1/17	94%	0.0001	4.765E-08	0.0002183	0.2305	0.002	mg/L	N	0	0	N	N	Stable		0.001	N			N				N	No
CCR-AP-4R	9/17	47%	0.0004	0.000001367	0.001169	1.494	0.002	mg/L	N	0	1	N	N	Stable		0.0004	Y			N				N	No
CCR-AP-5	5/17	71%	0.00018	0.000005208	0.002282	1.785	0.002	mg/L	N	0	1	Y	N	Stable		0.00015	Y			N				N	No
CCR-AP-6	8/17	53%	0.00022	0.000001349	0.001161	1.407	0.002	mg/L	N	0	1	Y	N	Stable		0.001	N			N				N	No
CCR-AP-8	5/17	71%	0.00029	1.694E-07	0.0004115	0.5531	0.002	mg/L	N	0	0	N	N	Stable		0.001	N			N				N	No

Notes:
1 - Groundwater protection standards compared against lower confidence level to determine statistically significant levels.

CCR	Coal Combustion Residuals
IDEM	Indiana Department of Environmental Management
MCL	maximum concentration limit
mg/L	milligrams per liter
NA	not applicable
RSL	Regional Screening Level
SSI	Statistically Significant Increase
SSL	Statistically Significant Levels

HALEY & ALDRICH, INC.
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216.739.0555

TECHNICAL MEMORANDUM

14 September 2022
File No. 129420

TO: Southern Indiana Gas and Electric Company

FROM: Haley & Aldrich, Inc.
Todd Plating, Sr. Project Manager
Steven F. Putrich, P.E., Project Principal

SUBJECT: Statistical Evaluation of the May 2022 Semi-annual Groundwater Assessment Monitoring Data
Southern Indiana Gas and Electric Company
East Ash Pond
F.B. Culley Generating Station; Warrick County, Indiana

Pursuant to Title 40 Code of Federal Regulations (40 CFR) § 257.93 and § 257.95 (Rule), this memorandum summarizes the statistical evaluation of the analytical results for the May 2022 semi-annual assessment monitoring event for the F.B. Culley Generating Station (FBC) East Ash Pond (EAP). Haley & Aldrich, Inc. (Haley & Aldrich) completed this statistical evaluation to determine if Appendix IV groundwater monitoring constituents have been detected in downgradient wells at statistically significant levels (SSL) greater than Groundwater Protection Standards (GWPS), consistent with the requirements in 40 CFR § 257.95.

Methods used during this statistical analysis are described in the *Statistical Data Analysis Plan for the F.B. Culley Generating Station* (Haley & Aldrich, 2017). A summary of how applicable performance standards described in § 257.93 (g) were achieved include:

- § 257.93 (g) (1) - Data set distribution was evaluated using basic summary statistics, graphical methods, and the Shapiro-Wilks Test of Normality. Parametric methods were used where normal distributions were identified. Those data sets were evaluated for outliers using box plots, Dixon's test and Rosner's test. Outlier identification and data set distribution groups are summarized in Table I.
- § 257.93 (g) (2) – Not applicable
- § 257.93 (g) (3) – Not applicable

- § 257.93 (g) (4) – Levels of confidence and additional supporting information for the use of tolerance intervals and prediction limits are included in Table I.
- § 257.93 (g) (5) – Non-detect values were accounted for by simple substitution, where the detection limit replaced the non-detect result. Non-detect values are identified and summarized in Table I.
- § 257.93 (g) (6) – Time series plots for groundwater monitoring wells included in this evaluation were reviewed to identify potential seasonal variability. No additional statistics to account for seasonality of spatial variability were necessary.

Data from the groundwater sampling event for the downgradient monitoring wells (CCR-AP-2 through CCR-AP-6 and CCR-AP-8) were compared to the GWPS established from the background dataset for the upgradient monitoring wells (CCR-AP-1R, CCR-AP-7, and CCR-AP-9) for detected Appendix IV constituents. GWPS for each of the Appendix IV constituents have been set equal to the highest value of the maximum contaminant level, regional screening level, or background concentration. The results of the assessment monitoring statistical evaluation are discussed below and provided in Table I.

Development of GWPS

The Rule provides four specific options for statistical evaluation of groundwater quality data collected at a coal combustion residual (CCR) unit (40 CFR §257.93(f) (1-4)). Haley & Aldrich certified the tolerance limit (TL) as the statistical method used for developing background concentration for the GWPS on 14 January 2019. As noted above, the GWPS for each of the Appendix IV constituents have been set equal to the highest value of the maximum contaminant level (MCL), regional screening level (RSL), or background concentration. The most recent groundwater sampling result from each compliance well was compared to the GWPS to determine if additional statistical testing is warranted.

STATISTICAL EVALUATION

An interwell statistical evaluation was used to identify SSLs. An interwell evaluation compares the most recent values from downgradient compliance wells to a background dataset composed of upgradient well data. Because the CCR unit is in assessment monitoring, no statistical evaluations were conducted on Appendix III (detection monitoring) constituents.

The parametric TL method was used to complete statistical evaluations of the referenced dataset. The TL procedure is one in which a concentration limit for each constituent is established from the distribution of the background data, with a minimum 95 percent confidence level. The upper endpoint of a tolerance interval is called the UTL. Depending on the data distribution, parametric or non-parametric TL procedures are used to evaluate groundwater monitoring data using this method. Parametric TLs utilize normally distributed data or data normalized via a transformation of the sample background data used to construct the limit. If the data are non-normal and a transformation is not indicated, non-parametric procedures (order statistics or bootstrap methods) are used to calculate the TL. If all the background data are non-detect, a maximum reporting limit may serve as an appropriate UTL.

These statistical evaluations were conducted using the background dataset for all detected Appendix IV constituents using parametric TL. If an Appendix IV constituent concentration from the May 2022 sampling event was greater than the GWPS, the lower confidence limit (LCL) for the downgradient well constituent was used to evaluate if an SSL was indicated. The LCL is the lower end of the confidence interval range, which is an estimated concentration range intended to contain the true mean or median of the population from which the sample is drawn. The confidence interval range is designed to locate the true population mean or median with a high degree of statistical confidence, or conversely, with a low probability of error.

The UTLs were calculated from the background well dataset using Chemstat software after testing for outlier sample results that would warrant removal from the dataset based on likely error in sampling or measurement. Both visual and statistical outlier tests for the background data were performed using Chemstat and U.S. Environmental Protection Agency's ProUCL 5.1 software, and a visual inspection of the data was performed using box plots and distribution plots for the downgradient sample data. No sample data were identified as outliers that warranted removal from the dataset.

BACKGROUND DISTRIBUTIONS

The groundwater analytical results for each sampling event from the background sample locations were combined to calculate the UTL for each detected Appendix IV constituent. The variability and distribution of the pooled dataset was evaluated to determine the method for UTL calculation. The background concentrations were periodically updated per the document *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, March 2009* (Unified Guidance).

TREND SUMMARY

Mann Kendall trend analyses were performed on data sets of sufficient sample size. Results of the trend analysis are included on Table I. In summary, 72 percent of trends analyzed are identified as stable or decreasing. No increasing trends were identified for constituents currently identified as SSLs, however increasing trends were identified for molybdenum at CCR-AP-2 and CCR-AP-6.

RESULTS OF APPENDIX IV DOWNGRADIENT STATISTICAL COMPARISONS

The sample concentrations from the downgradient wells for each of the detected Appendix IV constituents from the May 2022 assessment monitoring event were compared to their respective GWPS (Table I). A sample concentration greater than the GWPS is considered to represent an SSL. Based on previous compliance sampling events and statistical evaluations, interwell comparisons were utilized for all downgradient wells and constituents. Based on previous compliance sampling events and statistical evaluations, interwell comparisons were used to evaluate constituents not subject to an Alternative Source Demonstration (ASD) in downgradient monitoring wells. Because a successful ASD was completed for arsenic, an intrawell statistical analysis was used to evaluate that constituent. Based on

this statistical evaluation, an SSL greater than the GWPS was not identified. As a result, the EAP will remain in Assessment Monitoring.

Attachments:

Table I – Summary of Assessment Monitoring Statistical Evaluation – May 2022

TABLE

TABLE I
F.B. CULLEY EAP GENERATING STATION
ASSESSMENT MONITORING STATISTICAL ANALYSIS SUMMARY
PREPARED: AUGUST 2, 2022

										MCL Comparison					Inter-well Analysis					Intra-well Analysis		GWPS		
Location Id	Frequency of Detection	Percent Non-Detects	Maximum Detect	Variance	Standard Deviation	Coefficient of Variance	CCR MCL/RSL	Report Result Unit	Detection Exceedances (Y/N)	Number of Detection Exceedances	Number of Non-Detection Exceedances	Outlier Presence	Outlier Removed	Trend	Distribution Group	May 2022 Concentration (mg/L)	Detect?	Lower Confidence Level (LCL)	Upper Tolerance Limit (mg/L)	SSI (Exceedance above Background at Individual Well)	Upper Prediction Limits (ug/L)	SSI (Exceedance above Background at Individual Well)	Groundwater Protection Standard (Higher of MCL/RSL or Upper Tolerance Limit) mg/L	Exceedance above GWPS at Individual Well	SSL
CCR Appendix-IV: Antimony, Total (mg/L)																									
CCR-AP-1R	12/18	33%	0.0041	0.00003807	0.00617	1.496	0.006	mg/L	N	0	3	N	N	Stable											
CCR-AP-7	3/19	84%	0.00083	3.136E-07	0.00056	0.3166	0.006	mg/L	N	0	0	Y	N	Stable	Non-parametric				0.02				0.020		
CCR-AP-9	13/18	28%	0.0079	0.00003861	0.006213	1.311	0.006	mg/L	Y	2	3	Y	N	Stable											
CCR-AP-2	9/18	50%	0.0021	0.00002448	0.004947	1.391	0.006	mg/L	N	0	3	Y	N	Stable		0.0021	Y			N				N	No
CCR-AP-3	2/18	89%	0.00058	0.000000255	0.000505	0.2764	0.006	mg/L	N	0	0	Y	N	Stable		0.002	N			N				N	No
CCR-AP-4R	4/18	78%	0.002	0.000004012	0.002003	0.8978	0.006	mg/L	N	0	1	Y	N	Stable		0.002	N			N				N	No
CCR-AP-5	3/18	83%	0.00063	0.00001897	0.004356	1.596	0.006	mg/L	N	0	1	Y	N	Stable		0.002	N			N				N	No
CCR-AP-6	9/18	50%	0.0014	0.000004603	0.002145	1.174	0.006	mg/L	N	0	1	Y	N	Stable		0.002	N			N				N	No
CCR-AP-8	12/18	33%	0.0018	4.184E-07	0.0006468	0.5175	0.006	mg/L	N	0	0	N	N	Stable		0.00085	Y			N				N	No
CCR Appendix-IV: Arsenic, Total (mg/L)																									
CCR-AP-1R	18/18	0%	0.038	0.000161	0.01269	0.7498	0.01	mg/L	Y	9	0	N	N	Increase											
CCR-AP-7	19/19	0%	0.018	0.0000175	0.004183	0.6375	0.01	mg/L	Y	2	0	N	N	Stable	Non-parametric				0.038				0.038		
CCR-AP-9	18/18	0%	0.032	0.00004335	0.006584	0.6301	0.01	mg/L	Y	4	0	Y	N	Stable											
CCR-AP-2	18/18	0%	0.032	0.00007677	0.008762	0.7535	0.01	mg/L	Y	9	0	N	N	Increase	Normal	0.016	Y			N	0.044	N		N	No
CCR-AP-3	18/18	0%	0.095	0.00007885	0.00888	0.1171	0.01	mg/L	Y	18	0	N	N	Stable	Normal	0.085	Y			Y	0.107	N		N	No
CCR-AP-4R	18/18	0%	0.33	0.00716	0.08461	0.7673	0.01	mg/L	Y	18	0	Y	N	Increase	Log-transformed	0.12	Y			Y	0.650	N		N	No
CCR-AP-5	16/18	11%	0.008	0.000007356	0.002712	1.375	0.01	mg/L	N	0	0	Y	N	Stable	Non-parametric	0.008	Y			N	0.010	N		N	No
CCR-AP-6	18/18	0%	0.12	0.0004852	0.02203	0.2397	0.01	mg/L	Y	18	0	N	N	Increase	Normal	0.1	Y			Y	0.173	N		N	No
CCR-AP-8	18/18	0%	0.12	0.0004928	0.0222	0.2482	0.01	mg/L	Y	18	0	N	N	Increase	Normal	0.11	Y			Y	0.168	N		N	No
CCR Appendix-IV: Barium, Total (mg/L)																									
CCR-AP-1R	18/18	0%	0.59	0.02928	0.1711	0.7355	2	mg/L	N	0	0	N	N	Increase											
CCR-AP-7	19/19	0%	0.19	0.0007055	0.02656	0.197	2	mg/L	N	0	0	N	N	Stable	Non-parametric				0.720				2.000		
CCR-AP-9	18/18	0%	0.72	0.01582	0.1258	0.4321	2	mg/L	N	0	0	Y	N	Increase											
CCR-AP-2	18/18	0%	0.52	0.01715	0.131	0.6437	2	mg/L	N	0	0	N	N	Increase		0.22	Y			N				N	No
CCR-AP-3	18/18	0%	0.49	0.0009752	0.03123	0.07244	2	mg/L	N	0	0	N	N	Stable		0.46	Y			N				N	No
CCR-AP-4R	18/18	0%	1.4	0.06468	0.2543	0.3686	2	mg/L	N	0	0	N	N	Stable		0.57	Y			N				N	No
CCR-AP-5	18/18	0%	0.092	0.0003274	0.01809	0.3914	2	mg/L	N	0	0	Y	N	Stable		0.029	Y			N				N	No
CCR-AP-6	18/18	0%	0.69	0.003555	0.05962	0.1017	2	mg/L	N	0	0	N	N	Stable		0.51	Y			N				N	No
CCR-AP-8	18/18	0%	0.68	0.004136	0.06431	0.1124	2	mg/L	N	0	0	N	N	Stable		0.5	Y			N				N	No
CCR Appendix-IV: Beryllium, Total (mg/L)																									
CCR-AP-1R	18/18	0%	0.0066	0.000005644	0.002376	0.8909	0.004	mg/L	Y	7	0	Y	N	Increase											
CCR-AP-7	7/19	63%	0.00075	0.000000156	0.000395	0.5459	0.004	mg/L	N	0	0	N	N	Stable	Non-parametric				0.010				0.010		
CCR-AP-9	17/18	6%	0.0041	0.00000525	0.002291	1.542	0.004	mg/L	Y	1	1	Y	N	Increase											
CCR-AP-2	18/18	0%	0.0077	0.00000294	0.001715	1.039	0.004	mg/L	Y	1	0	N	N	Increase		0.0017	Y			N				N	No
CCR-AP-3	0/18	100%		0	0	0	0.004	mg/L	N	0	0	NA	NA	NA	NA	0.001	N			N				N	No
CCR-AP-4R	13/18	28%	0.0017	1.946E-07	0.0004412	0.6741	0.004	mg/L	N	0	0	N	N	Stable		0.001	N			N				N	No
CCR-AP-5	5/18	72%	0.00096	0.000004738	0.002177	1.608	0.004	mg/L	N	0	1	Y	N	Stable		0.001	N			N				N	No
CCR-AP-6	12/18	33%	0.00069	0.00000121	0.0011	1.39	0.004	mg/L	N	0	1	Y	N	Stable		0.001	N			N				N	No
CCR-AP-8	6/18	67%	0.00039	1.332E-07	0.0003649	0.4858	0.004	mg/L	N	0	0	N	N	Stable		0.001	N			N				N	No
CCR Appendix-IV: Cadmium, Total (mg/L)																									
CCR-AP-1R	6/18	67%	0.00087	0.00001021	0.003196	1.294	0.005	mg/L	N	0	2	N	N	Stable											
CCR-AP-7	2/19	89%	0.00032	5.984E-08	0.0002446	0.2662	0.005	mg/L	N	0	0	Y	N	Stable	Non-parametric				0.010				0.010		
CCR-AP-9	10/18	44%	0.0004	0.00001082	0.003289	1.662	0.005	mg/L	N	0	2	Y	N	Increasing											
CCR-AP-2	15/18	17%	0.0066	0.000007493	0.002737	1.302	0.005	mg/L	Y	1	1	Y	N	Increase		0.00086	Y			N				N	No
CCR-AP-3	0/18	100%		0	0	0	0.005	mg/L	N	0	0	N	N	NA		0.001	N			N				N	No
CCR-AP-4R	8/18	56%	0.00071	0.000001177	0.001085	1.187	0.005	mg/L	N	0	0	N	N	Stable		0.001	N			N				N	No
CCR-AP-5	13/18	28%	0.0012	0.000005054	0.002248	2.05	0.005	mg/L	N	0	1	Y	N	Stable		0.001	N			N				N	No
CCR-AP-6	11/18	39%	0.0006	1.212E-07	0.0003482	0.5777	0.005	mg/L	N	0	0	N	N	Stable		0.001	N			N				N	No
CCR-AP-8	4/18	78%	0.00028	1.099E-07	0.0003315	0.4002	0.005	mg/L	N	0	0	N	N	Stable		0.001	N			N				N	No
CCR Appendix-IV: Chromium, Total (mg/L)																									
CCR-AP-1R	18/18	0%	0.16	0.002676	0.05173	0.9164	0.1	mg/L	Y	5	0	N	N	Increase											
CCR-AP-7	11/19	42%	0.019	0.00001674	0.004092	1.17	0.1	mg/L	N	0	0	N	N	Stable	Non-parametric				0.160				0.160		
CCR-AP-9	18/18	0%	0.15	0.001086	0.03296	1.288	0.1	mg/L	Y	1	0	N	N	Increase											
CCR-AP-2	18/18	0%	0.082	0.0005518	0.02349	0.7596	0.1	mg/L	N	0	0	N	N	Increase		0.033	Y			N				N	No
CCR-AP-3	14/18	22%	0.0041	5.116E-07	0.0007153	0.2967	0.1	mg/L	N	0	0	N	N	Stable		0.0033	Y			N				N	No
CCR-AP-4R	16/18	11%	0.058	0.0001966	0.01402	1.22	0.1	mg/L	N	0	0	N	N	Stable		0.0034	Y			N				N	No
CCR-AP-5	1/18	94%	0.0016	0.00001809	0.004254	1.426	0.1	mg/L	N	0	0	Y	N	NA		0.002	N			N				N	No
CCR-AP-6	17/18	6%	0.031	0.00008224	0.009069	0.7264	0.1	mg/L	N	0	0	N	N	Increase		0.0019	Y			N				N	No
CCR-AP-8	16/18	11%	0.012	0.000007248	0.002692	0.6768	0.1	mg/L	N	0	0	N	N	Stable		0.002	N			N				N	No

TABLE I
F.B. CULLEY EAP GENERATING STATION
ASSESSMENT MONITORING STATISTICAL ANALYSIS SUMMARY
PREPARED: AUGUST 2, 2022

										MCL Comparison						Inter-well Analysis					Intra-well Analysis		GWPS		
CCR Appendix-IV: Cobalt, Total (mg/L)																									
CCR-AP-1R	18/18	0%	0.081	0.0008115	0.02849	0.9066	0.006	mg/L	Y	15	0	N	N	Increase											
CCR-AP-7	19/19	0%	0.015	0.00001225	0.0035	1.378	0.006	mg/L	Y	1	0	N	N	Decrease	Non-parametric				0.081				0.081		
CCR-AP-9	18/18	0%	0.047	0.00007948	0.008915	0.59	0.006	mg/L	Y	18	0	N	N	Increase											
CCR-AP-2	18/18	0%	0.038	0.00008171	0.009039	0.4227	0.006	mg/L	Y	18	0	N	N	Increase		0.032	Y			N				N	No
CCR-AP-3	18/18	0%	0.0094	0.000001976	0.001406	0.233	0.006	mg/L	Y	8	0	N	N	Decrease		0.0069	Y			N				N	No
CCR-AP-4R	18/18	0%	0.021	0.00002498	0.004998	0.7453	0.006	mg/L	Y	9	0	N	N	Stable		0.0024	Y			N				N	No
CCR-AP-5	18/18	0%	0.007	0.000005768	0.002402	0.6337	0.006	mg/L	Y	6	0	N	N	Decrease		0.00044	Y			N				N	No
CCR-AP-6	18/18	0%	0.018	0.00001515	0.003892	0.4509	0.006	mg/L	Y	13	0	N	N	Increase		0.0034	Y			N				N	No
CCR-AP-8	18/18	0%	0.017	0.00001278	0.003575	0.3783	0.006	mg/L	Y	15	0	N	N	Decrease		0.0031	Y			N				N	No
CCR Appendix-III: Fluoride (mg/L)																									
CCR-AP-1R	18/18	0%	3.24	0.03448	0.37136	0.7072	4	mg/L	N	0	0	Y	N	Stable											
CCR-AP-7	19/19	0%	2.28	0.039492	0.39744	1.378	4	mg/L	N	0	0	N	N	Stable	Normal				0.610				4.000		
CCR-AP-9	18/18	0%	1.68	0.01752	0.26472	0.8132	4	mg/L	N	0	0	Y	N	Stable											
CCR-AP-2	18/18	0%	2.76	0.08388	0.5792	1.7432	4	mg/L	N	0	0	N	N	Stable		0.63	Y			Y				N	No
CCR-AP-3	17/18	6%	3.72	0.13956	0.7472	1.7264	4	mg/L	N	0	0	N	N	Stable		0.53	Y			N				N	No
CCR-AP-4R	17/18	6%	2.56	0.0534	0.4624	1.2512	4	mg/L	N	0	0	N	N	Stable		0.31	Y			N				N	No
CCR-AP-5	18/18	0%	9.2	0.522	1.4452	1.1892	4	mg/L	N	0	0	N	N	Stable		2.3	Y			Y				N	No
CCR-AP-6	18/18	0%	2.76	0.06524	0.5108	1.0036	4	mg/L	N	0	0	N	N	Stable		0.69	Y			Y				N	No
CCR-AP-8	17/18	6%	2.04	0.04824	0.4392	1.5204	4	mg/L	N	0	0	N	N	Stable		0.42	Y			N				N	No
CCR Appendix-IV: Lead, Total (mg/L)																									
CCR-AP-1R	18/18	0%	0.094	0.0009525	0.03086	0.8995	0.015	mg/L	Y	9	0	N	N	Increase											
CCR-AP-7	13/19	32%	0.02	0.00002296	0.004791	1.444	0.015	mg/L	Y	1	0	N	N	Stable	Non-parametric				0.094				0.094		
CCR-AP-9	18/18	0%	0.041	0.00008013	0.008952	0.7232	0.015	mg/L	Y	4	0	N	N	Increase											
CCR-AP-2	18/18	0%	0.051	0.000239	0.01546	0.744	0.015	mg/L	Y	10	0	N	N	Increase		0.03	Y			N				N	No
CCR-AP-3	14/18	22%	0.0016	1.469E-07	0.0003833	0.5047	0.015	mg/L	N	0	0	N	N	Stable		0.0016	Y			N				N	No
CCR-AP-4R	18/18	0%	0.047	0.0001243	0.01115	1.201	0.015	mg/L	Y	3	0	N	N	Stable		0.0038	Y			N				N	No
CCR-AP-5	5/18	72%	0.0011	0.00000481	0.002193	1.655	0.015	mg/L	N	0	0	Y	N	Stable		0.00028	Y			N				N	No
CCR-AP-6	18/18	0%	0.024	0.0000463	0.006804	0.7743	0.015	mg/L	Y	3	0	N	N	Increase		0.00078	Y			N				N	No
CCR-AP-8	18/18	0%	0.0076	0.000002708	0.001646	0.8191	0.015	mg/L	N	0	0	N	N	Stable		0.00027	Y			N				N	No
CCR Appendix-IV: Lithium, Total (mg/L)																									
CCR-AP-1R	18/18	0%	0.23	0.003409	0.05838	0.6346	0.04	mg/L	Y	15	0	N	N	Increase											
CCR-AP-7	19/19	0%	0.039	0.00005068	0.007119	0.4926	0.04	mg/L	N	0	0	Y	N	Decrease	Non-parametric				0.230				0.230		
CCR-AP-9	18/18	0%	0.12	0.0004459	0.02112	0.4466	0.04	mg/L	Y	9	0	Y	N	Increase											
CCR-AP-2	13/18	28%	0.069	0.00285	0.05338	1.137	0.04	mg/L	Y	3	5	Y	N	Stable		0.021	Y			N				N	No
CCR-AP-3	0/18	100%		0.0005291	0.023	0.8317	0.04	mg/L	N	0	9	Y	N	NA		0.005	N			N				N	No
CCR-AP-4R	12/18	33%	0.047	0.0004018	0.02005	0.8826	0.04	mg/L	Y	1	5	N	N	Stable		0.0028	Y			N				N	No
CCR-AP-5	18/18	0%	0.15	0.001935	0.04399	0.4514	0.04	mg/L	Y	15	0	N	N	Decrease		0.009	Y			N				N	No
CCR-AP-6	8/18	56%	0.016	0.003226	0.0568	1.491	0.04	mg/L	N	0	8	N	N	Stable		0.0014	Y			N				N	No
CCR-AP-8	4/18	78%	0.014	0.0005061	0.0225	0.8759	0.04	mg/L	N	0	8	N	N	Stable		0.005	N			N				N	No
CCR Appendix-IV: Mercury, Total (mg/L)																									
CCR-AP-1R	0/17	100%		1.919E-07	0.0004381	1.354	0.002	mg/L	N	0	1	NA	NA	NA											
CCR-AP-7	0/16	100%		0	0	0	0.002	mg/L	N	0	0	NA	NA	NA	Non-parametric				0.0020				0.002		
CCR-AP-9	0/17	100%		0	0	0	0.002	mg/L	N	0	0	NA	NA	NA											
CCR-AP-2	4/17	76%	0.00038	2.326E-09	0.00004823	0.2363	0.002	mg/L	N	0	0	NA	NA	NA		0.00015	Y			N				N	No
CCR-AP-3	0/17	100%		0	0	0	0.002	mg/L	N	0	0	NA	NA	NA		0.0002	N			N				N	No
CCR-AP-4R	0/17	100%		2.353E-09	0.00004851	0.2291	0.002	mg/L	N	0	0	NA	NA	NA		0.0002	N			N				N	No
CCR-AP-5	0/17	100%		0	0	0	0.002	mg/L	N	0	0	NA	NA	NA		0.0002	N			N				N	No
CCR-AP-6	0/17	100%		0	0	0	0.002	mg/L	N	0	0	NA	NA	NA		0.0002	N			N				N	No
CCR-AP-8	0/17	100%		0	0	0	0.002	mg/L	N	0	0	NA	NA	NA		0.0002	N			N				N	No
CCR Appendix-IV: Molybdenum, Total (mg/L)																									
CCR-AP-1R	18/18	0%	0.023	0.0000182	0.004266	0.4318	0.1	mg/L	N	0	0	N	N	Stable											
CCR-AP-7	19/19	0%	0.013	0.00001036	0.003219	0.7934	0.1	mg/L	N	0	0	N	N	Decrease	Non-parametric				0.050				0.100		
CCR-AP-9	17/18	6%	0.012	0.0001171	0.01082	1.325	0.1	mg/L	N	0	0	N	N	Decrease											
CCR-AP-2	18/18	0%	0.0078	0.00000547	0.002339	0.596	0.1	mg/L	N	0	0	N	N	Increase		0.0043	Y			N				N	No
CCR-AP-3	18/18	0%	0.014	0.000005177	0.002275	0.2091	0.1	mg/L	N	0	0	N	N	Decrease		0.014	Y			N				N	No
CCR-AP-4R	16/18	11%	0.0096	0.000004766	0.002183	0.8315	0.1	mg/L	N	0	0	N	N	Decrease		0.00071	Y			N				N	No
CCR-AP-5	18/18	0%	0.53	0.01442	0.1201	0.3876	0.1	mg/L	Y	17	0	N	N	Stable	Normal	0.046	Y			N				N	No
CCR-AP-6	18/18	0%	0.033	0.00002226	0.004719	0.19	0.1	mg/L	N	0	0	N	N	Increase		0.023	Y			N				N	No
CCR-AP-8	18/18	0%	0.023	0.00001844	0.004294	0.3107	0.1	mg/L	N	0	0	N	N	Decrease		0.0029	Y			N				N	No
CCR Appendix-IV: Radium-226 & 228 (mg/L)																									
CCR-AP-1R	15/18	17%	7.53	5.016	2.24	0.5197	5	mg/L	Y	15	2	N	N	Stable											
CCR-AP-7	15/19	21%	1.72	3.064	1.75	0.9888	5	mg/L	Y	6	4	N	N	Stable	Non-parametric				12.600				12.600		
CCR-AP-9	16/18	11%	12.6	6.407	2.531	0.7234	5	mg/L	Y	16	2	N	N	Stable											
CCR-AP-2	15/18	17%	5.38	2.398	1.549	0.6654	5	mg/L	Y	12	1	N	N	Stable		2.45	Y			N				N	No
CCR-AP-3	14/18	22%	2.24	1.79	1.338	0.6883	5	mg/L	Y	12	3	N	N	Stable		5	N			N				N	No
CCR-AP-4R	18/18	0%	30	43.53	6.598	1.722	5	mg/L	Y	18	0	Y	N	Stable		2.61	Y	1.43		N				N	No
CCR-AP-5	12/18	33%	1.21	2.795	1.672	1.069	5	mg/L	Y	3	3	Y	N	Stable		1.33	N			N				N	No
CCR-AP-6	15/18	17%	10.2	5.095	2.257	0.8211	5	mg/L	Y	16	2	Y	N	Increase		1.56	Y			N				N	No

TABLE I
F.B. CULLEY EAP GENERATING STATION
ASSESSMENT MONITORING STATISTICAL ANALYSIS SUMMARY
PREPARED: AUGUST 2, 2022

										MCL Comparison						Inter-well Analysis					Intra-well Analysis		GWPS		
CCR-AP-8	15/18	17%	2.32	1.533	1.238	0.6334	5	mg/L	Y	14	2	N	N	Stable		1.54	Y			N				N	No
CCR Appendix-IV: Selenium, Total (mg/L)																									
CCR-AP-1R	6/18	67%	0.025	0.0002617	0.01618	1.206	0.05	mg/L	N	0	2	N	N	Stable											
CCR-AP-7	3/17	82%	0.0028	0.000002339	0.001529	0.3519	0.05	mg/L	N	0	0	Y	N	Stable	Non-parametric				0.050				0.050		
CCR-AP-9	5/18	72%	0.0099	0.0001475	0.01214	1.272	0.05	mg/L	N	0	1	N	N	Stable											
CCR-AP-2	11/18	39%	0.026	0.000159	0.01261	1.329	0.05	mg/L	N	0	1	Y	N	Stable		0.0019	Y			N				N	No
CCR-AP-3	17/18	6%	0.0068	0.000001998	0.001414	0.6358	0.05	mg/L	N	0	0	N	N	Stable		0.0018	Y			N				N	No
CCR-AP-4R	9/18	50%	0.031	0.00004575	0.006764	1.39	0.05	mg/L	N	0	0	N	N	Stable		0.005	N			N				N	No
CCR-AP-5	4/18	78%	0.007	0.0001158	0.01076	1.504	0.05	mg/L	N	0	1	N	N	NA		0.0029	Y			N				N	No
CCR-AP-6	14/18	22%	0.0053	0.00003044	0.005517	1.484	0.05	mg/L	N	0	0	N	N	Increase		0.0011	Y			N				N	No
CCR-AP-8	15/18	17%	0.007	0.000002721	0.00165	0.6135	0.05	mg/L	N	0	0	N	N	Stable		0.0014	Y			N				N	No
CCR Appendix-IV: Thallium, Total (mg/L)																									
CCR-AP-1R	14/18	22%	0.0027	0.000001429	0.001195	1.194	0.002	mg/L	Y	1	1	N	N	Increase											
CCR-AP-7	4/19	79%	0.00061	0.000000121	0.0003479	0.4172	0.002	mg/L	N	0	0	N	N	Stable	Non-parametric				0.010				0.010		
CCR-AP-9	9/18	50%	0.00098	0.000005873	0.002423	1.772	0.002	mg/L	N	0	2	N	N	Increase											
CCR-AP-2	15/18	17%	0.0076	0.000003799	0.001949	1.662	0.002	mg/L	Y	1	1	N	N	Increase		0.0005	Y			N				N	No
CCR-AP-3	1/18	94%	0.0001	0.000000045	0.0002121	0.2233	0.002	mg/L	N	0	0	N	N	Stable		0.001	N			N				N	No
CCR-AP-4R	9/18	50%	0.0004	0.000001289	0.001136	1.428	0.002	mg/L	N	0	1	N	N	Stable		0.001	N			N				N	No
CCR-AP-5	5/18	72%	0.00018	0.000004906	0.002215	1.754	0.002	mg/L	N	0	1	Y	N	Stable		0.001	N			N				N	No
CCR-AP-6	8/18	56%	0.00022	0.000001271	0.001128	1.35	0.002	mg/L	N	0	1	Y	N	Stable		0.001	N			N				N	No
CCR-AP-8	5/18	72%	0.00029	0.000000163	0.0004038	0.5325	0.002	mg/L	N	0	0	N	N	Stable		0.001	N			N				N	No

Notes:

CCR	Coal Combustion Residuals
IDEM	Indiana Department of Environmental Management
MCL	maximum concentration limit
mg/L	milligrams per liter
NA	not applicable
RSL	Regional Screening Level
SSI	Statistically Significant Increase
SSL	Statistically Significant Levels

APPENDIX **B**
Aquifer Test Results

HALEY ALDRICH

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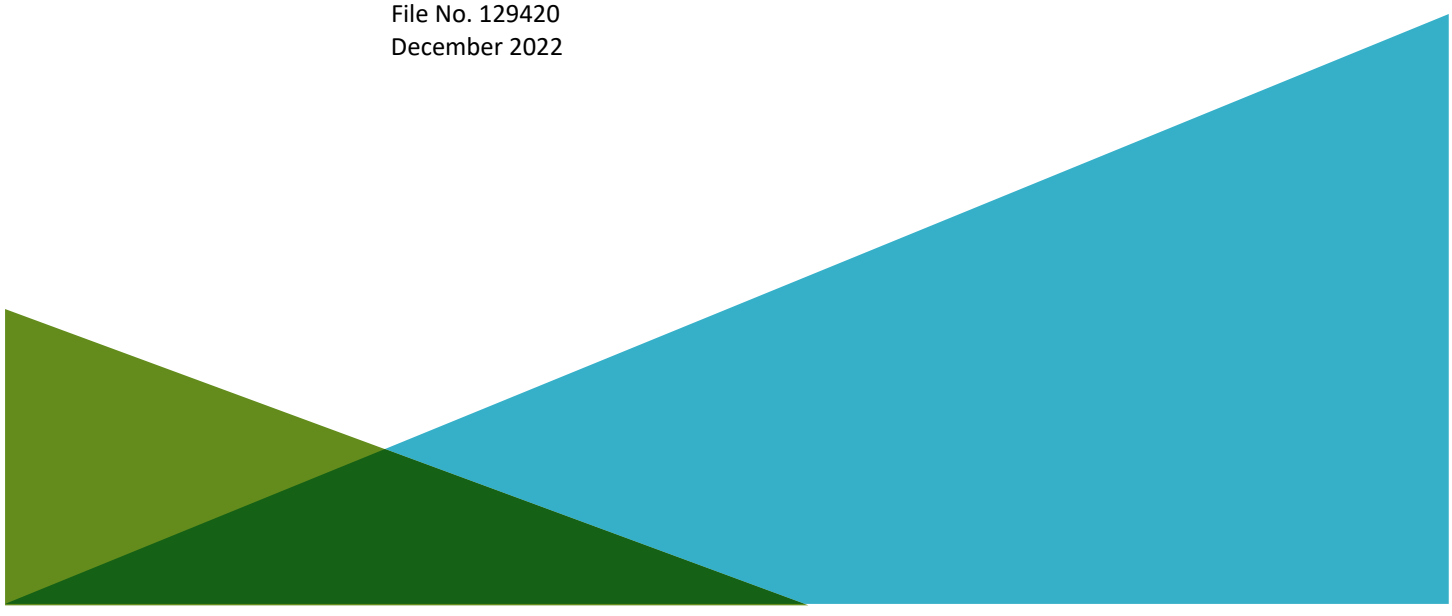
REPORT ON

AQUIFER PERFORMANCE TEST RESULTS
F.B. CULLEY GENERATING STATION
NEWBURGH, INDIANA

by
Haley & Aldrich, Inc.
Greenville, South Carolina

for
Southern Indiana Gas and Electric Company
Evansville, Indiana

File No. 129420
December 2022



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1. Introduction

Southern Indiana Gas and Electric Company (SIGECO) contracted Haley & Aldrich, Inc. (Haley & Aldrich) to characterize aquifer conditions beneath and downgradient of the F.B. Culley Generating Station East Ash Pond (EAP). The overall goal of the aquifer testing program was to adequately stress the aquifer to evaluate maximum sustainable pumping rates, measure water level response in nearby wells, calculate the hydraulic properties (transmissivity and storage) of the aquifer system, and record changes in groundwater quality parameters during the testing period. Aquifer characterization data were collected and analyzed to refine the groundwater flow and solute transport model in support of EAP closure planning and implementation. Activities to complete this work were performed in three phases:

- Phase One: Installation of nested observation wells by National Water Services, LLC (NWS)
- Phase Two: Installation of a pumping well by NWS
- Phase Three: Aquifer testing conducted by Haley & Aldrich with support from Cascade Environmental

2. Aquifer Test Field Methods

This section of the report drilling, samplings, and well installation procedures and data gathering activities conducted to characterize aquifer conditions beneath and downgradient of the EAP.

2.1 PUMPING WELL INSTALLATION

NWS installed the aquifer performance test pumping well (CCR-PW-1) using a bucket drill rig on the southerly berm of the EAP in a location that allowed for the strategic siting and installation of aquifer test observation wells. A 30-inch diameter borehole was drilled to a depth of approximately 70 feet at the contact with shale bedrock. Hydrostatic pressure was used to prevent borehole collapse. The pumping well was constructed with a 16-inch diameter, 20-foot-long, 0.07-inch machine-slotted stainless-steel screen and steel casing to surface. The well was constructed in place by welding 20-foot sections together before lowering into place by crane. Filter sand was added by gravity from the bottom of the borehole to approximately 43 feet followed by a six-foot-thick bentonite seal. The remaining annular space of the well was filled to the surface with a cement-bentonite grout slurry. After grout was cured, the steel well casing was cut to a level below grade and a concrete vault with manhole was installed at the surface to provide access and protection for the well.

After well completion, the pumping well was developed to remove fines from the well screen and promote an optimum hydraulic connection with the surrounding aquifer formation. Development was completed using twin disc surge and purge methods.

2.2 OBSERVATION WELL INSTALLATION

Observation wells were constructed between 10 feet and 100 feet to the east, west, and north of the pumping well as presented in Figure 1. These observations wells were installed to provide an array of locations to monitor response within the aquifer during the pumping test. NWS completed the drilling and construction of observation wells using conventional hollow stem auger drilling methods. The terminal depth of the observation wells was designed to correlate with nearby monitoring wells CCR-AP-8 and CCR-AP-8I. Observation well boring logs are provided in Appendix A.

Observation wells were constructed with 2-inch inner diameter schedule 40 polyvinyl chloride (PVC) casing; a 10-foot-long, 0.01-inch machine-slotted PVC screen; and a locking steel vault with a flush-mount cover. Filter sand was added by gravity from the bottom of the borehole to approximately 2 feet above the top of the well screen. A minimum of 2 feet of bentonite pellets was added by gravity above the sand pack to seal the well screen. The bentonite seal at location CCR-OW-5I, which was constructed within the footprint of the EAP, was placed across the contact between the pond ash and underlying alluvium with a minimum of 5 feet overlap. The annular space of each well was grouted to the surface to seal the well and prevent vertical migration of groundwater and/or surface water into the well.

After completion, the observation wells were developed to remove fines from the well screen and promote an optimum connection between the sand pack and surrounding aquifer. Development for observation wells was completed by surging and purging each well with a submersible pump.

2.3 PRESSURE TRANSDUCERS AND MULTIPARAMETER SONDES

Nineteen data logging pressure transducers and two multiparameter geochemical sondes were deployed prior to initiating the aquifer performance test on 18 October 2022. Because the transducers were non-vented units, a barometric pressure transducer was installed near CCR-OW-5I in the open air to measure barometric pressure changes before, during, and after the pumping test. Those measurements allow for groundwater level measurement to be adjusted for changes in barometric pressure before evaluating data to determine aquifer properties.

Nineteen data logging pressure transducers were installed in the following wells:

CCR-OW-1	CCR-OW-3I	CCR-AP-3	CCR-AP-6I
CCR-OW-1I	CCR-OW-4	CCR-AP-4	CCR-AP-8
CCR-OW-2	CCR-OW-4I	CCR-AP-5	CCR-AP-8I
CCR-OW-2I	CCR-OW-5I	CCR-AP-5I	CCR-PW-1
CCR-OW-3	CCR-AP-2	CCR-AP-6	

Multiparameter sondes were installed to monitor changes to the geochemical environment in the subsurface throughout pumping. Each sonde measured water level, specific conductivity, total dissolved solids, oxidation/reduction potential (ORP), dissolved oxygen, pH, and temperature.

Multiparameter sondes were installed at two observation wells (CCR-OW-2I and CCR-OW-3I).

2.4 INVESTIGATION DERIVED WASTE MANAGEMENT

Investigation derived wastes (IDW) were managed in accordance with requests of the Indiana Department of Natural Resources. Soil cuttings produced from drilling activities were collected and contained at the drilling location prior to being removed from within the designated flood plain area. Solid IDW were then relinquished to SIGECO for management.

Groundwater purged from the pumping well throughout the duration of the aquifer test was directly discharged into the EAP and thereafter managed by SIGECO. Additionally, water levels in the pond were monitored by SIGECO over the duration of the project to account for any hydraulic loading which could influence test results.

2.5 STEP TEST

Before initializing the 72-hour aquifer test, a step-drawdown test was conducted to determine an optimal pumping rate for the constant rate pumping test. The step-drawdown test consisted of four steps, each with a one-hour duration and included:

- Step 1: 3 gallons per minute (GPM)
- Step 2: 7 GPM
- Step 3: 12 GPM
- Step 4: 15 GPM

The pump was shut off after the conclusion of the fourth step and the aquifer was allowed to recover to 98 percent of initial starting conditions. A total of 2,192.5 gallons of groundwater was pumped during

the step-drawdown test. Figure 2 presents the drawdown and recovery curves associated with the step-drawdown test. Haley & Aldrich reviewed the results and determined a target pumping rate of 11 GPM to be optimal to sufficiently stress the aquifer system over the 72-hour aquifer test.

2.6 AQUIFER TEST

After groundwater levels recovered to pre-step-drawdown test levels, the 72-hour aquifer test was initialized with a target pumping rate of 11 GPM. Flow was monitored using an in-line digital flow meter and totalizer, recording flow in GPM and total flow in gallons. Water levels were monitored at one-minute intervals by the network of in-Situ pressure transducers in place and manually by on-site personnel using Solinst water level meters. Additionally, SIGECO facilities monitored and recorded the Ohio River stage elevation and EAP water levels on an hourly basis for the duration of the test.

Groundwater samples were collected from CCR-PW-1 purge water at regular intervals as specified in the work plan (Haley & Aldrich, Inc., 2022) via an in-line sampling port. Fourteen samples were collected in total over the duration of the 72-hours. A total of 47,922.1 gallons of groundwater was pumped during the test.

3. Data Evaluation

3.1 DATA PROCESSING

Measurements from data logging pressure transducers and a barometric pressure logger were exported into Microsoft Excel. Each data set was adjusted to a common time axis with one minute measurement frequency, relative to the start of the aquifer test. Measured barometric pressure was used to subtract barometric pressure from the total pressure recorded by the transducer to determine the hydrostatic pressures in each well. Hydrostatic pressure in each well was converted to water level elevations relative to mean sea level. Baseline water level data collected using transducers was compared with manually collected water level data and was found to be consistent and reliable.

Water level data was converted to feet of drawdown by choosing an index water level immediately prior to pumping that is consistent with baseline measurements collected over a period of 14 hours prior to testing. Two data sets were corrected for a disturbance to the transducer which caused an offset of sensor positioning in the well. The dataset for CCR-OW-3I was corrected for an offset of 0.35 feet and CCR-AP-8I was corrected for an offset of 0.09 feet.

Variability within the dataset was reviewed and confirmed to be related to the Ohio River stage. Figure 3 shows a correlation between Ohio River stage elevation and fluctuations observed in groundwater elevation. When compared with the variability of barometric pressure, river stage was found to be the primary influence on natural groundwater elevation variability.

3.2 PRESSURE TRANSDUCERS AND WATER LEVEL MEASUREMENTS

Data from the pressure transducers were downloaded on 23 October 2022. Barometric pressure changes during the pumping test were measured using an In-Situ BarroTROLL. After correcting the data sets to remove effects of barometric pressure, results were evaluated.

Groundwater elevation over time, barometric pressure, and Ohio River elevation are plotted on Figure 3. Findings from the time series data evaluation include:

- Instrumented monitoring wells and observation wells show a hydraulic connection to the Ohio River, indicated by a corresponding variation in groundwater to river stage fluctuation
- Six observations wells indicated a response to pumping at CCR-PW-1 including:

CCR-OW-1I	CCR-OW-4I
CCR-OW-2I	CCR-05I
CCR-OW-3I	CCR-AP-8I

3.3 DISTANCE DRAWDOWN AND RADIUS OF INFLUENCE

Depth to groundwater was measured continuously during the test to evaluate drawdown in the pumping well and surrounding observations wells. Those data along with the pumping rate (continuously monitored throughout the test) are presented on Figure 4. Maximum drawdown measured at the end of the 72-hour pumping period was plotted and contoured to determine the radius of influence (ROI) imparted by pumping at CCR-PW-1 (Figure 5). Measured drawdown versus distance from the pumping well were plotted to evaluate the theoretical drawdown in the pumping well and the

potential maximum ROI (Figure 6). Projection of the best fit line indicates a theoretical ROI of 3,060 feet. Based on measurements from surrounding observation wells, projected maximum drawdown at the pumping well appears to be approximately 1.6 feet. Actual measured drawdown during the pumping test was approximately 22 feet indicating a low efficiency pumping well. Additional evaluation of well efficiency to determine well skin effects or aquifer loss may be needed.

Spatial variability of pumping influence was evaluated by contouring the amount of drawdown measured in observation wells (Figure 5). The following observations were identified through this analysis:

- Pumping influence appears to be generally symmetrical with some potential horizontal anisotropy attributed to the extent of the sand unit associated with the pumping well screened interval.
- Pumping primarily influenced the intermediate groundwater zone, with no noteworthy influence measured in shallow observation wells.
- Drawdown in surrounding monitoring wells was relatively small compared to drawdown in the pumping well.

A constant head boundary condition (Ohio River) was observed at CCR-OW-1I, the most distant observation well. AQTESOLV analysis plots show potential recharge at CCR-OW-1I beginning approximately 100 minutes after pumping began (Appendix B).

3.4 AQUIFER PROPERTIES

Response to pumping at CCR-PW-1 occurred in the nearby intermediate observation wells within ten minutes of initiating the test. The farthest observed response was noted in CCR-OW-1I, approximately 100 feet from the pumping well. Water level response through time in observation wells, presented in Figure 4 and Figure 5, illustrates the ROI at 72 hours after the onset of pumping. Changes in water levels compared to the pre-pumping static water level before the start of the test were calculated in 1-minute intervals for the full duration of the test (pumping and recovery), approximately 90 hours.

Data was processed using the hydrologic analysis software AQTESOLV. A combined drawdown and recovery curve was plotted for each well that demonstrated a response to the pumping. The resulting curve was matched to solution curves generated based on inputted aquifer and well construction information. Drawdown/recovery curves from the observation wells best matched solutions for leaky confined aquifer systems, such as the Hantush-Jacob (1955)/Hantush (1964) without aquitard storage solutions. Matching drawdown/recovery curves using solution methods provide values for Transmissivity (T) and Storativity (S) of the aquifer system at the well locations, along with qualitative indications of the leakiness of the confining aquitard (Attachment B). Transmissivity was used to calculate hydraulic conductivity values (K) by dividing the calculated T by the aquifer thickness at the well location. A range of values determined for T, S, and K is provided below.

Aquifer Parameter	T (cm^2/S)	S (dimensionless)	K (cm/s)
Minimum	2.753	9.02×10^{-4}	1.06×10^{-2}
Maximum	21.870	1.33×10^{-2}	4.78×10^{-2}

These values are consistent with the type of soils observed during installation (silty to clean poorly graded sands). A summary of the T and S values for each well is provided in Table 1.

3.5 GROUNDWATER CONTOUR AND VELOCITY CALCULATIONS

Pumping test results indicate semi-confined conditions are present at the site. Groundwater elevation measurements collected before the start of pumping were used to develop groundwater flow maps for the shallow flow system (Figure 7) and the intermediate flow system (Figure 8). Hydraulic gradients for each flow system were determined to be 20.5 feet for the shallow flow system and 18.84 feet per foot for the intermediate flow system.

Groundwater seepage velocity for the intermediate flow system was calculated using gradients derived from groundwater elevation maps and properties calculated from pumping test results (geometric mean K value for intermediate wells of 45.81 feet per day).

$$V = Ki/ne$$

V = groundwater seepage velocity in feet per day
K = horizontal hydraulic conductivity in feet per day
i = horizontal groundwater gradient in feet per foot
ne = assumed effective porosity (0.25)

Intermediate flow system seepage velocity is estimated to be approximately 3,350 feet per day. Seepage velocity for the shallow system is estimated to be 218 feet per day (assuming K value of 2.65 feet per day derived for CCR-AP-5).

3.6 GROUNDWATER CONCENTRATION OVER TIME

Groundwater samples were collected from the pumping well and submitted for analysis of metals via United States Environmental Protection Agency method 6020 and geochemical parameters. Samples were collected every 3 hours during the first day of the test, every 6 hours during the second day of the test, and every 12 hours during the final day of the test. Constituent concentrations remained relatively stable throughout the pumping test. Time series plots of analytical results for arsenic are presented in Figure 9, boron in Figure 10 and molybdenum in Figure 11. Initial and final concentrations for those constituents are summarized below, and analytical results for all samples and constituents are summarized in Table 2.

CCR-PW-1 Groundwater Analytical Results	Initial (mg/L)	Final (mg/L)
Arsenic	0.0033 J	0.0035 J
Boron	22	20 ^-
Molybdenum	1.6	1.3

J: value is estimated
^-: Continuing Calibration Verification is outside acceptance limits, low biased

Multiparameter geochemical sondes measured water quality parameters pH and ORP continuously throughout the pumping test. pH remained stable in both CCR-OW-2I and CCR-OW-3I during the test as shown on Figure 12. ORP began to decline approximately 7 hours after pumping began and continued to decline throughout the duration of the test at both CCR-OW-2I and CCR-OW-3I, as shown on Figure 13.

4. Summary

Haley & Aldrich initiated a 72-hour pumping test on 19 October 2022 and concluded the test on 22 October 2022, pumping approximately 47,922 gallons of groundwater during the test. The pumping test successfully influenced the water level in the vicinity of the pumping well to allow for the calculation of aquifer properties, such as T, S, and K. In addition to measuring groundwater elevation and quantity, water quality was measured by collecting groundwater samples and monitoring geochemical changes in groundwater continuously throughout the test.

Semi-confined or leaky confined aquifer conditions were identified for the area near the pumping test. Those conditions suggest an interbedded system of permeable and less permeable units that form a multilayered flow system. Boring logs from the EAP also support the presence of a multilayered flow system, including a laterally extensive clay unit immediately beneath the pond. That clay unit likely contributes to the limited connection between the shallow water table associated with the EAP and deeper groundwater, as indicated by observed drawdown in the observation well network during the test. These conditions will be considered when designing water management strategies for pond closure, when evaluating corrective measure alternatives, and when selecting a groundwater remedy. Additionally, specific aquifer parameters (such as T, S, and K) calculated from pumping test data will be incorporated into the EAP groundwater flow model. That model can be used to simulate and evaluate the effectiveness of dewatering strategies, various groundwater remedial alternative designs, and ultimately help inform selection of a groundwater remedy.

Aquifer performance test findings are summarized below:

- Observations and analytical solutions indicate the intermediate flow system near the EAP behaves as a semi-confined or leaky confined aquifer system.
- Shallow groundwater elevation associated with ponded water was not influenced during pumping, indicating limited connectivity between groundwater beneath the clay unit at the base of the pond and water impounded in the EAP.
- Instrumented observation wells show a hydraulic connection to the Ohio River.
- In general, T, S, and K values are within the range of expected values for the soil types present at the site.
- Hydraulic conductivities determined for the intermediate flow zone are similar to but greater than values used in previous groundwater modeling efforts.
- The pumping well appears to be a low efficiency pumping well; potentially due to well skin effects.
- Constituent concentrations in groundwater, such as arsenic, boron, and molybdenum remained stable throughout the pumping test.
- While pH remained stable at both CCR-OW-2I and CCR-OW-3I throughout the pumping test, ORP began to decrease approximately 7 hours after pumping began and continued to decline throughout the remainder of the test.

References

1. Haley & Aldrich, Inc., 2022. Aquifer Characterization Work Plan

2. Hantush, M.S. and C.E. Jacob, 1955. Non-steady radial flow in an infinite leaky aquifer, Am. Geophys. Union Trans., vol. 36, no. 1, pp. 95-100.

3. Hantush, M.S., 1964. Hydraulics of wells, in: *Advances in Hydroscience*, V.T. Chow (editor), Academic Press, New York, pp. 281-442.

TABLES

TABLE 1

SUMMARY OF AQUIFER CHARACTERISTICS

F.B. CULLEY GENERATING STATION

NEWBURGH, INDIANA

Well ID	Transmissivity (cm^2/s)	Storativity	Leakage Parameter (*r/B*)	Saturated Thickness (ft)	Hydraulic Conductivity (cm/sec)
CCR-OW-1I	21.870	2.29E-03	0.1738	15	4.78E-02
CCR-OW-2I	3.630	6.19E-03	0.3236	10	1.19E-02
CCR-OW-3I	3.466	1.33E-02	0.3715	10	1.14E-02
CCR-OW-4I	4.364	8.13E-04	0.3981	10	1.43E-02
CCR-OW-5I	2.753	9.02E-04	0.5248	5	1.81E-02
CCR-AP-8I	3.889	1.68E-03	0.4898	12	1.06E-02

cm - centimeters

s - seconds

r/B - leakage parameter

ft - feet

TABLE 2
SUMMARY OF ANALYTICAL RESULTS
F.B. CULLEY GENERATING STATION
NEWBURGH, INDIANA

Location Name	CCR-PW-1	CCR-PW-1	CCR-PW-1	CCR-PW-1	CCR-PW-1	CCR-PW-1	CCR-PW-1	CCR-PW-1	CCR-PW-1	CCR-PW-1	CCR-PW-1	CCR-PW-1	CCR-PW-1	CCR-PW-1
Sample Name	AT-1-101922	AT-2-101922	AT-3-102022	AT-4-102022	AT-5-102022	AT-6-102022	AT-7-102022	AT-8-102022	AT-9-102022	AT-10-102122	AT-11-102122	AT-12-102122	AT-13-102222	AT-14-102222
Sample Date	10/19/2022	10/19/2022	10/20/2022	10/20/2022	10/20/2022	10/20/2022	10/20/2022	10/20/2022	10/20/2022	10/21/2022	10/21/2022	10/21/2022	10/22/2022	10/22/2022
Lab Sample ID	180-146720-2	180-146720-1	180-146720-3	180-146720-4	180-146720-5	180-146720-6	180-146720-7	180-146720-8	180-146810-1	180-146810-2	180-146810-3	180-146810-4	180-146810-5	180-146810-6
Inorganic Compounds (ug/L)														
Iron, Dissolved	**230**	100 U	100 U	100 U	100 U	**97 J**	**310**	**170**	**75 J^+**	**150**	**440**	**990**	**16000**	**15000**
Inorganic Compounds (mg/L)														
Arsenic, Total	**0.0033 J**	**0.0031 J**	**0.0058**	**0.0038 J**	**0.0029 J**	**0.0041 J**	**0.0027 J**	**0.003 J**	**0.0029 J**	**0.0027 J**	**0.0025 J**	**0.0034 J**	**0.0031 J**	**0.0035 J**
Barium, Total	**0.16**	**0.18**	**0.18**	**0.18**	**0.2**	**0.2**	**0.21**	**0.21**	**0.22**	**0.22**	**0.21**	**0.22**	**0.22**	**0.2**
Boron, Total	**22**	**22**	**22**	**21**	**22**	**22**	**22**	**21**	**25 ^-**	**22 ^-**	**22 ^-**	**22 ^-**	**21 ^-**	**20 ^-**
Cadmium, Total	**0.00046 J**	**0.00044 J**	**0.00046 J**	**0.00037 J**	**0.00045 J**	**0.00035 J**	**0.00042 J**	**0.00037 J**	**0.00035 J**	**0.00038 J**	**0.00032 J**	**0.00033 J**	**0.00032 J**	**0.00028 J**
Calcium, Total	**520**	**530**	**540**	**500**	**530**	**530**	**530**	**510**	**500**	**500**	**500**	**490**	**500**	**490**
Copper, Total	**0.0017 J**	0.002 U	0.002 U	0.002 U	0.002 U	**0.0074**	0.002 U	**0.0061**	0.002 U	0.002 U	**0.0077**	**0.013**	**0.0047**	**0.033**
Iron, Total	**17**	**17**	**18**	**17**	**18**	**18**	**18**	**17**	**16**	**16**	**16**	**16**	**16**	**16**
Magnesium, Total	**34**	**36**	**36**	**33**	**36**	**35**	**36**	**35**	**35**	**35**	**35**	**35**	**35**	**34**
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	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum, Total	**1.6**	**1.7**	**1.6**	**1.5**	**1.6**	**1.6**	**1.6**	**1.5**	**1.4**	**1.4**	**1.4**	**1.4**	**1.3**	**1.3**
Nickel, Total	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	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Potassium, Total	**88**	**92**	**95**	**90**	**98**	**99**	**100**	**100**	**110**	**110**	**110**	**110**	**120**	**120**
Quartz, Total	**20**	**20**	**20**	**18**	**19**	**19**	**19**	**19**	**20**	**20**	**20**	**20**	**19**	**20**
Selenium, Total	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Silver, Total	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Sodium, Total	**94**	**97**	**99**	**94**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**110**	**110**
Strontium, Stable, Total	**2.1**	**2.1**	**2.1**	**2**	**2.1**	**2.1**	**2.1**	**2.1**	**2**	**2**	**2**	**2**	**2**	**2**
Zinc, Total	**0.13**	**0.1**	**0.098**	**0.097**	**0.08**	**0.094**	**0.093**	**0.13**	**0.086**	**0.089**	**0.1**	**0.082**	**0.076**	**0.08**
Cyanide (free)	**0.0011 J**	**0.0016 J**	**0.0011 J**	**0.007**	**0.0039**	**0.0011 J**	**0.0048**	**0.005**	0.002 U	**0.0018 J**	**0.002**	**0.0089**	**0.0026**	0.002 U
Other														
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	**240**	**240**	**230**	**230**	**230**	**230**	**220**	**230**	**230**	**230**	**240**	**240**	**230**	**240**
Alkalinity, Total (as CaCO3) (mg/L)	**240**	**240**	**230**	**230**	**230**	**230**	**220**	**230**	**230**	**230**	**240**	**240**	**230**	**240**
Chloride (mg/L)	**190**	**190**	**200**	**220**	**200**	**220**	**220**	**240**	**260**	**270**	**260**	**260**	**250**	**280**
Fluoride (mg/L)	**0.2 J**	**0.25**	**0.16 J**	**0.39**	**0.32**	**0.32**	**0.15 J**	**0.16 J**	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Sulfate (mg/L)	**1200**	**1300**	**1200**	**1300**	**1100**	**1200**	**1200**	**1300**	**1300**	**1300**	**1200**	**1200**	**1100**	**1200**
Total Dissolved Solids (TDS) (mg/L)	**2600**	**2600**	**2500**	**2600**	**2600**	**2600**	**2600**	**2600**	**2600 H**	**2600**	**2600**	**2600**	**2600**	**2600**

ABBREVIATIONS AND NOTES:

CCR: Coal Combustion Residuals.
mg/L: milligram per liter.
ug/L: microgram per liter.
^-: Continuing Calibration Verification (CCV) is outside acceptance limits, low biased.
^+: Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.
J: value is estimated
U: not detected, value is the reporting limit
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

- MONITORING WELL
- OBSERVATION WELL
- PRODUCTION WELL
- EAST ASH POND

NOTES

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

N

0 80 160

SCALE IN FEET

HALEY ALDRICH

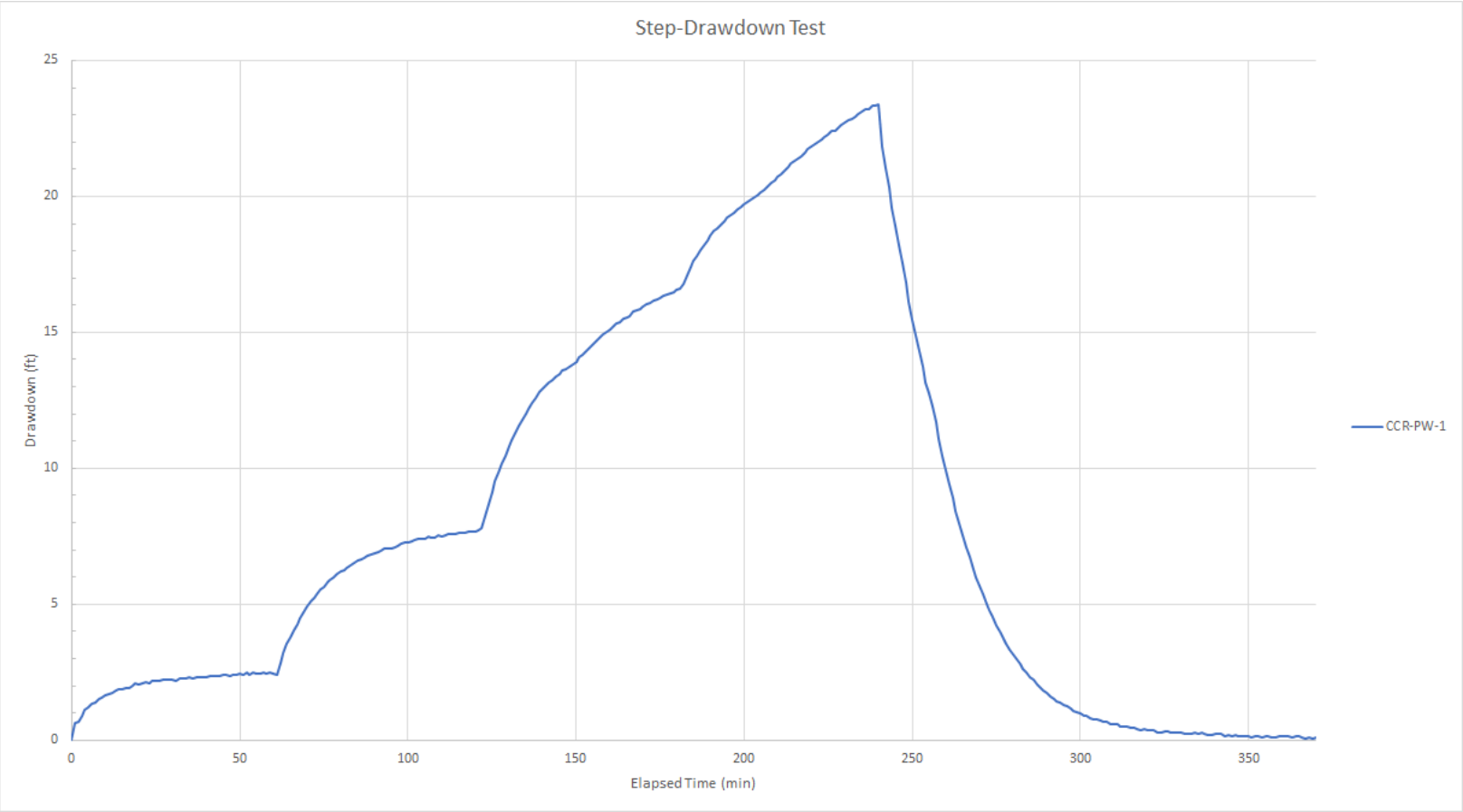
SOUTHERN INDIANA GAS AND ELECTRIC COMPANY
F.B. CULLEY GENERATING STATION
EAST ASH POND
NEWBURGH, INDIANA

AQUIFER PERFORMANCE TEST CONFIGURATION

DECEMBER 2022

FIGURE 1

GIS FILE PATH: C:\Users\hwachholz\Documents\working\superseded\442796_EVANSVILLE\GIS\Maps\2022_04\133274_000_0001_PROPOSED_WELL_LOCATIONS.mxd — USER: hwachholz — LAST SAVED: 4/7/2022 12:29:59 PM



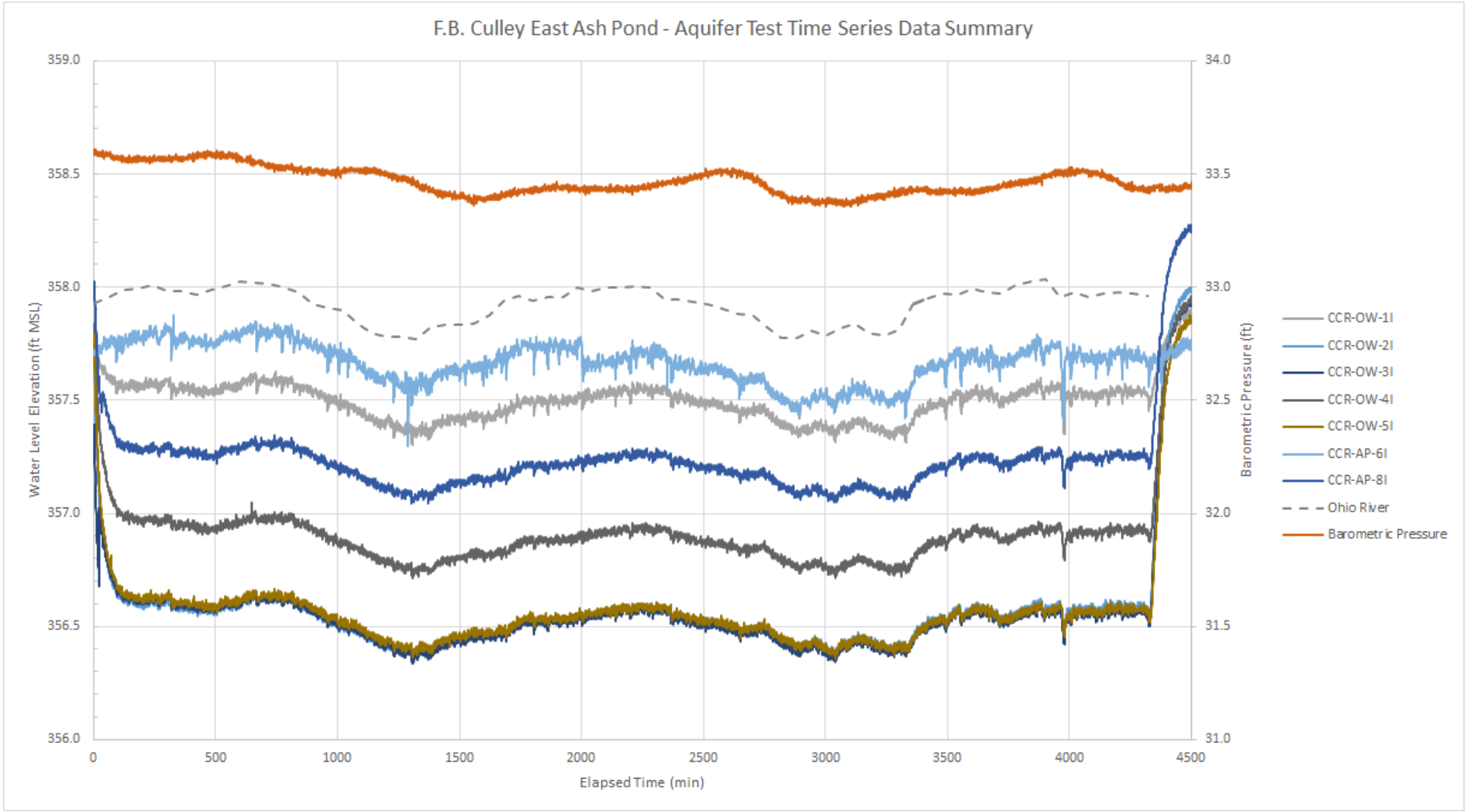
HALEY ALDRICH

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

CCR-PW-1 STEP-DRAWDOWN TEST

DECEMBER 2022

FIGURE 2



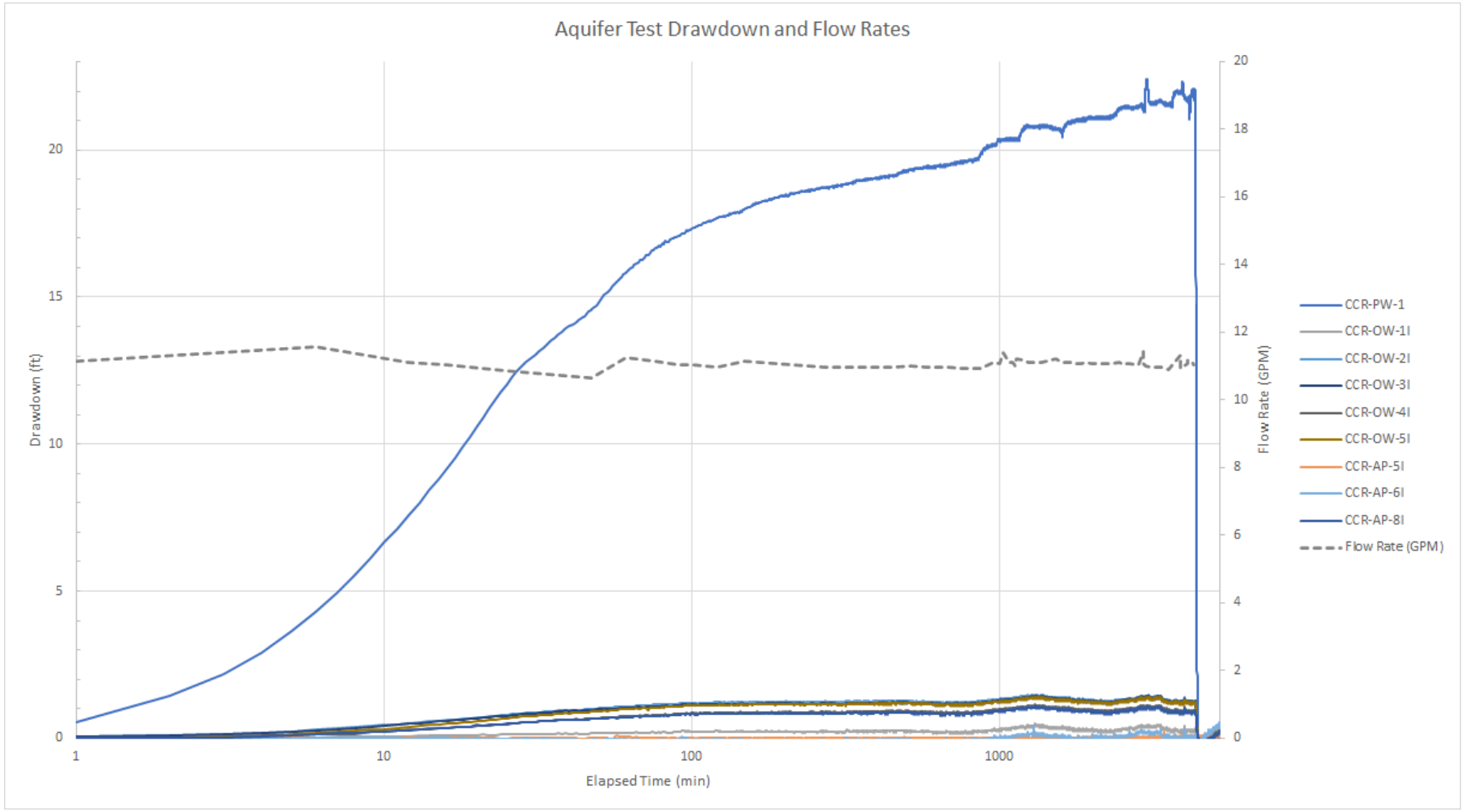
HALEY ALDRICH

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

AQUIFER PERFORMANCE TEST TIME SERIES DATA SUMMARY

DECEMBER 2022

FIGURE 3



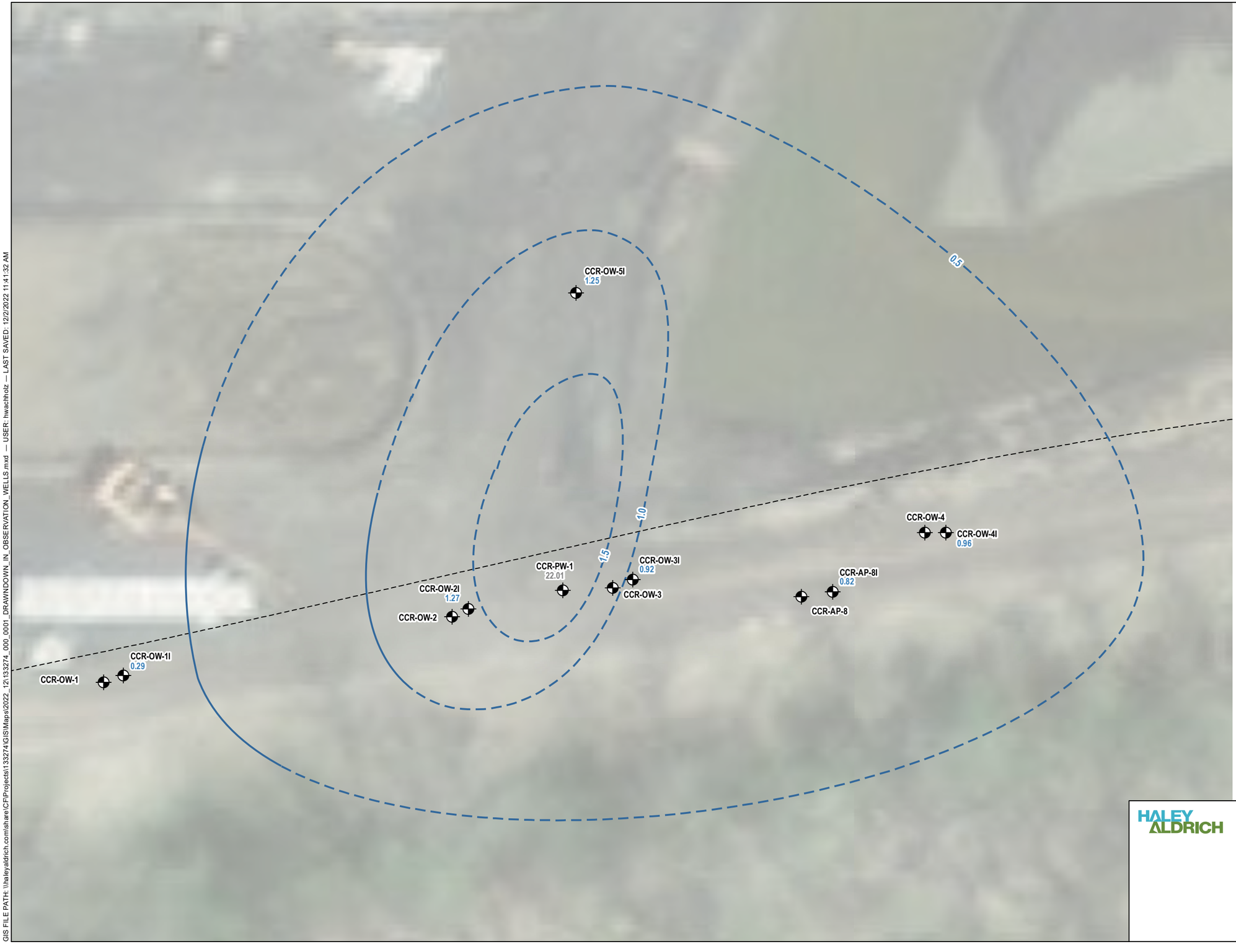
HALEY ALDRICH

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

AQUIFER PERFORMANCE TEST DRAWDOWN CURVES AND PUMPING RATE

DECEMBER 2022

FIGURE 4



LEGEND

- MONITORING WELL
- FEET OF DRAWDOWN IN OBSERVATION WELL
- EAST ASH POND

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. DRAWDOWN OBSERVED ON 22 OCTOBER 2022 AT 1510 CST.
3. AERIAL IMAGERY SOURCE: ESRI

N

0 20 40
SCALE IN FEET

HALEY ALDRICH

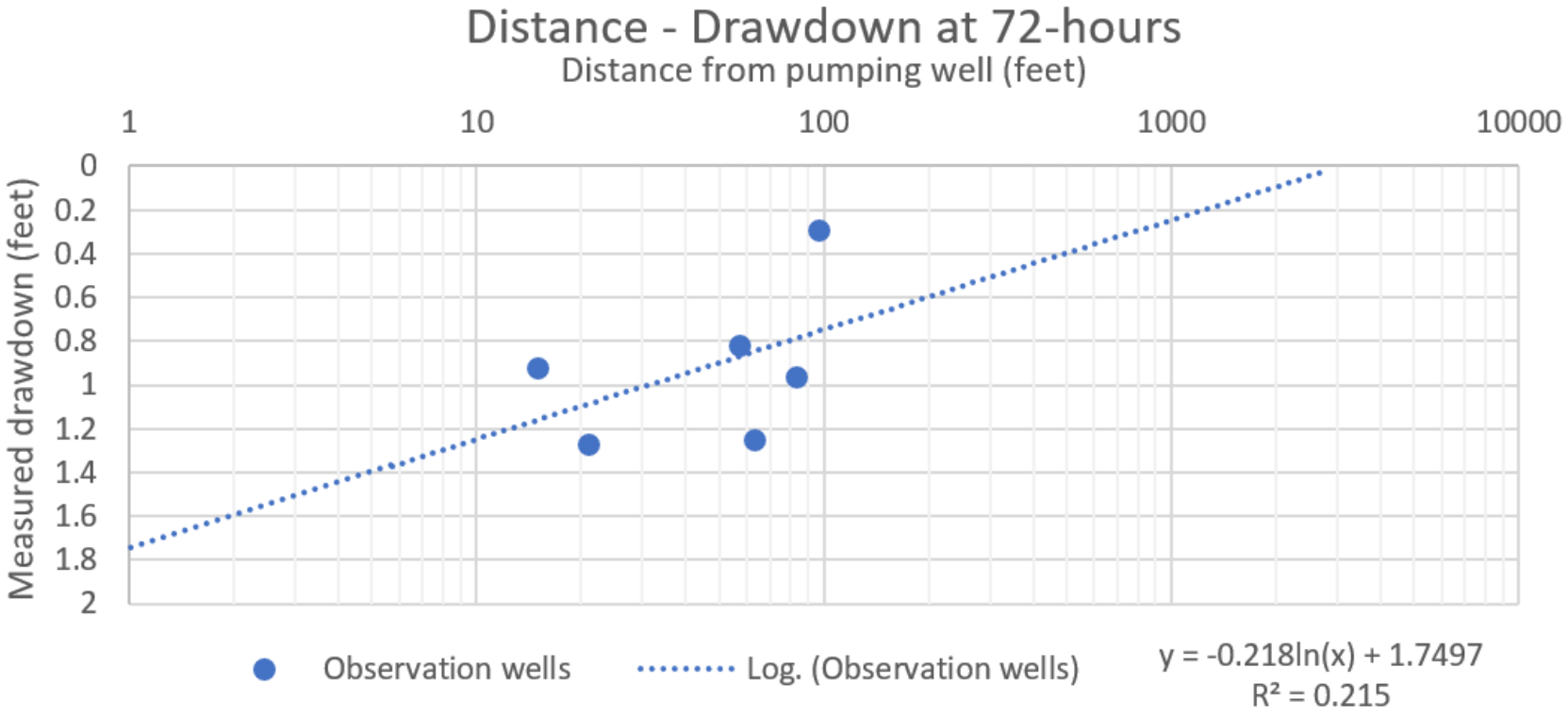
SOUTHERN INDIANA GAS AND ELECTRIC COMPANY
F.B. CULLEY GENERATING STATION
EAST ASH POND
NEWBURGH, INDIANA

RADIUS OF INFLUENCE AT 72-HOURS

DECEMBER 2022

FIGURE 5

GIS FILE PATH: \\haleyaldrich.com\share\CPProjects\133274\GIS\Maps\2022_12\133274_000_0001_DRAWNDOWN_IN_OBSERVATION_WELLS.mxd — USER: hwachholz — LAST SAVED: 12/2/2022 11:41:32 AM



Theoretical Maximum Radius of Influence: 3060 feet

Theoretical drawdown at pumping well: 1.6 feet

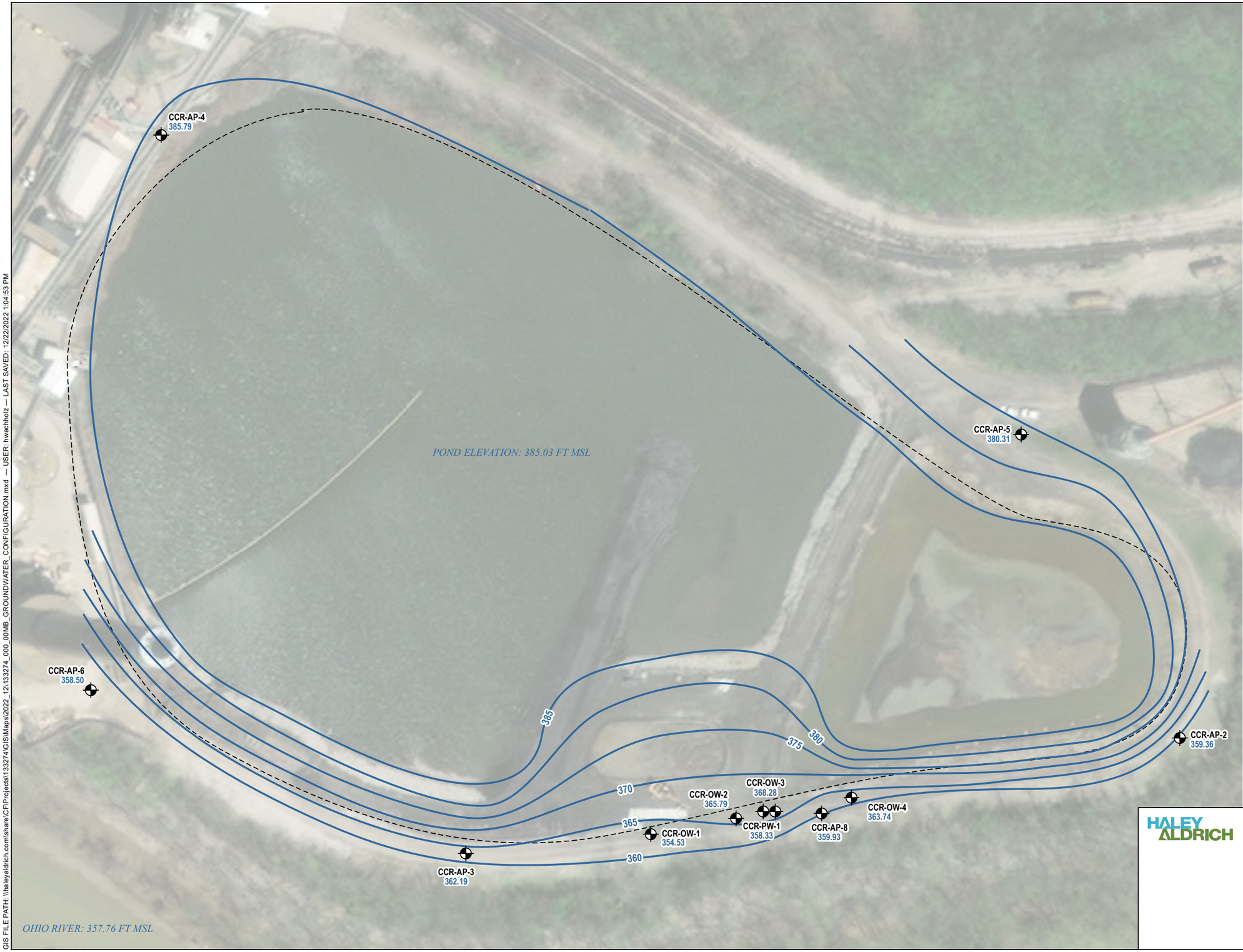
HALEY ALDRICH

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

DISTANCE DRAWDOWN AT 72-HOURS

DECEMBER 2022

FIGURE 6



LEGEND

- MONITORING WELL
- GROUNDWATER ELEVATION CONTOUR, 5-FT INTERVAL
- EAST ASH POND

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. WATER LEVEL DATA COLLECTED BY A NETWORK OF PRESSURE TRANSDUCERS.
3. RIVER STAGE DATA COLLECTED BY CENTERPOINT FACILITY.
4. POND STAGE DATA COLLECTED BY CENTERPOINT FACILITY.
5. WATER LEVELS WERE COLLECTED ON 18 OCTOBER 2022 AT 18:00.
6. AERIAL IMAGERY SOURCE: ESRI

N

0 80 160
SCALE IN FEET

HALEY ALDRICH

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

SHALLOW GROUNDWATER CONFIGURATION - OCTOBER 2022

DECEMBER 2022

FIGURE 7

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\133274\GIS\Maps\2022_12\133274_000_00MB_GROUNDWATER_CONFIGURATION.mxd — USER: hwachholz — LAST SAVED: 12/22/2022 1:04:53 PM

LEGEND

- MONITORING WELL
- GROUNDWATER ELEVATION CONTOUR, 5-FT INTERVAL
- EAST ASH POND

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. WATER LEVEL DATA COLLECTED BY A NETWORK OF PRESSURE TRANSDUCERS.
3. RIVER STAGE DATA COLLECTED BY CENTERPOINT FACILITY.
4. POND STAGE DATA COLLECTED BY CENTERPOINT FACILITY.
5. WATER LEVELS WERE COLLECTED ON 18 OCTOBER 2022 AT 18:00.
6. AERIAL IMAGERY SOURCE: ESRI

N

0 80 160
SCALE IN FEET

HALEY ALDRICH

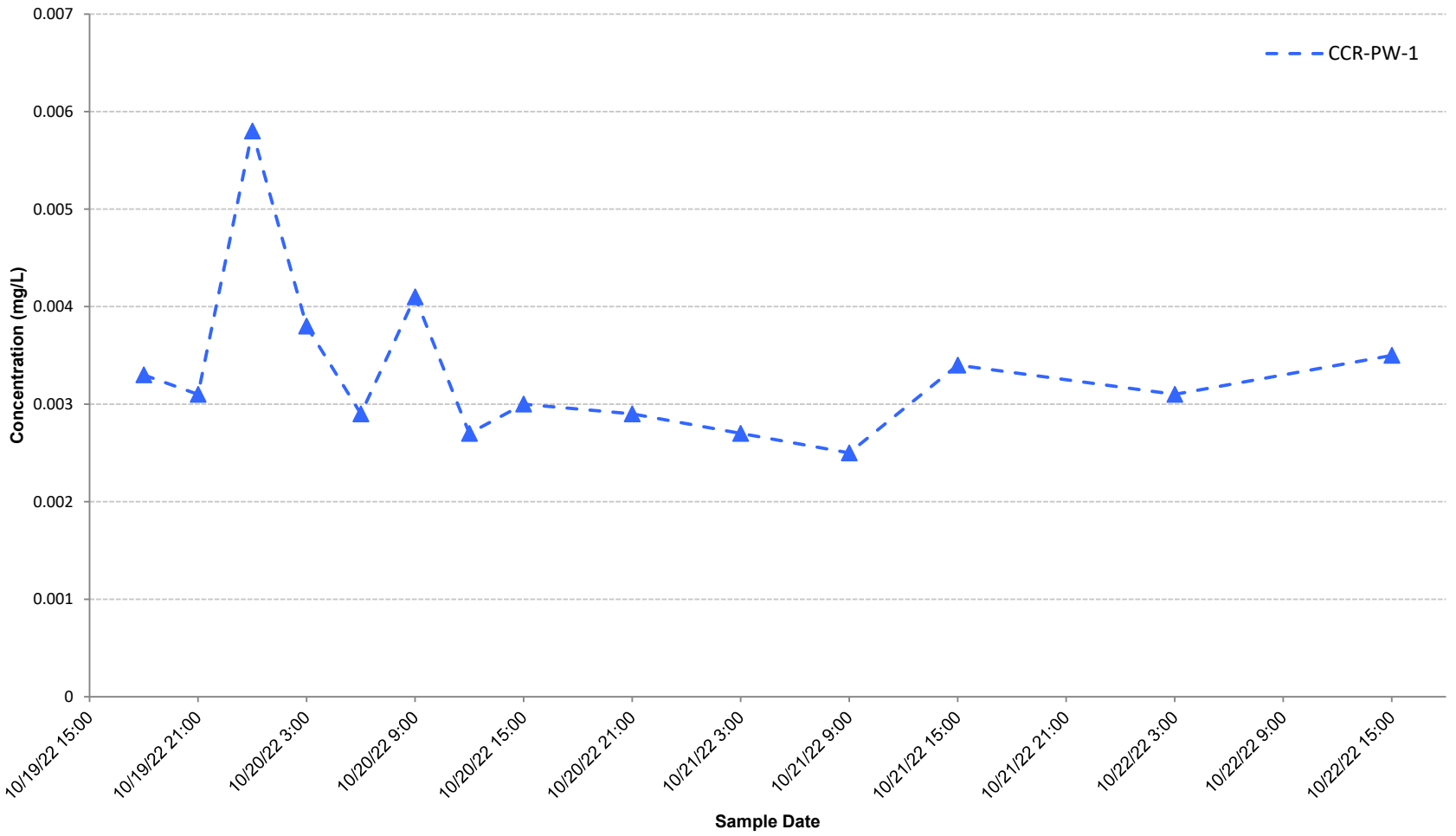
SOUTHERN INDIANA GAS AND ELECTRIC COMPANY
F.B. CULLEY GENERATING STATION
EAST ASH POND
NEWBURGH, INDIANA

INTERMEDIATE GROUNDWATER CONFIGURATION - OCTOBER 2022

DECEMBER 2022

FIGURE 8

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\133274\GIS\Maps\2022_12\133274_000_00MB_GROUNDWATER_CONFIGURATION.mxd — USER: hwachholz — LAST SAVED: 12/22/2022 1:04:53 PM



NOTES:

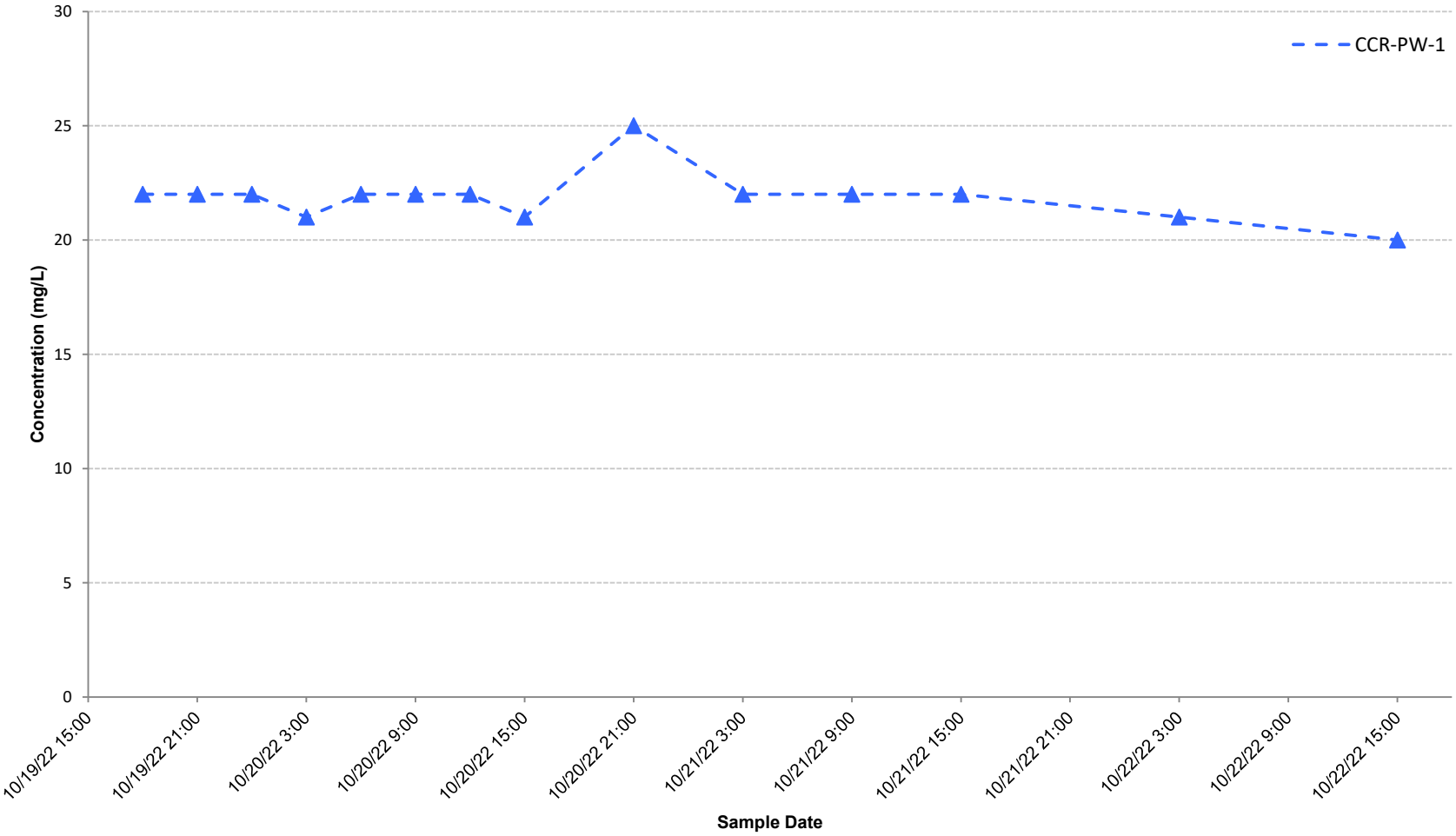
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.

HALEY ALDRICH

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

ARSENIC CONCENTRATION OVER TIME

DECEMBER 2022 FIGURE 9



NOTES:

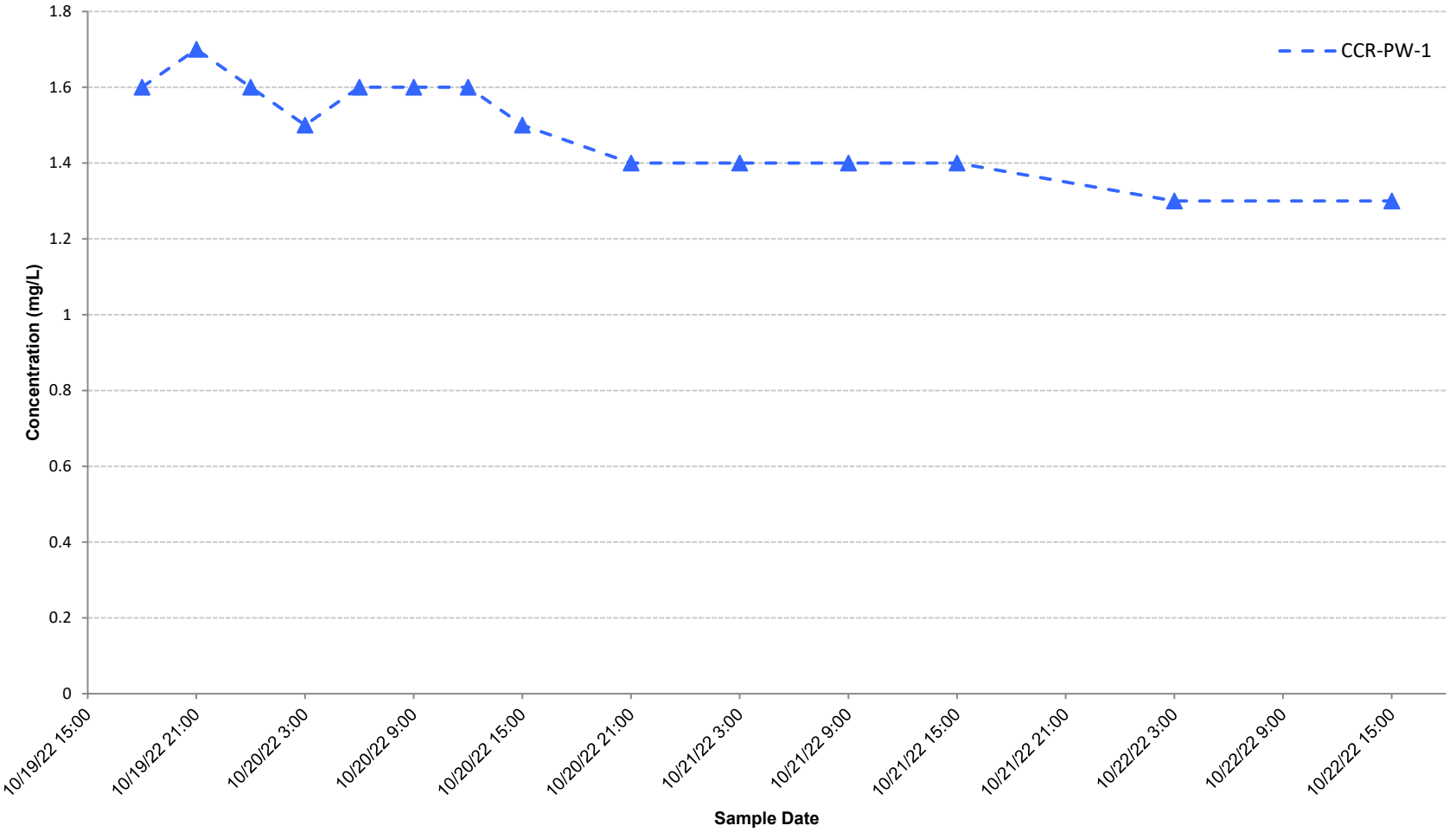
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.

HALEY ALDRICH

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

BORON CONCENTRATION OVER TIME

DECEMBER 2022 FIGURE 10



NOTES:

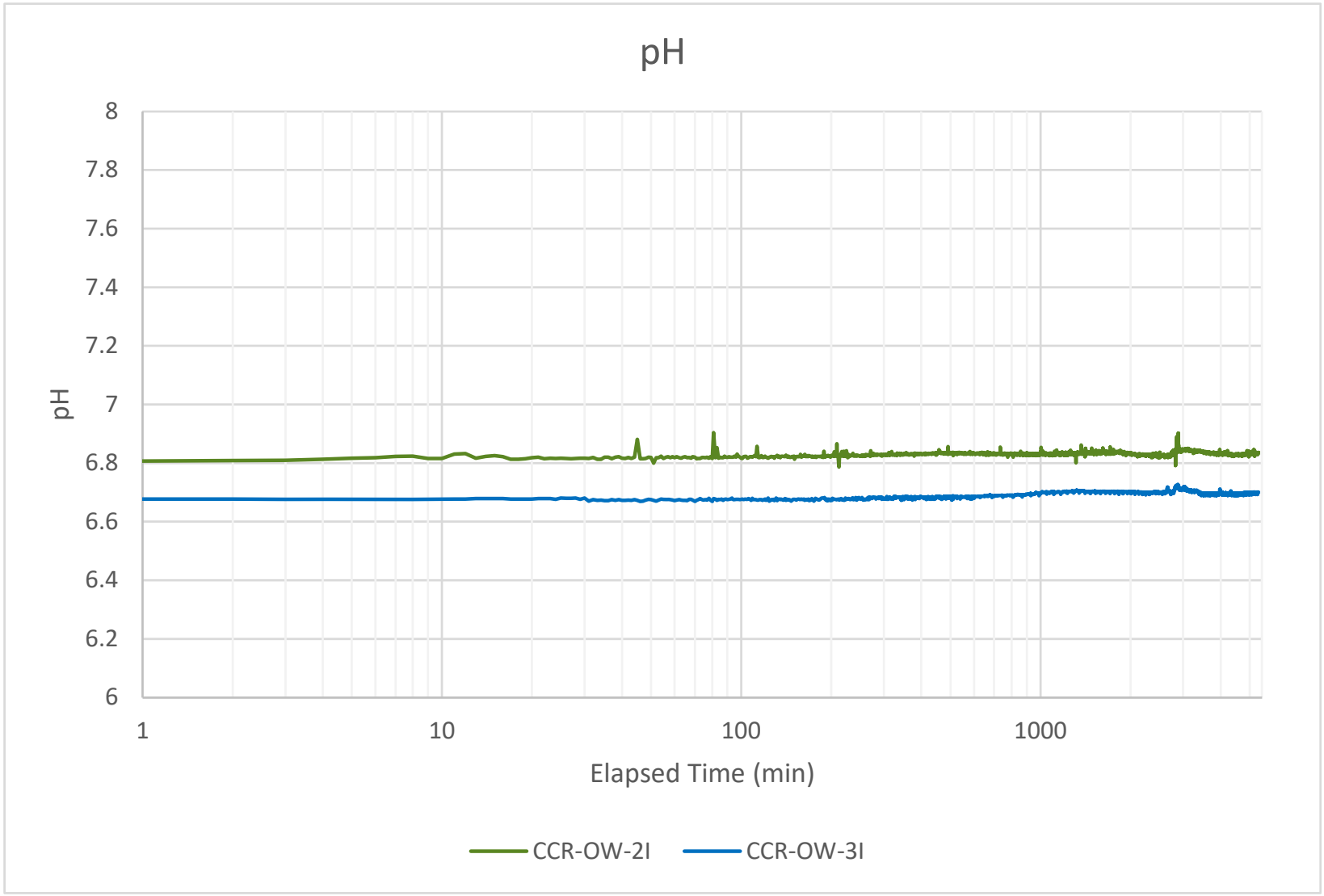
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.

HALEY ALDRICH

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

MOLYBDENUM CONCENTRATION OVER TIME

DECEMBER 2022 FIGURE 11



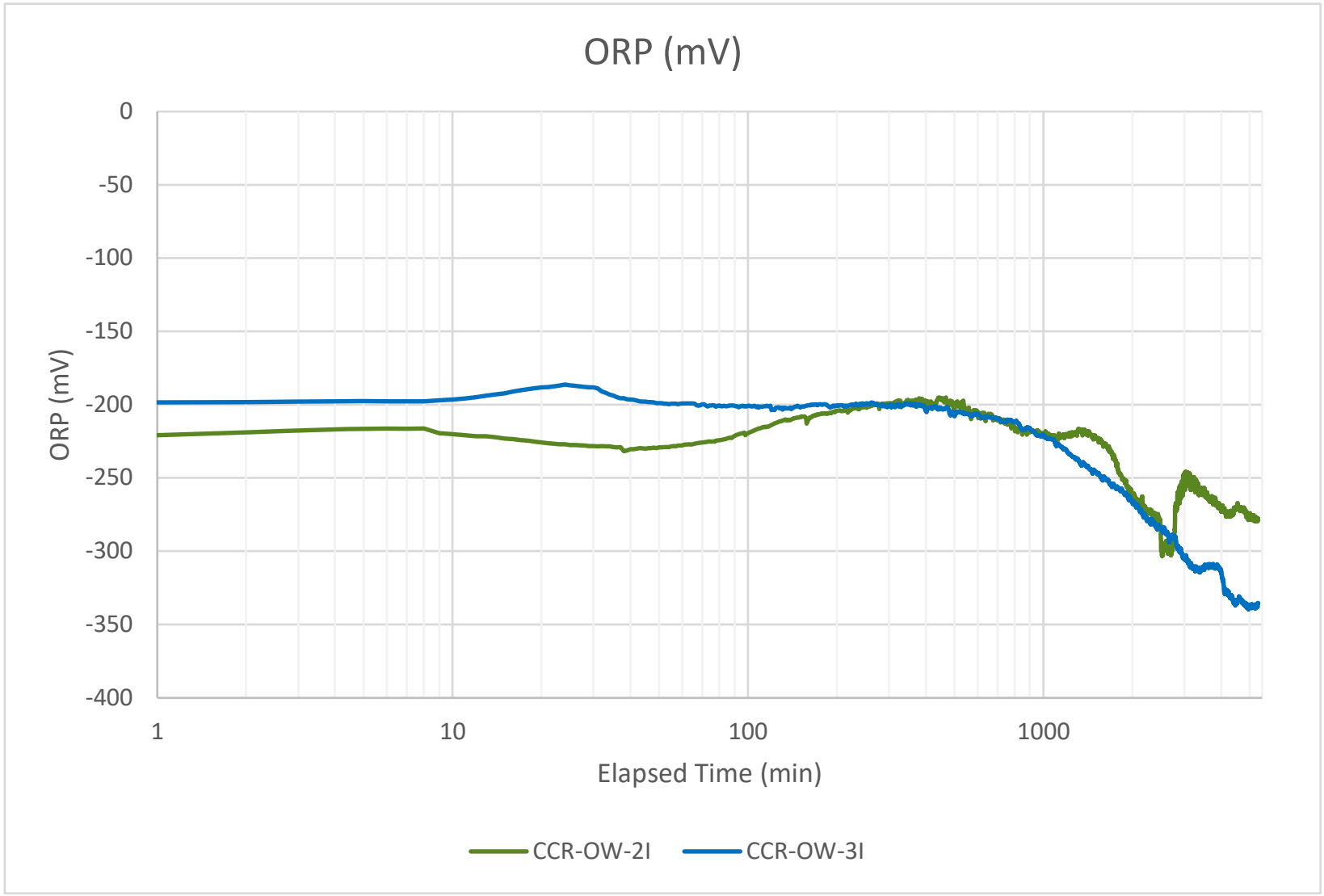
HALEY ALDRICH

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

pH OVER TIME

DECEMBER 2022

FIGURE 12



HALEY ALDRICH

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

ORP OVER TIME

DECEMBER 2022

FIGURE 13

APPENDIX A
Boring Logs

TEST BORING REPORT

Boring No. CCR-OW-1

Project	F.B. Culley, Indiana
Client	SIGECO
Contractor	National Water Services, LLC

File No. 129420-034
Sheet No. 1 of 2
Start June 21, 2022
Finish June 21, 2022
Driller J. Hackney
H&A Rep. K. Henning
Elevation 395.0 (est.)
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	-	S	-	Rig Make & Model: Direct Rotary
Inside Diameter (in.)	-	1 3/8	4	Bit Type: Hollow Stem Auger
Hammer Weight (lb)	-	140	-	Drill Mud: None
Hammer Fall (in.)	-	30	-	Casing: Open Hole
				Hoist/Hammer:
				PID Make & Model: None

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							GRAVEL and SAND roadbase material -FILL-	50	40	5			5				
5				ML			Stiff dark brown SILT (ML), no structure, no odor					10	90				
10				ML		385.0 10.0	Dense dark brown SILT (ML), no structure, no odor					10	90				
15				MH		380.0 15.0	Dark brown elastic SILT with sand (ML), no structure, no odor				5	10	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) 48.0
Rock Cored (ft) -
Samples -

Boring No. CCR-OW-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 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-OW-1
File No. 129420-034
Sheet No. 2 of 2

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
20				MH			Same as above				5	10	85				
						370.0											
25				CL		25.0	Soft brown lean CLAY with sand (CL), no structure, no odor, wet				5	10	85				
30				CL			Same as above				5	10	85				
35				CL			Same as above				5	10	85				
40				CL			Soft dark brown CLAY (CL), no structure, no odor, wet				5	10	85				
45				ML		350.0 45.0	Dark brown sandy SILT (ML), no structure, no odor, very wet					30	50				
						347.0 48.0	BOTTOM OF EXPLORATION 48.0 FT										

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

Boring No. CCR-OW-1

TEST BORING REPORT

Boring No. CCR-OW-1I

Project	F.B. Culley, Indiana
Client	SIGECO
Contractor	National Water Services, LLC

File No. 129420-034
Sheet No. 1 of 3
Start June 20, 2022
Finish June 20, 2022
Driller J. Hackney
H&A Rep. K. Henning
Elevation Datum 397.0 (est.)
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	-	S	-	Rig Make & Model: Direct Rotary
Inside Diameter (in.)	-	1 3/8	4	Bit Type: Hollow Stem Auger
Hammer Weight (lb)	-	140	-	Drill Mud: None
Hammer Fall (in.)	-	30	-	Casing: Open Hole
				Hoist/Hammer:
				PID Make & Model: None

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							GRAVEL and SAND roadbase material -FILL-	50	40	5			5				
5				ML			Stiff dark brown SILT (ML), no structure, no odor				5	5	90				
10				ML		387.0 10.0	Dense dark brown SILT (ML), no structure, no odor				5	5	90				
15				MH		382.0 15.0	Dark brown elastic SILT with sand (ML), no structure, no odor				5	10	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) 70.4
Rock Cored (ft) -
Samples -

Boring No. CCR-OW-1I

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-OW-1I
File No. 129420-034
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
20				MH			Same as above				5	10	85				
						372.0											
25				CL		25.0	Soft brown lean CLAY (CL), no structure, no odor, wet				5	5	85				
30				CL			Same as above				5	5	85				
35				CL			Same as above				5	5	85				
40				CL			Soft dark brown lean CLAY (CL), no structure, no odor, wet				5	5	85				
						352.0											
45				ML		45.0	Dark brown sandy SILT (ML), no structure, no odor, very wet				20	30	50				

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

Boring No. CCR-OW-1I

TEST BORING REPORT

Boring No. CCR-OW-1I
File No. 129420-034
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
50						344.0											
				MH		53.0	Dense dark brown elastic SILT with sand (MH), no structure, no odor, wet, trace wood fragments				10	15	75				
55																	
60				MH			Same as above				10	15	75				
65				MH			Dark brown sandy elastic SILT, no structure, no odor, wet				10	20	70				
70						326.6											
						70.4	BOTTOM OF EXPLORATION 70.4 FT										

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

Boring No. CCR-OW-1I

TEST BORING REPORT

Boring No. CCR-OW-2

Project	F.B. Culley, Indiana
Client	SIGECO
Contractor	National Water Services, LLC

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	-	S	-	Rig Make & Model: Direct Rotary
Inside Diameter (in.)	-	1 3/8	4	Bit Type: Hollow Stem Auger
Hammer Weight (lb)	-	140	-	Drill Mud: None
Hammer Fall (in.)	-	30	-	Casing: Open Hole
				Hoist/Hammer:
				PID Make & Model: None

File No.	129420-034
Sheet No.	1 of 2
Start	June 30, 2022
Finish	June 30, 2022
Driller	J. Hackney
H&A Rep.	K. Henning
Elevation Datum	397.0 (est.)
Location	See Plan

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				GW			Hard well graded GRAVEL (GW), no structure, no odor										
						392.0											
5				CL		5.0	Brown CLAY (CL), no structure, no odor					10	90				
10				CL			Same as above					10	90				
15				CL			Same as above					10	90				
20																	

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

Sample ID	Well Diagram	Summary	
O - Open End Rod	Riser Pipe	Overburden (ft)	46.0
T - Thin Wall Tube	Screen	Rock Cored (ft)	-
U - Undisturbed Sample	Filter Sand	Samples	-
S - Split Spoon Sample	Cuttings		
	Grout	**Boring No.**	**CCR-OW-2**
	Concrete		
	Bentonite Seal		

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.

HALEY ALDRICH

TEST BORING REPORT

Boring No. CCR-OW-2
File No. 129420-034
Sheet No. 2 of 2

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
20				CL			Same as above					10	90				
25				CL			Same as above, except moist					10	90				
30				CL			Same as above, except moist					10	90				
35				CL			Brown compact lean CLAY with sand (CL), no structure, no odor, wet				5	10	85				
40				CL			Same as above				5	10	85				
45				CL			Same as above				5	10	85				
						351.0 46.0	BOTTOM OF EXPLORATION 46.0 FT										

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

Boring No. CCR-OW-2

TEST BORING REPORT

Boring No. CCR-OW-2I

Project	F.B. Culley, Indiana
Client	SIGECO
Contractor	National Water Services, LLC

File No. 129420-034
Sheet No. 1 of 3
Start July 5, 2022
Finish July 5, 2022
Driller J. Hackney
H&A Rep. K. Henning
Elevation 397.0 (est.)
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	-	S	-	Rig Make & Model: Direct Rotary
Inside Diameter (in.)	-	1 3/8	4	Bit Type: Hollow Stem Auger
Hammer Weight (lb)	-	140	-	Drill Mud: None
Hammer Fall (in.)	-	30	-	Casing: Open Hole
				Hoist/Hammer:
				PID Make & Model: None

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							Thick GRAVEL -FILL-										
5				CL			Brown compact lean CLAY (CL), no structure, no odor, dry/moist					10	90				
10				CL			Same as above					10	90				
15				CL			Same as above					10	90				
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) 68.0
Rock Cored (ft) -
Samples -

Boring No. CCR-OW-2I

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.

HALEY ALDRICH

TEST BORING REPORT

Boring No. CCR-OW-2I

File No. 129420-034
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
20				CL			Same as above					10	90				
25				CL			Same as above					10	90				
30				CL			Same as above					10	90				
35				CL			Brown compact lean CLAY (CL), no structure, no odor, moist, increasing wetness					10	90				
40				CL			Same as above					10	90				
45				CL			Same as above					10	90				

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

Boring No. CCR-OW-2I

TEST BORING REPORT

Boring No. CCR-OW-2I
File No. 129420-034
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
50				CL			Same as above					10	90				
				CL			Brownish-gray compact lean CLAY (CL), no odor, wet, trace organic					10	90				
55				CL			Brown lean CLAY (CL), no odor, very wet					10	90				
						339.0											
				SC		58.0	Clayey SAND (SP), very wet				20	40	40				
60																	
				SC			Same as above				20	40	40				
65																	
						329.0	-TOP OF BEDROCK AT 68.0 FT-										
						68.0	BOTTOM OF EXPLORATION 68.0 FT										

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

Boring No. CCR-OW-2I

TEST BORING REPORT

Boring No. CCR-OW-3

Project	F.B. Culley, Indiana
Client	SIGECO
Contractor	National Water Services, LLC

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	-	S	-	Rig Make & Model: Direct Rotary
Inside Diameter (in.)	-	1 3/8	4	Bit Type: Hollow Stem Auger
Hammer Weight (lb)	-	140	-	Drill Mud: None
Hammer Fall (in.)	-	30	-	Casing: Open Hole
				Hoist/Hammer:
				PID Make & Model: None

File No.	129420-034
Sheet No.	1 of 2
Start	June 28, 2022
Finish	June 28, 2022
Driller	J. Hackney
H&A Rep.	K. Henning
Elevation Datum	397.0 (est.)
Location	See Plan

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				GP			Thick GRAVEL (GP), no structure, no odor -FILL-										
						391.0 6.0											
				CL			Dense dark brown lean CLAY (CL), no structure, no odor, moist					10	90				
10				CL			Same as above					10	90				
15				CL			Same as above					10	90				
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)	47.0
Rock Cored (ft)	-
Samples	-

Boring No. CCR-OW-3

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-OW-3
File No. 129420-034
Sheet No. 2 of 2

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
20				CL			Same as above					10	90				
25				CL			Dense brown lean CLAY (CL), no structure, no odor, moist/wet					10	90				
30				CL			Same as above					10	90				
35				CL			Same as above					10	90				
40				CL			Dense dark brown lean CLAY (CL), no structure, no odor, wet					10	90				
45				CL			Same as above					10	90				
						350.0 47.0	BOTTOM OF EXPLORATION 47.0 FT										

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

Boring No. CCR-OW-3

TEST BORING REPORT

Boring No. CCR-OW-3I

Project	F.B. Culley, Indiana
Client	SIGECO
Contractor	National Water Services, LLC

File No. 129420-034
Sheet No. 1 of 3
Start June 20, 2022
Finish June 20, 2022
Driller J. Hackney
H&A Rep. K. Henning
Elevation 397.0 (est.)
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	-	S	-	Rig Make & Model: Direct Rotary
Inside Diameter (in.)	-	1 3/8	4	Bit Type: Hollow Stem Auger
Hammer Weight (lb)	-	140	-	Drill Mud: None
Hammer Fall (in.)	-	30	-	Casing: Open Hole
				Hoist/Hammer:
				PID Make & Model: None

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				GW			Gray well graded GRAVEL (GW), no structure, no odor, dry										
							-FILL-										
						390.0											
				CL		7.0	Brown lean CLAY (CL), no structure, no odor, dry					10	90				
5																	
10																	
15				CL			Brown lean CLAY (CL), no structure, no odor					10	90				
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) 70.0
Rock Cored (ft) -
Samples -

Boring No. CCR-OW-3I

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-OW-3I
File No. 129420-034
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
20				CL			Same as above					10	90				
25				CL			Same as above					10	90				
30				CL			Same as above					10	90				
35				CL			Same as above					10	90				
40				CL			Same as above					10	90				
45				CL			Brown lean CLAY with sand (CL), no structure, no odor, moist				5	10	85				

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

Boring No. CCR-OW-3I

TEST BORING REPORT

Boring No. CCR-OW-3I
File No. 129420-034
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
50				CL			Brown lean CLAY with sand (CL), no structure, no odor, dry/moist, some fine sand				10	10	80				
				CL			Brown lean CLAY with sand (CL), no structure, no odor				5	15	80				
55																	
						337.0											
60				SC		60.0	Clayey SAND (SC), no structure, organic odor, with pebbles and wood			15	20	20	45				
65																	
						327.0	-TOP OF SHALE AT 70.0 FT-										
70						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-OW-3I

TEST BORING REPORT

Boring No. CCR-OW-4

Project	F.B. Culley, Indiana
Client	SIGECO
Contractor	National Water Services, LLC

File No. 129420-034
Sheet No. 1 of 2
Start June 27, 2022
Finish June 27, 2022
Driller J. Hackney
H&A Rep. K. Henning
Elevation Datum 397.0 (est.)
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	-	S	-	Rig Make & Model: Direct Rotary
Inside Diameter (in.)	-	1 3/8	4	Bit Type: Hollow Stem Auger
Hammer Weight (lb)	-	140	-	Drill Mud: None
Hammer Fall (in.)	-	30	-	Casing: Open Hole
				Hoist/Hammer:
				PID Make & Model: None

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							GRAVEL and SAND roadbase material -FILL-										
				ML			Stiff dark brown SILT with sand (ML), no structure, no odor, moist				5	15	80				
				MH		390.0 / 7.0	Brown elastic SILT (MH), no structure, no odor				5	5	90				
10																	
				MH			Stiff brown elastic SILT (ML), no structure, no odor, moist					10	90				
15																	
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)	47.0
Rock Cored (ft)	-
Samples	-

Boring No. CCR-OW-4

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.

HALEY ALDRICH

TEST BORING REPORT

Boring No. CCR-OW-4
File No. 129420-034
Sheet No. 2 of 2

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
20				MH			Medium dense gray-brown elastic SILT (ML), no structure, no odor, moist, trace wood fragments				5	5	90				
25				MH			Medium dense brownish-gray elastic SILT with sand (ML), no structure, no odor, very wet				5	10	85				
30																	
35				MH			Dense brownish-gray elastic SILT with sand (ML), no structure, no odor, wet				5	10	85				
40																	
45				MH			Dense brown elastic SILT with sand (ML), no structure, no odor, wet				5	10	85				
						350.0 47.0	BOTTOM OF EXPLORATION 47.0 FT										

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

Boring No. CCR-OW-4

TEST BORING REPORT

Boring No. CCR-OW-4I

Project	F.B. Culley, Indiana
Client	SIGECO
Contractor	National Water Services, LLC

File No. 129420-034
Sheet No. 1 of 3
Start June 27, 2022
Finish June 27, 2022
Driller J. Hackney
H&A Rep. K. Henning
Elevation Datum 397.0 (est.)
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	-	S	-	Rig Make & Model: Direct Rotary
Inside Diameter (in.)	-	1 3/8	4	Bit Type: Hollow Stem Auger
Hammer Weight (lb)	-	140	-	Drill Mud: None
Hammer Fall (in.)	-	30	-	Casing: Open Hole
				Hoist/Hammer:
				PID Make & Model: None

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							GRAVEL and SAND roadbase material -FILL-										
				ML			Stiff dark brown SILT with sand (ML), no structure, no odor, moist				5	15	80				
						390.0 7.0											
				MH			Brown elastic SILT (MH), no structure, no odor					10	90				
10																	
				MH			Stiff brown elastic SILT (ML), no structure, no odor, moist					10	90				
15																	
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)	69.0
Rock Cored (ft)	-
Samples	-

Boring No. CCR-OW-4I

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-OW-4I
File No. 129420-034
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
20				MH			Medium dense gray-brown elastic SILT (ML), no structure, no odor, moist, trace wood fragments					10	90				
25				MH			Medium dense brownish-gray elastic SILT with sand (ML), no structure, no odor, very wet				5	10	85				
30																	
35				MH			Dense brownish-gray elastic SILT with sand (ML), no structure, no odor, wet				5	10	85				
40																	
45				MH			Dense brown elastic SILT with sand (ML), no structure, no odor, wet				5	10	85				

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

Boring No. CCR-OW-4I

TEST BORING REPORT

Boring No. CCR-OW-4I
File No. 129420-034
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
50																	
55				CL		342.0 55.0	Dark brown lean CLAY with sand (CL), no structure, no odor, very wet				10	15	75				
60																	
65				CL			Same as above				10	15	75				
						328.0 69.0	BOTTOM OF EXPLORATION 69.0 FT										

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

Boring No. CCR-OW-4I

TEST BORING REPORT

Boring No. CCR-OW-5I

Project	F.B. Culley, Indiana
Client	SIGECO
Contractor	National Water Services, LLC

File No. 129420-034
Sheet No. 1 of 3
Start July 6, 2022
Finish July 6, 2022
Driller J. Hackney
H&A Rep. K. Henning
Elevation Datum 397.0 (est.)
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	-	S	-	Rig Make & Model: Direct Rotary
Inside Diameter (in.)	-	1 3/8	4	Bit Type: Hollow Stem Auger
Hammer Weight (lb)	-	140	-	Drill Mud: None
Hammer Fall (in.)	-	30	-	Casing: Open Hole
				Hoist/Hammer:
				PID Make & Model: None

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				ASH			Loose black coal ASH, no structure, no odor, moist				30	20	50				
				ASH			Medium stiff brownish-black coal ASH, no structure, no odor, moist				30	20	50				
5				ASH			Medium stiff brownish-black coal ASH, no structure, no odor, moist				30	20	50				
10				ASH			Loosely stiff brownish-black coal ASH, no structure, no odor, moist				30	20	50				
15				ASH			Loosely brownish-black coal ASH, no structure, no odor, wet				30	20	50				
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)	63.0
Rock Cored (ft)	-
Samples	-

Boring No. CCR-OW-5I

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-OW-5I
File No. 129420-034
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
20				ASH			Loose brown-black coal ASH, no structure, no odor, wet				30	20	50				
25				ASH			Very loose black-brown coal ASH, increasingly wet				20	20	60				
30				ASH			Very loose black-brown coal ASH, very wet				20	20	60				
35				ASH			Same as above										
						358.0											
40				CL		39.0	Dark brown lean CLAY with silt (CL)					10	90				
45				CL			Brown lean CLAY (CL), very wet					10	90				

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

Boring No. CCR-OW-5I

HALEY ALDRICH

TEST BORING REPORT

Boring No. CCR-OW-5I

File No. 129420-034
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
50				CL			Thin 1/2 in. layer clayey SAND				10	50	40				
						338.0											
55				SW-SC		59.0	Well-graded SAND with clay (SW-SC), fines upwards, inclusions of rounded pebbles			10	30	20	40				
						334.0	-TOP OF BEDROCK AT 63.0 FT-										
60						63.0	BOTTOM OF EXPLORATION 63.0 FT										

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

Boring No. CCR-OW-5I

H&A-TEST BORING-09 REV 129420.GLB HA-TB+CORE+WELL-07-2 W FENCE.GDT \\HALEYALDRICH.COM\SHARE\CF\PROJECTS\129420\GINT\2022_129420-034OW.GPJ Jan 3, 23

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

Well No. CCR-OW-1

Project	F.B. Culley
Location	Indiana
Client	SIGECO
Contractor	NWS
Driller	J. Hackney
Initial Water Level (depth bgs)	ft

Well Diagram

- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

File No.	129420-034
Date Installed	21 Jun 2022
H&A Rep.	K. Henning
Location	See Plan
Ground El.	395.0 (est.)
Datum	

SOIL/ROCK CONDITIONS	DEPTH (ft.)	GRAPHIC	WELL DETAILS	DEPTH (ft.)	ELEVATION (ft.)
				0.0	395.0
FILL	48.0			1.5	393.5
				4.4	390.6
				36.0	359.0
				46.0	349.0
				46.3	348.7
				48.0	347.0

WELL CONSTRUCTION DETAILS

Type of protective cover	Bolted - 9/16" hex.
Depth of below ground surface	0.0 ft
Depth of top of riser below ground surface	0.0 ft
Type of protective casing	
Length	
Inside diameter	
Depth of bottom of	ft
Type of riser pipe	Schedule 40 PVC
Inside diameter of riser pipe	2.0 in.
Depth of bottom of riser pipe	36.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	1.5
Bentonite	1.5	2.9
Sand	34.0	14.0
	-	-

Diameter of borehole	8.0 in.
Depth to top of well screen	36.0 ft
Type of screen	Machine slotted Sch 40 PVC
Screen gauge or size of openings	0.010 in.
Diameter of screen	2.0 in.
Type of Backfill around Screen	Filter Pack Sand
Depth to bottom of well screen	46.0 ft
Bottom of silt trap	46.4 ft
Depth of bottom of well	48.0 ft
Depth of bottom of borehole	48.0 ft

COMMENTS:

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

Well No. CCR-OW-1I

Project	F.B. Culley
Location	Indiana
Client	SIGECO
Contractor	NWS
Driller	J. Hackney
Initial Water Level (depth bgs)	ft

Well Diagram

- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

File No.	129420-034
Date Installed	20 Jun 2022
H&A Rep.	K. Henning
Location	See Plan
Ground El.	397.0 (est.)
Datum	

SOIL/ROCK CONDITIONS	DEPTH (ft.)	GRAPHIC	WELL DETAILS	DEPTH (ft.)	ELEVATION (ft.)
				0.0	397.0
				1.5	395.5
FILL				56.5	340.5
				60.0	337.0
	70.4			70.0	327.0

WELL CONSTRUCTION DETAILS

Type of protective cover	Bolted - 9/16" hex.
Depth of below ground surface	0.0 ft
Height of top of riser above ground surface	0.5 ft
Type of protective casing	
Length	
Inside diameter	
Depth of bottom of	ft
Type of riser pipe	Schedule 40 PVC
Inside diameter of riser pipe	2.0 in.
Depth of bottom of riser pipe	60.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	1.5
Bentonite	1.5	56.5
	-	-
	-	-

Diameter of borehole	8.0 in.
Depth to top of well screen	60.0 ft
Type of screen	Machine slotted Sch 40 PVC
Screen gauge or size of openings	0.010 in.
Diameter of screen	2.0 in.
Type of Backfill around Screen	Filter Pack Sand
Depth to bottom of well screen	70.0 ft
Bottom of silt trap	70.3 ft
Depth of bottom of well	70.4 ft
Depth of bottom of borehole	70.4 ft

COMMENTS:

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

Well No. CCR-OW-2

Project F.B. Culley
Location Indiana
Client SIGECO
Contractor NWS
Driller J. Hackney

Initial Water Level (depth bgs) ft

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

File No. 129420-034
Date Installed 30 Jun 2022
H&A Rep. K. Henning
Location See Plan

Ground El. 397.0 (est.)
Datum

SOIL/ROCK CONDITIONS	DEPTH (ft.)	GRAPHIC	WELL DETAILS	DEPTH (ft.)	ELEVATION (ft.)
				0.0	397.0
				1.5	395.5
FILL				33.0	364.0
				34.0	363.0
				44.0	353.0
				45.7	351.3
	46.0				

WELL CONSTRUCTION DETAILS

Type of protective cover: Bolted - 9/16" hex.
Depth of below ground surface: 0.0 ft
Depth of top of riser below ground surface: 0.0 ft
Type of protective casing:
Length:
Inside diameter:
Depth of bottom of: ft
Type of riser pipe: Schedule 40 PVC
Inside diameter of riser pipe: 2.0 in.
Depth of bottom of riser pipe: 34.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	1.5
Bentonite	1.5	31.5
Sand	33.0	13.0
	-	-

Diameter of borehole: 8.0 in.
Depth to top of well screen: 34.0 ft
Type of screen: Machine slotted Sch 40 PVC
Screen gauge or size of openings: 0.010 in.
Diameter of screen: 2.0 in.
Type of Backfill around Screen: Filter Pack
Depth to bottom of well screen: 44.0 ft
Bottom of silt trap: 45.7 ft
Depth of bottom of well: 46.0 ft
Depth of bottom of borehole: 46.0 ft

COMMENTS:

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

Well No. CCR-OW-2I

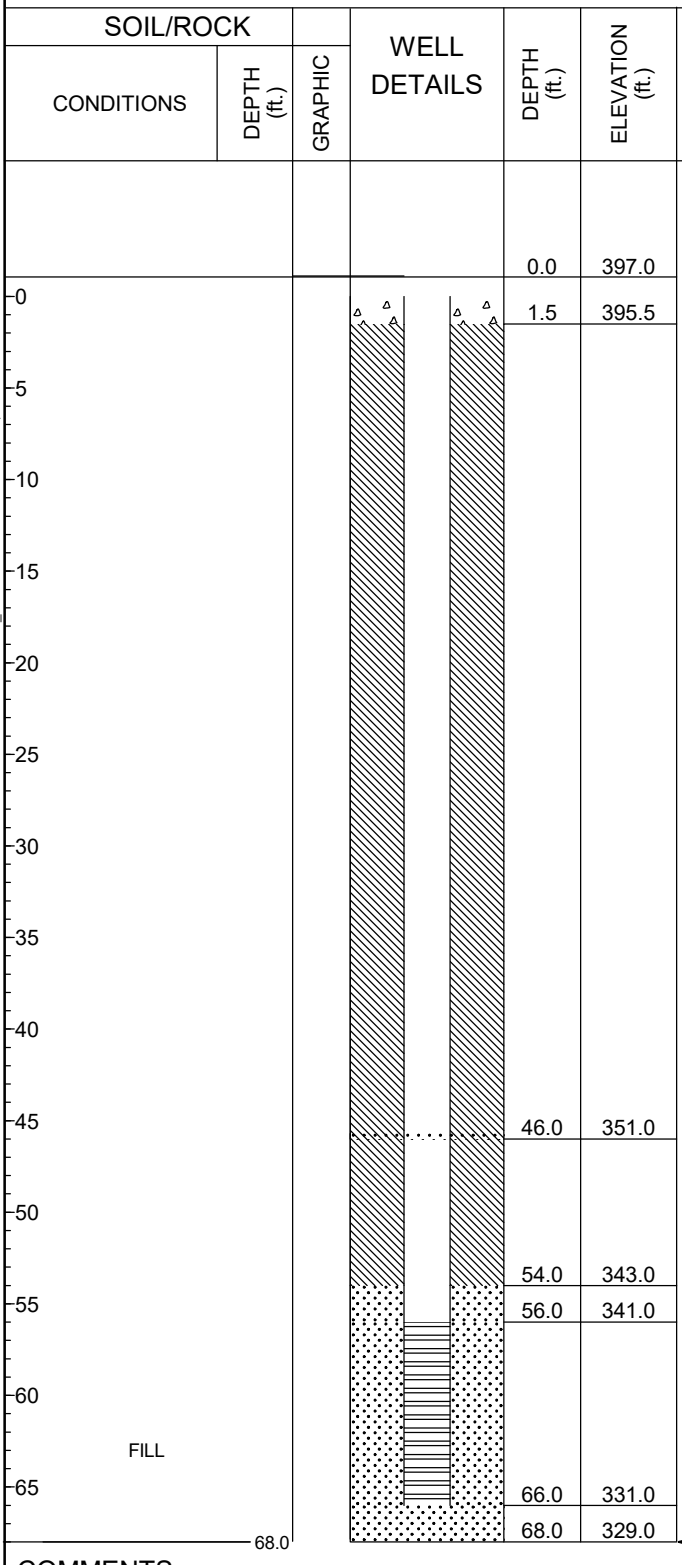
Project F.B. Culley
Location Indiana
Client SIGECO
Contractor NWS
Driller J. Hackney

Initial Water Level (depth bgs) ft

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

File No. 129420-034
Date Installed 5 Jul 2022
H&A Rep. K. Henning
Location See Plan

Ground El. 397.0 (est.)
Datum



WELL CONSTRUCTION DETAILS

Type of protective cover: Bolted - 9/16" hex.
Depth of below ground surface: 0.0 ft
Depth of top of riser below ground surface: 0.0 ft
Type of protective casing:
Length:
Inside diameter:
Depth of bottom of: ft
Type of riser pipe: Schedule 40 PVC
Inside diameter of riser pipe: 2.0 in.
Depth of bottom of riser pipe: 56.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	1.5
Bentonite	1.5	52.5
Sand	54.0	14.0
	-	-

Diameter of borehole: 8.0 in.
Depth to top of well screen: 56.0 ft
Type of screen: Machine slotted Sch 40 PVC
Screen gauge or size of openings: 0.010 in.
Diameter of screen: 2.0 in.
Type of Backfill around Screen: Filter Pakc
Depth to bottom of well screen: 66.0 ft
Bottom of silt trap: 0.0 ft
Depth of bottom of well: 68.0 ft
Depth of bottom of borehole: 68.0 ft

COMMENTS:

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

Well No. CCR-OW-3

Project F.B. Culley
Location Indiana
Client SIGECO
Contractor NWS
Driller J. Hackney

Initial Water Level (depth bgs) ft

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

File No. 129420-034
Date Installed 28 Jun 2022
H&A Rep. K. Henning
Location See Plan

Ground El. 397.0 (est.)
Datum

SOIL/ROCK CONDITIONS	DEPTH (ft.)	GRAPHIC	WELL DETAILS	DEPTH (ft.)	ELEVATION (ft.)
				0.0	397.0
FILL				1.5	395.5
				34.0	363.0
				35.0	362.0
				45.0	352.0
				46.7	350.3
	47.0				

WELL CONSTRUCTION DETAILS

Type of protective cover: Bolted - 9/16" hex.
Depth of below ground surface: 0.0 ft
Depth of top of riser below ground surface: 0.0 ft
Type of protective casing:
Length:
Inside diameter:
Depth of bottom of: ft
Type of riser pipe: Schedule 40 PVC
Inside diameter of riser pipe: 2.0 in.
Depth of bottom of riser pipe: 35.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	1.5
Bentonite	1.5	32.5
Sand	34.0	13.0
	-	-

Diameter of borehole: 8.0 in.
Depth to top of well screen: 35.0 ft
Type of screen: Machine slotted Sch 40 PVC
Screen gauge or size of openings: 0.010 in.
Diameter of screen: 2.0 in.
Type of Backfill around Screen: Filter Pack Sand
Depth to bottom of well screen: 45.0 ft
Bottom of silt trap: 46.6 ft
Depth of bottom of well: 47.0 ft
Depth of bottom of borehole: 47.0 ft

COMMENTS:

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

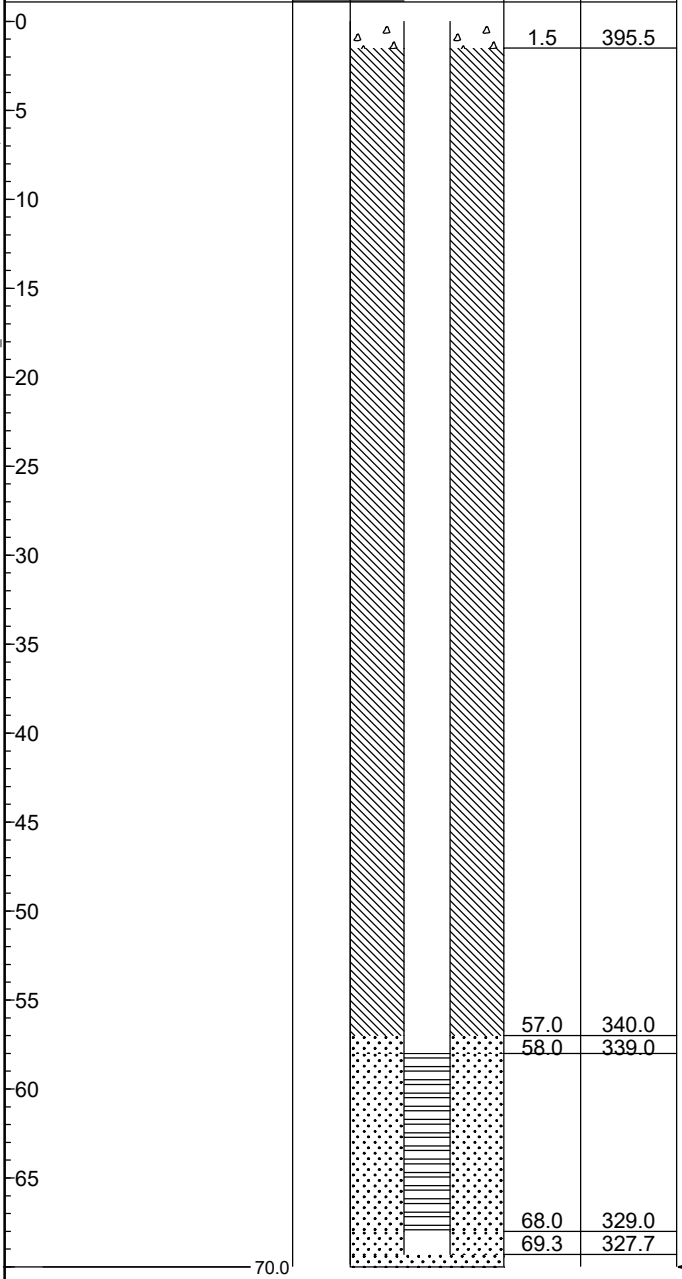
Well No. CCR-OW-3I

Project	F.B. Culley
Location	Indiana
Client	SIGECO
Contractor	NWS
Driller	J. Hackney
Initial Water Level (depth bgs)	ft

Well Diagram

- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

File No.	129420-034
Date Installed	20 Jun 2022
H&A Rep.	K. Henning
Location	See Plan
Ground El.	397.0 (est.)
Datum	



WELL CONSTRUCTION DETAILS

Type of protective cover	Bolted - 9/16" hex.
Depth of below ground surface	0.0 ft
Depth of top of riser below ground surface	0.0 ft
Type of protective casing	
Length	
Inside diameter	
Depth of bottom of	ft
Type of riser pipe	Schedule 40 PVC
Inside diameter of riser pipe	2.0 in.
Depth of bottom of riser pipe	68.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	1.5
Bentonite	1.5	55.5
Sand	57.0	13.0
	-	-

Diameter of borehole	8.0 in.
Depth to top of well screen	68.0 ft
Type of screen	Machine slotted Sch 40 PVC
Screen gauge or size of openings	0.010 in.
Diameter of screen	2.0 in.
Type of Backfill around Screen	Filter Pack Sand
Depth to bottom of well screen	68.0 ft
Bottom of silt trap	69.3 ft
Depth of bottom of well	70.0 ft
Depth of bottom of borehole	70.0 ft

COMMENTS:

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

Well No. CCR-OW-4

Project F.B. Culley
Location Indiana
Client SIGECO
Contractor NWS
Driller J. Hackney

Initial Water Level (depth bgs) ft

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

File No. 129420-034
Date Installed 27 Jun 2022
H&A Rep. K. Henning
Location See Plan

Ground El. 397.0 (est.)
Datum

SOIL/ROCK CONDITIONS	DEPTH (ft.)	GRAPHIC	WELL DETAILS	DEPTH (ft.)	ELEVATION (ft.)
				0.0	397.0
				1.5	395.5
FILL				34.0	363.0
				36.0	361.0
				46.0	351.0
	47.0			46.3	350.7

WELL CONSTRUCTION DETAILS

Type of protective cover: Bolted - 9/16" hex.
Depth of below ground surface: 0.0 ft
Depth of top of riser below ground surface: 0.0 ft
Type of protective casing:
Length:
Inside diameter:
Depth of bottom of: ft
Type of riser pipe: Schedule 40 PVC
Inside diameter of riser pipe: 2.0 in.
Depth of bottom of riser pipe: 36.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	1.5
Bentonite	1.5	32.5
Sand	34.0	13.0
	-	-

Diameter of borehole: 8.0 in.
Depth to top of well screen: 36.0 ft
Type of screen: Machine slotted Sch 40 PVC
Screen gauge or size of openings: 0.010 in.
Diameter of screen: 2.0 in.
Type of Backfill around Screen: Filter Pack Sand
Depth to bottom of well screen: 46.0 ft
Bottom of silt trap: 46.3 ft
Depth of bottom of well: 47.0 ft
Depth of bottom of borehole: 47.0 ft

COMMENTS:

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

Well No. CCR-OW-4I

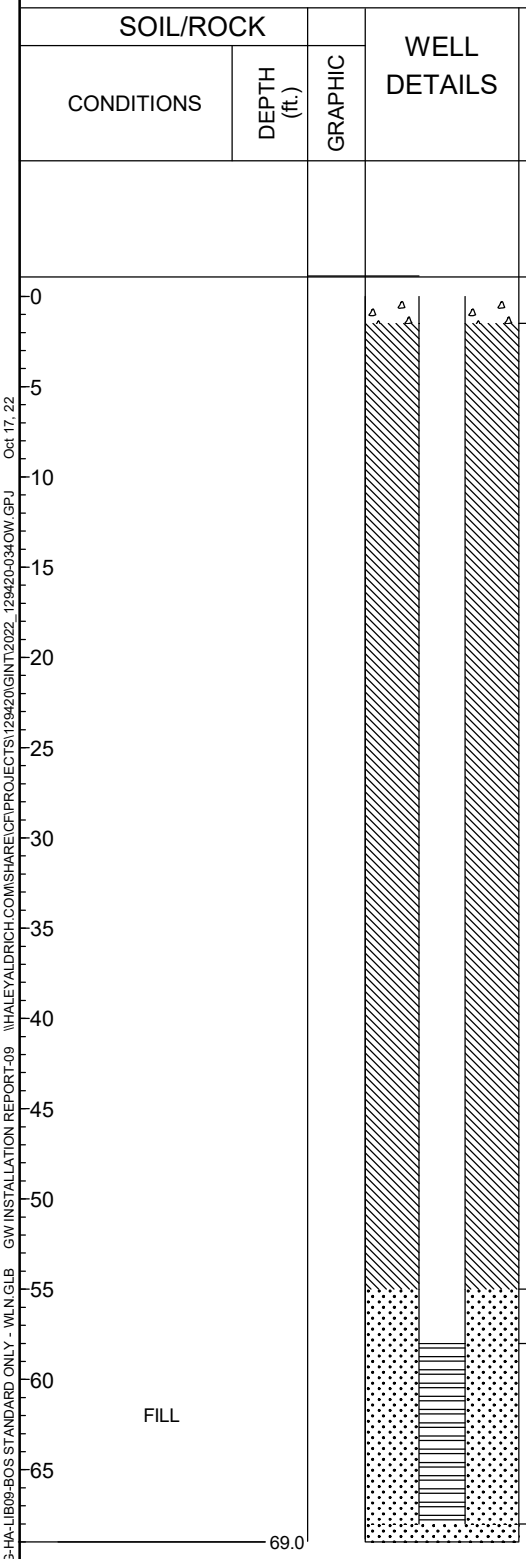
Project F.B. Culley
Location Indiana
Client SIGECO
Contractor NWS
Driller J. Hackney

Initial Water Level (depth bgs) ft

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

File No. 129420-034
Date Installed 27 Jun 2022
H&A Rep. K. Henning
Location See Plan

Ground El. 397.0 (est.)
Datum



WELL CONSTRUCTION DETAILS

Type of protective cover: Bolted - 9/16" hex.

Depth of below ground surface: 0.0 ft

Depth of top of riser below ground surface: 0.0 ft

Type of protective casing:

Length:

Inside diameter:

Depth of bottom of: ft

Type of riser pipe: Schedule 40 PVC

Inside diameter of riser pipe: 2.0 in.

Depth of bottom of riser pipe: 58.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	1.5
Bentonite	1.5	53.5
Sand	55.0	14.0
	-	-

Diameter of borehole: 8.0 in.

Depth to top of well screen: 58.0 ft

Type of screen: Machine slotted Sch 40 PVC

Screen gauge or size of openings: 0.010 in.

Diameter of screen: 2.0 in.

Type of Backfill around Screen: Filter Pack Sand

Depth to bottom of well screen: 68.0 ft

Bottom of silt trap: 0.0 ft

Depth of bottom of well: 69.0 ft

Depth of bottom of borehole: 69.0 ft

COMMENTS:

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

Well No. CCR-OW-5I

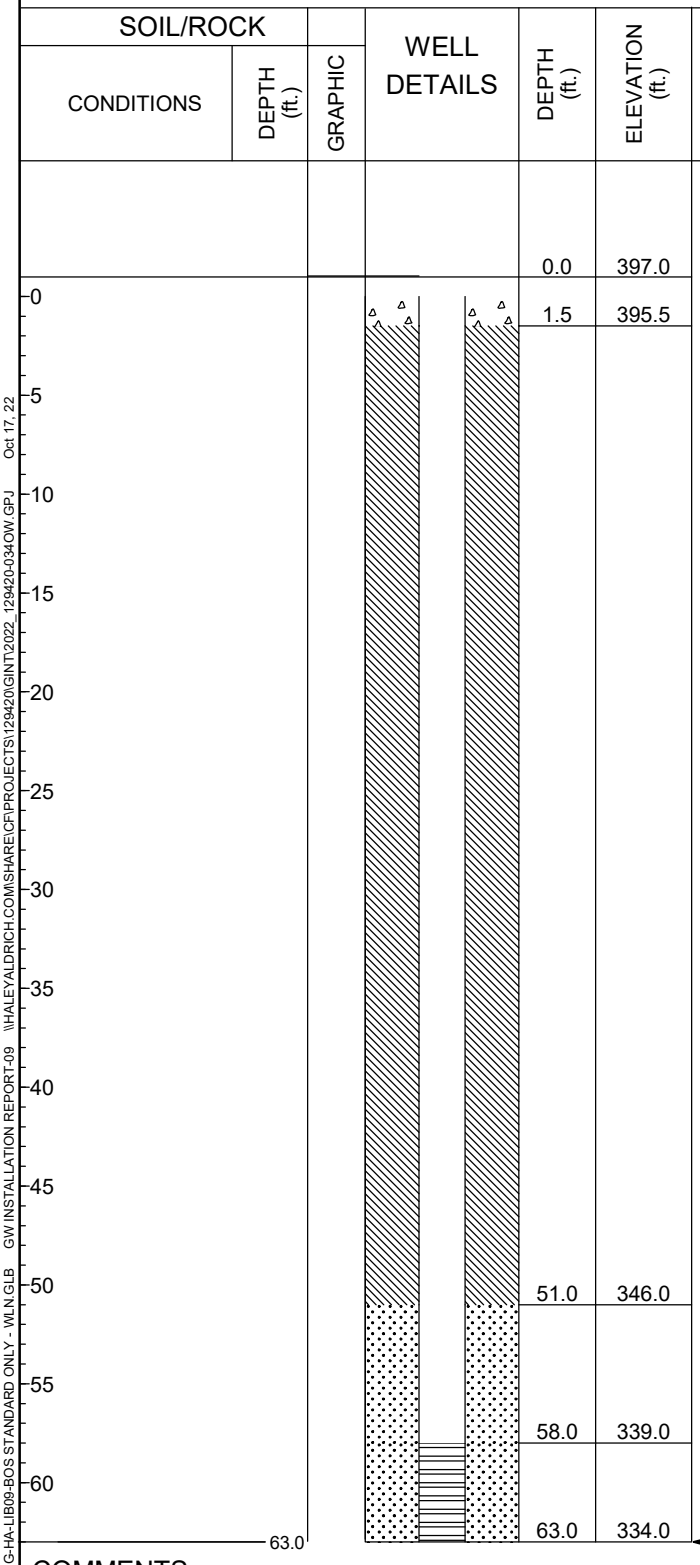
Project F.B. Culley
Location Indiana
Client SIGECO
Contractor NWS
Driller J. Hackney

Initial Water Level (depth bgs) ft

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

File No. 129420-034
Date Installed 6 Jul 2022
H&A Rep. K. Henning
Location See Plan

Ground El. 397.0 (est.)
Datum



WELL CONSTRUCTION DETAILS

Type of protective cover: Bolted - 9/16" hex.

Depth of below ground surface: 0.0 ft

Height of top of riser above ground surface: 0.4 ft

Type of protective casing:

Length:

Inside diameter:

Depth of bottom of: ft

Type of riser pipe: Schedule 40 PVC

Inside diameter of riser pipe: 2.0 in.

Depth of bottom of riser pipe: 58.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	1.5
Bentonite	1.5	51.0
Sand	51.0	12.0
	-	-

Diameter of borehole: 8.0 in.

Depth to top of well screen: 58.0 ft

Type of screen: Machine slotted Sch 40 PVC

Screen gauge or size of openings: 0.010 in.

Diameter of screen: 2.0 in.

Type of Backfill around Screen: Filter Pack Sand

Depth to bottom of well screen: 63.0 ft

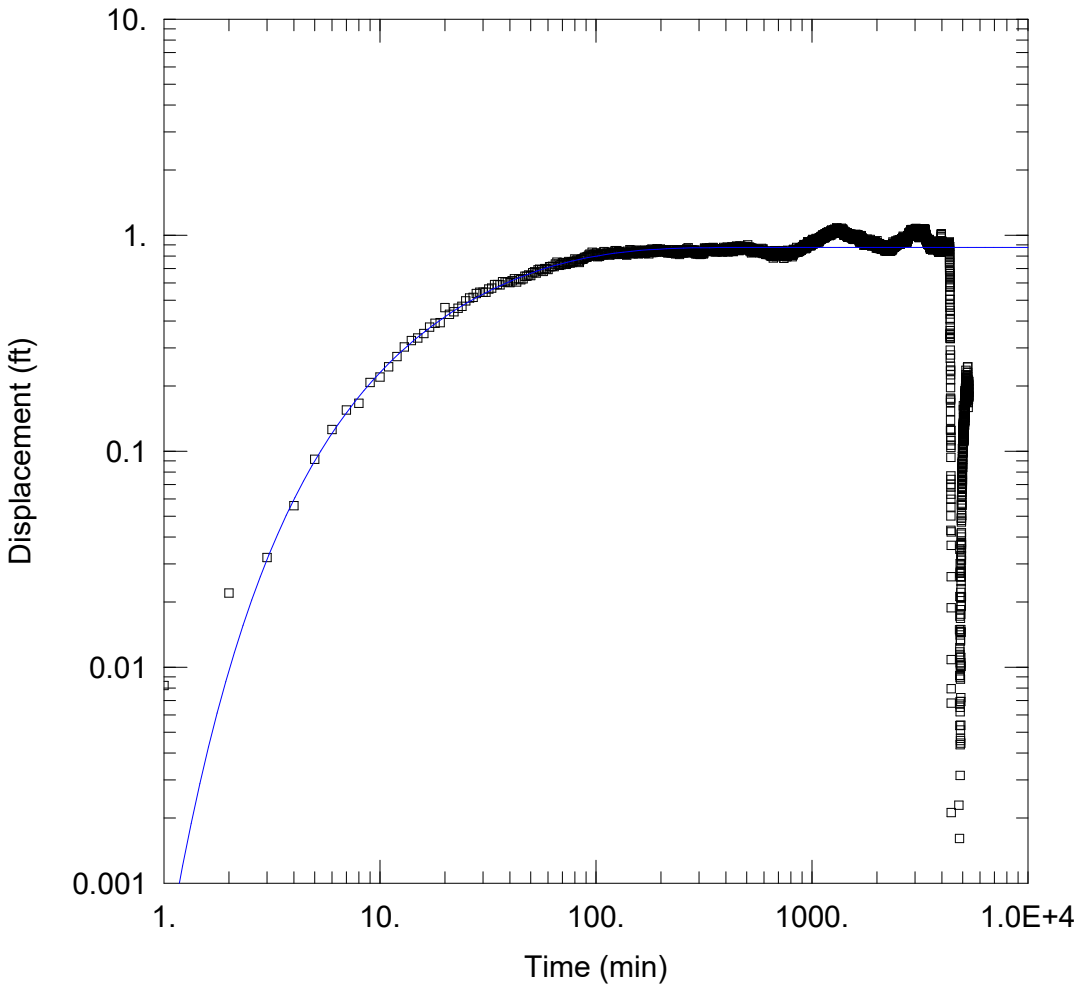
Bottom of silt trap: 0.0 ft

Depth of bottom of well: 63.0 ft

Depth of bottom of borehole: 63.0 ft

COMMENTS:

APPENDIX B
AQTESOLV Outputs



WELL TEST ANALYSIS

Data Set: C:\...\CCR-AP-8I.aqt
Date: 11/29/22 Time: 15:14:39

PROJECT INFORMATION

Company: Haley & Aldrich
Client: SIGECO
Project: 0129420-034
Location: F.B.Culley East Ash Pond
Test Well: CCR-PW-1
Test Date: 10-19-2022

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
CCR-PW-1	0	0

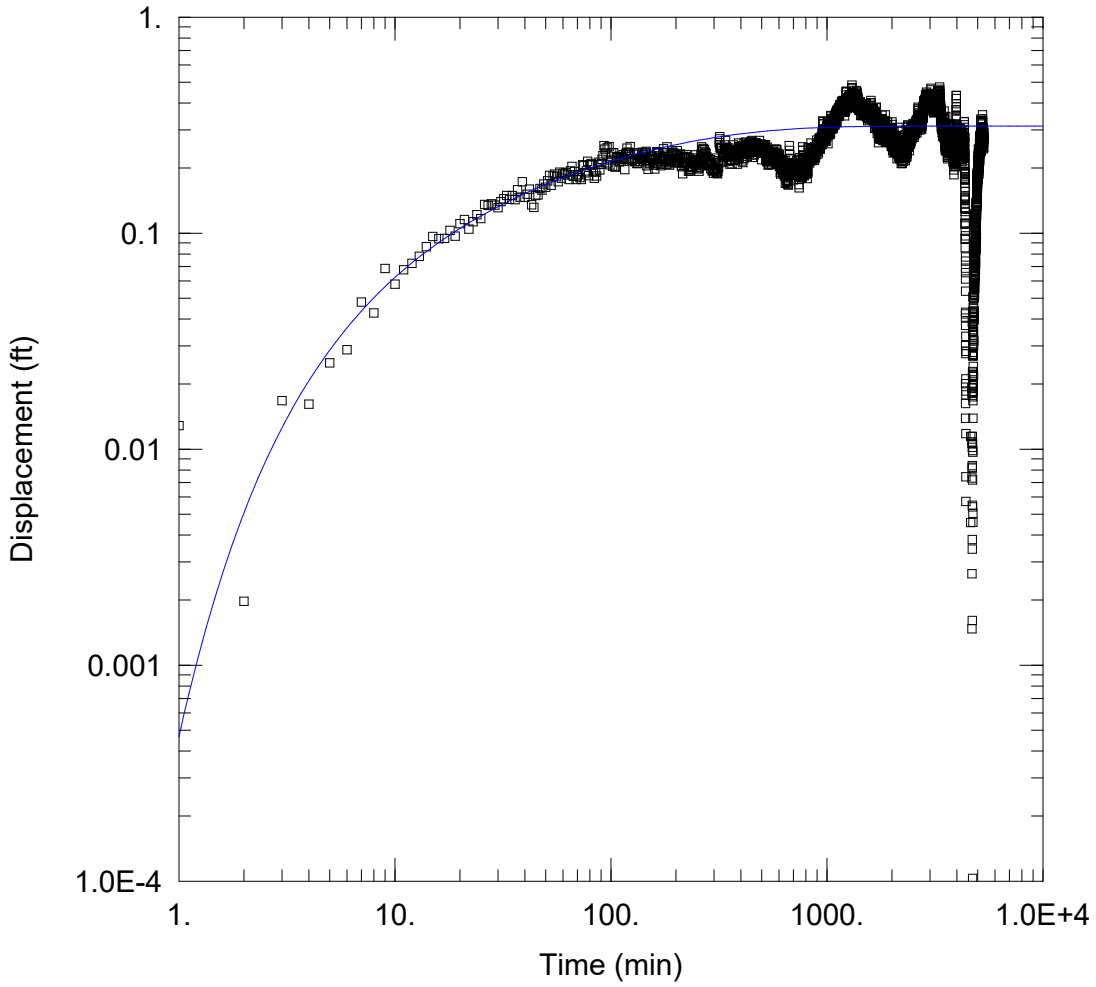
Observation Wells

Well Name	X (ft)	Y (ft)
□ CCR-AP-8I	56.09	0.27

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 3.889 cm^2/sec
S = 0.001679
r/B = 0.4898
Kz/Kr = 1.
b = 12. ft



WELL TEST ANALYSIS

Data Set: C:\...\CCR-OW-1I.aqt
Date: 11/29/22 Time: 14:42:39

PROJECT INFORMATION

Company: Haley & Aldrich
Client: SIGECO
Project: 0129420-034
Location: F.B.Culley East Ash Pond
Test Well: CCR-PW-1
Test Date: 10-19-2022

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
CCR-PW-1	0	0

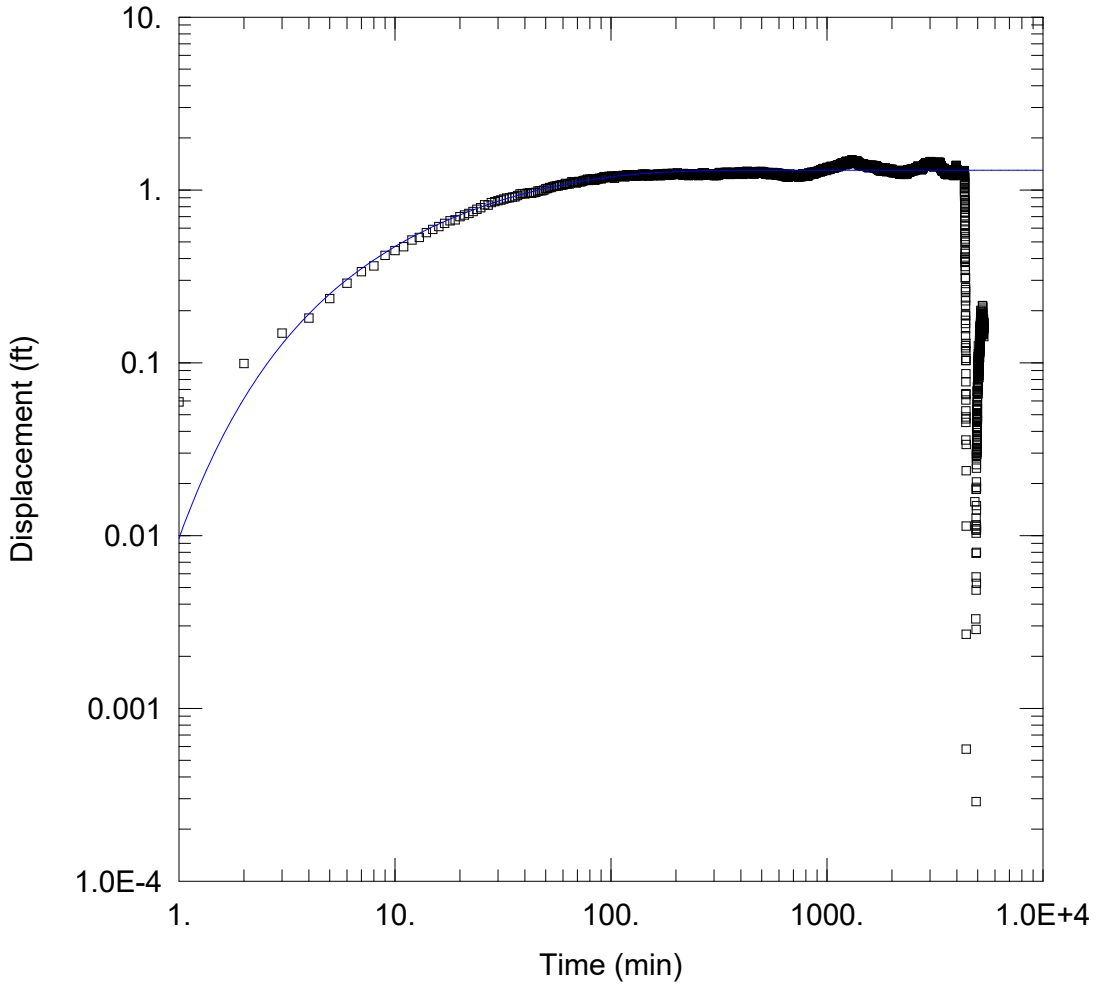
Observation Wells

Well Name	X (ft)	Y (ft)
▫ CCR-OW-1I	-93.19	-19.38

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 21.87 cm^2/sec
S = 0.002291
r/B = 0.1738
Kz/Kr = 1.
b = 15. ft



WELL TEST ANALYSIS

Data Set: C:\...\CCR-OW-2I.aqt
Date: 11/29/22 Time: 14:49:55

PROJECT INFORMATION

Company: Haley & Aldrich
Client: SIGECO
Project: 0129420-034
Location: F.B.Culley East Ash Pond
Test Well: CCR-PW-1
Test Date: 10-19-2022

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
CCR-PW-1	0	0

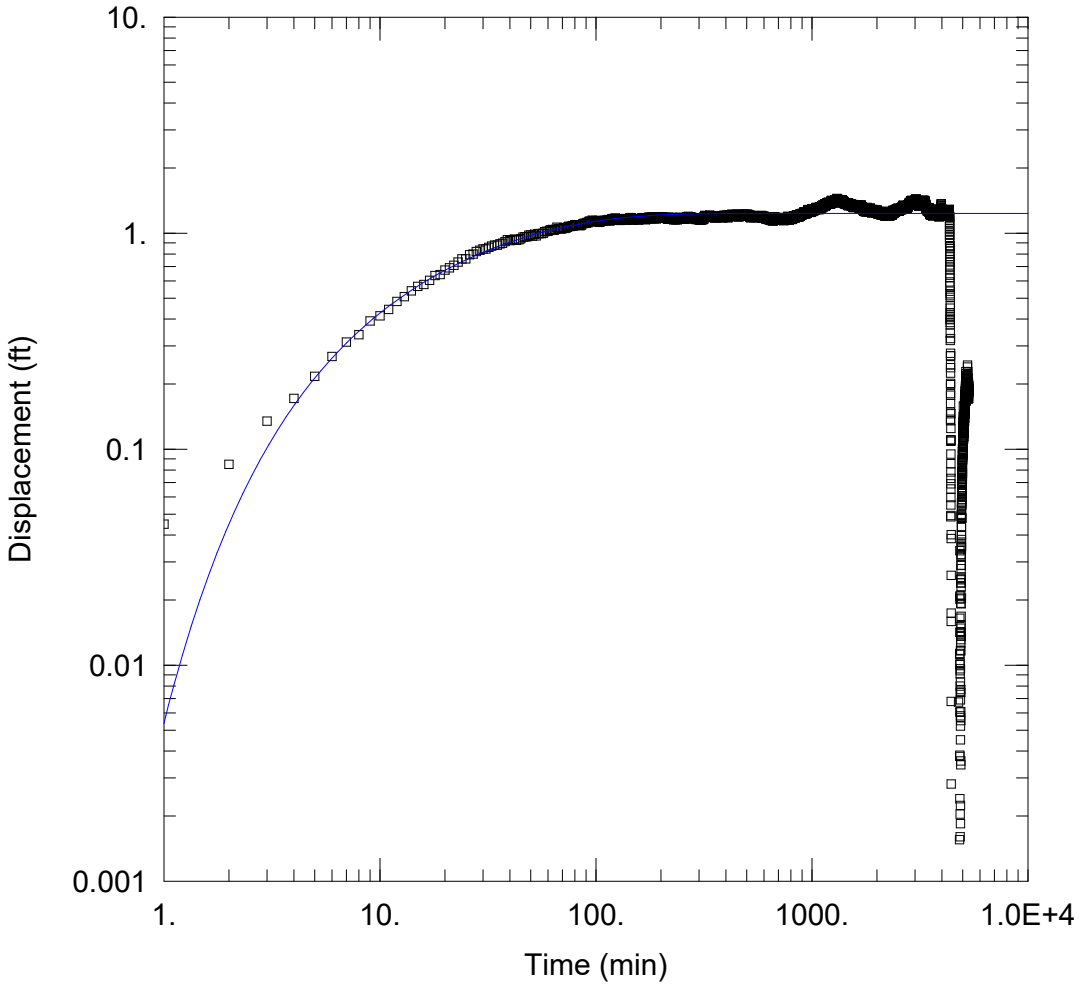
Observation Wells

Well Name	X (ft)	Y (ft)
□ CCR-OW-2I	-19.81	-3.97

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 3.63 cm^2/sec
S = 0.006185
r/B = 0.3236
Kz/Kr = 1.
b = 10. ft



WELL TEST ANALYSIS

Data Set: C:\...\CCR-OW-3I.aqt
Date: 11/29/22 Time: 14:53:33

PROJECT INFORMATION

Company: Haley & Aldrich
Client: SIGECO
Project: 0129420-034
Location: F.B.Culley East Ash Pond
Test Well: CCR-PW-1
Test Date: 10-19-2022

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
CCR-PW-1	0	0

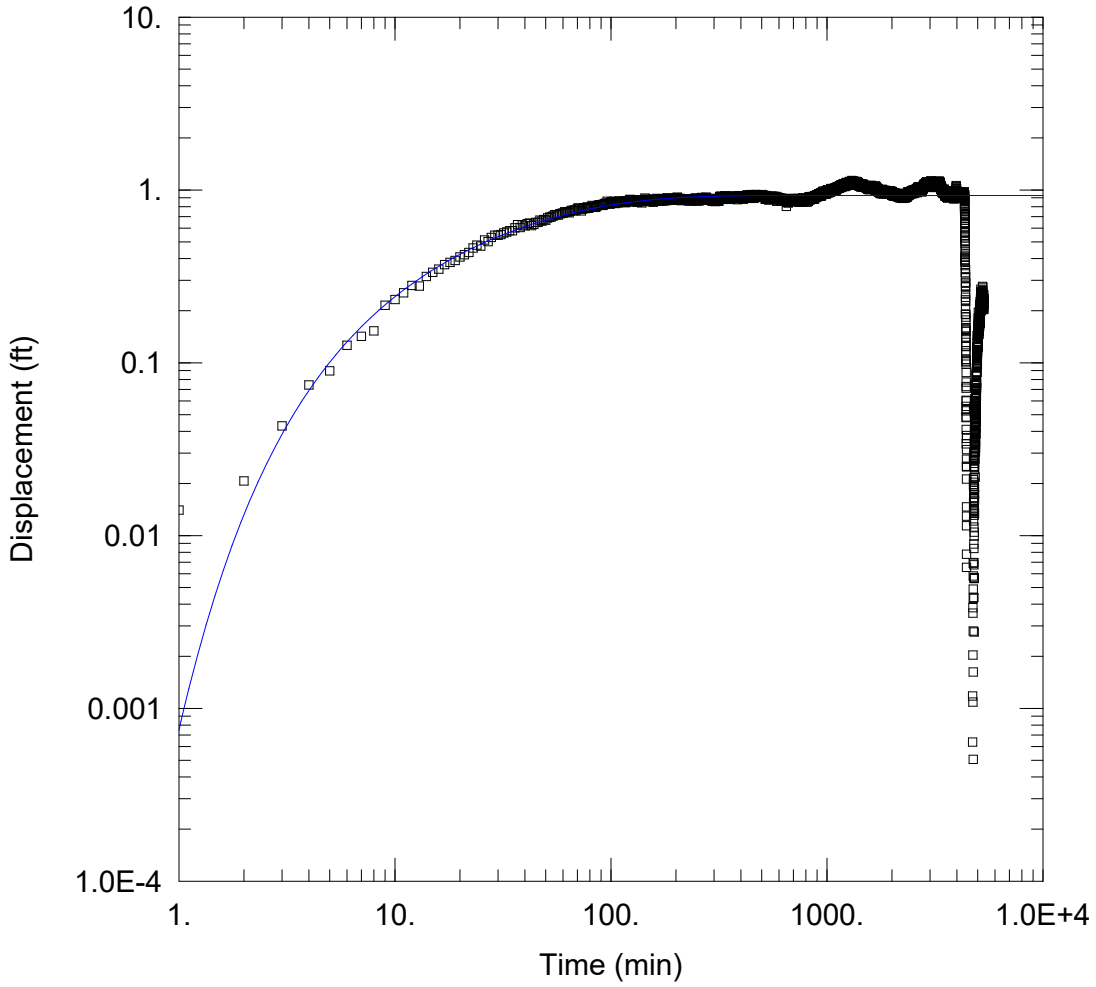
Observation Wells

Well Name	X (ft)	Y (ft)
▫ CCR-OW-3I	14.45	2.2

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 3.466 cm^2/sec
S = 0.01334
r/B = 0.3715
Kz/Kr = 1.
b = 10. ft



WELL TEST ANALYSIS

Data Set: C:\...\CCR-OW-4I.aqt
Date: 11/29/22 Time: 14:55:27

PROJECT INFORMATION

Company: Haley & Aldrich
Client: SIGECO
Project: 0129420-034
Location: F.B.Culley East Ash Pond
Test Well: CCR-PW-1
Test Date: 10-19-2022

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
CCR-PW-1	0	0

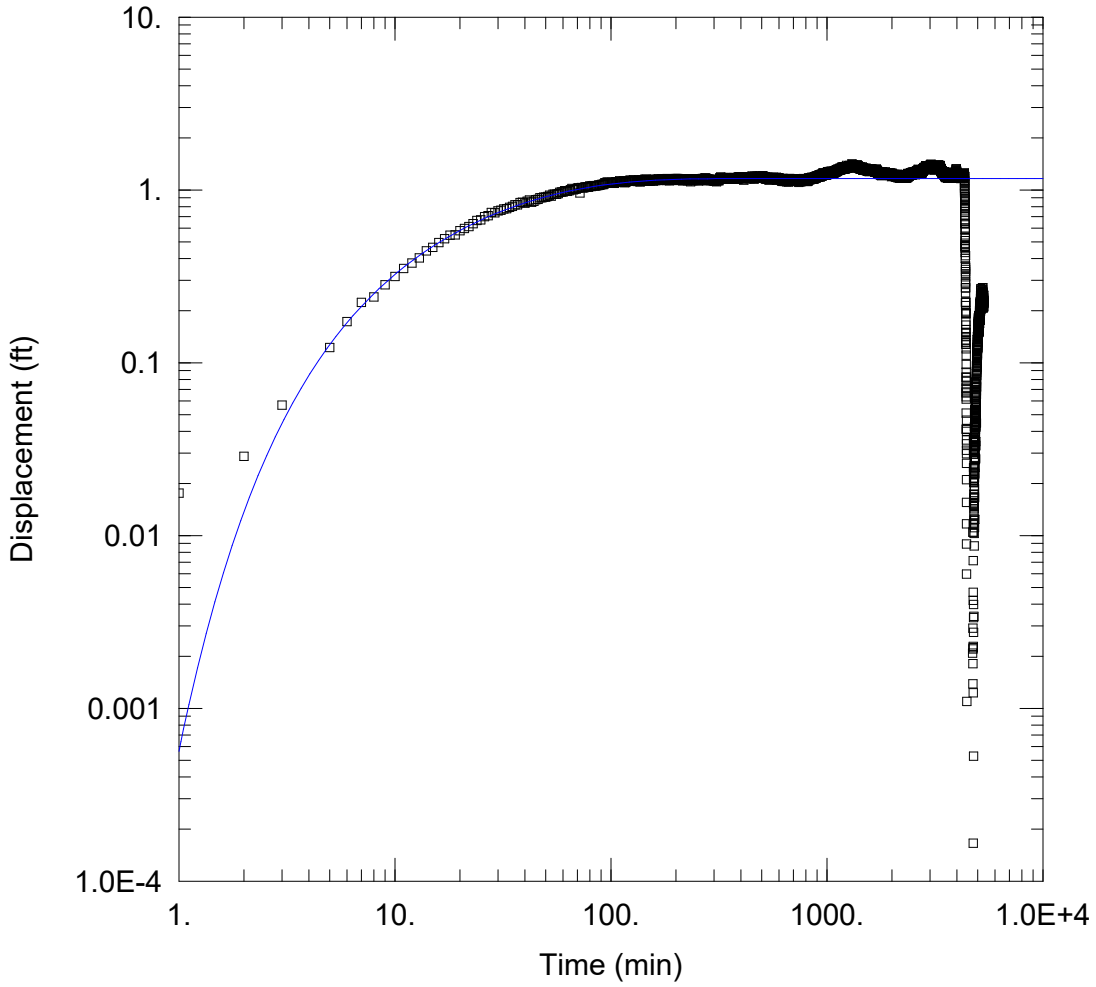
Observation Wells

Well Name	X (ft)	Y (ft)
▫ CCR-OW-4I	78.91	13.12

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 4.364 cm^2/sec
S = 0.0008128
r/B = 0.3981
Kz/Kr = 1.
b = 10. ft



WELL TEST ANALYSIS

Data Set: C:\...\CCR-OW-5I.aqt
Date: 11/29/22 Time: 14:56:06

PROJECT INFORMATION

Company: Haley & Aldrich
Client: SIGECO
Project: 0129420-034
Location: F.B.Culley East Ash Pond
Test Well: CCR-PW-1
Test Date: 10-19-2022

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
CCR-PW-1	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
□ CCR-OW-5I	2.48	64.25

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 2.753 cm^2/sec
S = 0.0009016
r/B = 0.5248
Kz/Kr = 1.
b = 5. ft

APPENDIX C
Field Forms

Low-Flow Test Report:

Test Date / Time: 11/30/2022 10:16:37 AM
Project: CULLEY EAST
Operator Name: Jon Hill

Location Name: CCR AP-6I **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 10 ft** **Top of Screen: 64.7 ft** **Total Depth: 74.7 ft** **Initial Depth to Water: 39.08 m**	**Pump Type: Dedicated** **Tubing Type: LDPE** **Pump Intake From TOC: 70 ft** **Flow Cell Volume: 130 ml** **Final Draw Down: 0 m**	**Instrument Used: Aqua TROLL 500** **Serial Number: 792625**

Test Notes:
1.0 gallons purged

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10	
11/30/2022 10:16 AM	00:00	6.94 pH	18.01 °C	3,090.2 µS/cm	0.09 mg/L		91.9 mV	39.08 m
11/30/2022 10:19 AM	03:00	6.87 pH	17.95 °C	3,091.9 µS/cm	0.08 mg/L		94.2 mV	39.08 m
11/30/2022 10:22 AM	06:00	6.95 pH	18.02 °C	3,099.7 µS/cm	0.07 mg/L		88.7 mV	39.08 m
11/30/2022 10:25 AM	09:00	6.88 pH	17.97 °C	3,114.1 µS/cm	0.06 mg/L		91.6 mV	39.08 m
11/30/2022 10:28 AM	12:00	6.96 pH	18.02 °C	3,131.1 µS/cm	0.06 mg/L		86.5 mV	39.08 m
11/30/2022 10:31 AM	15:00	6.89 pH	17.92 °C	3,105.8 µS/cm	0.05 mg/L		89.0 mV	39.08 m
11/30/2022 10:34 AM	18:00	6.96 pH	17.99 °C	3,115.5 µS/cm	0.05 mg/L		84.6 mV	39.08 m

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 11/30/2022 10:55:44 AM
Project: CULLEY EAST (2)
Operator Name: Jon Hill

Location Name: CCR AP-8I **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 10 ft** **Top of Screen: 58.7 ft** **Total Depth: 68.7 ft** **Initial Depth to Water: 35.6 ft**	**Pump Type: Dedicated** **Tubing Type: LDPE** **Pump Intake From TOC: 64 ft** **Estimated Total Volume Pumped: 5400 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 300 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: Aqua TROLL 500** **Serial Number: 792625**

Test Notes:
1.0 gallons purged

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10		
11/30/2022 10:55 AM	00:00	6.83 pH	16.94 °C	3,903.5 µS/cm	0.03 mg/L		27.8 mV	35.60 ft	300.00 ml/min
11/30/2022 10:58 AM	03:00	6.81 pH	16.93 °C	3,909.9 µS/cm	0.01 mg/L		-47.7 mV	35.60 ft	300.00 ml/min
11/30/2022 11:01 AM	06:00	6.91 pH	16.96 °C	3,908.2 µS/cm	0.00 mg/L		-80.7 mV	35.60 ft	300.00 ml/min
11/30/2022 11:04 AM	09:00	6.91 pH	16.81 °C	3,899.7 µS/cm	0.00 mg/L		-90.9 mV	35.60 ft	300.00 ml/min
11/30/2022 11:07 AM	12:00	6.98 pH	16.97 °C	3,900.3 µS/cm	0.01 mg/L		-99.9 mV	35.60 ft	300.00 ml/min
11/30/2022 11:10 AM	15:00	6.98 pH	16.91 °C	3,891.4 µS/cm	0.01 mg/L		-102.5 mV	35.60 ft	300.00 ml/min
11/30/2022 11:13 AM	18:00	6.98 pH	16.98 °C	3,880.2 µS/cm	0.01 mg/L		-105.0 mV	35.60 ft	300.00 ml/min

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 5/9/2022 10:42:19 AM
Project: FB CULLEY (12)
Operator Name: Hayley Torres

Location Name: CCR-AP-2 **Initial Depth to Water: 32.37 ft**	**Pump Type: Hydrasleeve** **Tubing Type: LDPE** **Pump Intake From TOC: 0 ft** **Estimated Total Volume Pumped: 300 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: Not Applicable** **Final Draw Down: 0 ft**	**Instrument Used: Aqua TROLL 600** **Serial Number: 651925**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10	+/- 5	
5/9/2022 10:42 AM	00:00	7.95 pH	20.01 °C	1,592.9 µS/cm	8.00 mg/L	1,530.1 NTU	-7.7 mV	32.37 ft	
5/9/2022 10:45 AM	03:00	6.68 pH	18.59 °C	1,559.7 µS/cm	4.89 mg/L	1,069.4 NTU	55.1 mV		

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 5/9/2022 11:10:08 AM
Project: FB CULLEY (13)
Operator Name: Hayley Torres

Location Name: CCR-AP-3R **Initial Depth to Water: 30.89 ft**	**Pump Type: Hydrasleeve** **Tubing Type: LDPE** **Pump Intake From TOC: 0 ft** **Estimated Total Volume Pumped: 300 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: Not Applicable** **Final Draw Down: 0 ft**	**Instrument Used: Aqua TROLL 600** **Serial Number: 651925**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10	+/- 5	
5/9/2022 11:10 AM	00:00	7.62 pH	19.22 °C	1,635.6 µS/cm	8.19 mg/L	218.45 NTU	-188.4 mV	30.89 ft	
5/9/2022 11:13 AM	03:00	7.02 pH	18.35 °C	1,696.0 µS/cm	2.86 mg/L	200.79 NTU	-125.0 mV		

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 5/9/2022 12:02:22 PM
Project: FB CULLEY (14)
Operator Name: Hayley Torres

Location Name: CCR-AP-4R **Initial Depth to Water: 10.06 ft**	**Pump Type: Hydrasleeve** **Tubing Type: LDPE** **Pump Intake From TOC: 0 ft** **Estimated Total Volume Pumped: 300 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: Not Applicable** **Final Draw Down: 0 ft**	**Instrument Used: Aqua TROLL 600** **Serial Number: 651925**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10	+/- 5	
5/9/2022 12:02 PM	00:00	7.70 pH	19.39 °C	1,350.9 µS/cm	7.04 mg/L	449.58 NTU	-215.1 mV	10.06 ft	
5/9/2022 12:05 PM	03:00	6.56 pH	17.98 °C	1,385.5 µS/cm	2.09 mg/L	325.31 NTU	-96.5 mV		

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 5/6/2022 11:14:27 AM
Project: FB CULLEY (10)
Operator Name: Hayley Torres

Location Name: CCR-AP-5I **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 10 ft** **Top of Screen: 75.3 ft** **Total Depth: 85.3 ft** **Initial Depth to Water: 12.59 ft**	**Pump Type: Dedicated** **Tubing Type: LDPE** **Pump Intake From TOC: 75 ft** **Estimated Total Volume Pumped: 0.25 gal** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: Aqua TROLL 600** **Serial Number: 651925**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10	+/- 5	
5/6/2022 11:14 AM	00:00	7.67 pH	18.32 °C	1,950.2 µS/cm	2.14 mg/L	90.85 NTU	59.9 mV	12.59 ft	100.00 ml/min
5/6/2022 11:17 AM	03:00	7.28 pH	17.75 °C	1,963.6 µS/cm	0.93 mg/L	66.85 NTU	57.1 mV		100.00 ml/min
5/6/2022 11:20 AM	06:00	7.14 pH	17.59 °C	1,945.1 µS/cm	1.74 mg/L	56.17 NTU	39.4 mV		100.00 ml/min
5/6/2022 11:23 AM	09:00	6.98 pH	17.79 °C	1,954.3 µS/cm	1.39 mg/L	40.84 NTU	11.4 mV		100.00 ml/min
5/6/2022 11:26 AM	12:00	6.90 pH	17.75 °C	1,957.7 µS/cm	1.17 mg/L	41.58 NTU	-12.9 mV		100.00 ml/min
5/6/2022 11:29 AM	15:00	6.86 pH	17.50 °C	1,956.4 µS/cm	1.01 mg/L	49.18 NTU	-28.1 mV		100.00 ml/min
5/6/2022 11:32 AM	18:00	6.84 pH	17.39 °C	1,956.9 µS/cm	0.94 mg/L	48.94 NTU	-34.1 mV		100.00 ml/min
5/6/2022 11:35 AM	21:00	6.83 pH	17.35 °C	1,949.8 µS/cm	0.87 mg/L	25.48 NTU	-39.4 mV		100.00 ml/min
5/6/2022 11:38 AM	24:00	6.83 pH	17.36 °C	1,946.2 µS/cm	0.78 mg/L	36.91 NTU	-44.2 mV		100.00 ml/min
5/6/2022 11:41 AM	27:00	6.83 pH	17.29 °C	1,936.8 µS/cm	0.70 mg/L	40.98 NTU	-49.2 mV		100.00 ml/min
5/6/2022 11:44 AM	30:00	6.82 pH	17.20 °C	1,931.0 µS/cm	0.64 mg/L	24.35 NTU	-54.9 mV		100.00 ml/min
5/6/2022 11:47 AM	33:00	6.82 pH	17.21 °C	1,919.2 µS/cm	0.58 mg/L	39.01 NTU	-60.9 mV		100.00 ml/min
5/6/2022 11:50 AM	36:00	6.83 pH	17.18 °C	1,908.9 µS/cm	0.53 mg/L	24.64 NTU	-65.8 mV		100.00 ml/min
5/6/2022 11:53 AM	39:00	6.83 pH	17.15 °C	1,896.1 µS/cm	0.49 mg/L	30.71 NTU	-70.2 mV		100.00 ml/min
5/6/2022 11:56 AM	42:00	6.84 pH	17.10 °C	1,888.8 µS/cm	0.46 mg/L	24.18 NTU	-74.6 mV		100.00 ml/min

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 5/9/2022 9:46:38 AM
Project: FB CULLEY (11)
Operator Name: Hayley Torres

Location Name: CCR-AP-6 **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 10 ft** **Top of Screen: 35.5 ft** **Total Depth: 45.5 ft** **Initial Depth to Water: 37.32 ft**	**Pump Type: Hydrasleeve** **Tubing Type: LDPE** **Pump Intake From TOC: 0 ft** **Estimated Total Volume Pumped: 300 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: Not Applicable** **Final Draw Down: 0 ft**	**Instrument Used: Aqua TROLL 600** **Serial Number: 651925**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10	+/- 5	
5/9/2022 9:46 AM	00:00	7.28 pH	18.47 °C	1,713.3 µS/cm	5.87 mg/L	264.27 NTU	-146.6 mV	37.32 ft	
5/9/2022 9:49 AM	03:00	7.19 pH	18.52 °C	1,712.0 µS/cm	2.75 mg/L	226.12 NTU	-140.2 mV		

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 5/10/2022 10:23:05 AM
Project: FB CULLEY (17)
Operator Name: Hayley Torres

Location Name: CCR-AP-6I **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 10 ft** **Top of Screen: 64.7 ft** **Total Depth: 74.7 ft** **Initial Depth to Water: 33.31 ft**	**Pump Type: Dedicated** **Tubing Type: LDPE** **Pump Intake From TOC: 69.7 ft** **Estimated Total Volume Pumped: 0.25 gal** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: Aqua TROLL 600** **Serial Number: 651925**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10	+/- 5	
5/10/2022 10:23 AM	00:00	7.74 pH	20.02 °C	2,817.0 µS/cm	7.68 mg/L	139.34 NTU	76.6 mV	33.31 ft	100.00 ml/min
5/10/2022 10:26 AM	03:00	6.88 pH	18.84 °C	2,899.3 µS/cm	4.11 mg/L	2.01 NTU	61.7 mV		100.00 ml/min
5/10/2022 10:29 AM	06:00	6.85 pH	19.09 °C	2,977.3 µS/cm	1.61 mg/L	3.84 NTU	-15.5 mV		100.00 ml/min
5/10/2022 10:32 AM	09:00	6.99 pH	19.17 °C	3,016.9 µS/cm	0.96 mg/L	0.89 NTU	-42.1 mV		100.00 ml/min
5/10/2022 10:35 AM	12:00	7.03 pH	19.22 °C	3,020.5 µS/cm	0.77 mg/L	1.71 NTU	-52.4 mV		100.00 ml/min
5/10/2022 10:38 AM	15:00	7.04 pH	19.25 °C	2,995.5 µS/cm	0.53 mg/L	1.17 NTU	-56.1 mV		100.00 ml/min
5/10/2022 10:41 AM	18:00	7.04 pH	19.30 °C	2,992.6 µS/cm	0.49 mg/L	0.53 NTU	-57.3 mV		100.00 ml/min

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 5/10/2022 12:14:43 PM
Project: FB CULLEY (19)
Operator Name: Hayley Torres

Location Name: CCR-AP-8 **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 10 ft** **Top of Screen: 35.5 ft** **Total Depth: 45.5 ft** **Initial Depth to Water: 27.95 ft**	**Pump Type: Peristaltic** **Tubing Type: LDPE** **Pump Intake From TOC: 45.5 ft** **Estimated Total Volume Pumped: 1800 gal** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: Aqua TROLL 600** **Serial Number: 651925**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10	+/- 5	
5/10/2022 12:14 PM	00:00	6.92 pH	30.04 °C	2.27 µS/cm	7.33 mg/L	1.30 NTU	-134.8 mV	27.95 ft	100.00 ml/min
5/10/2022 12:17 PM	03:00	6.82 pH	24.02 °C	1,948.3 µS/cm	1.38 mg/L	43.37 NTU	-136.5 mV		100.00 ml/min
5/10/2022 12:20 PM	06:00	6.78 pH	21.99 °C	1,939.7 µS/cm	0.92 mg/L	21.17 NTU	-136.3 mV		100.00 ml/min
5/10/2022 12:23 PM	09:00	6.76 pH	21.37 °C	1,938.8 µS/cm	0.77 mg/L	14.45 NTU	-139.0 mV		100.00 ml/min
5/10/2022 12:26 PM	12:00	6.71 pH	20.96 °C	1,936.5 µS/cm	0.64 mg/L	10.98 NTU	-139.3 mV		100.00 ml/min
5/10/2022 12:29 PM	15:00	6.66 pH	20.74 °C	1,933.3 µS/cm	0.57 mg/L	8.89 NTU	-141.7 mV		100.00 ml/min
5/10/2022 12:32 PM	18:00	6.63 pH	20.96 °C	1,933.1 µS/cm	0.54 mg/L	8.43 NTU	-142.7 mV		100.00 ml/min

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 5/10/2022 11:21:45 AM
Project: FB CULLEY (18)
Operator Name: Hayley Torres

Location Name: CCR-AP-8I **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 10 ft** **Top of Screen: 58.7 ft** **Total Depth: 68.7 ft** **Initial Depth to Water: 30.03 ft**	**Pump Type: Dedicated** **Tubing Type: LDPE** **Pump Intake From TOC: 63.7 ft** **Estimated Total Volume Pumped: 0.2 gal** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: Aqua TROLL 600** **Serial Number: 651925**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10	+/- 5	
5/10/2022 11:21 AM	00:00	6.58 pH	20.61 °C	3,193.6 µS/cm	2.99 mg/L	62.59 NTU	77.0 mV	30.03 ft	100.00 ml/min
5/10/2022 11:24 AM	03:00	6.45 pH	21.12 °C	3,390.9 µS/cm	1.17 mg/L	62.75 NTU	-23.3 mV		100.00 ml/min
5/10/2022 11:27 AM	06:00	6.56 pH	22.72 °C	3,479.3 µS/cm	1.06 mg/L	92.53 NTU	-71.4 mV		100.00 ml/min
5/10/2022 11:30 AM	09:00	6.58 pH	23.85 °C	3,491.0 µS/cm	1.16 mg/L	84.51 NTU	-76.6 mV		100.00 ml/min
5/10/2022 11:33 AM	12:00	6.61 pH	24.18 °C	3,510.3 µS/cm	1.17 mg/L	82.63 NTU	-82.6 mV		100.00 ml/min
5/10/2022 11:36 AM	15:00	6.63 pH	24.23 °C	3,530.3 µS/cm	1.20 mg/L	82.68 NTU	-86.7 mV		100.00 ml/min
5/10/2022 11:39 AM	18:00	6.65 pH	24.28 °C	3,550.4 µS/cm	1.24 mg/L	78.07 NTU	-90.8 mV		100.00 ml/min
5/10/2022 11:42 AM	21:00	6.67 pH	24.30 °C	3,565.4 µS/cm	1.26 mg/L	75.00 NTU	-94.6 mV		100.00 ml/min
5/10/2022 11:45 AM	24:00	6.68 pH	24.29 °C	3,571.2 µS/cm	1.27 mg/L	71.67 NTU	-97.5 mV		100.00 ml/min

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 5/9/2022 1:27:44 PM
Project: FB CULLEY (15)
Operator Name: Hayley Torres

Location Name: CCR-AP-9 **Initial Depth to Water: 61.09 ft**	**Pump Type: Hydrasleeve** **Tubing Type: LDPE** **Pump Intake From TOC: 0 ft** **Estimated Total Volume Pumped: 300 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: Aqua TROLL 600** **Serial Number: 651925**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10	+/- 5	
5/9/2022 1:27 PM	00:00	7.83 pH	20.14 °C	923.12 µS/cm	5.80 mg/L	1,189.6 NTU	-12.8 mV	61.09 ft	
5/9/2022 1:30 PM	03:00	7.14 pH	17.03 °C	983.18 µS/cm	4.47 mg/L	830.14 NTU	11.8 mV		

Samples

Sample ID:	Description:

Low-Flow Test Report:

Test Date / Time: 5/5/2022 12:49:36 PM
Project: FB CULLEY (8)
Operator Name: Hayley Torres

Location Name: CCR-AP-11 **Well Diameter: 2 in** **Casing Type: PVC** **Screen Length: 10 ft** **Top of Screen: 45 ft** **Total Depth: 55 ft** **Initial Depth to Water: 14.27 ft**	**Pump Type: Peristaltic** **Tubing Type: LDPE** **Pump Intake From TOC: 50 ft** **Estimated Total Volume Pumped: 0.25 gal** **Flow Cell Volume: 130 ml** **Final Flow Rate: 100 ml/min** **Final Draw Down: 0 ft**	**Instrument Used: Aqua TROLL 600** **Serial Number: 651925**

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth to Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10	+/- 5	
5/5/2022 12:49 PM	00:00	6.86 pH	16.94 °C	603.92 µS/cm	4.80 mg/L	93.86 NTU	116.0 mV	14.27 ft	100.00 ml/min
5/5/2022 12:52 PM	03:00	6.42 pH	17.26 °C	636.21 µS/cm	4.40 mg/L	69.31 NTU	-6.1 mV		100.00 ml/min
5/5/2022 12:55 PM	06:00	6.39 pH	17.45 °C	895.15 µS/cm	4.29 mg/L	70.91 NTU	-21.9 mV		100.00 ml/min
5/5/2022 12:58 PM	09:00	6.36 pH	17.65 °C	1,183.9 µS/cm	2.20 mg/L	267.18 NTU	-48.9 mV		100.00 ml/min
5/5/2022 1:01 PM	12:00	6.38 pH	17.67 °C	1,191.7 µS/cm	2.19 mg/L	274.80 NTU	-49.0 mV		100.00 ml/min
5/5/2022 1:04 PM	15:00	6.38 pH	17.56 °C	1,229.7 µS/cm	2.24 mg/L	226.91 NTU	-48.8 mV		100.00 ml/min
5/5/2022 1:07 PM	18:00	6.38 pH	17.42 °C	1,259.8 µS/cm	2.24 mg/L	230.85 NTU	-50.9 mV		100.00 ml/min
5/5/2022 1:10 PM	21:00	6.39 pH	17.24 °C	1,311.1 µS/cm	2.11 mg/L	176.04 NTU	-54.2 mV		100.00 ml/min
5/5/2022 1:13 PM	24:00	6.39 pH	17.01 °C	1,340.1 µS/cm	1.97 mg/L	170.54 NTU	-57.1 mV		100.00 ml/min
5/5/2022 1:16 PM	27:00	6.39 pH	16.84 °C	1,365.3 µS/cm	1.78 mg/L	157.54 NTU	-58.9 mV		100.00 ml/min
5/5/2022 1:19 PM	30:00	6.39 pH	16.48 °C	1,384.7 µS/cm	1.70 mg/L	127.08 NTU	-60.5 mV		100.00 ml/min
5/5/2022 1:22 PM	33:00	6.40 pH	16.20 °C	1,398.8 µS/cm	1.60 mg/L	157.40 NTU	-62.1 mV		100.00 ml/min
5/5/2022 1:25 PM	36:00	6.40 pH	16.11 °C	1,409.7 µS/cm	1.49 mg/L	122.98 NTU	-64.1 mV		100.00 ml/min
5/5/2022 1:28 PM	39:00	6.40 pH	16.05 °C	1,413.9 µS/cm	1.40 mg/L	128.24 NTU	-65.7 mV		100.00 ml/min
5/5/2022 1:31 PM	42:00	6.40 pH	15.91 °C	1,418.0 µS/cm	1.34 mg/L	127.20 NTU	-66.8 mV		100.00 ml/min

Samples

Sample ID:	Description:

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GROUNDWATER SAMPLING RECORD

Page 1 of 1

PROJECT	Culley East	H&A FILE NO.	
LOCATION		PROJECT MGR.	
CLIENT	Vectren	FIELD REP	Jim Hall
CONTRACTOR	Atlas	DATE	11.29.22

GROUNDWATER SAMPLING INFORMATION

Well No.		CCR-AP-1					
Water Depth (ft)		54.32					
Time		835					
Product							
Depth Of Well (ft)							
Inside Diameter (in)		2.0"					
Standing Water Depth (ft) [1]							
Volume Of Water In Well (gal)							
Purging Device		NA					
Volume of Bailer/Pump Capacity							
Cleaning Procedure		Dedicated					
Bails Removed/ Volume Removed		NA					
Time Purging Started		NA					
Time Purging Stopped		NA					
Sampling Device		Hydrasleeve					
Cleaning Procedure		Dedicated					
TIME SAMPLES TAKEN	VOA						
	ABN	Sample at	845				
	Metals						

PARAMETERS	Time	850											
	DTW	54.32											
	pH	7.64											
	Conductivity	1413.7											
	Turbidity	303.17											
	Dissolved Oxygen	4.89											
	Temp, ^{0}C	12.61											
	ORP	-0.6											

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

1. Standing Water Depth = Depth of Well - Water Depth

Form 3005

HALEY & ALDRICH

GROUNDWATER SAMPLING RECORD

PROJECT	Cully East	H&A FILE NO.	
LOCATION		PROJECT MGR.	
CLIENT	Vectren	FIELD REP	Jon Hall
CONTRACTOR	Atlas	DATE	11.29.22

GROUNDWATER SAMPLING INFORMATION

Well No.	CCR-AP-2						
Water Depth (ft)	34.40						
Time	1011						
Product							
Depth Of Well (ft)							
Inside Diameter (in)	2.0"						
Standing Water Depth (ft) [1]							
Volume Of Water In Well (gal)							
Purging Device	NA						
Volume of Bailer/Pump Capacity	NA						
Cleaning Procedure	Dedicated						
Bails Removed/ Volume Removed	0						
Time Purging Started	NA						
Time Purging Stopped	NA						
Sampling Device	Hydrastove						
Cleaning Procedure	Dedicated						
TIME SAMPLES TAKEN: VOA							
TIME SAMPLES TAKEN: ABN	Sample at	1020					
TIME SAMPLES TAKEN: Metals							

PARAMETERS													
Time	1025												
DTW	34.40												
pH	6.50												
Conductivity	20923												
Turbidity	186.0												
Dissolved Oxygen	2.03												
Temp, ^{0}C	15.21												
ORP	11.7												

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

1. Standing Water Depth = Depth of Well - Water Depth

HALEY & ALDRICH

GROUNDWATER SAMPLING RECORD

PROJECT	Cully East	H&A FILE NO.	
LOCATION		PROJECT MGR.	
CLIENT	Vectren	FIELD REP	Sam Hill
CONTRACTOR	Atlas	DATE	11.29.22

GROUNDWATER SAMPLING INFORMATION

Well No.		CCR-AP-3R					
Water Depth (ft)		32.68					
Time		1130					
Product							
Depth Of Well (ft)							
Inside Diameter (in)		2.0"					
Standing Water Depth (ft) [1]							
Volume Of Water In Well (gal)							
Purging Device		NA					
Volume of Bailer/Pump Capacity		NA					
Cleaning Procedure		—					
Bails Removed/ Volume Removed		Ø					
Time Purging Started		NA					
Time Purging Stopped		NA					
Sampling Device		Hydrastrove					
Cleaning Procedure		dedicated					
TIME SAMPLES TAKEN	VOA						
	ABN	Sample at	1140				
	Metals						
PARAMETERS	Time	1145					
	DTW	32.68					
	pH	7.02					
	Conductivity	1854					
	Turbidity	411.98					
	Dissolved Oxygen	0.81					
	Temp, ^{0}C	17.53					
	ORP	-110.2					

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

1. Standing Water Depth = Depth of Well - Water Depth

HALEY & ALDRICH

GROUNDWATER SAMPLING RECORD

PROJECT	Cullen East	H&A FILE NO.	
LOCATION		PROJECT MGR.	
CLIENT	Vistra	FIELD REP	Jon Hill
CONTRACTOR	Atlas	DATE	11.29.22

GROUNDWATER SAMPLING INFORMATION

Well No.	CCR-AP-4R						
Water Depth (ft)	9.50						
Time	930						
Product							
Depth Of Well (ft)							
Inside Diameter (in)	2.0"						
Standing Water Depth (ft) [1]							
Volume Of Water In Well (gal)							
Purging Device	NA						
Volume of Bailer/Pump Capacity	NA						
Cleaning Procedure	Dedicated						
Bails Removed/ Volume Removed	Ø						
Time Purging Started	NA						
Time Purging Stopped	NA						
Sampling Device	Hydrasleeve						
Cleaning Procedure	Dedicated						
TIME SAMPLES TAKEN: VOA							
TIME SAMPLES TAKEN: ABN	Sample at	940					
TIME SAMPLES TAKEN: Metals							
TIME SAMPLES TAKEN:							
TIME SAMPLES TAKEN:							
TIME SAMPLES TAKEN:							

PARAMETERS													
Time	945												
DTW	9.50												
pH	6.80												
Conductivity	1659.0												
Turbidity	114.09												
Dissolved Oxygen	4.07												
Temp, °C	16.02												
ORP	-63.0												

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

1. Standing Water Depth = Depth of Well - Water Depth

HALEY & ALDRICH

GROUNDWATER SAMPLING RECORD

PROJECT	Gulley East	H&A FILE NO.	
LOCATION		PROJECT MGR.	
CLIENT	Urchin	FIELD REP	Jon Ahl
CONTRACTOR	Atlas	DATE	11.29.22

GROUNDWATER SAMPLING INFORMATION

Well No.	AP-5						
Water Depth (ft)	14.35						
Time	1255						
Product							
Depth Of Well (ft)							
Inside Diameter (in)	2.0"						
Standing Water Depth (ft) [1]							
Volume Of Water In Well (gal)							
Purging Device							
Volume of Bailer/Pump Capacity							
Cleaning Procedure	Dedicated	tubing					
Bails Removed/ Volume Removed	0						
Time Purging Started	NA						
Time Purging Stopped	NA						
Sampling Device	Peristaltic	pump					
Cleaning Procedure							
TIME SAMPLES TAKEN: VOA							
TIME SAMPLES TAKEN: ABN	Sample at	1300					
TIME SAMPLES TAKEN: Metals							

PARAMETERS: Time	1305														
DTW	14.35														
pH	7.30														
Conductivity	1981.2														
Turbidity	93.41														
Dissolved Oxygen	1.99														
Temp, ^{0}C	16.46														
ORP	-83.0														

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

1. Standing Water Depth = Depth of Well - Water Depth

Dup - 1

HALEY & ALDRICH

GROUNDWATER SAMPLING RECORD

PROJECT	Colby East	H&A FILE NO.	
LOCATION		PROJECT MGR.	
CLIENT	Vectren	FIELD REP	Jon Hall
CONTRACTOR	Atlas	DATE	11.29.22

GROUNDWATER SAMPLING INFORMATION

Well No.	CCR-AP-5I						
Water Depth (ft)	15.55						
Time	1215						
Product							
Depth Of Well (ft)	85.30						
Inside Diameter (in)	2.0"						
Standing Water Depth (ft) (1)							
Volume Of Water In Well (gal)	11.16						
Purging Device	Pump						
Volume of Bailer/Pump Capacity	0.40 gpm						
Cleaning Procedure	Dedicated						
Bails Removed/ Volume Removed	33 gallons						
Time Purging Started	1215						
Time Purging Stopped	1342						
Sampling Device	Pump						
Cleaning Procedure	Dedicated						
TIME SAMPLES TAKEN: VOA							
TIME SAMPLES TAKEN: ABN	Sample at	1350					
TIME SAMPLES TAKEN: Metals							
TIME SAMPLES TAKEN:							
TIME SAMPLES TAKEN:							
TIME SAMPLES TAKEN:							

PARAMETERS													
Time	1345												
DTW	34.75												
pH	6.98												
Conductivity	2358.8												
Turbidity	5.65												
Dissolved Oxygen	2.06												
Temp, ^{0}C	15.55												
ORP	-37.7												

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

1. Standing Water Depth = Depth of Well - Water Depth

Drawdown 15.55 → 34.75

Form 3005

HALEY & ALDRICH

GROUNDWATER SAMPLING RECORD

PROJECT	Cully East	H&A FILE NO.	
LOCATION		PROJECT MGR.	
CLIENT	Vectren	FIELD REP	Jon Hill
CONTRACTOR	Atlas	DATE	11.29.22

GROUNDWATER SAMPLING INFORMATION

Well No.		CCR-MP-6					
Water Depth (ft)		39.32					
Time		1150					
Product							
Depth Of Well (ft)							
Inside Diameter (in)		2.0"					
Standing Water Depth (ft) (1)							
Volume Of Water In Well (gal)							
Purging Device		NA					
Volume of Bailer/Pump Capacity		NA					
Cleaning Procedure		Dedicated					
Bails Removed/ Volume Removed		Ø					
Time Purging Started		NA					
Time Purging Stopped		NA					
Sampling Device		Hydrasleeve					
Cleaning Procedure		Dedicated					
TIME SAMPLES TAKEN	VOA						
	ABN	Sampled at	1155				
	Metals						

PARAMETERS	Time	1200											
	DTW	39.32											
	pH	7.13											
	Conductivity	1795.4											
	Turbidity	181.40											
	Dissolved Oxygen	1.46											
	Temp, ^{0}C	16.92											
	ORP	-113.9											

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

1. Standing Water Depth = Depth of Well - Water Depth

HALEY & ALDRICH

GROUNDWATER SAMPLING RECORD

PROJECT	Colby East	H&A FILE NO.	
LOCATION		PROJECT MGR.	
CLIENT	Vector	FIELD REP	Jon Hall
CONTRACTOR	Atlas	DATE	11.30.22

GROUNDWATER SAMPLING INFORMATION

Well No.	CCR-AP-6T						
Water Depth (ft)	39.08						
Time	915						
Product							
Depth Of Well (ft)	74.70						
Inside Diameter (in)	2.0"						
Standing Water Depth (ft) (1)							
Volume Of Water In Well (gal)							
Purging Device	Pump						
Volume of Bailer/Pump Capacity							
Cleaning Procedure	Dedicated						
Bails Removed/ Volume Removed	1.0 gall.						
Time Purging Started	916						
Time Purging Stopped	934						
Sampling Device	Pump						
Cleaning Procedure	Dedicated						
TIME SAMPLES TAKEN: VOA							
ABN	Sample #	940					
Metals							

PARAMETERS												
Time	916	919	922	925	928	931	934					
DTW	39.08	39.10	39.10	39.11	39.11	39.12	39.12					
pH	6.94	6.89	6.95	6.88	6.96	6.89	6.96					
Conductivity	3090.2	3091.9	3099.7	3114.1	3134.1	3105.8	3115.5					
Turbidity	Ø	Ø	Ø	Ø	Ø	Ø	Ø					
Dissolved Oxygen	.09	.08	.07	.06	.06	.05	.05					
Temp, ^{0}C	18.01	17.95	18.02	17.97	18.02	17.92	17.99					
ORP	91.9	94.2	88.7	91.6	86.5	89.0	84.6					

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

1. Standing Water Depth = Depth of Well - Water Depth

HALEY & ALDRICH

GROUNDWATER SAMPLING RECORD

Page 1 of 1

PROJECT	Cully East	H&A FILE NO.	
LOCATION		PROJECT MGR.	
CLIENT	Nextera	FIELD REP	Jon Hill
CONTRACTOR	ATLAS	DATE	11.29.22

GROUNDWATER SAMPLING INFORMATION

Well No.	CCR-AP-8						
Water Depth (ft)	31.00						
Time	1100						
Product							
Depth Of Well (ft)							
Inside Diameter (in)	2.0"						
Standing Water Depth (ft) [1]							
Volume Of Water In Well (gal)							
Purging Device	NA						
Volume of Bailer/Pump Capacity	NA						
Cleaning Procedure	Dedicated						
Bails Removed/ Volume Removed	Ø						
Time Purging Started	NA						
Time Purging Stopped	NA						
Sampling Device	Hydrasleeve						
Cleaning Procedure	Dedicated						
TIME SAMPLES TAKEN: VOA							
TIME SAMPLES TAKEN: ABN	Sample at	1110					
TIME SAMPLES TAKEN: Metals							
TIME SAMPLES TAKEN:							
TIME SAMPLES TAKEN:							
TIME SAMPLES TAKEN:							

PARAMETERS													
Time	1115												
DTW	31.00												
pH	6.95												
Conductivity	18302												
Turbidity	14.21												
Dissolved Oxygen	0.95												
Temp, ^{0}C	16.14												
ORP	-116.5												

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

1. Standing Water Depth = Depth of Well - Water Depth

Form 3005

HALEY & ALDRICH

GROUNDWATER SAMPLING RECORD

PROJECT	Cully East	H&A FILE NO.	
LOCATION		PROJECT MGR.	
CLIENT	Vectren	FIELD REP	Jon Hall
CONTRACTOR	Atlas	DATE	11.30.22

GROUNDWATER SAMPLING INFORMATION

Well No.	CCR-AP-8I						
Water Depth (ft)	35.60						
Time	955						
Product							
Depth Of Well (ft)	68.70						
Inside Diameter (in)	2.0"						
Standing Water Depth (ft) [1]							
Volume Of Water In Well (gal)							
Purging Device	Pump						
Volume of Bailer/Pump Capacity							
Cleaning Procedure	Dedicated						
Bails Removed/ Volume Removed	1.0 gall.						
Time Purging Started	956						
Time Purging Stopped	1014						
Sampling Device	Pump						
Cleaning Procedure	Dedicated						
TIME SAMPLES TAKEN: VOA							
TIME SAMPLES TAKEN: ABN							
TIME SAMPLES TAKEN: Metals	Sample at	1020					

PARAMETERS												
Time	956	959	1002	1005	1008	1011	1014					
DTW	35.60	35.65	35.62	35.67	35.70	35.66	35.70					
pH	6.83	6.81	6.91	6.91	6.98	6.98	6.98					
Conductivity	3903.5	3909.9	3908.2	3899.7	3900.3	3891.4	3880.2					
Turbidity	Ø	Ø	Ø	Ø	Ø	Ø	Ø					
Dissolved Oxygen	.03	.01	0.0	0.0	0.01	0.01	0.01					
Temp, °C	16.94	16.93	16.96	16.81	16.97	16.91	16.98					
ORP	27.8	-47.7	-80.7	-90.9	-99.9	-102.5	-105.0					

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

1. Standing Water Depth = Depth of Well - Water Depth

FB-1 (10:00)

HALEY & ALDRICH

GROUNDWATER SAMPLING RECORD

PROJECT	Cully East	H&A FILE NO.	
LOCATION		PROJECT MGR.	
CLIENT	Vectren	FIELD REP	Jon Hill
CONTRACTOR	Atlas	DATE	11.29.22

GROUNDWATER SAMPLING INFORMATION

Well No.		CCR-AP-9					
Water Depth (ft)		65.86					
Time		800					
Product							
Depth Of Well (ft)							
Inside Diameter (in)		2.0"					
Standing Water Depth (ft) [1]							
Volume Of Water In Well (gal)							
Purging Device		NA					
Volume of Bailer/Pump Capacity							
Cleaning Procedure		Dedicated					
Bails Removed/ Volume Removed		0					
Time Purging Started		NA					
Time Purging Stopped		NA					
Sampling Device		Hydrasleeve					
Cleaning Procedure		Dedicated					
TIME SAMPLES TAKEN	VOA						
	ABN	Sample at	8:05 AM				
	Metals						

PARAMETERS	Time	810											
	DTW	65.86											
	pH	6.94											
	Conductivity	11753											
	Turbidity	202.98											
	Dissolved Oxygen	2.74											
	Temp, ^{0}C	11.65											
	ORP	-7.9											

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

1. Standing Water Depth = Depth of Well - Water Depth

HALEY & ALDRICH

GROUNDWATER SAMPLING RECORD

Page 1 of 1

PROJECT	Cutler East Nov 2022 Sam	H&A FILE NO.	
LOCATION	Cutler Station	PROJECT MGR.	
CLIENT	Veolia	FIELD REP	M. BESTINE
CONTRACTOR	ATLAS	DATE	11/28/22 - 11/29/22

GROUNDWATER SAMPLING INFORMATION

Well No.	CLR-AP-11												
Water Depth (ft)		17.98											
Time		11/28/22	15:00										
Product													
Depth Of Well (ft)													
Inside Diameter (in)													
Standing Water Depth (ft) (1)													
Volume Of Water In Well (gal)													
Purging Device													
Volume of Bailer/Pump Capacity													
Cleaning Procedure													
Bails Removed/ Volume Removed		18 gallons											
Time Purging Started		805 am	11/29/22										
Time Purging Stopped		10:11 am											
Sampling Device		portable pump											
Cleaning Procedure													
TIME SAMPLES TAKEN	VOA												
	ABN												
	Metals	11/29/22											
	Sample 1011												
PARAMETERS	Time	1011											
	DTW	29.05											
	pH	6.70											
	Conductivity	571.7											
	Turbidity	18.47											
	Dissolved Oxygen	2.11											
	Temp, °C	15.89											
	ORP	-78.2											

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

1. Standing Water Depth = Depth of Well - Water Depth

Dedicated pump not operating. Pulled pump 11/28
Used portable pump 11/29. Unable to limit drawdown
w/in acceptable limits. purge 3 wv

Form 3005

FB CULLEY STATION
EAST ASH POND
CCR Groundwater Sampling Event
Gauging Date: May 5, 2022
ATC Project No. 170LF01283

WELL ID	DATE	TIME	DTW FROM TOC (feet)
East Ash Pond Wells			
CCR-AP-2	5/5/2022	9:43	32.29
CCR-AP-3R	5/5/2022	9:57	31.35
CCR-AP-4R	5/5/2022	8:38	9.92
CCR-AP-5	5/5/2022	9:28	10.91
CCR-AP-5I	5/5/2022	9:34	12.54
CCR-AP-6	5/5/2022	10:13	38.79
CCR-AP-6I	5/5/2022	10:15	39.06
CCR-AP-8	5/5/2022	9:53	27.85
CCR-AP-8I	5/5/2022	9:54	35.40
CCR-AP-11	5/5/2022	9:40	14.27
Background Wells			
CCR-AP-1R	5/5/2022	7:47	57.54
CCR-AP-7	5/5/2022	7:28	5.60
CCR-AP-9	5/5/2022	8:11	61.05

NOTES
DTW= Depth to Water
TOC= Top of Casing

FB CULLEY STATION
EAST ASH POND
CCR Groundwater Sampling Event
Gauging Date: November 28, 2022
ATC Project No. 170LF01283

WELL ID	DATE	TIME	DTW FROM TOC (feet)
East Ash Pond Wells			
CCR-AP-2	11/28/2022	14:14	34.38
CCR-AP-3R	11/28/2022	14:30	32.65
CCR-AP-4R	11/28/2022	15:09	9.40
CCR-AP-5	11/28/2022	14:10	14.35
CCR-AP-5I	11/28/2022	14:04	15.60
CCR-AP-6	11/28/2022	14:45	39.30
CCR-AP-6I	11/28/2022	14:40	39.27
CCR-AP-8	11/28/2022	14:45	30.92
CCR-AP-8I	11/28/2022	14:40	35.70
CCR-AP-11	11/28/2022	13:53	17.61
Background Wells			
CCR-AP-1R	11/28/2022	13:31	54.25
CCR-AP-7	11/28/2022	13:25	17.30
CCR-AP-9	11/28/2022	13:43	65.80

NOTES
DTW= Depth to Water
TOC= Top of Casing

APPENDIX **D**
Laboratory Analytical Reports

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

Laboratory Job ID: 180-137837-3
Client Project/Site: CCR GW Monitoring FB Culley East
Revision: 1

For:
Haley & Aldrich, Inc.
465 Medford St
Suite 2200
Boston, Massachusetts 02129-0414

Attn: Mark Miesfeldt

Authorized for release by:
6/21/2022 12:15:06 PM

Ken Hayes, Project Manager II
(615)301-5035
Ken.Hayes@et.eurofinsus.com

PA Lab ID: 02-00416

Table of Contents

Job ID: 180-137837-3

Laboratory: Eurofins Pittsburgh

Narrative

Job Narrative
180-137837-3

Comments
No additional comments.

Revision
The report being provided is a revision of the original report sent on 5/25/2022. The report (revision 1) is being revised due to: Client - To merge job -4 into -3.

Receipt
The samples were received on 5/10/2022 9:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.1° C.

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

RAD
Methods 903.0, 9315: Radium-226 batch 565412
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. CCR-AP-5I (180-137837-2), CCR-AP-11 (180-137837-3), FIELD BLANK (180-137837-4), (LCS 160-565412/1-A), (LCSD 160-565412/2-A) and (MB 160-565412/16-A)

Methods 904.0, 9320: Radium-228 batch 569652:
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. CCR-AP-5I (180-137837-2), CCR-AP-11 (180-137837-3), FIELD BLANK (180-137837-4), (LCS 160-569652/2-A), (LCSD 160-569652/3-A) and (MB 160-569652/1-A)

Method PrecSep_0: Radium-228 Prep Batch 160-565413
The following samples were prepared at a reduced aliquot due to Matrix: CCR-AP-5I (180-137837-2) and CCR-AP-11 (180-137837-3). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method PrecSep_0: Radium-228 Prep Batch 160-569652
Insufficient sample volume was available to perform a sample duplicate for the following samples: CCR-AP-5I (180-137837-2), CCR-AP-11 (180-137837-3) and FIELD BLANK (180-137837-4). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method PrecSep_0: Radium-228 Prep Batch 160-569652
The following samples were prepared at a reduced aliquot due to Matrix: CCR-AP-5I (180-137837-2), CCR-AP-11 (180-137837-3) and FIELD BLANK (180-137837-4). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method PrecSep-21: Radium-226 Prep Batch 160-565412
The following samples were prepared at a reduced aliquot due to Matrix: CCR-AP-5I (180-137837-2) and CCR-AP-11 (180-137837-3). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

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

Metals
Method 6020A: The following sample was diluted to bring the concentration of target analytes within the calibration range: CCR-AP-5I (180-137837-2). Elevated reporting limits (RLs) are provided.

Job ID: 180-137837-3 (Continued)

Laboratory: Eurofins Pittsburgh (Continued)

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

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

Definitions/Glossary

Client: Haley & Aldrich, Inc. Job ID: 180-137837-3
Project/Site: CCR GW Monitoring FB Culley East

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.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

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
CFU	Colony Forming Unit
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)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
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)
TNTC	Too Numerous To Count

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.
Job ID: 180-137837-3
Project/Site: CCR GW Monitoring FB Culley East

Laboratory: Eurofins Pittsburgh

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

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	19-033-0	05-29-22
California	State	2891	04-30-22 *
Connecticut	State	PH-0688	05-29-22
Florida	NELAP	E871008	05-29-22
Georgia	State	PA 02-00416	05-29-22
Illinois	NELAP	004375	05-29-22
Kansas	NELAP	E-10350	05-29-22
Kentucky (UST)	State	162013	04-30-22 *
Kentucky (WW)	State	KY98043	05-29-22
Louisiana	NELAP	04041	05-29-22
Maine	State	PA00164	03-06-24
Minnesota	NELAP	042-999-482	05-29-22
Nevada	State	PA00164	08-31-22
New Hampshire	NELAP	2030	05-29-22
New Jersey	NELAP	PA005	05-29-22
New York	NELAP	11182	05-29-22
North Carolina (WW/SW)	State	434	05-29-22
North Dakota	State	R-227	04-30-22 *
Oregon	NELAP	PA-2151	02-07-23
Pennsylvania	NELAP	02-00416	05-29-22
Rhode Island	State	LAO00362	12-31-21 *
South Carolina	State	89014	05-29-22
Texas	NELAP	T104704528	05-29-22
USDA	Federal	P-Soil-01	06-26-22
USDA	US Federal Programs	P330-16-00211	06-26-22
Utah	NELAP	PA001462019-8	05-31-22
Virginia	NELAP	10043	05-25-22
West Virginia DEP	State	142	05-29-22
Wisconsin	State	998027800	08-31-22

Laboratory: Eurofins St. Louis

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	07-01-22
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22

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

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc. Job ID: 180-137837-3
Project/Site: CCR GW Monitoring FB Culley East

Laboratory: Eurofins St. Louis (Continued)

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

Authority	Program	Identification Number	Expiration Date
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-23
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

Sample Summary

Client: Haley & Aldrich, Inc.
Job ID: 180-137837-3
Project/Site: CCR GW Monitoring FB Culley East

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-137837-2	CCR-AP-5I	Water	05/06/22 11:05	05/10/22 09:00
180-137837-3	CCR-AP-11	Water	05/05/22 12:05	05/10/22 09:00
180-137837-4	FIELD BLANK	Water	05/05/22 08:23	05/10/22 09:00

Method Summary

Client: Haley & Aldrich, Inc.
Job ID: 180-137837-3
Project/Site: CCR GW Monitoring FB Culley East

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	TAL PIT
EPA 6020A	Metals (ICP/MS)	SW846	TAL PIT
EPA 7470A	Mercury (CVAA)	SW846	TAL PIT
EPA 9040C	pH	SW846	TAL PIT
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PIT
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
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT
7470A	Preparation, Mercury	SW846	TAL PIT
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

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

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

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

Lab Chronicle

Client: Haley & Aldrich, Inc.
Job ID: 180-137837-3
Project/Site: CCR GW Monitoring FB Culley East

Client Sample ID: CCR-AP-5I
Lab Sample ID: 180-137837-2
Date Collected: 05/06/22 11:05
Matrix: Water
Date Received: 05/10/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			399568	05/21/22 21:46	LWM	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399200	05/18/22 11:08	EMR	TAL PIT
Total Recoverable	Analysis	EPA 6020A		10			399861	05/24/22 12:10	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399200	05/18/22 11:08	EMR	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			399450	05/19/22 13:01	RSK	TAL PIT
	Instrument ID: DORY									
Total/NA	Prep	7470A			50 mL	50 mL	399384	05/19/22 12:46	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			399476	05/20/22 10:01	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Analysis	EPA 9040C		1			398727	05/13/22 10:19	HEK	TAL PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	398280	05/10/22 14:32	JCR	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			503.51 mL	1.0 g	565412	05/13/22 10:29	MS	TAL SL
Total/NA	Analysis	9315		1			569033	06/08/22 22:23	FLC	TAL SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			745.96 mL	1.0 g	569652	06/13/22 10:44	MS	TAL SL
Total/NA	Analysis	9320		1			570477	06/17/22 14:05	CLP	TAL SL
	Instrument ID: GFPCPURPLE									
Total/NA	Analysis	Ra226_Ra228		1			570889	06/20/22 19:41	EMH	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-11
Lab Sample ID: 180-137837-3
Date Collected: 05/05/22 12:05
Matrix: Water
Date Received: 05/10/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			399568	05/21/22 22:11	LWM	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399200	05/18/22 11:08	EMR	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			399450	05/19/22 13:15	RSK	TAL PIT
	Instrument ID: DORY									
Total/NA	Prep	7470A			50 mL	50 mL	399384	05/19/22 12:46	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			399476	05/20/22 10:02	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Analysis	EPA 9040C		1			398749	05/13/22 15:36	HEK	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	398280	05/10/22 14:32	JCR	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			494.31 mL	1.0 g	565412	05/13/22 10:29	MS	TAL SL
Total/NA	Analysis	9315		1			569033	06/08/22 22:24	FLC	TAL SL
	Instrument ID: GFPCRED									

Lab Chronicle

Client: Haley & Aldrich, Inc.
Job ID: 180-137837-3
Project/Site: CCR GW Monitoring FB Culley East

Client Sample ID: CCR-AP-11
Lab Sample ID: 180-137837-3
Date Collected: 05/05/22 12:05
Matrix: Water
Date Received: 05/10/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep_0			753.92 mL	1.0 g	569652	06/13/22 10:44	MS	TAL SL
Total/NA	Analysis	9320		1			570477	06/17/22 14:05	CLP	TAL SL
	Instrument ID: GFPCPURPLE									
Total/NA	Analysis	Ra226_Ra228		1			570889	06/20/22 19:41	EMH	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD BLANK
Lab Sample ID: 180-137837-4
Date Collected: 05/05/22 08:23
Matrix: Water
Date Received: 05/10/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			399568	05/21/22 22:36	LWM	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399200	05/18/22 11:08	EMR	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			399450	05/19/22 13:19	RSK	TAL PIT
	Instrument ID: DORY									
Total/NA	Prep	7470A			50 mL	50 mL	399384	05/19/22 12:46	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			399476	05/20/22 10:03	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Analysis	EPA 9040C		1			398749	05/13/22 15:38	HEK	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	398280	05/10/22 14:32	JCR	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			998.00 mL	1.0 g	565412	05/13/22 10:29	MS	TAL SL
Total/NA	Analysis	9315		1	1.0 mL	1.0 mL	569033	06/08/22 22:24	FLC	TAL SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			991.55 mL	1.0 g	569652	06/13/22 10:44	MS	TAL SL
Total/NA	Analysis	9320		1	1.0 mL	1.0 mL	570477	06/17/22 14:05	CLP	TAL SL
	Instrument ID: GFPCPURPLE									
Total/NA	Analysis	Ra226_Ra228		1			570889	06/20/22 19:41	EMH	TAL SL
	Instrument ID: NOEQUIP									

Laboratory References:

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

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

Client: Haley & Aldrich, Inc.
Job ID: 180-137837-3
Project/Site: CCR GW Monitoring FB Culley East

Analyst References:

Lab: TAL PIT

- Batch Type: Prep
  - EMR = Elizabeth Rarick
  - RJR = Ron Rosenbaum
- Batch Type: Analysis
  - HEK = Hope Kiesling
  - JCR = Jessica Rodgers
  - LWM = Larry Matko
  - RJR = Ron Rosenbaum
  - RSK = Robert Kurtz

Lab: TAL SL

- Batch Type: Prep
  - MS = Matthew Swaringam
- Batch Type: Analysis
  - CLP = Cassandra Park
  - EMH = Elizabeth Hoerchler
  - FLC = Fernando Cruz

Client Sample ID: CCR-AP-5I
Date Collected: 05/06/22 11:05
Date Received: 05/10/22 09:00

Lab Sample ID: 180-137837-2
Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	210		1.0	0.71	mg/L			05/21/22 21:46	1
Fluoride	1.1		0.10	0.026	mg/L			05/21/22 21:46	1
Sulfate	460		1.0	0.76	mg/L			05/21/22 21:46	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0017	J	0.0020	0.00051	mg/L		05/18/22 11:08	05/19/22 13:01	1
Arsenic	0.0052		0.0010	0.00028	mg/L		05/18/22 11:08	05/19/22 13:01	1
Barium	0.064		0.010	0.0031	mg/L		05/18/22 11:08	05/19/22 13:01	1
Beryllium	ND		0.0010	0.00027	mg/L		05/18/22 11:08	05/19/22 13:01	1
Boron	12		0.80	0.60	mg/L		05/18/22 11:08	05/24/22 12:10	10
Cadmium	0.00070	J	0.0010	0.00022	mg/L		05/18/22 11:08	05/19/22 13:01	1
Calcium	210		0.50	0.13	mg/L		05/18/22 11:08	05/19/22 13:01	1
Chromium	0.0053		0.0020	0.0015	mg/L		05/18/22 11:08	05/19/22 13:01	1
Cobalt	0.0034		0.00050	0.00026	mg/L		05/18/22 11:08	05/19/22 13:01	1
Lead	0.0024	B	0.0010	0.00017	mg/L		05/18/22 11:08	05/19/22 13:01	1
Lithium	0.023	B	0.0050	0.00083	mg/L		05/18/22 11:08	05/19/22 13:01	1
Molybdenum	0.0084		0.0050	0.00061	mg/L		05/18/22 11:08	05/19/22 13:01	1
Selenium	0.0014	J	0.0050	0.00074	mg/L		05/18/22 11:08	05/19/22 13:01	1
Thallium	ND		0.0010	0.00047	mg/L		05/18/22 11:08	05/19/22 13:01	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.00020		0.00020	0.00013	mg/L		05/19/22 12:46	05/20/22 10:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1300		10	10	mg/L			05/10/22 14:32	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1	0.1	SU			05/13/22 10:19	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.813		0.505	0.510	1.00	0.675	pCi/L	05/13/22 10:29	06/08/22 22:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*82.5*		*40 - 110*	*05/13/22 10:29*	*06/08/22 22:23*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.544	U	0.535	0.537	1.00	0.857	pCi/L	06/13/22 10:44	06/17/22 14:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*76.8*		*40 - 110*	*06/13/22 10:44*	*06/17/22 14:05*	*1*
Y Carrier	*81.9*		*40 - 110*	*06/13/22 10:44*	*06/17/22 14:05*	*1*

Client Sample ID: CCR-AP-5I
Lab Sample ID: 180-137837-2
Date Collected: 05/06/22 11:05
Matrix: Water
Date Received: 05/10/22 09:00

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	1.36		0.736	0.741	5.00	0.857	pCi/L		06/20/22 19:41	1

Client Sample ID: CCR-AP-11
Lab Sample ID: 180-137837-3
Date Collected: 05/05/22 12:05
Matrix: Water
Date Received: 05/10/22 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	14		1.0	0.71	mg/L			05/21/22 22:11	1
Fluoride	0.53		0.10	0.026	mg/L			05/21/22 22:11	1
Sulfate	320		1.0	0.76	mg/L			05/21/22 22:11	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00051	mg/L		05/18/22 11:08	05/19/22 13:15	1
Arsenic	0.019		0.0010	0.00028	mg/L		05/18/22 11:08	05/19/22 13:15	1
Barium	0.10		0.010	0.0031	mg/L		05/18/22 11:08	05/19/22 13:15	1
Beryllium	ND		0.0010	0.00027	mg/L		05/18/22 11:08	05/19/22 13:15	1
Boron	0.39		0.080	0.060	mg/L		05/18/22 11:08	05/19/22 13:15	1
Cadmium	ND		0.0010	0.00022	mg/L		05/18/22 11:08	05/19/22 13:15	1
Calcium	73		0.50	0.13	mg/L		05/18/22 11:08	05/19/22 13:15	1
Chromium	ND		0.0020	0.0015	mg/L		05/18/22 11:08	05/19/22 13:15	1
Cobalt	0.029		0.00050	0.00026	mg/L		05/18/22 11:08	05/19/22 13:15	1
Lead	0.00067	J B	0.0010	0.00017	mg/L		05/18/22 11:08	05/19/22 13:15	1
Lithium	0.0039	J B	0.0050	0.00083	mg/L		05/18/22 11:08	05/19/22 13:15	1
Molybdenum	0.0015	J	0.0050	0.00061	mg/L		05/18/22 11:08	05/19/22 13:15	1
Selenium	ND		0.0050	0.00074	mg/L		05/18/22 11:08	05/19/22 13:15	1
Thallium	ND		0.0010	0.00047	mg/L		05/18/22 11:08	05/19/22 13:15	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		05/19/22 12:46	05/20/22 10:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	910		10	10	mg/L			05/10/22 14:32	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.3	HF	0.1	0.1	SU			05/13/22 15:36	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.27		0.508	0.521	1.00	0.490	pCi/L	05/13/22 10:29	06/08/22 22:24	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.5*		*40 - 110*	*05/13/22 10:29*	*06/08/22 22:24*	*1*

Client Sample ID: CCR-AP-11
Lab Sample ID: 180-137837-3
Date Collected: 05/05/22 12:05
Matrix: Water
Date Received: 05/10/22 09:00

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.233	U	0.325	0.325	1.00	0.547	pCi/L	06/13/22 10:44	06/17/22 14:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.8*		*40 - 110*	*06/13/22 10:44*	*06/17/22 14:05*	*1*
Y Carrier	*83.0*		*40 - 110*	*06/13/22 10:44*	*06/17/22 14:05*	*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	**1.51**		0.603	0.614	5.00	0.547	pCi/L		06/20/22 19:41	1

Client Sample ID: FIELD BLANK
Lab Sample ID: 180-137837-4
Date Collected: 05/05/22 08:23
Matrix: Water
Date Received: 05/10/22 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**0.78**	**J**	1.0	0.71	mg/L			05/21/22 22:36	1
Fluoride	ND		0.10	0.026	mg/L			05/21/22 22:36	1
Sulfate	ND		1.0	0.76	mg/L			05/21/22 22:36	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00051	mg/L		05/18/22 11:08	05/19/22 13:19	1
Arsenic	ND		0.0010	0.00028	mg/L		05/18/22 11:08	05/19/22 13:19	1
Barium	ND		0.010	0.0031	mg/L		05/18/22 11:08	05/19/22 13:19	1
Beryllium	ND		0.0010	0.00027	mg/L		05/18/22 11:08	05/19/22 13:19	1
Boron	**0.10**		0.080	0.060	mg/L		05/18/22 11:08	05/19/22 13:19	1
Cadmium	ND		0.0010	0.00022	mg/L		05/18/22 11:08	05/19/22 13:19	1
Calcium	ND		0.50	0.13	mg/L		05/18/22 11:08	05/19/22 13:19	1
Chromium	ND		0.0020	0.0015	mg/L		05/18/22 11:08	05/19/22 13:19	1
Cobalt	ND		0.00050	0.00026	mg/L		05/18/22 11:08	05/19/22 13:19	1
Lead	ND		0.0010	0.00017	mg/L		05/18/22 11:08	05/19/22 13:19	1
Lithium	ND		0.0050	0.00083	mg/L		05/18/22 11:08	05/19/22 13:19	1
Molybdenum	ND		0.0050	0.00061	mg/L		05/18/22 11:08	05/19/22 13:19	1
Selenium	ND		0.0050	0.00074	mg/L		05/18/22 11:08	05/19/22 13:19	1
Thallium	ND		0.0010	0.00047	mg/L		05/18/22 11:08	05/19/22 13:19	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		05/19/22 12:46	05/20/22 10:03	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			05/10/22 14:32	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.7**	**HF**	0.1	0.1	SU			05/13/22 15:38	1

Client Sample ID: FIELD BLANK
Lab Sample ID: 180-137837-4

Date Collected: 05/05/22 08:23
Matrix: Water

Date Received: 05/10/22 09:00

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.00212	U	0.167	0.167	1.00	0.339	pCi/L	05/13/22 10:29	06/08/22 22:24	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.3*		*40 - 110*	*05/13/22 10:29*	*06/08/22 22:24*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0614	U	0.260	0.260	1.00	0.474	pCi/L	06/13/22 10:44	06/17/22 14:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.8*		*40 - 110*	*06/13/22 10:44*	*06/17/22 14:05*	*1*
Y Carrier	*87.1*		*40 - 110*	*06/13/22 10:44*	*06/17/22 14:05*	*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	0.0593	U	0.309	0.309	5.00	0.474	pCi/L		06/20/22 19:41	1

Method: EPA 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 180-399568/7
Matrix: Water
Analysis Batch: 399568

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			05/21/22 12:03	1
Fluoride	ND		0.10	0.026	mg/L			05/21/22 12:03	1
Sulfate	ND		1.0	0.76	mg/L			05/21/22 12:03	1

Lab Sample ID: LCS 180-399568/5
Matrix: Water
Analysis Batch: 399568

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	50.0	48.5		mg/L		97	80 - 120
Fluoride	2.50	2.36		mg/L		94	80 - 120
Sulfate	50.0	48.9		mg/L		98	80 - 120

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

Lab Sample ID: MB 180-399200/1-A
Matrix: Water
Analysis Batch: 399450

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 399200

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00051	mg/L		05/18/22 11:08	05/19/22 19:15	1
Arsenic	ND		0.0010	0.00028	mg/L		05/18/22 11:08	05/19/22 19:15	1
Barium	ND		0.010	0.0031	mg/L		05/18/22 11:08	05/19/22 19:15	1
Beryllium	ND		0.0010	0.00027	mg/L		05/18/22 11:08	05/19/22 19:15	1
Boron	ND		0.080	0.060	mg/L		05/18/22 11:08	05/19/22 19:15	1
Cadmium	ND		0.0010	0.00022	mg/L		05/18/22 11:08	05/19/22 19:15	1
Calcium	ND		0.50	0.13	mg/L		05/18/22 11:08	05/19/22 19:15	1
Chromium	ND		0.0020	0.0015	mg/L		05/18/22 11:08	05/19/22 19:15	1
Cobalt	ND		0.00050	0.00026	mg/L		05/18/22 11:08	05/19/22 19:15	1
Lead	0.000178	J	0.0010	0.00017	mg/L		05/18/22 11:08	05/19/22 19:15	1
Lithium	0.00126	J	0.0050	0.00083	mg/L		05/18/22 11:08	05/19/22 19:15	1
Molybdenum	ND		0.0050	0.00061	mg/L		05/18/22 11:08	05/19/22 19:15	1
Selenium	ND		0.0050	0.00074	mg/L		05/18/22 11:08	05/19/22 19:15	1
Thallium	ND		0.0010	0.00047	mg/L		05/18/22 11:08	05/19/22 19:15	1

Lab Sample ID: LCS 180-399200/2-A
Matrix: Water
Analysis Batch: 399450

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 399200

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.250	0.246		mg/L		98	80 - 120
Arsenic	1.00	0.938		mg/L		94	80 - 120
Barium	1.00	0.919		mg/L		92	80 - 120
Beryllium	0.500	0.481		mg/L		96	80 - 120
Boron	1.25	1.21		mg/L		97	80 - 120
Cadmium	0.500	0.469		mg/L		94	80 - 120
Calcium	25.0	26.1		mg/L		105	80 - 120
Chromium	0.500	0.465		mg/L		93	80 - 120
Cobalt	0.500	0.477		mg/L		95	80 - 120

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

Lab Sample ID: LCS 180-399200/2-A
Matrix: Water
Analysis Batch: 399450

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 399200

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Lead	0.500	0.476		mg/L		95	80 - 120
Lithium	0.500	0.472		mg/L		94	80 - 120
Molybdenum	0.500	0.478		mg/L		96	80 - 120
Selenium	1.00	0.915		mg/L		92	80 - 120
Thallium	1.00	0.945		mg/L		95	80 - 120

Method: EPA 7470A - Mercury (CVAA)

Lab Sample ID: MB 180-399384/1-A
Matrix: Water
Analysis Batch: 399476

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 399384

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		05/19/22 12:46	05/20/22 09:40	1

Lab Sample ID: LCS 180-399384/2-A
Matrix: Water
Analysis Batch: 399476

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 399384

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00250	0.00277		mg/L		111	80 - 120

Method: EPA 9040C - pH

Lab Sample ID: LCS 180-398727/3
Matrix: Water
Analysis Batch: 398727

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 180-398749/1
Matrix: Water
Analysis Batch: 398749

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-565412/16-A
Matrix: Water
Analysis Batch: 569033

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 565412

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.02927	U	0.122	0.122	1.00	0.243	pCi/L	05/13/22 10:29	06/08/22 22:24	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.5*		*40 - 110*	*05/13/22 10:29*	*06/08/22 22:24*	*1*

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

Lab Sample ID: LCS 160-565412/1-A
Matrix: Water
Analysis Batch: 569033

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 565412

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	9.666		1.24	1.00	0.253	pCi/L	85	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*96.8*		*40 - 110*

Lab Sample ID: LCSD 160-565412/2-A
Matrix: Water
Analysis Batch: 569033

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 565412

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-226			11.3	8.897		1.18	1.00	0.273	pCi/L	78	75 - 125	0.32	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*94.8*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-569652/1-A
Matrix: Water
Analysis Batch: 570479

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 569652

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.2531	U	0.337	0.338	1.00	0.562	pCi/L	06/13/22 10:44	06/17/22 14:02	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.5*		*40 - 110*	*06/13/22 10:44*	*06/17/22 14:02*	*1*
Y Carrier	*86.7*		*40 - 110*	*06/13/22 10:44*	*06/17/22 14:02*	*1*

Lab Sample ID: LCS 160-569652/2-A
Matrix: Water
Analysis Batch: 570477

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 569652

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.53	7.595		1.08	1.00	0.523	pCi/L	89	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*98.3*		*40 - 110*
Y Carrier	*86.0*		*40 - 110*

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCSD 160-569652/3-A
Matrix: Water
Analysis Batch: 570477

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 569652

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-228			8.53	7.525		1.08	1.00	0.532	pCi/L	88	75 - 125	0.03	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*96.3*		*40 - 110*
Y Carrier	*85.2*		*40 - 110*

HPLC/IC

Analysis Batch: 399568

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-137837-2	CCR-AP-5I	Total/NA	Water	EPA 9056A	
180-137837-3	CCR-AP-11	Total/NA	Water	EPA 9056A	
180-137837-4	FIELD BLANK	Total/NA	Water	EPA 9056A	
MB 180-399568/7	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-399568/5	Lab Control Sample	Total/NA	Water	EPA 9056A	

Metals

Prep Batch: 399200

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-137837-2	CCR-AP-5I	Total Recoverable	Water	3005A	
180-137837-3	CCR-AP-11	Total Recoverable	Water	3005A	
180-137837-4	FIELD BLANK	Total Recoverable	Water	3005A	
MB 180-399200/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-399200/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 399384

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-137837-2	CCR-AP-5I	Total/NA	Water	7470A	
180-137837-3	CCR-AP-11	Total/NA	Water	7470A	
180-137837-4	FIELD BLANK	Total/NA	Water	7470A	
MB 180-399384/1-A	Method Blank	Total/NA	Water	7470A	
LCS 180-399384/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 399450

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-137837-2	CCR-AP-5I	Total Recoverable	Water	EPA 6020A	399200
180-137837-3	CCR-AP-11	Total Recoverable	Water	EPA 6020A	399200
180-137837-4	FIELD BLANK	Total Recoverable	Water	EPA 6020A	399200
MB 180-399200/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	399200
LCS 180-399200/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	399200

Analysis Batch: 399476

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-137837-2	CCR-AP-5I	Total/NA	Water	EPA 7470A	399384
180-137837-3	CCR-AP-11	Total/NA	Water	EPA 7470A	399384
180-137837-4	FIELD BLANK	Total/NA	Water	EPA 7470A	399384
MB 180-399384/1-A	Method Blank	Total/NA	Water	EPA 7470A	399384
LCS 180-399384/2-A	Lab Control Sample	Total/NA	Water	EPA 7470A	399384

Analysis Batch: 399861

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-137837-2	CCR-AP-5I	Total Recoverable	Water	EPA 6020A	399200

General Chemistry

Analysis Batch: 398280

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-137837-2	CCR-AP-5I	Total/NA	Water	SM 2540C	
180-137837-3	CCR-AP-11	Total/NA	Water	SM 2540C	
180-137837-4	FIELD BLANK	Total/NA	Water	SM 2540C	

QC Association Summary

Client: Haley & Aldrich, Inc.
Job ID: 180-137837-3
Project/Site: CCR GW Monitoring FB Culley East

General Chemistry

Analysis Batch: 398727

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-137837-2	CCR-AP-5I	Total/NA	Water	EPA 9040C	
LCS 180-398727/3	Lab Control Sample	Total/NA	Water	EPA 9040C	

Analysis Batch: 398749

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-137837-3	CCR-AP-11	Total/NA	Water	EPA 9040C	
180-137837-4	FIELD BLANK	Total/NA	Water	EPA 9040C	
LCS 180-398749/1	Lab Control Sample	Total/NA	Water	EPA 9040C	

Rad

Prep Batch: 565412

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-137837-2	CCR-AP-5I	Total/NA	Water	PrecSep-21	
180-137837-3	CCR-AP-11	Total/NA	Water	PrecSep-21	
180-137837-4	FIELD BLANK	Total/NA	Water	PrecSep-21	
MB 160-565412/16-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-565412/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-565412/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 569652

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-137837-2	CCR-AP-5I	Total/NA	Water	PrecSep_0	
180-137837-3	CCR-AP-11	Total/NA	Water	PrecSep_0	
180-137837-4	FIELD BLANK	Total/NA	Water	PrecSep_0	
MB 160-569652/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-569652/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-569652/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Hayley Toles	Lab PM: Hayes, Ken	Carrier Tracking No(s):	COC No: 180-80666-14505.1
Client Contact: Mark Breting	Phone: 812-455-0886	E-Mail: Ken.Hayes@et.eurofinsus.com	State of Origin:	Page: Page 1 of 2
Company: Atlas Technical Consultants LLC	PWSID:			Job #:
Address: 7988 Centerpoint Drive Suite 100	Due Date Requested:			
City: Indianapolis	TAT Requested (days):			
State, Zip: IN, 46256	Compliance Project: Δ Yes Δ No			
Phone: 864-214-8750(Tel)	PO #: FB-242026. AB-241410			
Email: mark.breting@atcassociates.com	WO #:			
Project Name: CCR Groundwater Monitoring FB Culley	Project #: 18016014			
Site:	SSOW#:			

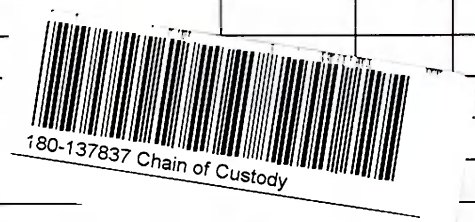
Analysis Requested

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	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		6020A, 7470A		2540C_Calcd - TDS		9315_Ra226, 9320_Ra228		Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	N	D	N	D	N	D		
WAP-1	5-6-22	8:35	G	W			✓	✓	✓	✓	✓	✓	✓	✓		1 1-liter collected
CCR-AP-5I	5-6-22	11:05	G	W			✓	✓	✓	✓	✓	✓	✓	✓		
CCR-AP-11	5-5-22	12:38	G	W			✓	✓	✓	✓	✓	✓	✓	✓		
Field Blank	5-5-22	8:23	G	W			✓	✓	✓	✓	✓	✓	✓	✓		



#202

Virginia Beach

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	[signature]	5-6-22 / 14:30	Atlas	[signature]	5/6/22 1454	[illegible]
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Hayley Toles	Lab PM: Hayes, Ken	Carrier Tracking No(s):	COC No: 180-80666-14505.1
Client Contact: Mark Breting	Phone: 812-455-0886	E-Mail: Ken.Hayes@et.eurofinsus.com	State of Origin:	Page: Page 1 of 2
Company: Atlas Technical Consultants LLC	PWSID:	Analysis Requested		Job #:
Address: 7988 Centerpoint Drive Suite 100	Due Date 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)
City: Indianapolis	TAT Requested (days):			
State, Zip: IN, 46256	Compliance Project: Δ Yes Δ No			
Phone: 864-214-8750(Tel)	PO #: FB-242026. AB-241410			
Email: mark.breting@atcassociates.com	WO #:			
Project Name: CCR Groundwater Monitoring FB Culley	Project #: 18016014			
Site:	SSOW#:			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)	9040C, 9056A_ORGFM_28D	6020A, 7470A	2540C_Calcd - TDS	9315_Ra226, 9320_Ra228	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	N	D		
WAP-1	5-6-22	8:35	G	W			✓	✓	✓	✓	MEB 5/16/22	1 1-liter collected
CCR-AP-5I	5-6-22	11:05	G	W			✓	✓	✓	✓	(ATC)	
CCR-AP-11	5-5-22	12:38	G	W			✓	✓	✓	✓		
Field Blank	5-5-22	8:23	G	W			✓	✓	✓	✓		

180-137837 Chain of Custody

Virginia Beach #202

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:

	Date/Time:	Company		Date/Time:	Company
Relinquished by: Hayley Toles	5-6-22 / 14:30	Atlas	Received by:	5/16/22 0954	EATC
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:

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 180-137837-3

Login Number: 137837
List Number: 1
Creator: Abernathy, Eric L

List Source: Eurofins Pittsburgh

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?	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: 180-137837-3

Login Number: 137837
List Number: 2
Creator: Booker, Autumn R

List Source: Eurofins St. Louis
List Creation: 05/12/22 11:07 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.	True	
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	
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	

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ANALYTICAL REPORT

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

Laboratory Job ID: 180-138040-1
Client Project/Site: CCR Groundwater Monitoring FB Culley
Revision: 1

For:
Haley & Aldrich, Inc.
465 Medford St
Suite 2200
Boston, Massachusetts 02129-0414

Attn: Mark Miesfeldt

Authorized for release by:
6/17/2022 5:53:52 PM

Ken Hayes, Project Manager II
(615)301-5035
Ken.Hayes@et.eurofinsus.com

PA Lab ID: 02-00416

Table of Contents

Job ID: 180-138040-1

Laboratory: Eurofins Pittsburgh

Narrative

Job Narrative
180-138040-1

Comments
No additional comments.

Receipt
The samples were received on 5/12/2022 9:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 2.1º C, 2.8º C and 2.8º C.

GC Semi VOA
Method 9056A: The following sample was diluted due to the conductivity of the sample matrix: CCR-AP-6I (180-138040-7). Elevated reporting limits (RLs) are provided.

Method 9056A: The matrix spike (MS) recoveries for analytical batch 180-400173 were outside control limits. Sample matrix interference and/or non-homogeneity are 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.

RAD
Method 9315: Radium-226 batch 565799
The detection goal was not met for the following samples. Samples were prepped at a reduced volume due to the presence of matrix interferences: CCR-AP-1R (180-138040-1) and CCR-AP-4 (180-138040-4). Analytical results are reported with the detection limit achieved.

Method 9315: Radium-226 batch 565799
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. :CCR-AP-1R (180-138040-1), CCR-AP-2 (180-138040-2), CCR-AP-4 (180-138040-4), CCR-AP-5 (180-138040-5), CCR-AP-6I (180-138040-7), CCR-AP-8I (180-138040-9), CCR-AP-9 (180-138040-10), BLIND DUPLICATE (180-138040-11), (LCS 160-565799/1-A), (LCSD 160-565799/2-A) and (MB 160-565799/19-A)

Methods 903.0, 9315: Radium-226 batch 566195
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. :CCR-AP-3 (180-138040-3), CCR-AP-6 (180-138040-6), CCR-AP-8 (180-138040-8), (LCS 160-566195/1-A), (LCSD 160-566195/2-A) and (MB 160-566195/23-A)

Method 9320: Radium-228 Batch 566201
The detection goal was not met for the following sample. Sample was prepped at a reduced volume due to the presence of matrix interferences: CCR-AP-3 (180-138040-3). Analytical results are reported with the detection limit achieved.

Methods 904.0, 9320: Radium-228 Batch 566201
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. :CCR-AP-3 (180-138040-3), CCR-AP-6 (180-138040-6), CCR-AP-8 (180-138040-8), (LCS 160-566201/1-A), (LCSD 160-566201/2-A) and (MB 160-566201/23-A)

Method 9320: Radium 228 Batch 160-569786:
The following sample(s) did not meet the requested limit (RL) due to the reduced sample volume attributed to the presence of matrix interference. During preparation the analyst visually noted matrix effects. The data have been reported with this narrative. CCR-AP-1R (180-138040-1) and CCR-AP-9 (180-138040-10)

Method 9320: Radium 228 Batch 160-569786:
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is

Job ID: 180-138040-1 (Continued)

Laboratory: Eurofins Pittsburgh (Continued)

sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. CCR-AP-1R (180-138040-1), CCR-AP-2 (180-138040-2), CCR-AP-4 (180-138040-4), CCR-AP-5 (180-138040-5), CCR-AP-6I (180-138040-7), CCR-AP-8I (180-138040-9), CCR-AP-9 (180-138040-10), BLIND DUPLICATE (180-138040-11), (LCS 160-569786/2-A), (LCSD 160-569786/3-A) and (MB 160-569786/1-A)

Method PrecSep_0: Radium-228 Prep Batch 160-565801
The following samples were prepared at a reduced aliquot due to Matrix: CCR-AP-1R (180-138040-1), CCR-AP-2 (180-138040-2), CCR-AP-4 (180-138040-4), CCR-AP-5 (180-138040-5) and CCR-AP-9 (180-138040-10). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method PrecSep_0: Radium-22 Prep Batch 160-566201
The following samples were prepared at a reduced aliquot due to Matrix: CCR-AP-3 (180-138040-3), CCR-AP-6 (180-138040-6) and CCR-AP-8 (180-138040-8). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method PrecSep_0: Radium-228 Prep Batch 160-569786
The following samples were prepared at a reduced aliquot due to Matrix: CCR-AP-1R (180-138040-1), CCR-AP-2 (180-138040-2), CCR-AP-4 (180-138040-4), CCR-AP-5 (180-138040-5), CCR-AP-8I (180-138040-9) and BLIND DUPLICATE (180-138040-11). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method PrecSep_0: Radium-228 Prep Batch 160-569786
Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 160-569786.

Method PrecSep-21: Radium-226 Prep Batch 160-565799
The following samples were prepared at a reduced aliquot due to Matrix: CCR-AP-1R (180-138040-1), CCR-AP-2 (180-138040-2), CCR-AP-4 (180-138040-4), CCR-AP-5 (180-138040-5) and CCR-AP-9 (180-138040-10). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method PrecSep-21: Radium-226 Prep Batch 160-566195
The following samples were prepared at a reduced aliquot due to Matrix: CCR-AP-3 (180-138040-3), CCR-AP-6 (180-138040-6) and CCR-AP-8 (180-138040-8). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

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

Metals
Method 6020A: The continuing calibration blank (CCB) associated with batch 180-400138 recovered above the upper control limit for manganese. The samples associated with this CCB were 10X the CCB concentration/batch QC for the affected analytes; therefore, the data have been reported. The associated samples are impacted: CCR-AP-8 (180-138040-8), CCR-AP-8I (180-138040-9), CCR-AP-9 (180-138040-10) and (CCB 180-400138/107).

Method 6020A: The following samples were diluted to bring the concentration of target analytes within the calibration range: CCR-AP-6I (180-138040-7) and CCR-AP-8I (180-138040-9). Elevated reporting limits (RLs) are provided.

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

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

Definitions/Glossary

Client: Haley & Aldrich, Inc. Job ID: 180-138040-1
Project/Site: CCR Groundwater Monitoring FB Culley

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
^2	Calibration Blank (ICB and/or CCB) is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Rad

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
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
CFU	Colony Forming Unit
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)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
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)
TNTC	Too Numerous To Count

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc. Job ID: 180-138040-1
Project/Site: CCR Groundwater Monitoring FB Culley

Laboratory: Eurofins Pittsburgh

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

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	19-033-0	05-29-22
California	State	2891	04-30-22 *
Connecticut	State	PH-0688	05-29-22
Florida	NELAP	E871008	05-29-22
Georgia	State	PA 02-00416	05-29-22
Illinois	NELAP	004375	05-29-22
Kansas	NELAP	E-10350	05-29-22
Kentucky (UST)	State	162013	04-30-22 *
Kentucky (WW)	State	KY98043	05-29-22
Louisiana	NELAP	04041	05-29-22
Maine	State	PA00164	03-06-24
Minnesota	NELAP	042-999-482	05-29-22
Nevada	State	PA00164	08-31-22
New Hampshire	NELAP	2030	05-29-22
New Jersey	NELAP	PA005	05-29-22
New York	NELAP	11182	05-29-22
North Carolina (WW/SW)	State	434	05-29-22
North Dakota	State	R-227	04-30-22 *
Oregon	NELAP	PA-2151	02-07-23
Pennsylvania	NELAP	02-00416	05-29-22
Rhode Island	State	LAO00362	12-31-21 *
South Carolina	State	89014	05-29-22
Texas	NELAP	T104704528	05-29-22
USDA	Federal	P-Soil-01	06-26-22
USDA	US Federal Programs	P330-16-00211	06-26-22
Utah	NELAP	PA001462019-8	05-31-22
Virginia	NELAP	10043	05-29-22
West Virginia DEP	State	142	05-29-22
Wisconsin	State	998027800	08-31-22

Laboratory: Eurofins St. Louis

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	07-01-22
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22

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

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc. Job ID: 180-138040-1
Project/Site: CCR Groundwater Monitoring FB Culley

Laboratory: Eurofins St. Louis (Continued)

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

Authority	Program	Identification Number	Expiration Date
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-23
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

Sample Summary

Client: Haley & Aldrich, Inc.
Job ID: 180-138040-1
Project/Site: CCR Groundwater Monitoring FB Culley

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-138040-1	CCR-AP-1R	Water	05/10/22 08:38	05/12/22 09:00
180-138040-2	CCR-AP-2	Water	05/09/22 09:36	05/12/22 09:00
180-138040-3	CCR-AP-3	Water	05/09/22 10:06	05/12/22 09:00
180-138040-4	CCR-AP-4	Water	05/09/22 10:55	05/12/22 09:00
180-138040-5	CCR-AP-5	Water	05/10/22 15:10	05/12/22 09:00
180-138040-6	CCR-AP-6	Water	05/09/22 08:45	05/12/22 09:00
180-138040-7	CCR-AP-6I	Water	05/10/22 09:50	05/12/22 09:00
180-138040-8	CCR-AP-8	Water	05/10/22 12:38	05/12/22 09:00
180-138040-9	CCR-AP-8I	Water	05/10/22 10:55	05/12/22 09:00
180-138040-10	CCR-AP-9	Water	05/09/22 12:23	05/12/22 09:00
180-138040-11	BLIND DUPLICATE	Water	05/10/22 00:01	05/12/22 09:00

Method Summary

Client: Haley & Aldrich, Inc.
Job ID: 180-138040-1
Project/Site: CCR Groundwater Monitoring FB Culley

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	TAL PIT
EPA 6020A	Metals (ICP/MS)	SW846	TAL PIT
EPA 7470A	Mercury (CVAA)	SW846	TAL PIT
EPA 9040C	pH	SW846	TAL PIT
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PIT
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
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT
7470A	Preparation, Mercury	SW846	TAL PIT
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

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

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

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

Lab Chronicle

Client: Haley & Aldrich, Inc.
Job ID: 180-138040-1
Project/Site: CCR Groundwater Monitoring FB Culley

Client Sample ID: CCR-AP-1R
Lab Sample ID: 180-138040-1
Date Collected: 05/10/22 08:38
Matrix: Water
Date Received: 05/12/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			399664	05/23/22 20:58	M1D	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400138	05/26/22 17:47	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400265	05/27/22 13:17	RSK	TAL PIT
	Instrument ID: NEMO									
Total/NA	Prep	7470A			50 mL	50 mL	399689	05/23/22 14:01	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			399733	05/23/22 21:11	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Analysis	EPA 9040C		1			398815	05/14/22 09:25	HEK	TAL PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	398712	05/13/22 12:22	JCR	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			250.24 mL	1.0 g	565799	05/16/22 13:21	MS	TAL SL
Total/NA	Analysis	9315		1			569247	06/09/22 21:26	FLC	TAL SL
	Instrument ID: GFPCBLUE									
Total/NA	Prep	PrecSep_0			243.88 mL	1.0 g	569786	06/13/22 14:29	MS	TAL SL
Total/NA	Analysis	9320		1			570477	06/17/22 11:54	CLP	TAL SL
	Instrument ID: GFPCPURPLE									
Total/NA	Analysis	Ra226_Ra228		1			570488	06/17/22 17:17	EMH	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-2
Lab Sample ID: 180-138040-2
Date Collected: 05/09/22 09:36
Matrix: Water
Date Received: 05/12/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			399664	05/23/22 21:57	M1D	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400138	05/26/22 17:51	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400265	05/27/22 13:19	RSK	TAL PIT
	Instrument ID: NEMO									
Total/NA	Prep	7470A			50 mL	50 mL	399689	05/23/22 14:01	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			399733	05/23/22 20:51	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Analysis	EPA 9040C		1			398815	05/14/22 09:29	HEK	TAL PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	398712	05/13/22 12:22	JCR	TAL PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Haley & Aldrich, Inc.
Job ID: 180-138040-1
Project/Site: CCR Groundwater Monitoring FB Culley

Client Sample ID: CCR-AP-2
Lab Sample ID: 180-138040-2
Date Collected: 05/09/22 09:36
Matrix: Water
Date Received: 05/12/22 09:00

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			506.97 mL	1.0 g	565799	05/16/22 13:21	MS	TAL SL
Total/NA	Analysis	9315		1			569247	06/09/22 21:26	FLC	TAL SL
	Instrument ID: GFPCBLUE									
Total/NA	Prep	PrecSep_0			503.42 mL	1.0 g	569786	06/13/22 14:29	MS	TAL SL
Total/NA	Analysis	9320		1			570480	06/17/22 11:57	CLP	TAL SL
	Instrument ID: GFPCORANGE									
Total/NA	Analysis	Ra226_Ra228		1			570488	06/17/22 17:17	EMH	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-3
Lab Sample ID: 180-138040-3
Date Collected: 05/09/22 10:06
Matrix: Water
Date Received: 05/12/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			399664	05/23/22 22:27	M1D	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400138	05/26/22 18:05	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400265	05/27/22 13:30	RSK	TAL PIT
	Instrument ID: NEMO									
Total/NA	Prep	7470A			50 mL	50 mL	399689	05/23/22 14:01	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			399733	05/23/22 20:55	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Analysis	EPA 9040C		1			398815	05/14/22 09:32	HEK	TAL PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	398712	05/13/22 12:22	JCR	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			500.07 mL	1.0 g	566195	05/18/22 10:14	MS	TAL SL
Total/NA	Analysis	9315		1			569457	06/10/22 16:33	FLC	TAL SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			500.07 mL	1.0 g	566201	05/18/22 10:52	MS	TAL SL
Total/NA	Analysis	9320		1			569458	06/10/22 12:22	FLC	TAL SL
	Instrument ID: GFPCBLUE									
Total/NA	Analysis	Ra226_Ra228		1			569801	06/13/22 19:01	CLP	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-4
Lab Sample ID: 180-138040-4
Date Collected: 05/09/22 10:55
Matrix: Water
Date Received: 05/12/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1	1 mL	1.0 mL	400173	05/27/22 21:03	M1D	TAL PIT
	Instrument ID: CHICS2100B									

Lab Chronicle

Client: Haley & Aldrich, Inc.
Job ID: 180-138040-1
Project/Site: CCR Groundwater Monitoring FB Culley

Client Sample ID: CCR-AP-4
Lab Sample ID: 180-138040-4
Date Collected: 05/09/22 10:55
Matrix: Water
Date Received: 05/12/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400138	05/26/22 18:09	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400265	05/27/22 13:32	RSK	TAL PIT
	Instrument ID: NEMO									
Total/NA	Prep	7470A			50 mL	50 mL	399689	05/23/22 14:01	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			399733	05/23/22 20:56	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Analysis	EPA 9040C		1			398815	05/14/22 09:35	HEK	TAL PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	398712	05/13/22 12:22	JCR	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			500.87 mL	1.0 g	565799	05/16/22 13:21	MS	TAL SL
Total/NA	Analysis	9315		1			569247	06/09/22 21:26	FLC	TAL SL
	Instrument ID: GFPCBLUE									
Total/NA	Prep	PrecSep_0			496.06 mL	1.0 g	569786	06/13/22 14:29	MS	TAL SL
Total/NA	Analysis	9320		1			570480	06/17/22 11:57	CLP	TAL SL
	Instrument ID: GFPCORANGE									
Total/NA	Analysis	Ra226_Ra228		1			570488	06/17/22 17:17	EMH	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-5
Lab Sample ID: 180-138040-5
Date Collected: 05/10/22 15:10
Matrix: Water
Date Received: 05/12/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			399664	05/23/22 23:41	M1D	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400138	05/26/22 18:12	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400265	05/27/22 13:40	RSK	TAL PIT
	Instrument ID: NEMO									
Total/NA	Prep	7470A			50 mL	50 mL	399689	05/23/22 14:01	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			399733	05/23/22 20:57	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Analysis	EPA 9040C		1			398815	05/14/22 09:48	HEK	TAL PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	398712	05/13/22 12:22	JCR	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			748.25 mL	1.0 g	565799	05/16/22 13:21	MS	TAL SL
Total/NA	Analysis	9315		1			569247	06/09/22 21:26	FLC	TAL SL
	Instrument ID: GFPCBLUE									

Lab Chronicle

Client: Haley & Aldrich, Inc.
Job ID: 180-138040-1
Project/Site: CCR Groundwater Monitoring FB Culley

Client Sample ID: CCR-AP-5
Lab Sample ID: 180-138040-5
Date Collected: 05/10/22 15:10
Matrix: Water
Date Received: 05/12/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep_0			748.98 mL	1.0 g	569786	06/13/22 14:29	MS	TAL SL
Total/NA	Analysis	9320		1			570480	06/17/22 11:57	CLP	TAL SL
	Instrument ID: GFPCORANGE									
Total/NA	Analysis	Ra226_Ra228		1			570488	06/17/22 17:17	EMH	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-6
Lab Sample ID: 180-138040-6
Date Collected: 05/09/22 08:45
Matrix: Water
Date Received: 05/12/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			399664	05/24/22 00:55	M1D	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400138	05/26/22 18:16	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400265	05/27/22 13:43	RSK	TAL PIT
	Instrument ID: NEMO									
Total/NA	Prep	7470A			50 mL	50 mL	399689	05/23/22 14:01	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			399733	05/23/22 20:59	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Analysis	EPA 9040C		1			398815	05/14/22 09:52	HEK	TAL PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	398712	05/13/22 12:22	JCR	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			496.14 mL	1.0 g	566195	05/18/22 10:14	MS	TAL SL
Total/NA	Analysis	9315		1			569457	06/10/22 16:34	FLC	TAL SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			496.14 mL	1.0 g	566201	05/18/22 10:52	MS	TAL SL
Total/NA	Analysis	9320		1			569458	06/10/22 12:23	FLC	TAL SL
	Instrument ID: GFPCBLUE									
Total/NA	Analysis	Ra226_Ra228		1			569801	06/13/22 19:01	CLP	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-6I
Lab Sample ID: 180-138040-7
Date Collected: 05/10/22 09:50
Matrix: Water
Date Received: 05/12/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		2.5			399664	05/24/22 01:25	M1D	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400138	05/26/22 18:19	RSK	TAL PIT
	Instrument ID: A									

Lab Chronicle

Client: Haley & Aldrich, Inc.
Job ID: 180-138040-1
Project/Site: CCR Groundwater Monitoring FB Culley

Client Sample ID: CCR-AP-6I
Lab Sample ID: 180-138040-7
Date Collected: 05/10/22 09:50
Matrix: Water
Date Received: 05/12/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		10			400265	05/27/22 13:45	RSK	TAL PIT
	Instrument ID: NEMO									
Total/NA	Prep	7470A			50 mL	50 mL	399689	05/23/22 14:01	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			399733	05/23/22 21:00	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Analysis	EPA 9040C		1			398815	05/14/22 09:55	HEK	TAL PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	398712	05/13/22 12:22	JCR	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			997.69 mL	1.0 g	565799	05/16/22 13:21	MS	TAL SL
Total/NA	Analysis	9315		1			569247	06/09/22 21:26	FLC	TAL SL
	Instrument ID: GFPCBLUE									
Total/NA	Prep	PrecSep_0			996.87 mL	1.0 g	569786	06/13/22 14:29	MS	TAL SL
Total/NA	Analysis	9320		1			570480	06/17/22 11:57	CLP	TAL SL
	Instrument ID: GFPCORANGE									
Total/NA	Analysis	Ra226_Ra228		1			570488	06/17/22 17:17	EMH	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-8
Lab Sample ID: 180-138040-8
Date Collected: 05/10/22 12:38
Matrix: Water
Date Received: 05/12/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			399664	05/24/22 01:55	M1D	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400138	05/26/22 18:41	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400265	05/27/22 13:48	RSK	TAL PIT
	Instrument ID: NEMO									
Total/NA	Prep	7470A			50 mL	50 mL	399689	05/23/22 14:01	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			399733	05/23/22 21:01	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Analysis	EPA 9040C		1			398815	05/14/22 09:58	HEK	TAL PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	398712	05/13/22 12:22	JCR	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			752.12 mL	1.0 g	566195	05/18/22 10:14	MS	TAL SL
Total/NA	Analysis	9315		1			569457	06/10/22 16:34	FLC	TAL SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			752.12 mL	1.0 g	566201	05/18/22 10:52	MS	TAL SL
Total/NA	Analysis	9320		1			569458	06/10/22 12:23	FLC	TAL SL
	Instrument ID: GFPCBLUE									

Lab Chronicle

Client: Haley & Aldrich, Inc.
Job ID: 180-138040-1
Project/Site: CCR Groundwater Monitoring FB Culley

Client Sample ID: CCR-AP-8
Lab Sample ID: 180-138040-8
Date Collected: 05/10/22 12:38
Matrix: Water
Date Received: 05/12/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Ra226_Ra228		1			569801	06/13/22 19:01	CLP	TAL SL

Client Sample ID: CCR-AP-8I
Lab Sample ID: 180-138040-9
Date Collected: 05/10/22 10:55
Matrix: Water
Date Received: 05/12/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		2.5	1 mL	1.0 mL	400173	05/27/22 22:02	M1D	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400138	05/26/22 18:45	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		10			400265	05/27/22 13:50	RSK	TAL PIT
	Instrument ID: NEMO									
Total/NA	Prep	7470A			50 mL	50 mL	399689	05/23/22 14:01	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			399733	05/23/22 21:02	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Analysis	EPA 9040C		1			398815	05/14/22 10:02	HEK	TAL PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	398712	05/13/22 12:22	JCR	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			995.43 mL	1.0 g	565799	05/16/22 13:21	MS	TAL SL
Total/NA	Analysis	9315		1			569247	06/09/22 21:26	FLC	TAL SL
	Instrument ID: GFPCBLUE									
Total/NA	Prep	PrecSep_0			741.40 mL	1.0 g	569786	06/13/22 14:29	MS	TAL SL
Total/NA	Analysis	9320		1			570480	06/17/22 11:58	CLP	TAL SL
	Instrument ID: GFPCORANGE									
Total/NA	Analysis	Ra226_Ra228		1			570488	06/17/22 17:17	EMH	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-9
Lab Sample ID: 180-138040-10
Date Collected: 05/09/22 12:23
Matrix: Water
Date Received: 05/12/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1	1 mL	1.0 mL	400173	05/27/22 21:33	M1D	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400138	05/26/22 18:59	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400265	05/27/22 13:53	RSK	TAL PIT
	Instrument ID: NEMO									

Lab Chronicle

Client: Haley & Aldrich, Inc.
Job ID: 180-138040-1
Project/Site: CCR Groundwater Monitoring FB Culley

Client Sample ID: CCR-AP-9
Lab Sample ID: 180-138040-10
Date Collected: 05/09/22 12:23
Matrix: Water
Date Received: 05/12/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	399689	05/23/22 14:01	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			399733	05/23/22 21:03	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Analysis	EPA 9040C		1			398815	05/14/22 10:05	HEK	TAL PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	398712	05/13/22 12:22	JCR	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			496.02 mL	1.0 g	565799	05/16/22 13:21	MS	TAL SL
Total/NA	Analysis	9315		1			569248	06/09/22 21:27	FLC	TAL SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			255.54 mL	1.0 g	569786	06/13/22 14:29	MS	TAL SL
Total/NA	Analysis	9320		1			570480	06/17/22 11:58	CLP	TAL SL
	Instrument ID: GFPCORANGE									
Total/NA	Analysis	Ra226_Ra228		1			570488	06/17/22 17:17	EMH	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: BLIND DUPLICATE
Lab Sample ID: 180-138040-11
Date Collected: 05/10/22 00:01
Matrix: Water
Date Received: 05/12/22 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			399664	05/24/22 02:25	M1D	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400138	05/26/22 19:03	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			25 mL	25 mL	399388	05/19/22 12:54	NAF	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			400265	05/27/22 13:56	RSK	TAL PIT
	Instrument ID: NEMO									
Total/NA	Prep	7470A			50 mL	50 mL	399689	05/23/22 14:01	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			399733	05/23/22 21:04	RJR	TAL PIT
	Instrument ID: HGY									
Total/NA	Analysis	EPA 9040C		1			398815	05/14/22 10:08	HEK	TAL PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	398707	05/13/22 12:11	JCR	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			1000.10 mL	1.0 g	565799	05/16/22 13:21	MS	TAL SL
Total/NA	Analysis	9315		1			569248	06/09/22 21:28	FLC	TAL SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			756.29 mL	1.0 g	569786	06/13/22 14:29	MS	TAL SL
Total/NA	Analysis	9320		1			570480	06/17/22 11:58	CLP	TAL SL
	Instrument ID: GFPCORANGE									
Total/NA	Analysis	Ra226_Ra228		1			570488	06/17/22 17:17	EMH	TAL SL
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Haley & Aldrich, Inc.
Job ID: 180-138040-1
Project/Site: CCR Groundwater Monitoring FB Culley

Laboratory References:

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

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

Analyst References:

Lab: TAL PIT

Batch Type: Prep

NAF = Nicholas Frankos

RJR = Ron Rosenbaum

Batch Type: Analysis

HEK = Hope Kiesling

JCR = Jessica Rodgers

M1D = Maureen Donlin

RJR = Ron Rosenbaum

RSK = Robert Kurtz

Lab: TAL SL

Batch Type: Prep

MS = Matthew Swaringam

Batch Type: Analysis

CLP = Cassandra Park

EMH = Elizabeth Hoerchler

FLC = Fernando Cruz

Client Sample ID: CCR-AP-1R
Date Collected: 05/10/22 08:38
Date Received: 05/12/22 09:00

Lab Sample ID: 180-138040-1
Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	17		1.0	0.71	mg/L			05/23/22 20:58	1
Fluoride	0.48		0.10	0.026	mg/L			05/23/22 20:58	1
Sulfate	210		1.0	0.76	mg/L			05/23/22 20:58	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0041		0.0020	0.00051	mg/L		05/19/22 12:54	05/26/22 17:47	1
Arsenic	0.034		0.0010	0.00028	mg/L		05/19/22 12:54	05/26/22 17:47	1
Barium	0.32		0.010	0.0031	mg/L		05/19/22 12:54	05/26/22 17:47	1
Beryllium	0.0053		0.0010	0.00027	mg/L		05/19/22 12:54	05/26/22 17:47	1
Boron	0.69		0.080	0.060	mg/L		05/19/22 12:54	05/27/22 13:17	1
Cadmium	0.00043	J	0.0010	0.00022	mg/L		05/19/22 12:54	05/26/22 17:47	1
Calcium	79		0.50	0.13	mg/L		05/19/22 12:54	05/26/22 17:47	1
Chromium	0.11		0.0020	0.0015	mg/L		05/19/22 12:54	05/26/22 17:47	1
Cobalt	0.080		0.00050	0.00026	mg/L		05/19/22 12:54	05/26/22 17:47	1
Lead	0.078		0.0010	0.00017	mg/L		05/19/22 12:54	05/26/22 17:47	1
Lithium	0.15		0.0050	0.00083	mg/L		05/19/22 12:54	05/26/22 17:47	1
Molybdenum	0.023		0.0050	0.00061	mg/L		05/19/22 12:54	05/26/22 17:47	1
Selenium	0.0024	J	0.0050	0.00074	mg/L		05/19/22 12:54	05/26/22 17:47	1
Thallium	0.00056	J	0.0010	0.00047	mg/L		05/19/22 12:54	05/26/22 17:47	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		05/23/22 14:01	05/23/22 21:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	890		10	10	mg/L			05/13/22 12:22	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.6	HF	0.1	0.1	SU			05/14/22 09:25	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	2.69	G	1.15	1.17	1.00	1.25	pCi/L	05/16/22 13:21	06/09/22 21:26	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*87.3*		*40 - 110*	*05/16/22 13:21*	*06/09/22 21:26*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	4.24	G	2.02	2.05	1.00	2.72	pCi/L	06/13/22 14:29	06/17/22 11:54	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.3*		*40 - 110*	*06/13/22 14:29*	*06/17/22 11:54*	*1*
Y Carrier	*62.4*		*40 - 110*	*06/13/22 14:29*	*06/17/22 11:54*	*1*

Client Sample ID: CCR-AP-1R
Lab Sample ID: 180-138040-1
Date Collected: 05/10/22 08:38
Matrix: Water
Date Received: 05/12/22 09:00

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	6.92		2.32	2.36	5.00	2.72	pCi/L		06/17/22 17:17	1

Client Sample ID: CCR-AP-2
Lab Sample ID: 180-138040-2
Date Collected: 05/09/22 09:36
Matrix: Water
Date Received: 05/12/22 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	190		1.0	0.71	mg/L			05/23/22 21:57	1
Fluoride	0.63		0.10	0.026	mg/L			05/23/22 21:57	1
Sulfate	240		1.0	0.76	mg/L			05/23/22 21:57	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0021		0.0020	0.00051	mg/L		05/19/22 12:54	05/26/22 17:51	1
Arsenic	0.016		0.0010	0.00028	mg/L		05/19/22 12:54	05/26/22 17:51	1
Barium	0.22		0.010	0.0031	mg/L		05/19/22 12:54	05/26/22 17:51	1
Beryllium	0.0017		0.0010	0.00027	mg/L		05/19/22 12:54	05/26/22 17:51	1
Boron	6.9		0.080	0.060	mg/L		05/19/22 12:54	05/27/22 13:19	1
Cadmium	0.00086	J	0.0010	0.00022	mg/L		05/19/22 12:54	05/26/22 17:51	1
Calcium	190		0.50	0.13	mg/L		05/19/22 12:54	05/26/22 17:51	1
Chromium	0.033		0.0020	0.0015	mg/L		05/19/22 12:54	05/26/22 17:51	1
Cobalt	0.032		0.00050	0.00026	mg/L		05/19/22 12:54	05/26/22 17:51	1
Lead	0.030		0.0010	0.00017	mg/L		05/19/22 12:54	05/26/22 17:51	1
Lithium	0.021		0.0050	0.00083	mg/L		05/19/22 12:54	05/26/22 17:51	1
Molybdenum	0.0043	J	0.0050	0.00061	mg/L		05/19/22 12:54	05/26/22 17:51	1
Selenium	0.0019	J	0.0050	0.00074	mg/L		05/19/22 12:54	05/26/22 17:51	1
Thallium	0.00050	J	0.0010	0.00047	mg/L		05/19/22 12:54	05/26/22 17:51	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.00015	J	0.00020	0.00013	mg/L		05/23/22 14:01	05/23/22 20:51	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1100		10	10	mg/L			05/13/22 12:22	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.8	HF	0.1	0.1	SU			05/14/22 09:29	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.30		0.703	0.712	1.00	0.937	pCi/L	05/16/22 13:21	06/09/22 21:26	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*79.6*		*40 - 110*	*05/16/22 13:21*	*06/09/22 21:26*	*1*

Client Sample ID: CCR-AP-2
Lab Sample ID: 180-138040-2
Date Collected: 05/09/22 09:36
Matrix: Water
Date Received: 05/12/22 09:00

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.15		0.678	0.686	1.00	0.972	pCi/L	06/13/22 14:29	06/17/22 11:57	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*87.8*		*40 - 110*	*06/13/22 14:29*	*06/17/22 11:57*	*1*
Y Carrier	*85.2*		*40 - 110*	*06/13/22 14:29*	*06/17/22 11:57*	*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	2.45		0.977	0.989	5.00	0.972	pCi/L		06/17/22 17:17	1

Client Sample ID: CCR-AP-3
Lab Sample ID: 180-138040-3
Date Collected: 05/09/22 10:06
Matrix: Water
Date Received: 05/12/22 09:00

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			05/23/22 22:27	1
Fluoride	0.53		0.10	0.026	mg/L			05/23/22 22:27	1
Sulfate	3.9		1.0	0.76	mg/L			05/23/22 22:27	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00051	mg/L		05/19/22 12:54	05/26/22 18:05	1
Arsenic	0.085		0.0010	0.00028	mg/L		05/19/22 12:54	05/26/22 18:05	1
Barium	0.46		0.010	0.0031	mg/L		05/19/22 12:54	05/26/22 18:05	1
Beryllium	ND		0.0010	0.00027	mg/L		05/19/22 12:54	05/26/22 18:05	1
Boron	0.19		0.080	0.060	mg/L		05/19/22 12:54	05/27/22 13:30	1
Cadmium	ND		0.0010	0.00022	mg/L		05/19/22 12:54	05/26/22 18:05	1
Calcium	190		0.50	0.13	mg/L		05/19/22 12:54	05/26/22 18:05	1
Chromium	0.0033		0.0020	0.0015	mg/L		05/19/22 12:54	05/26/22 18:05	1
Cobalt	0.0069		0.00050	0.00026	mg/L		05/19/22 12:54	05/26/22 18:05	1
Lead	0.0016		0.0010	0.00017	mg/L		05/19/22 12:54	05/26/22 18:05	1
Lithium	ND		0.0050	0.00083	mg/L		05/19/22 12:54	05/26/22 18:05	1
Molybdenum	0.014		0.0050	0.00061	mg/L		05/19/22 12:54	05/26/22 18:05	1
Selenium	0.0018	J	0.0050	0.00074	mg/L		05/19/22 12:54	05/26/22 18:05	1
Thallium	ND		0.0010	0.00047	mg/L		05/19/22 12:54	05/26/22 18:05	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		05/23/22 14:01	05/23/22 20:55	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	950		10	10	mg/L			05/13/22 12:22	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.1	HF	0.1	0.1	SU			05/14/22 09:32	1

Client Sample ID: CCR-AP-3 — Lab Sample ID: 180-138040-3

Date Collected: 05/09/22 10:06 — **Matrix: Water**
Date Received: 05/12/22 09:00

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.583	U	0.521	0.524	1.00	0.793	pCi/L	05/18/22 10:14	06/10/22 16:33	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*75.6*		*40 - 110*	*05/18/22 10:14*	*06/10/22 16:33*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.112	U G	0.731	0.731	1.00	1.32	pCi/L	05/18/22 10:52	06/10/22 12:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*75.6*		*40 - 110*	*05/18/22 10:52*	*06/10/22 12:22*	*1*
Y Carrier	*81.5*		*40 - 110*	*05/18/22 10:52*	*06/10/22 12:22*	*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	0.695	U	0.898	0.899	5.00	1.32	pCi/L		06/13/22 19:01	1

Client Sample ID: CCR-AP-4 — Lab Sample ID: 180-138040-4

Date Collected: 05/09/22 10:55 — **Matrix: Water**
Date Received: 05/12/22 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**20**		1.0	0.71	mg/L			05/27/22 21:03	1
Fluoride	**0.31**		0.10	0.026	mg/L			05/27/22 21:03	1
Sulfate	**2.3**		1.0	0.76	mg/L			05/27/22 21:03	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00051	mg/L		05/19/22 12:54	05/26/22 18:09	1
Arsenic	**0.12**		0.0010	0.00028	mg/L		05/19/22 12:54	05/26/22 18:09	1
Barium	**0.57**		0.010	0.0031	mg/L		05/19/22 12:54	05/26/22 18:09	1
Beryllium	ND		0.0010	0.00027	mg/L		05/19/22 12:54	05/26/22 18:09	1
Boron	**0.12**		0.080	0.060	mg/L		05/19/22 12:54	05/27/22 13:32	1
Cadmium	ND		0.0010	0.00022	mg/L		05/19/22 12:54	05/26/22 18:09	1
Calcium	**150**		0.50	0.13	mg/L		05/19/22 12:54	05/26/22 18:09	1
Chromium	**0.0034**		0.0020	0.0015	mg/L		05/19/22 12:54	05/26/22 18:09	1
Cobalt	**0.0024**		0.00050	0.00026	mg/L		05/19/22 12:54	05/26/22 18:09	1
Lead	**0.0038**		0.0010	0.00017	mg/L		05/19/22 12:54	05/26/22 18:09	1
Lithium	**0.0028**	**J**	0.0050	0.00083	mg/L		05/19/22 12:54	05/26/22 18:09	1
Molybdenum	**0.00071**	**J**	0.0050	0.00061	mg/L		05/19/22 12:54	05/26/22 18:09	1
Selenium	ND		0.0050	0.00074	mg/L		05/19/22 12:54	05/26/22 18:09	1
Thallium	ND		0.0010	0.00047	mg/L		05/19/22 12:54	05/26/22 18:09	1

Client: Haley & Aldrich, Inc.
Job ID: 180-138040-1
Project/Site: CCR Groundwater Monitoring FB Culley

Client Sample ID: CCR-AP-4
Lab Sample ID: 180-138040-4
Date Collected: 05/09/22 10:55
Matrix: Water
Date Received: 05/12/22 09:00

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		05/23/22 14:01	05/23/22 20:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**810**		10	10	mg/L			05/13/22 12:22	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.6**	**HF**	0.1	0.1	SU			05/14/22 09:35	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**1.05**	**G**	0.735	0.742	1.00	1.01	pCi/L	05/16/22 13:21	06/09/22 21:26	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*46.6*		*40 - 110*	*05/16/22 13:21*	*06/09/22 21:26*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.55**		0.722	0.736	1.00	0.982	pCi/L	06/13/22 14:29	06/17/22 11:57	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.3*		*40 - 110*	*06/13/22 14:29*	*06/17/22 11:57*	*1*
Y Carrier	*84.1*		*40 - 110*	*06/13/22 14:29*	*06/17/22 11:57*	*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	**2.61**		1.03	1.05	5.00	1.01	pCi/L		06/17/22 17:17	1

Client Sample ID: CCR-AP-5
Lab Sample ID: 180-138040-5
Date Collected: 05/10/22 15:10
Matrix: Water
Date Received: 05/12/22 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**25**		1.0	0.71	mg/L			05/23/22 23:41	1
Fluoride	**2.3**		0.10	0.026	mg/L			05/23/22 23:41	1
Sulfate	**270**		1.0	0.76	mg/L			05/23/22 23:41	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00051	mg/L		05/19/22 12:54	05/26/22 18:12	1
Arsenic	**0.0080**		0.0010	0.00028	mg/L		05/19/22 12:54	05/26/22 18:12	1
Barium	**0.029**		0.010	0.0031	mg/L		05/19/22 12:54	05/26/22 18:12	1
Beryllium	ND		0.0010	0.00027	mg/L		05/19/22 12:54	05/26/22 18:12	1
Boron	**1.5**		0.080	0.060	mg/L		05/19/22 12:54	05/27/22 13:40	1
Cadmium	ND		0.0010	0.00022	mg/L		05/19/22 12:54	05/26/22 18:12	1

Client Sample ID: CCR-AP-5 — Lab Sample ID: 180-138040-5

Date Collected: 05/10/22 15:10 — **Matrix: Water**
Date Received: 05/12/22 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	**130**		0.50	0.13	mg/L		05/19/22 12:54	05/26/22 18:12	1
Chromium	ND		0.0020	0.0015	mg/L		05/19/22 12:54	05/26/22 18:12	1
Cobalt	**0.00044**	**J**	0.00050	0.00026	mg/L		05/19/22 12:54	05/26/22 18:12	1
Lead	**0.00028**	**J**	0.0010	0.00017	mg/L		05/19/22 12:54	05/26/22 18:12	1
Lithium	**0.0090**		0.0050	0.00083	mg/L		05/19/22 12:54	05/26/22 18:12	1
Molybdenum	**0.046**		0.0050	0.00061	mg/L		05/19/22 12:54	05/26/22 18:12	1
Selenium	**0.0029**	**J**	0.0050	0.00074	mg/L		05/19/22 12:54	05/26/22 18:12	1
Thallium	ND		0.0010	0.00047	mg/L		05/19/22 12:54	05/26/22 18:12	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		05/23/22 14:01	05/23/22 20:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**580**		10	10	mg/L			05/13/22 12:22	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.5**	**HF**	0.1	0.1	SU			05/14/22 09:48	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.864**		0.445	0.452	1.00	0.566	pCi/L	05/16/22 13:21	06/09/22 21:26	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*79.8*		*40 - 110*	*05/16/22 13:21*	*06/09/22 21:26*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.462	U	0.347	0.349	1.00	0.525	pCi/L	06/13/22 14:29	06/17/22 11:57	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.5*		*40 - 110*	*06/13/22 14:29*	*06/17/22 11:57*	*1*
Y Carrier	*92.7*		*40 - 110*	*06/13/22 14:29*	*06/17/22 11:57*	*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	**1.33**		0.564	0.571	5.00	0.566	pCi/L		06/17/22 17:17	1

Client Sample ID: CCR-AP-6 — Lab Sample ID: 180-138040-6

Date Collected: 05/09/22 08:45 — **Matrix: Water**
Date Received: 05/12/22 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**42**		1.0	0.71	mg/L			05/24/22 00:55	1

Client Sample ID: CCR-AP-6
Lab Sample ID: 180-138040-6

Date Collected: 05/09/22 08:45
Matrix: Water
Date Received: 05/12/22 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**0.69**		0.10	0.026	mg/L			05/24/22 00:55	1
Sulfate	**13**		1.0	0.76	mg/L			05/24/22 00:55	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00051	mg/L		05/19/22 12:54	05/26/22 18:16	1
Arsenic	**0.10**		0.0010	0.00028	mg/L		05/19/22 12:54	05/26/22 18:16	1
Barium	**0.51**		0.010	0.0031	mg/L		05/19/22 12:54	05/26/22 18:16	1
Beryllium	ND		0.0010	0.00027	mg/L		05/19/22 12:54	05/26/22 18:16	1
Boron	**0.69**		0.080	0.060	mg/L		05/19/22 12:54	05/27/22 13:43	1
Cadmium	ND		0.0010	0.00022	mg/L		05/19/22 12:54	05/26/22 18:16	1
Calcium	**190**		0.50	0.13	mg/L		05/19/22 12:54	05/26/22 18:16	1
Chromium	**0.0019**	**J**	0.0020	0.0015	mg/L		05/19/22 12:54	05/26/22 18:16	1
Cobalt	**0.0034**		0.00050	0.00026	mg/L		05/19/22 12:54	05/26/22 18:16	1
Lead	**0.00078**	**J**	0.0010	0.00017	mg/L		05/19/22 12:54	05/26/22 18:16	1
Lithium	**0.0014**	**J**	0.0050	0.00083	mg/L		05/19/22 12:54	05/26/22 18:16	1
Molybdenum	**0.023**		0.0050	0.00061	mg/L		05/19/22 12:54	05/26/22 18:16	1
Selenium	**0.0011**	**J**	0.0050	0.00074	mg/L		05/19/22 12:54	05/26/22 18:16	1
Thallium	ND		0.0010	0.00047	mg/L		05/19/22 12:54	05/26/22 18:16	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		05/23/22 14:01	05/23/22 20:59	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**970**		10	10	mg/L			05/13/22 12:22	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.2**	**HF**	0.1	0.1	SU			05/14/22 09:52	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.910**		0.460	0.467	1.00	0.515	pCi/L	05/18/22 10:14	06/10/22 16:34	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.8*		*40 - 110*	*05/18/22 10:14*	*06/10/22 16:34*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.646	U	0.590	0.593	1.00	0.936	pCi/L	05/18/22 10:52	06/10/22 12:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.8*		*40 - 110*	*05/18/22 10:52*	*06/10/22 12:23*	*1*
Y Carrier	*80.0*		*40 - 110*	*05/18/22 10:52*	*06/10/22 12:23*	*1*

Client Sample ID: CCR-AP-6 Lab Sample ID: 180-138040-6

Date Collected: 05/09/22 08:45 **Matrix: Water**
Date Received: 05/12/22 09:00

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	1.56		0.748	0.755	5.00	0.936	pCi/L		06/13/22 19:01	1

Client Sample ID: CCR-AP-6I Lab Sample ID: 180-138040-7

Date Collected: 05/10/22 09:50 **Matrix: Water**
Date Received: 05/12/22 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	180		2.5	1.8	mg/L			05/24/22 01:25	2.5
Fluoride	0.12	J	0.25	0.065	mg/L			05/24/22 01:25	2.5
Sulfate	1300		2.5	1.9	mg/L			05/24/22 01:25	2.5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00051	mg/L		05/19/22 12:54	05/26/22 18:19	1
Arsenic	0.0041		0.0010	0.00028	mg/L		05/19/22 12:54	05/26/22 18:19	1
Barium	0.031		0.010	0.0031	mg/L		05/19/22 12:54	05/26/22 18:19	1
Beryllium	ND		0.0010	0.00027	mg/L		05/19/22 12:54	05/26/22 18:19	1
Boron	20		0.80	0.60	mg/L		05/19/22 12:54	05/27/22 13:45	10
Cadmium	ND		0.0010	0.00022	mg/L		05/19/22 12:54	05/26/22 18:19	1
Calcium	520		0.50	0.13	mg/L		05/19/22 12:54	05/26/22 18:19	1
Chromium	ND		0.0020	0.0015	mg/L		05/19/22 12:54	05/26/22 18:19	1
Cobalt	0.0020		0.00050	0.00026	mg/L		05/19/22 12:54	05/26/22 18:19	1
Lead	ND		0.0010	0.00017	mg/L		05/19/22 12:54	05/26/22 18:19	1
Lithium	0.052		0.0050	0.00083	mg/L		05/19/22 12:54	05/26/22 18:19	1
Molybdenum	0.71		0.0050	0.00061	mg/L		05/19/22 12:54	05/26/22 18:19	1
Selenium	ND		0.0050	0.00074	mg/L		05/19/22 12:54	05/26/22 18:19	1
Thallium	ND		0.0010	0.00047	mg/L		05/19/22 12:54	05/26/22 18:19	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		05/23/22 14:01	05/23/22 21:00	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2600		20	20	mg/L			05/13/22 12:22	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1	0.1	SU			05/14/22 09:55	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.269	U	0.237	0.238	1.00	0.361	pCi/L	05/16/22 13:21	06/09/22 21:26	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.5*		*40 - 110*	*05/16/22 13:21*	*06/09/22 21:26*	*1*

Client Sample ID: CCR-AP-6I
Lab Sample ID: 180-138040-7
Date Collected: 05/10/22 09:50
Matrix: Water
Date Received: 05/12/22 09:00

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.481		0.269	0.272	1.00	0.375	pCi/L	06/13/22 14:29	06/17/22 11:57	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.3*		*40 - 110*	*06/13/22 14:29*	*06/17/22 11:57*	*1*
Y Carrier	*93.5*		*40 - 110*	*06/13/22 14:29*	*06/17/22 11:57*	*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	0.750		0.359	0.361	5.00	0.375	pCi/L		06/17/22 17:17	1

Client Sample ID: CCR-AP-8
Lab Sample ID: 180-138040-8
Date Collected: 05/10/22 12:38
Matrix: Water
Date Received: 05/12/22 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	15		1.0	0.71	mg/L			05/24/22 01:55	1
Fluoride	0.42		0.10	0.026	mg/L			05/24/22 01:55	1
Sulfate	32		1.0	0.76	mg/L			05/24/22 01:55	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00085	J	0.0020	0.00051	mg/L		05/19/22 12:54	05/26/22 18:41	1
Arsenic	0.11		0.0010	0.00028	mg/L		05/19/22 12:54	05/26/22 18:41	1
Barium	0.50	^2	0.010	0.0031	mg/L		05/19/22 12:54	05/26/22 18:41	1
Beryllium	ND		0.0010	0.00027	mg/L		05/19/22 12:54	05/26/22 18:41	1
Boron	0.10		0.080	0.060	mg/L		05/19/22 12:54	05/27/22 13:48	1
Cadmium	ND		0.0010	0.00022	mg/L		05/19/22 12:54	05/26/22 18:41	1
Calcium	250		0.50	0.13	mg/L		05/19/22 12:54	05/26/22 18:41	1
Chromium	ND		0.0020	0.0015	mg/L		05/19/22 12:54	05/26/22 18:41	1
Cobalt	0.0031		0.00050	0.00026	mg/L		05/19/22 12:54	05/26/22 18:41	1
Lead	0.00027	J	0.0010	0.00017	mg/L		05/19/22 12:54	05/26/22 18:41	1
Lithium	ND		0.0050	0.00083	mg/L		05/19/22 12:54	05/26/22 18:41	1
Molybdenum	0.0029	J	0.0050	0.00061	mg/L		05/19/22 12:54	05/26/22 18:41	1
Selenium	0.0014	J	0.0050	0.00074	mg/L		05/19/22 12:54	05/26/22 18:41	1
Thallium	ND		0.0010	0.00047	mg/L		05/19/22 12:54	05/26/22 18:41	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		05/23/22 14:01	05/23/22 21:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1100		10	10	mg/L			05/13/22 12:22	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.0	HF	0.1	0.1	SU			05/14/22 09:58	1

Client Sample ID: CCR-AP-8 — Lab Sample ID: 180-138040-8

Date Collected: 05/10/22 12:38 — **Matrix: Water**
Date Received: 05/12/22 09:00

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.899		0.388	0.396	1.00	0.450	pCi/L	05/18/22 10:14	06/10/22 16:34	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.8*		*40 - 110*	*05/18/22 10:14*	*06/10/22 16:34*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.637		0.390	0.395	1.00	0.566	pCi/L	05/18/22 10:52	06/10/22 12:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.8*		*40 - 110*	*05/18/22 10:52*	*06/10/22 12:23*	*1*
Y Carrier	*82.2*		*40 - 110*	*05/18/22 10:52*	*06/10/22 12:23*	*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	1.54		0.550	0.559	5.00	0.566	pCi/L		06/13/22 19:01	1

Client Sample ID: CCR-AP-8I — Lab Sample ID: 180-138040-9

Date Collected: 05/10/22 10:55 — **Matrix: Water**
Date Received: 05/12/22 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	430		2.5	1.8	mg/L			05/27/22 22:02	2.5
Fluoride	0.33		0.25	0.065	mg/L			05/27/22 22:02	2.5
Sulfate	900		2.5	1.9	mg/L			05/27/22 22:02	2.5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00051	mg/L		05/19/22 12:54	05/26/22 18:45	1
Arsenic	0.0018		0.0010	0.00028	mg/L		05/19/22 12:54	05/26/22 18:45	1
Barium	0.22	^2	0.010	0.0031	mg/L		05/19/22 12:54	05/26/22 18:45	1
Beryllium	ND		0.0010	0.00027	mg/L		05/19/22 12:54	05/26/22 18:45	1
Boron	13		0.80	0.60	mg/L		05/19/22 12:54	05/27/22 13:50	10
Cadmium	ND		0.0010	0.00022	mg/L		05/19/22 12:54	05/26/22 18:45	1
Calcium	440		0.50	0.13	mg/L		05/19/22 12:54	05/26/22 18:45	1
Chromium	ND		0.0020	0.0015	mg/L		05/19/22 12:54	05/26/22 18:45	1
Cobalt	ND		0.00050	0.00026	mg/L		05/19/22 12:54	05/26/22 18:45	1
Lead	ND		0.0010	0.00017	mg/L		05/19/22 12:54	05/26/22 18:45	1
Lithium	0.40		0.0050	0.00083	mg/L		05/19/22 12:54	05/26/22 18:45	1
Molybdenum	0.51		0.0050	0.00061	mg/L		05/19/22 12:54	05/26/22 18:45	1
Selenium	ND		0.0050	0.00074	mg/L		05/19/22 12:54	05/26/22 18:45	1
Thallium	ND		0.0010	0.00047	mg/L		05/19/22 12:54	05/26/22 18:45	1

Client Sample ID: CCR-AP-8I
Lab Sample ID: 180-138040-9
Date Collected: 05/10/22 10:55
Matrix: Water
Date Received: 05/12/22 09:00

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		05/23/22 14:01	05/23/22 21:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**2600**		20	20	mg/L			05/13/22 12:22	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.8**	**HF**	0.1	0.1	SU			05/14/22 10:02	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**1.70**		0.454	0.479	1.00	0.427	pCi/L	05/16/22 13:21	06/09/22 21:26	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.0*		*40 - 110*	*05/16/22 13:21*	*06/09/22 21:26*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.88**		0.523	0.551	1.00	0.575	pCi/L	06/13/22 14:29	06/17/22 11:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.3*		*40 - 110*	*06/13/22 14:29*	*06/17/22 11:58*	*1*
Y Carrier	*94.2*		*40 - 110*	*06/13/22 14:29*	*06/17/22 11:58*	*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	**3.58**		0.693	0.730	5.00	0.575	pCi/L		06/17/22 17:17	1

Client Sample ID: CCR-AP-9
Lab Sample ID: 180-138040-10
Date Collected: 05/09/22 12:23
Matrix: Water
Date Received: 05/12/22 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**10**		1.0	0.71	mg/L			05/27/22 21:33	1
Fluoride	**0.26**		0.10	0.026	mg/L			05/27/22 21:33	1
Sulfate	**100**		1.0	0.76	mg/L			05/27/22 21:33	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.0075**		0.0020	0.00051	mg/L		05/19/22 12:54	05/26/22 18:59	1
Arsenic	**0.0085**		0.0010	0.00028	mg/L		05/19/22 12:54	05/26/22 18:59	1
Barium	**0.27**	**^2**	0.010	0.0031	mg/L		05/19/22 12:54	05/26/22 18:59	1
Beryllium	**0.00090**	**J**	0.0010	0.00027	mg/L		05/19/22 12:54	05/26/22 18:59	1
Boron	**0.47**		0.080	0.060	mg/L		05/19/22 12:54	05/27/22 13:53	1
Cadmium	ND		0.0010	0.00022	mg/L		05/19/22 12:54	05/26/22 18:59	1

Client Sample ID: CCR-AP-9 — Lab Sample ID: 180-138040-10

Date Collected: 05/09/22 12:23 — **Matrix: Water**
Date Received: 05/12/22 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	**130**		0.50	0.13	mg/L		05/19/22 12:54	05/26/22 18:59	1
Chromium	**0.020**		0.0020	0.0015	mg/L		05/19/22 12:54	05/26/22 18:59	1
Cobalt	**0.014**		0.00050	0.00026	mg/L		05/19/22 12:54	05/26/22 18:59	1
Lead	**0.014**		0.0010	0.00017	mg/L		05/19/22 12:54	05/26/22 18:59	1
Lithium	**0.042**		0.0050	0.00083	mg/L		05/19/22 12:54	05/26/22 18:59	1
Molybdenum	**0.0029**	**J**	0.0050	0.00061	mg/L		05/19/22 12:54	05/26/22 18:59	1
Selenium	ND		0.0050	0.00074	mg/L		05/19/22 12:54	05/26/22 18:59	1
Thallium	ND		0.0010	0.00047	mg/L		05/19/22 12:54	05/26/22 18:59	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		05/23/22 14:01	05/23/22 21:03	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**650**		10	10	mg/L			05/13/22 12:22	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.3**	**HF**	0.1	0.1	SU			05/14/22 10:05	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.363	U	0.538	0.539	1.00	0.918	pCi/L	05/16/22 13:21	06/09/22 21:27	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*67.6*		*40 - 110*	*05/16/22 13:21*	*06/09/22 21:27*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.999	U G	1.05	1.06	1.00	1.71	pCi/L	06/13/22 14:29	06/17/22 11:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*100*		*40 - 110*	*06/13/22 14:29*	*06/17/22 11:58*	*1*
Y Carrier	*91.2*		*40 - 110*	*06/13/22 14:29*	*06/17/22 11:58*	*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	1.36	U	1.18	1.19	5.00	1.71	pCi/L		06/17/22 17:17	1

Client Sample ID: BLIND DUPLICATE — Lab Sample ID: 180-138040-11

Date Collected: 05/10/22 00:01 — **Matrix: Water**
Date Received: 05/12/22 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**27**		1.0	0.71	mg/L			05/24/22 02:25	1

Client Sample ID: BLIND DUPLICATE
Lab Sample ID: 180-138040-11
Date Collected: 05/10/22 00:01
Matrix: Water
Date Received: 05/12/22 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**2.3**		0.10	0.026	mg/L			05/24/22 02:25	1
Sulfate	**270**		1.0	0.76	mg/L			05/24/22 02:25	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00051	mg/L		05/19/22 12:54	05/26/22 19:03	1
Arsenic	**0.0085**		0.0010	0.00028	mg/L		05/19/22 12:54	05/26/22 19:03	1
Barium	**0.033**		0.010	0.0031	mg/L		05/19/22 12:54	05/27/22 13:56	1
Beryllium	ND		0.0010	0.00027	mg/L		05/19/22 12:54	05/26/22 19:03	1
Boron	**1.5**		0.080	0.060	mg/L		05/19/22 12:54	05/27/22 13:56	1
Cadmium	ND		0.0010	0.00022	mg/L		05/19/22 12:54	05/26/22 19:03	1
Calcium	**140**		0.50	0.13	mg/L		05/19/22 12:54	05/26/22 19:03	1
Chromium	**0.0015**	**J**	0.0020	0.0015	mg/L		05/19/22 12:54	05/26/22 19:03	1
Cobalt	**0.00045**	**J**	0.00050	0.00026	mg/L		05/19/22 12:54	05/26/22 19:03	1
Lead	**0.00039**	**J**	0.0010	0.00017	mg/L		05/19/22 12:54	05/26/22 19:03	1
Lithium	**0.0098**		0.0050	0.00083	mg/L		05/19/22 12:54	05/26/22 19:03	1
Molybdenum	**0.048**		0.0050	0.00061	mg/L		05/19/22 12:54	05/26/22 19:03	1
Selenium	**0.0031**	**J**	0.0050	0.00074	mg/L		05/19/22 12:54	05/26/22 19:03	1
Thallium	ND		0.0010	0.00047	mg/L		05/19/22 12:54	05/26/22 19:03	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		05/23/22 14:01	05/23/22 21:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**590**		10	10	mg/L			05/13/22 12:11	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.5**	**HF**	0.1	0.1	SU			05/14/22 10:08	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.464**		0.268	0.271	1.00	0.354	pCi/L	05/16/22 13:21	06/09/22 21:28	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.3*		*40 - 110*	*05/16/22 13:21*	*06/09/22 21:28*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0919	U	0.307	0.307	1.00	0.553	pCi/L	06/13/22 14:29	06/17/22 11:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.3*		*40 - 110*	*06/13/22 14:29*	*06/17/22 11:58*	*1*
Y Carrier	*91.2*		*40 - 110*	*06/13/22 14:29*	*06/17/22 11:58*	*1*

Client Sample Results

Client: Haley & Aldrich, Inc.
Job ID: 180-138040-1
Project/Site: CCR Groundwater Monitoring FB Culley

Client Sample ID: BLIND DUPLICATE
Lab Sample ID: 180-138040-11
Date Collected: 05/10/22 00:01
Matrix: Water
Date Received: 05/12/22 09:00

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	0.556		0.408	0.409	5.00	0.553	pCi/L		06/17/22 17:17	1

Method: EPA 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 180-399664/7
Matrix: Water
Analysis Batch: 399664

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			05/23/22 13:58	1
Fluoride	ND		0.10	0.026	mg/L			05/23/22 13:58	1
Sulfate	ND		1.0	0.76	mg/L			05/23/22 13:58	1

Lab Sample ID: LCS 180-399664/5
Matrix: Water
Analysis Batch: 399664

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	50.0	52.4		mg/L		105	80 - 120
Fluoride	2.50	2.51		mg/L		101	80 - 120
Sulfate	50.0	52.7		mg/L		105	80 - 120

Lab Sample ID: MB 180-400173/7
Matrix: Water
Analysis Batch: 400173

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			05/27/22 18:01	1
Fluoride	ND		0.10	0.026	mg/L			05/27/22 18:01	1
Sulfate	ND		1.0	0.76	mg/L			05/27/22 18:01	1

Lab Sample ID: LCS 180-400173/6
Matrix: Water
Analysis Batch: 400173

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	50.0	49.2		mg/L		98	80 - 120
Fluoride	2.50	2.52		mg/L		101	80 - 120
Sulfate	50.0	49.5		mg/L		99	80 - 120

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

Lab Sample ID: MB 180-399388/1-A
Matrix: Water
Analysis Batch: 400138

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 399388

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00051	mg/L		05/19/22 12:54	05/26/22 16:45	1
Arsenic	ND		0.0010	0.00028	mg/L		05/19/22 12:54	05/26/22 16:45	1
Barium	ND		0.010	0.0031	mg/L		05/19/22 12:54	05/26/22 16:45	1
Beryllium	ND		0.0010	0.00027	mg/L		05/19/22 12:54	05/26/22 16:45	1
Boron	ND		0.080	0.060	mg/L		05/19/22 12:54	05/26/22 16:45	1
Cadmium	ND		0.0010	0.00022	mg/L		05/19/22 12:54	05/26/22 16:45	1
Calcium	ND		0.50	0.13	mg/L		05/19/22 12:54	05/26/22 16:45	1
Chromium	ND		0.0020	0.0015	mg/L		05/19/22 12:54	05/26/22 16:45	1
Cobalt	ND		0.00050	0.00026	mg/L		05/19/22 12:54	05/26/22 16:45	1
Lead	ND		0.0010	0.00017	mg/L		05/19/22 12:54	05/26/22 16:45	1
Lithium	ND		0.0050	0.00083	mg/L		05/19/22 12:54	05/26/22 16:45	1
Molybdenum	ND		0.0050	0.00061	mg/L		05/19/22 12:54	05/26/22 16:45	1

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

Lab Sample ID: MB 180-399388/1-A
Matrix: Water
Analysis Batch: 400138

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 399388

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	ND		0.0050	0.00074	mg/L		05/19/22 12:54	05/26/22 16:45	1
Thallium	ND		0.0010	0.00047	mg/L		05/19/22 12:54	05/26/22 16:45	1

Lab Sample ID: LCS 180-399388/2-A
Matrix: Water
Analysis Batch: 400138

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 399388

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.250	0.259		mg/L		104	80 - 120
Arsenic	1.00	0.961		mg/L		96	80 - 120
Barium	1.00	0.954		mg/L		95	80 - 120
Beryllium	0.500	0.477		mg/L		95	80 - 120
Boron	1.25	1.15		mg/L		92	80 - 120
Cadmium	0.500	0.488		mg/L		98	80 - 120
Calcium	25.0	26.0		mg/L		104	80 - 120
Chromium	0.500	0.486		mg/L		97	80 - 120
Cobalt	0.500	0.492		mg/L		98	80 - 120
Lead	0.500	0.493		mg/L		99	80 - 120
Lithium	0.500	0.458		mg/L		92	80 - 120
Molybdenum	0.500	0.489		mg/L		98	80 - 120
Selenium	1.00	0.951		mg/L		95	80 - 120
Thallium	1.00	0.988		mg/L		99	80 - 120

Method: EPA 7470A - Mercury (CVAA)

Lab Sample ID: MB 180-399689/1-A
Matrix: Water
Analysis Batch: 399733

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 399689

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		05/23/22 14:01	05/23/22 20:49	1

Lab Sample ID: LCS 180-399689/2-A
Matrix: Water
Analysis Batch: 399733

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 399689

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00250	0.00252		mg/L		101	80 - 120

Method: EPA 9040C - pH

Lab Sample ID: LCS 180-398815/3
Matrix: Water
Analysis Batch: 398815

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	99 - 101

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

Lab Sample ID: MB 180-398707/2
Matrix: Water
Analysis Batch: 398707

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			05/13/22 12:11	1

Lab Sample ID: LCS 180-398707/1
Matrix: Water
Analysis Batch: 398707

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			251	240		mg/L		96	85 - 115		

Lab Sample ID: MB 180-398712/2
Matrix: Water
Analysis Batch: 398712

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			05/13/22 12:22	1

Lab Sample ID: LCS 180-398712/1
Matrix: Water
Analysis Batch: 398712

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			251	230		mg/L		92	85 - 115		

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-565799/19-A
Matrix: Water
Analysis Batch: 569250

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 565799

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.4520		0.299	0.302	1.00	0.417	pCi/L	05/16/22 13:21	06/09/22 22:13	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*70.6*		*40 - 110*	*05/16/22 13:21*	*06/09/22 22:13*	*1*

Lab Sample ID: LCS 160-565799/1-A
Matrix: Water
Analysis Batch: 569247

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 565799

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	11.17		1.43	1.00	0.325	pCi/L	99	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*87.5*		*40 - 110*

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

Lab Sample ID: LCSD 160-565799/2-A
Matrix: Water
Analysis Batch: 569247

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 565799

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-226			11.3	11.05		1.40	1.00	0.325	pCi/L	97	75 - 125	0.04	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*90.3*		*40 - 110*

Lab Sample ID: MB 160-566195/23-A
Matrix: Water
Analysis Batch: 569457

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 566195

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.04462	U	0.128	0.128	1.00	0.297	pCi/L	05/18/22 10:14	06/10/22 16:35	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*05/18/22 10:14*	*06/10/22 16:35*	*1*

Lab Sample ID: LCS 160-566195/1-A
Matrix: Water
Analysis Batch: 569457

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 566195

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	9.436		1.23	1.00	0.282	pCi/L	83	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*102*		*40 - 110*

Lab Sample ID: LCSD 160-566195/2-A
Matrix: Water
Analysis Batch: 569457

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 566195

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-226			11.3	9.059		1.21	1.00	0.275	pCi/L	80	75 - 125	0.15	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*96.3*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-566201/23-A
Matrix: Water
Analysis Batch: 569458

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 566201

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1966	U	0.248	0.249	1.00	0.412	pCi/L	05/18/22 10:52	06/10/22 12:23	1

Method: 9320 - Radium-228 (GFPC) (Continued)

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110	05/18/22 10:52	06/10/22 12:23	1
Y Carrier	83.0		40 - 110	05/18/22 10:52	06/10/22 12:23	1

Lab Sample ID: LCS 160-566201/1-A
Matrix: Water
Analysis Batch: 569469

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 566201

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.55	6.576		0.929	1.00	0.395	pCi/L	77	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	102		40 - 110
Y Carrier	85.6		40 - 110

Lab Sample ID: LCSD 160-566201/2-A
Matrix: Water
Analysis Batch: 569469

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 566201

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-228			8.55	6.523		0.958	1.00	0.442	pCi/L	76	75 - 125	0.03	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	96.3		40 - 110
Y Carrier	81.5		40 - 110

Lab Sample ID: MB 160-569786/1-A
Matrix: Water
Analysis Batch: 570477

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 569786

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1352	U	0.283	0.283	1.00	0.490	pCi/L	06/13/22 14:29	06/17/22 11:51	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	98.8		40 - 110	06/13/22 14:29	06/17/22 11:51	1
Y Carrier	86.7		40 - 110	06/13/22 14:29	06/17/22 11:51	1

Lab Sample ID: LCS 160-569786/2-A
Matrix: Water
Analysis Batch: 570477

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 569786

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.53	8.567		1.17	1.00	0.514	pCi/L	100	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	95.0		40 - 110
Y Carrier	84.9		40 - 110

Client: Haley & Aldrich, Inc.
Job ID: 180-138040-1
Project/Site: CCR Groundwater Monitoring FB Culley

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCSD 160-569786/3-A
Matrix: Water
Analysis Batch: 570477

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 569786

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-228			8.53	8.446		1.14	1.00	0.444	pCi/L	99	75 - 125	0.05	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*99.0*		*40 - 110*
Y Carrier	*84.5*		*40 - 110*

HPLC/IC

Analysis Batch: 399664

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138040-1	CCR-AP-1R	Total/NA	Water	EPA 9056A	
180-138040-2	CCR-AP-2	Total/NA	Water	EPA 9056A	
180-138040-3	CCR-AP-3	Total/NA	Water	EPA 9056A	
180-138040-5	CCR-AP-5	Total/NA	Water	EPA 9056A	
180-138040-6	CCR-AP-6	Total/NA	Water	EPA 9056A	
180-138040-7	CCR-AP-6I	Total/NA	Water	EPA 9056A	
180-138040-8	CCR-AP-8	Total/NA	Water	EPA 9056A	
180-138040-11	BLIND DUPLICATE	Total/NA	Water	EPA 9056A	
MB 180-399664/7	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-399664/5	Lab Control Sample	Total/NA	Water	EPA 9056A	

Analysis Batch: 400173

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138040-4	CCR-AP-4	Total/NA	Water	EPA 9056A	
180-138040-9	CCR-AP-8I	Total/NA	Water	EPA 9056A	
180-138040-10	CCR-AP-9	Total/NA	Water	EPA 9056A	
MB 180-400173/7	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-400173/6	Lab Control Sample	Total/NA	Water	EPA 9056A	

Metals

Prep Batch: 399388

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138040-1	CCR-AP-1R	Total Recoverable	Water	3005A	
180-138040-2	CCR-AP-2	Total Recoverable	Water	3005A	
180-138040-3	CCR-AP-3	Total Recoverable	Water	3005A	
180-138040-4	CCR-AP-4	Total Recoverable	Water	3005A	
180-138040-5	CCR-AP-5	Total Recoverable	Water	3005A	
180-138040-6	CCR-AP-6	Total Recoverable	Water	3005A	
180-138040-7	CCR-AP-6I	Total Recoverable	Water	3005A	
180-138040-8	CCR-AP-8	Total Recoverable	Water	3005A	
180-138040-9	CCR-AP-8I	Total Recoverable	Water	3005A	
180-138040-10	CCR-AP-9	Total Recoverable	Water	3005A	
180-138040-11	BLIND DUPLICATE	Total Recoverable	Water	3005A	
MB 180-399388/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-399388/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 399689

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138040-1	CCR-AP-1R	Total/NA	Water	7470A	
180-138040-2	CCR-AP-2	Total/NA	Water	7470A	
180-138040-3	CCR-AP-3	Total/NA	Water	7470A	
180-138040-4	CCR-AP-4	Total/NA	Water	7470A	
180-138040-5	CCR-AP-5	Total/NA	Water	7470A	
180-138040-6	CCR-AP-6	Total/NA	Water	7470A	
180-138040-7	CCR-AP-6I	Total/NA	Water	7470A	
180-138040-8	CCR-AP-8	Total/NA	Water	7470A	
180-138040-9	CCR-AP-8I	Total/NA	Water	7470A	
180-138040-10	CCR-AP-9	Total/NA	Water	7470A	
180-138040-11	BLIND DUPLICATE	Total/NA	Water	7470A	
MB 180-399689/1-A	Method Blank	Total/NA	Water	7470A	

Metals (Continued)

Prep Batch: 399689 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 180-399689/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 399733

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138040-1	CCR-AP-1R	Total/NA	Water	EPA 7470A	399689
180-138040-2	CCR-AP-2	Total/NA	Water	EPA 7470A	399689
180-138040-3	CCR-AP-3	Total/NA	Water	EPA 7470A	399689
180-138040-4	CCR-AP-4	Total/NA	Water	EPA 7470A	399689
180-138040-5	CCR-AP-5	Total/NA	Water	EPA 7470A	399689
180-138040-6	CCR-AP-6	Total/NA	Water	EPA 7470A	399689
180-138040-7	CCR-AP-6I	Total/NA	Water	EPA 7470A	399689
180-138040-8	CCR-AP-8	Total/NA	Water	EPA 7470A	399689
180-138040-9	CCR-AP-8I	Total/NA	Water	EPA 7470A	399689
180-138040-10	CCR-AP-9	Total/NA	Water	EPA 7470A	399689
180-138040-11	BLIND DUPLICATE	Total/NA	Water	EPA 7470A	399689
MB 180-399689/1-A	Method Blank	Total/NA	Water	EPA 7470A	399689
LCS 180-399689/2-A	Lab Control Sample	Total/NA	Water	EPA 7470A	399689

Analysis Batch: 400138

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138040-1	CCR-AP-1R	Total Recoverable	Water	EPA 6020A	399388
180-138040-2	CCR-AP-2	Total Recoverable	Water	EPA 6020A	399388
180-138040-3	CCR-AP-3	Total Recoverable	Water	EPA 6020A	399388
180-138040-4	CCR-AP-4	Total Recoverable	Water	EPA 6020A	399388
180-138040-5	CCR-AP-5	Total Recoverable	Water	EPA 6020A	399388
180-138040-6	CCR-AP-6	Total Recoverable	Water	EPA 6020A	399388
180-138040-7	CCR-AP-6I	Total Recoverable	Water	EPA 6020A	399388
180-138040-8	CCR-AP-8	Total Recoverable	Water	EPA 6020A	399388
180-138040-9	CCR-AP-8I	Total Recoverable	Water	EPA 6020A	399388
180-138040-10	CCR-AP-9	Total Recoverable	Water	EPA 6020A	399388
180-138040-11	BLIND DUPLICATE	Total Recoverable	Water	EPA 6020A	399388
MB 180-399388/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	399388
LCS 180-399388/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	399388

Analysis Batch: 400265

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138040-1	CCR-AP-1R	Total Recoverable	Water	EPA 6020A	399388
180-138040-2	CCR-AP-2	Total Recoverable	Water	EPA 6020A	399388
180-138040-3	CCR-AP-3	Total Recoverable	Water	EPA 6020A	399388
180-138040-4	CCR-AP-4	Total Recoverable	Water	EPA 6020A	399388
180-138040-5	CCR-AP-5	Total Recoverable	Water	EPA 6020A	399388
180-138040-6	CCR-AP-6	Total Recoverable	Water	EPA 6020A	399388
180-138040-7	CCR-AP-6I	Total Recoverable	Water	EPA 6020A	399388
180-138040-8	CCR-AP-8	Total Recoverable	Water	EPA 6020A	399388
180-138040-9	CCR-AP-8I	Total Recoverable	Water	EPA 6020A	399388
180-138040-10	CCR-AP-9	Total Recoverable	Water	EPA 6020A	399388
180-138040-11	BLIND DUPLICATE	Total Recoverable	Water	EPA 6020A	399388

QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: CCR Groundwater Monitoring FB Culley

Job ID: 180-138040-1

General Chemistry

Analysis Batch: 398707

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138040-11	BLIND DUPLICATE	Total/NA	Water	SM 2540C	
MB 180-398707/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-398707/1	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 398712

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138040-1	CCR-AP-1R	Total/NA	Water	SM 2540C	
180-138040-2	CCR-AP-2	Total/NA	Water	SM 2540C	
180-138040-3	CCR-AP-3	Total/NA	Water	SM 2540C	
180-138040-4	CCR-AP-4	Total/NA	Water	SM 2540C	
180-138040-5	CCR-AP-5	Total/NA	Water	SM 2540C	
180-138040-6	CCR-AP-6	Total/NA	Water	SM 2540C	
180-138040-7	CCR-AP-6I	Total/NA	Water	SM 2540C	
180-138040-8	CCR-AP-8	Total/NA	Water	SM 2540C	
180-138040-9	CCR-AP-8I	Total/NA	Water	SM 2540C	
180-138040-10	CCR-AP-9	Total/NA	Water	SM 2540C	
MB 180-398712/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-398712/1	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 398815

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138040-1	CCR-AP-1R	Total/NA	Water	EPA 9040C	
180-138040-2	CCR-AP-2	Total/NA	Water	EPA 9040C	
180-138040-3	CCR-AP-3	Total/NA	Water	EPA 9040C	
180-138040-4	CCR-AP-4	Total/NA	Water	EPA 9040C	
180-138040-5	CCR-AP-5	Total/NA	Water	EPA 9040C	
180-138040-6	CCR-AP-6	Total/NA	Water	EPA 9040C	
180-138040-7	CCR-AP-6I	Total/NA	Water	EPA 9040C	
180-138040-8	CCR-AP-8	Total/NA	Water	EPA 9040C	
180-138040-9	CCR-AP-8I	Total/NA	Water	EPA 9040C	
180-138040-10	CCR-AP-9	Total/NA	Water	EPA 9040C	
180-138040-11	BLIND DUPLICATE	Total/NA	Water	EPA 9040C	
LCS 180-398815/3	Lab Control Sample	Total/NA	Water	EPA 9040C	

Rad

Prep Batch: 565799

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138040-1	CCR-AP-1R	Total/NA	Water	PrecSep-21	
180-138040-2	CCR-AP-2	Total/NA	Water	PrecSep-21	
180-138040-4	CCR-AP-4	Total/NA	Water	PrecSep-21	
180-138040-5	CCR-AP-5	Total/NA	Water	PrecSep-21	
180-138040-7	CCR-AP-6I	Total/NA	Water	PrecSep-21	
180-138040-9	CCR-AP-8I	Total/NA	Water	PrecSep-21	
180-138040-10	CCR-AP-9	Total/NA	Water	PrecSep-21	
180-138040-11	BLIND DUPLICATE	Total/NA	Water	PrecSep-21	
MB 160-565799/19-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-565799/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-565799/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: CCR Groundwater Monitoring FB Culley

Job ID: 180-138040-1

Rad

Prep Batch: 566195

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138040-3	CCR-AP-3	Total/NA	Water	PrecSep-21	
180-138040-6	CCR-AP-6	Total/NA	Water	PrecSep-21	
180-138040-8	CCR-AP-8	Total/NA	Water	PrecSep-21	
MB 160-566195/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-566195/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-566195/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 566201

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138040-3	CCR-AP-3	Total/NA	Water	PrecSep_0	
180-138040-6	CCR-AP-6	Total/NA	Water	PrecSep_0	
180-138040-8	CCR-AP-8	Total/NA	Water	PrecSep_0	
MB 160-566201/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-566201/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-566201/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Prep Batch: 569786

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-138040-1	CCR-AP-1R	Total/NA	Water	PrecSep_0	
180-138040-2	CCR-AP-2	Total/NA	Water	PrecSep_0	
180-138040-4	CCR-AP-4	Total/NA	Water	PrecSep_0	
180-138040-5	CCR-AP-5	Total/NA	Water	PrecSep_0	
180-138040-7	CCR-AP-6I	Total/NA	Water	PrecSep_0	
180-138040-9	CCR-AP-8I	Total/NA	Water	PrecSep_0	
180-138040-10	CCR-AP-9	Total/NA	Water	PrecSep_0	
180-138040-11	BLIND DUPLICATE	Total/NA	Water	PrecSep_0	
MB 160-569786/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-569786/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-569786/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

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Client Information	Sampler: Hayley Tolles	Lab PM: Hayes, Ken	Carrier Tracking No(s):	COC No: 180-80666-14505.2
Client Contact: Mark Breting	Phone: 812-455-0888	E-Mail: Ken.Hayes@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: Atlas Technical Consultants LLC	PWSID:			Job #:
Address: 7988 Centerpoint Drive Suite 100	Due Date Requested:			
City: Indianapolis	TAT Requested (days):			
State, Zip: IN, 46256	Compliance Project: Δ Yes Δ No			
Phone: 864-214-8750(Tel)	PO #: FB-242026. AB-241410			
Email: mark.breting@atcassociates.com	WO #:			
Project Name: CCR Groundwater Monitoring FB Culley	Project #: 18016014			
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)	9040C, 9056A_ORGFM_28D N	9040C, 9056A_ORGFM_28D D	6020A, 7470A N	6020A, 7470A D	2540C_Calcd - TDS N	2540C_Calcd - TDS D	9315_Ra226, 9320_Ra228 N	9315_Ra226, 9320_Ra228 D	Total Number of containers	Special Instructions/Note:
Preservation Code:																
CCR-AP-1R	5-10-22	8:38	G	W			✓	✓	✓	✓	✓	✓			(1)	1-liter
CCR-AP-2	5-9-22	9:36	G	W			✓	✓	✓	✓	✓	✓			(1)	1-liter
CCR-AP-3	5-9-22	10:06	G	W			✓	✓	✓	✓	✓	✓			(1)	1-liter
CCR-AP-4	5-9-22	10:55	G	W			✓	✓	✓	✓	✓	✓			(1)	1-liter
CCR-AP-5	5-10-22	15:10	G	W			✓	✓	✓	✓	✓	✓				
CCR-AP-6	5-9-22	8:45	G	W			✓	✓	✓	✓	✓	✓			(1)	1-liter
CCR-AP-61	5-10-22	9:50	G	W			✓	✓	✓	✓	✓	✓				
CCR-AP-8	5-10-22	12:38	G	W			✓	✓	✓	✓	✓	✓				
CCR-AP-81	5-10-22	10:55	G	W			✓	✓	✓	✓	✓	✓				
CCR-AP-9	5-9-22	12:23	G	W			✓	✓	✓	✓	✓	✓			(1)	1-liter
Blind Duplicate	5-10-22		G	W			✓	✓	✓	✓	✓	✓				

180-138040 Chain of Custody

#202

Virginia Beach

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: One of 3 coolers shipping through Fedex

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

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Hayley Tolles	5-11-22 / 11:35	ATLAS	UPS / Fedex	5-11-22 / 11:35	
2					5/12/22 930	
3						

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

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 180-138040-1

Login Number: 138040
List Number: 1
Creator: Abernathy, Eric L

List Source: Eurofins Pittsburgh

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?	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: 180-138040-1

Login Number: 138040
List Number: 2
Creator: Booker, Autumn R

List Source: Eurofins St. Louis
List Creation: 05/14/22 02:05 PM

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.	N/A	
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	

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1 2 3 4 5 6 7 8 9 10 11 12 13

ANALYTICAL REPORT

PREPARED FOR

Attn: Mark Miesfeldt
Haley & Aldrich, Inc.
400 Augusta Street
Suite 100
Greenville, South Carolina 29601

Generated 1/11/2023 11:42:49 AM

JOB DESCRIPTION

CCR Groundwater Monitoring FB Culley
SDG NUMBER Culley East

JOB NUMBER

180-148606-1

Eurofins Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh PA 15238

See page two for job notes and contact information.

myEOL

Job Notes

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of Eurofins Environment Testing Northeast, LLC Pittsburgh and its client. All questions regarding this report should be directed to the Eurofins Environment Testing Northeast, LLC Pittsburgh Project Manager or designee who has signed this report.

PA Lab ID: 02-00416

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Pittsburgh Project Manager.

Authorization

Generated
1/11/2023 11:42:49 AM

Authorized for release by
Ken Hayes, Project Manager II
Ken.Hayes@et.eurofinsus.com
(615)301-5035

Table of Contents

Job ID: 180-148606-1

Laboratory: Eurofins Pittsburgh

Narrative

Job Narrative
180-148606-1

Comments
No additional comments.

Receipt
The samples were received on 12/1/2022 10:35 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 2.4º C, 2.6º C and 2.8º C.

Receipt Exceptions
The reference method requires samples to be preserved to a pH of >2 SU. The following samples were received with insufficient preservation at a pH of <2 SU: CCR-AP-1R (180-148606-1), CCR-AP-2 (180-148606-2), CCR-AP-3R (180-148606-3), CCR-AP-4R (180-148606-4), CCR-AP-5 (180-148606-5), CCR-AP-5I (180-148606-6), CCR-AP-6 (180-148606-7), CCR-AP-6I (180-148606-8), CCR-AP-8 (180-148606-9), CCR-AP-8I (180-148606-10), CCR-AP-9 (180-148606-11), CCR-AP-11 (180-148606-12), DUP-1 (180-148606-13) and FB-1 (180-148606-14). 180-148606-A-11. The sample was preserved to the appropriate pH in the laboratory.

GC Semi VOA
Method 9056A: The continuing calibration blank (CCB) for analytical batch 180-419730 contained Chloride above the reporting limit (RL). All reported samples associated with this CCB were either ND for this analyte or contained this analyte at a concentration greater than 10X the value found in the CCB; therefore, re-analysis of samples was not performed.

Method 9056A: The following samples were diluted due to the nature of the sample matrix: CCR-AP-5 (180-148606-5), CCR-AP-5I (180-148606-6), CCR-AP-6I (180-148606-8), CCR-AP-8I (180-148606-10) and DUP-1 (180-148606-13). Elevated reporting limits (RLs) are provided.

Method 9056A: Due to the high concentration of sulfate, the matrix spike / matrix spike duplicate (MS/MSD) for analytical batch 180-419730 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

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

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

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

Narrative

Job Narrative
180-148606-2

Comments
No additional comments.

Receipt
The samples were received on 12/1/2022 10:35 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 2.4º C, 2.6º C and 2.8º C.

Receipt Exceptions
The reference method requires samples to be preserved to a pH of >2 SU. The following samples were received with insufficient preservation at a pH of <2 SU: CCR-AP-1R (180-148606-1), CCR-AP-2 (180-148606-2), CCR-AP-3R (180-148606-3), CCR-AP-4R (180-148606-4), CCR-AP-5 (180-148606-5), CCR-AP-5I (180-148606-6), CCR-AP-6 (180-148606-7), CCR-AP-6I (180-148606-8), CCR-AP-8 (180-148606-9), CCR-AP-8I (180-148606-10), CCR-AP-9 (180-148606-11), CCR-AP-11 (180-148606-12), DUP-1 (180-148606-13) and FB-1 (180-148606-14). 180-148606-A-11. The sample was preserved to the appropriate pH in the laboratory.

Job ID: 180-148606-1 (Continued)

Laboratory: Eurofins Pittsburgh (Continued)

RAD

Methods 903.0, 9315: Radium-226 batch 592635
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. CCR-AP-2 (180-148606-2), CCR-AP-3R (180-148606-3), CCR-AP-4R (180-148606-4), CCR-AP-5 (180-148606-5), CCR-AP-5I (180-148606-6), CCR-AP-6 (180-148606-7), CCR-AP-6I (180-148606-8), CCR-AP-8 (180-148606-9), CCR-AP-8I (180-148606-10), CCR-AP-9 (180-148606-11), CCR-AP-11 (180-148606-12), FB-1 (180-148606-14), (LCS 160-592635/2-A), (MB 160-592635/1-A), (310-245828-A-1-A) and (310-245828-B-1-A DU)

Method 9315: Radium-226 batch 592977
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. CCR-AP-1R (180-148606-1), DUP-1 (180-148606-13), (LCS 160-592977/2-A), (LCSD 160-592977/3-A) and (MB 160-592977/1-A)

Method 9320: Radium-228 batch 592637
The detection goal was not met for the following sample(s). Samples were prepped at a reduced volume due to the presence of matrix interferences: CCR-AP-2 (180-148606-2), CCR-AP-3R (180-148606-3), CCR-AP-4R (180-148606-4), CCR-AP-5 (180-148606-5), CCR-AP-6 (180-148606-7), CCR-AP-8 (180-148606-9) and CCR-AP-9 (180-148606-11). Analytical results are reported with the detection limit achieved.

Methods 904.0, 9320: Radium-228 batch 592637
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. CCR-AP-2 (180-148606-2), CCR-AP-3R (180-148606-3), CCR-AP-4R (180-148606-4), CCR-AP-5 (180-148606-5), CCR-AP-5I (180-148606-6), CCR-AP-6 (180-148606-7), CCR-AP-6I (180-148606-8), CCR-AP-8 (180-148606-9), CCR-AP-8I (180-148606-10), CCR-AP-9 (180-148606-11), CCR-AP-11 (180-148606-12), FB-1 (180-148606-14), (LCS 160-592637/2-A), (MB 160-592637/1-A), (310-245828-A-1-B) and (310-245828-B-1-B DU)

Method 9320: Radium 228 batch 592979
The LCS recovered at (128%). The limits in our LIMS system at 75-125 reflect the requirements of a regulatory agency that represents a large amount of our work. However the samples associated with this LCS are not from this agency and are therefore held to our in-house statistical limits of (62-148%) per method requirements. The LCS passes, no further action is required (LCS 160-592979/2-A)

Method 9320: Radium 228 batch 592979
The detection goal was not met for the following samples. Samples were prepped at a reduced volume due to the presence of matrix interferences: CCR-AP-1R (180-148606-1) and DUP-1 (180-148606-13). Analytical results are reported with the detection limit achieved.

Method 9320: Radium 228 batch 592979
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. CCR-AP-1R (180-148606-1), DUP-1 (180-148606-13), (LCS 160-592979/2-A), (LCSD 160-592979/3-A) and (MB 160-592979/1-A)

Method PrecSep_0: Radium-228 Prep Batch 160-592979
The following samples were prepared at a reduced aliquot due to Matrix: CCR-AP-1R (180-148606-1) and DUP-1 (180-148606-13). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method PrecSep_0: Radium-228 Prep Batch 160-592979
A deviation from the Standard Operating Procedure (SOP) occurred. Details are as follows: Due to matrix interference observed in the initial prep of the sample, the sample was prepared at a reduced aliquot, cooked dry, muffled in an oven, and digested to reduce organic interference before the procedure for water samples was continued.

Method PrecSep-21: Radium-226 Prep Batch 160-592977

Job ID: 180-148606-1 (Continued)

Laboratory: Eurofins Pittsburgh (Continued)

A deviation from the Standard Operating Procedure (SOP) occurred. Details are as follows: Due to matrix interference observed in the initial prep of the sample, the sample was prepared at a reduced aliquot, cooked dry, muffled in an oven, and digested to reduce organic interference before the procedure for water samples was continued.

Method PrecSep-21: Radium-226 Prep Batch 160-592977
The following samples were prepared at a reduced aliquot due to Matrix: CCR-AP-1R (180-148606-1) and DUP-1 (180-148606-13). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

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

Definitions/Glossary

Client: Haley & Aldrich, Inc.
Project/Site: CCR Groundwater Monitoring FB Culley

Job ID: 180-148606-1
SDG: Culley East

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
^2	Calibration Blank (ICB and/or CCB) is outside acceptance limits.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
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
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Rad

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
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
CFU	Colony Forming Unit
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)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
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)

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
TNTC	Too Numerous To Count

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.
Project/Site: CCR Groundwater Monitoring FB Culley

Job ID: 180-148606-1
SDG: Culley East

Laboratory: Eurofins Pittsburgh

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

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	19-033-0	06-27-22 *
California	State	2891	04-30-23
Connecticut	State	PH-0688	09-30-22 *
Florida	NELAP	E871008	06-30-23
Georgia	State	PA 02-00416	04-30-23
Illinois	NELAP	004375	06-30-23
Kansas	NELAP	E-10350	03-31-23
Kentucky (UST)	State	162013	04-30-23
Kentucky (WW)	State	KY98043	12-31-22
Louisiana	NELAP	04041	06-30-22 *
Louisiana (All)	NELAP	04041	06-30-23
Maine	State	PA00164	03-06-24
Minnesota	NELAP	042-999-482	12-31-22
New Hampshire	NELAP	2030	04-04-23
New Jersey	NELAP	PA005	06-30-23
New York	NELAP	11182	04-01-23
North Carolina (WW/SW)	State	434	12-31-22
North Dakota	State	R-227	04-30-23
Oregon	NELAP	PA-2151	02-07-23
Pennsylvania	NELAP	02-00416	04-30-23
Rhode Island	State	LAO00362	12-31-22
South Carolina	State	89014	04-20-23
Texas	NELAP	T104704528	03-31-23
US Fish & Wildlife	US Federal Programs	058448	03-31-23
USDA	US Federal Programs	P330-16-00211	06-21-24
Utah	NELAP	PA001462019-8	05-31-23
Virginia	NELAP	10043	09-14-23
West Virginia DEP	State	142	01-31-23
Wisconsin	State	998027800	08-31-23

Laboratory: Eurofins Canton

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

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-27-23
Connecticut	State	PH-0590	12-31-23
Florida	NELAP	E87225	06-30-23
Georgia	State	4062	02-27-23
Illinois	NELAP	200004	07-31-23
Iowa	State	421	06-01-23
Kentucky (UST)	State	112225	02-27-23
Kentucky (WW)	State	KY98016	12-31-22
Michigan	State	9135	02-27-23
Minnesota	NELAP	039-999-348	12-31-22
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-23
New York	NELAP	10975	04-01-23
Ohio	State	8303	02-27-23
Ohio VAP	State	CL0024	02-27-23
Oregon	NELAP	4062	02-27-23

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

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.
Job ID: 180-148606-1
Project/Site: CCR Groundwater Monitoring FB Culley
SDG: Culley East

Laboratory: Eurofins Canton (Continued)

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

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	68-00340	08-31-23
Texas	NELAP	T104704517-22-17	08-31-23
Virginia	NELAP	460175	09-14-23
Washington	State	C971	01-12-23
West Virginia DEP	State	210	12-31-22

Laboratory: Eurofins St. Louis

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-23
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	06-30-23
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-23
HI - RadChem Recognition	State	n/a	06-30-23
Illinois	NELAP	200023	11-30-23
Iowa	State	373	12-01-24
Kansas	NELAP	E-10236	10-31-23
Kentucky (DW)	State	KY90125	12-31-22 *
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-23
Louisiana (All)	NELAP	04080	06-30-23
Louisiana (DW)	State	LA011	12-31-23
Maryland	State	310	09-30-23
MI - RadChem Recognition	State	9005	06-30-23
Missouri	State	780	06-30-25
Nevada	State	MO000542020-1	07-31-23
New Jersey	NELAP	MO002	06-30-23
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-23
Oklahoma	NELAP	9997	08-31-23
Oregon	NELAP	4157	09-01-23
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-23
Texas	NELAP	T104704193	07-31-23
US Fish & Wildlife	US Federal Programs	058448	07-31-23
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	07-31-23
Virginia	NELAP	10310	06-14-24
Washington	State	C592	08-30-23
West Virginia DEP	State	381	10-31-23

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

Sample Summary

Client: Haley & Aldrich, Inc.
Project/Site: CCR Groundwater Monitoring FB Culley

Job ID: 180-148606-1
SDG: Culley East

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-148606-1	CCR-AP-1R	Water	11/29/22 08:45	12/01/22 10:35
180-148606-2	CCR-AP-2	Water	11/29/22 10:20	12/01/22 10:35
180-148606-3	CCR-AP-3R	Water	11/29/22 11:40	12/01/22 10:35
180-148606-4	CCR-AP-4R	Water	11/29/22 09:40	12/01/22 10:35
180-148606-5	CCR-AP-5	Water	11/29/22 13:00	12/01/22 10:35
180-148606-6	CCR-AP-5I	Water	11/29/22 13:50	12/01/22 10:35
180-148606-7	CCR-AP-6	Water	11/29/22 11:55	12/01/22 10:35
180-148606-8	CCR-AP-6I	Water	11/30/22 09:40	12/01/22 10:35
180-148606-9	CCR-AP-8	Water	11/29/22 11:10	12/01/22 10:35
180-148606-10	CCR-AP-8I	Water	11/30/22 10:20	12/01/22 10:35
180-148606-11	CCR-AP-9	Water	11/29/22 08:05	12/01/22 10:35
180-148606-12	CCR-AP-11	Water	11/29/22 10:11	12/01/22 10:35
180-148606-13	DUP-1	Water	11/29/22 00:01	12/01/22 10:35
180-148606-14	FB-1	Water	11/30/22 10:00	12/01/22 10:35

Method Summary

Client: Haley & Aldrich, Inc.
Project/Site: CCR Groundwater Monitoring FB Culley

Job ID: 180-148606-1
SDG: Culley East

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	EET PIT
6020A	Metals (ICP/MS)	SW846	EET CAN
7470A	Mercury (CVAA)	SW846	EET CAN
EPA 9040C	pH	SW846	EET PIT
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET PIT
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CAN
7470A	Preparation, Mercury	SW846	EET CAN

Protocol References:

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

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

Laboratory References:

EET CAN = Eurofins Canton, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

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

Client Sample ID: CCR-AP-1R
Lab Sample ID: 180-148606-1
Date Collected: 11/29/22 08:45
Matrix: Water
Date Received: 12/01/22 10:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			419730	12/03/22 23:50	SNL	EET PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555197	12/08/22 21:19	RKT	EET CAN
	Instrument ID: I14									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		5			555430	12/09/22 12:03	AJC	EET CAN
	Instrument ID: I14									
Total/NA	Prep	7470A			50 mL	50 mL	554957	12/07/22 12:00	SHB	EET CAN
Total/NA	Analysis	7470A		1			555245	12/08/22 17:04	MRL	EET CAN
	Instrument ID: H3									
Total/NA	Analysis	EPA 9040C		1			419938	12/05/22 15:43	MAM	EET PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	419719	12/02/22 19:02	LWM	EET PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			255.68 mL	1.0 g	592977	12/09/22 10:53	DJP	EET SL
Total/NA	Analysis	9315		1			595481	01/04/23 15:36	FLC	EET SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			255.68 mL	1.0 g	592979	12/09/22 11:03	DJP	EET SL
Total/NA	Analysis	9320		1			594847	12/27/22 11:58	FLC	EET SL
	Instrument ID: GFPCBLUE									
Total/NA	Analysis	Ra226_Ra228		1			595888	01/06/23 16:50	SCB	EET SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-2
Lab Sample ID: 180-148606-2
Date Collected: 11/29/22 10:20
Matrix: Water
Date Received: 12/01/22 10:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			419730	12/03/22 22:26	SNL	EET PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555197	12/08/22 21:31	RKT	EET CAN
	Instrument ID: I14									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		50			555430	12/09/22 12:15	AJC	EET CAN
	Instrument ID: I14									
Total/NA	Prep	7470A			50 mL	50 mL	554957	12/07/22 12:00	SHB	EET CAN
Total/NA	Analysis	7470A		1			555245	12/08/22 17:06	MRL	EET CAN
	Instrument ID: H3									
Total/NA	Analysis	EPA 9040C		1			419938	12/05/22 15:49	MAM	EET PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	419719	12/02/22 19:02	LWM	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: CCR Groundwater Monitoring FB Culley

Job ID: 180-148606-1
SDG: Culley East

Client Sample ID: CCR-AP-2

Lab Sample ID: 180-148606-2
Date Collected: 11/29/22 10:20
Matrix: Water
Date Received: 12/01/22 10:35

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			255.89 mL	1.0 g	592635	12/07/22 09:40	DJP	EET SL
Total/NA	Analysis	9315		1			595083	12/29/22 10:42	FLC	EET SL
	Instrument ID: GFPCBLUE									
Total/NA	Prep	PrecSep_0			255.89 mL	1.0 g	592637	12/07/22 10:05	DJP	EET SL
Total/NA	Analysis	9320		1			594468	12/21/22 11:38	FLC	EET SL
	Instrument ID: GFPCBLUE									
Total/NA	Analysis	Ra226_Ra228		1			595889	01/06/23 16:51	SCB	EET SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-3R

Lab Sample ID: 180-148606-3
Date Collected: 11/29/22 11:40
Matrix: Water
Date Received: 12/01/22 10:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			419730	12/03/22 22:40	SNL	EET PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555197	12/08/22 21:33	RKT	EET CAN
	Instrument ID: I14									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555430	12/09/22 12:17	AJC	EET CAN
	Instrument ID: I14									
Total/NA	Prep	7470A			50 mL	50 mL	554957	12/07/22 12:00	SHB	EET CAN
Total/NA	Analysis	7470A		1			555245	12/08/22 17:13	MRL	EET CAN
	Instrument ID: H3									
Total/NA	Analysis	EPA 9040C		1			419938	12/05/22 15:55	MAM	EET PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	419719	12/02/22 19:02	LWM	EET PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			253.33 mL	1.0 g	592635	12/07/22 09:40	DJP	EET SL
Total/NA	Analysis	9315		1			595081	12/29/22 10:46	FLC	EET SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			253.33 mL	1.0 g	592637	12/07/22 10:05	DJP	EET SL
Total/NA	Analysis	9320		1			594468	12/21/22 11:38	FLC	EET SL
	Instrument ID: GFPCBLUE									
Total/NA	Analysis	Ra226_Ra228		1			595889	01/06/23 16:51	SCB	EET SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-4R

Lab Sample ID: 180-148606-4
Date Collected: 11/29/22 09:40
Matrix: Water
Date Received: 12/01/22 10:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			419730	12/03/22 22:54	SNL	EET PIT
	Instrument ID: CHIC2100A									

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: CCR Groundwater Monitoring FB Culley

Job ID: 180-148606-1
SDG: Culley East

Client Sample ID: CCR-AP-4R

Date Collected: 11/29/22 09:40
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555197	12/08/22 21:36	RKT	EET CAN
	Instrument ID: I14									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555430	12/09/22 12:20	AJC	EET CAN
	Instrument ID: I14									
Total/NA	Prep	7470A			50 mL	50 mL	554957	12/07/22 12:00	SHB	EET CAN
Total/NA	Analysis	7470A		1			555245	12/08/22 17:15	MRL	EET CAN
	Instrument ID: H3									
Total/NA	Analysis	EPA 9040C		1			419938	12/05/22 16:08	MAM	EET PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	419719	12/02/22 19:02	LWM	EET PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			501.44 mL	1.0 g	592635	12/07/22 09:40	DJP	EET SL
Total/NA	Analysis	9315		1			595081	12/29/22 10:46	FLC	EET SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			501.44 mL	1.0 g	592637	12/07/22 10:05	DJP	EET SL
Total/NA	Analysis	9320		1			594468	12/21/22 11:38	FLC	EET SL
	Instrument ID: GFPCBLUE									
Total/NA	Analysis	Ra226_Ra228		1			595889	01/06/23 16:51	SCB	EET SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-5

Date Collected: 11/29/22 13:00
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-5

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	EPA 9056A		1			419730	12/03/22 23:08	SNL	EET PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555197	12/08/22 21:43	RKT	EET CAN
	Instrument ID: I14									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		50			555430	12/09/22 12:27	AJC	EET CAN
	Instrument ID: I14									
Total/NA	Prep	7470A			50 mL	50 mL	554957	12/07/22 12:00	SHB	EET CAN
Total/NA	Analysis	7470A		1			555245	12/08/22 17:22	MRL	EET CAN
	Instrument ID: H3									
Total/NA	Analysis	EPA 9040C		1			419938	12/05/22 16:20	MAM	EET PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	419719	12/02/22 19:02	LWM	EET PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			257.99 mL	1.0 g	592635	12/07/22 09:40	DJP	EET SL
Total/NA	Analysis	9315		1			595081	12/29/22 10:46	FLC	EET SL
	Instrument ID: GFPCRED									

Client Sample ID: CCR-AP-5
Date Collected: 11/29/22 13:00
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-5
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_0			257.99 mL	1.0 g	592637	12/07/22 10:05	DJP	EET SL
Total/NA	Analysis	9320		1			594468	12/21/22 11:38	FLC	EET SL
	Instrument ID: GFPCBLUE									
Total/NA	Analysis	Ra226_Ra228		1			595889	01/06/23 16:51	SCB	EET SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-5I
Date Collected: 11/29/22 13:50
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-6
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	EPA 9056A		2.5			419730	12/03/22 23:36	SNL	EET PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555197	12/08/22 21:46	RKT	EET CAN
	Instrument ID: I14									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		50			555430	12/09/22 12:30	AJC	EET CAN
	Instrument ID: I14									
Total/NA	Prep	7470A			50 mL	50 mL	554957	12/07/22 12:00	SHB	EET CAN
Total/NA	Analysis	7470A		1			555245	12/08/22 17:24	MRL	EET CAN
	Instrument ID: H3									
Total/NA	Analysis	EPA 9040C		1			419938	12/05/22 16:25	MAM	EET PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	419719	12/02/22 19:02	LWM	EET PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			1004.11 mL	1.0 g	592635	12/07/22 09:40	DJP	EET SL
Total/NA	Analysis	9315		1			595081	12/29/22 10:47	FLC	EET SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			1004.11 mL	1.0 g	592637	12/07/22 10:05	DJP	EET SL
Total/NA	Analysis	9320		1			594468	12/21/22 11:38	FLC	EET SL
	Instrument ID: GFPCBLUE									
Total/NA	Analysis	Ra226_Ra228		1			595889	01/06/23 16:51	SCB	EET SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-6
Date Collected: 11/29/22 11:55
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-7
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	EPA 9056A		1			419730	12/04/22 00:59	SNL	EET PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555197	12/08/22 21:48	RKT	EET CAN
	Instrument ID: I14									

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: CCR Groundwater Monitoring FB Culley

Job ID: 180-148606-1
SDG: Culley East

Client Sample ID: CCR-AP-6

Date Collected: 11/29/22 11:55
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		5			555430	12/09/22 12:32	AJC	EET CAN
	Instrument ID: I14									
Total/NA	Prep	7470A			50 mL	50 mL	554957	12/07/22 12:00	SHB	EET CAN
Total/NA	Analysis	7470A		1			555245	12/08/22 17:26	MRL	EET CAN
	Instrument ID: H3									
Total/NA	Analysis	EPA 9040C		1			419938	12/05/22 16:31	MAM	EET PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	419719	12/02/22 19:02	LWM	EET PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			497.77 mL	1.0 g	592635	12/07/22 09:40	DJP	EET SL
Total/NA	Analysis	9315		1			595081	12/29/22 11:51	FLC	EET SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			497.77 mL	1.0 g	592637	12/07/22 10:05	DJP	EET SL
Total/NA	Analysis	9320		1			594468	12/21/22 11:39	FLC	EET SL
	Instrument ID: GFPCBLUE									
Total/NA	Analysis	Ra226_Ra228		1			595889	01/06/23 16:51	SCB	EET SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-6I

Date Collected: 11/30/22 09:40
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-8

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	EPA 9056A		2.5			419730	12/04/22 01:13	SNL	EET PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555197	12/08/22 21:51	RKT	EET CAN
	Instrument ID: I14									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		100			555430	12/09/22 12:35	AJC	EET CAN
	Instrument ID: I14									
Total/NA	Prep	7470A			50 mL	50 mL	554957	12/07/22 12:00	SHB	EET CAN
Total/NA	Analysis	7470A		1			555245	12/08/22 17:28	MRL	EET CAN
	Instrument ID: H3									
Total/NA	Analysis	EPA 9040C		1			419938	12/05/22 16:37	MAM	EET PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	419868	12/05/22 17:39	LWM	EET PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			996.52 mL	1.0 g	592635	12/07/22 09:40	DJP	EET SL
Total/NA	Analysis	9315		1			595081	12/29/22 11:52	FLC	EET SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			996.52 mL	1.0 g	592637	12/07/22 10:05	DJP	EET SL
Total/NA	Analysis	9320		1			594468	12/21/22 11:39	FLC	EET SL
	Instrument ID: GFPCBLUE									

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: CCR Groundwater Monitoring FB Culley

Job ID: 180-148606-1
SDG: Culley East

Client Sample ID: CCR-AP-6I
Date Collected: 11/30/22 09:40
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-8
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	Ra226_Ra228		1			595889	01/06/23 16:51	SCB	EET SL

Client Sample ID: CCR-AP-8
Date Collected: 11/29/22 11:10
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-9
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	EPA 9056A		1			419730	12/04/22 01:27	SNL	EET PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555197	12/08/22 21:53	RKT	EET CAN
	Instrument ID: I14									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555430	12/09/22 12:37	AJC	EET CAN
	Instrument ID: I14									
Total/NA	Prep	7470A			50 mL	50 mL	554957	12/07/22 12:00	SHB	EET CAN
Total/NA	Analysis	7470A		1			555245	12/08/22 17:30	MRL	EET CAN
	Instrument ID: H3									
Total/NA	Analysis	EPA 9040C		1			419938	12/05/22 16:43	MAM	EET PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	419719	12/02/22 19:02	LWM	EET PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			495.20 mL	1.0 g	592635	12/07/22 09:40	DJP	EET SL
Total/NA	Analysis	9315		1			595081	12/29/22 11:52	FLC	EET SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			495.20 mL	1.0 g	592637	12/07/22 10:05	DJP	EET SL
Total/NA	Analysis	9320		1			594432	12/21/22 11:40	FLC	EET SL
	Instrument ID: GFPCPURPLE									
Total/NA	Analysis	Ra226_Ra228		1			595889	01/06/23 16:51	SCB	EET SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-8I
Date Collected: 11/30/22 10:20
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-10
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	EPA 9056A		2.5			419730	12/04/22 01:41	SNL	EET PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555197	12/08/22 21:56	RKT	EET CAN
	Instrument ID: I14									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		50			555430	12/09/22 12:40	AJC	EET CAN
	Instrument ID: I14									

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: CCR Groundwater Monitoring FB Culley

Job ID: 180-148606-1
SDG: Culley East

Client Sample ID: CCR-AP-8I

Date Collected: 11/30/22 10:20
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-10

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	554957	12/07/22 12:00	SHB	EET CAN
Total/NA	Analysis	7470A		1			555447	12/09/22 11:54	MRL	EET CAN
	Instrument ID: H2									
Total/NA	Analysis	EPA 9040C		1			419938	12/05/22 16:48	MAM	EET PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	419868	12/05/22 17:39	LWM	EET PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			991.94 mL	1.0 g	592635	12/07/22 09:40	DJP	EET SL
Total/NA	Analysis	9315		1			595081	12/29/22 11:52	FLC	EET SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			991.94 mL	1.0 g	592637	12/07/22 10:05	DJP	EET SL
Total/NA	Analysis	9320		1			594432	12/21/22 11:41	FLC	EET SL
	Instrument ID: GFPCPURPLE									
Total/NA	Analysis	Ra226_Ra228		1			595889	01/06/23 16:51	SCB	EET SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-9

Date Collected: 11/29/22 08:05
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-11

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	EPA 9056A		1			419730	12/04/22 02:50	SNL	EET PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555197	12/08/22 21:58	RKT	EET CAN
	Instrument ID: I14									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		2			555430	12/09/22 12:47	AJC	EET CAN
	Instrument ID: I14									
Total/NA	Prep	7470A			50 mL	50 mL	554957	12/07/22 12:00	SHB	EET CAN
Total/NA	Analysis	7470A		1			555245	12/08/22 17:34	MRL	EET CAN
	Instrument ID: H3									
Total/NA	Analysis	EPA 9040C		1			419938	12/05/22 16:53	MAM	EET PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	419719	12/02/22 19:02	LWM	EET PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			250.18 mL	1.0 g	592635	12/07/22 09:40	DJP	EET SL
Total/NA	Analysis	9315		1			595081	12/29/22 11:52	FLC	EET SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			250.18 mL	1.0 g	592637	12/07/22 10:05	DJP	EET SL
Total/NA	Analysis	9320		1			594432	12/21/22 11:41	FLC	EET SL
	Instrument ID: GFPCPURPLE									
Total/NA	Analysis	Ra226_Ra228		1			595889	01/06/23 16:51	SCB	EET SL
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: CCR Groundwater Monitoring FB Culley

Job ID: 180-148606-1
SDG: Culley East

Client Sample ID: CCR-AP-11

Date Collected: 11/29/22 10:11
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-12

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	EPA 9056A		1			419730	12/04/22 01:55	SNL	EET PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555197	12/08/22 22:01	RKT	EET CAN
	Instrument ID: I14									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555430	12/09/22 12:50	AJC	EET CAN
	Instrument ID: I14									
Total/NA	Prep	7470A			50 mL	50 mL	554957	12/07/22 12:00	SHB	EET CAN
Total/NA	Analysis	7470A		1			555245	12/08/22 17:36	MRL	EET CAN
	Instrument ID: H3									
Total/NA	Analysis	EPA 9040C		1			419938	12/05/22 16:59	MAM	EET PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	419719	12/02/22 19:02	LWM	EET PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			748.47 mL	1.0 g	592635	12/07/22 09:40	DJP	EET SL
Total/NA	Analysis	9315		1			595081	12/29/22 11:52	FLC	EET SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			748.47 mL	1.0 g	592637	12/07/22 10:05	DJP	EET SL
Total/NA	Analysis	9320		1			594442	12/21/22 11:29	FLC	EET SL
	Instrument ID: GFPCORANGE									
Total/NA	Analysis	Ra226_Ra228		1			595889	01/06/23 16:51	SCB	EET SL
	Instrument ID: NOEQUIP									

Client Sample ID: DUP-1

Date Collected: 11/29/22 00:01
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-13

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	EPA 9056A		1			419730	12/04/22 02:09	SNL	EET PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555197	12/08/22 22:03	RKT	EET CAN
	Instrument ID: I14									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		50			555430	12/09/22 12:57	AJC	EET CAN
	Instrument ID: I14									
Total/NA	Prep	7470A			50 mL	50 mL	554957	12/07/22 12:00	SHB	EET CAN
Total/NA	Analysis	7470A		1			555245	12/08/22 17:38	MRL	EET CAN
	Instrument ID: H3									
Total/NA	Analysis	EPA 9040C		1			419938	12/05/22 17:09	MAM	EET PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	419719	12/02/22 19:02	LWM	EET PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: CCR Groundwater Monitoring FB Culley

Job ID: 180-148606-1
SDG: Culley East

Client Sample ID: DUP-1

Date Collected: 11/29/22 00:01
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-13

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			256.30 mL	1.0 g	592977	12/09/22 10:53	DJP	EET SL
Total/NA	Analysis	9315		1			595481	01/04/23 15:37	FLC	EET SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			256.30 mL	1.0 g	592979	12/09/22 11:03	DJP	EET SL
Total/NA	Analysis	9320		1			594847	12/27/22 11:59	FLC	EET SL
	Instrument ID: GFPCBLUE									
Total/NA	Analysis	Ra226_Ra228		1			595888	01/06/23 16:50	SCB	EET SL
	Instrument ID: NOEQUIP									

Client Sample ID: FB-1

Date Collected: 11/30/22 10:00
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-14

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	EPA 9056A		1			419730	12/04/22 02:36	SNL	EET PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555197	12/08/22 22:06	RKT	EET CAN
	Instrument ID: I14									
Total Recoverable	Prep	3005A			50 mL	50 mL	554956	12/07/22 12:00	SHB	EET CAN
Total Recoverable	Analysis	6020A		1			555430	12/09/22 13:00	AJC	EET CAN
	Instrument ID: I14									
Total/NA	Prep	7470A			50 mL	50 mL	554957	12/07/22 12:00	SHB	EET CAN
Total/NA	Analysis	7470A		1			555245	12/08/22 17:40	MRL	EET CAN
	Instrument ID: H3									
Total/NA	Analysis	EPA 9040C		1			419938	12/05/22 17:19	MAM	EET PIT
	Instrument ID: PHTITRATOR									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	419866	12/05/22 16:53	LWM	EET PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			990.52 mL	1.0 g	592635	12/07/22 09:40	DJP	EET SL
Total/NA	Analysis	9315		1			595081	12/29/22 11:52	FLC	EET SL
	Instrument ID: GFPCRED									
Total/NA	Prep	PrecSep_0			990.52 mL	1.0 g	592637	12/07/22 10:05	DJP	EET SL
Total/NA	Analysis	9320		1			594442	12/21/22 11:29	FLC	EET SL
	Instrument ID: GFPCORANGE									
Total/NA	Analysis	Ra226_Ra228		1			595889	01/06/23 16:51	SCB	EET SL
	Instrument ID: NOEQUIP									

Laboratory References:

EET CAN = Eurofins Canton, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

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

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: CCR Groundwater Monitoring FB Culley

Job ID: 180-148606-1
SDG: Culley East

Analyst References:

Lab: EET CAN
- Batch Type: Prep
  - SHB = Samuel Banks
- Batch Type: Analysis
  - AJC = Alexander Colosi
  - MRL = Matthew Loeb
  - RKT = Roger Toth

Lab: EET PIT
- Batch Type: Analysis
  - LWM = Leslie McIntire
  - MAM = Matthew Martin
  - SNL = Sean Lordo

Lab: EET SL
- Batch Type: Prep
  - DJP = Dalton Pieper
- Batch Type: Analysis
  - FLC = Fernando Cruz
  - SCB = Sarah Bernsen

Client Sample ID: CCR-AP-1R

Date Collected: 11/29/22 08:45
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-1

Matrix: Water

Method: SW846 EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	17	^2	1.0	0.71	mg/L			12/03/22 23:50	1
Fluoride	0.47		0.10	0.026	mg/L			12/03/22 23:50	1
Sulfate	250		1.0	0.76	mg/L			12/03/22 23:50	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0014	J	0.0020	0.00057	mg/L		12/07/22 12:00	12/08/22 21:19	1
Arsenic	0.018		0.0050	0.00075	mg/L		12/07/22 12:00	12/08/22 21:19	1
Barium	0.27		0.0050	0.0022	mg/L		12/07/22 12:00	12/08/22 21:19	1
Beryllium	0.0040		0.0010	0.00062	mg/L		12/07/22 12:00	12/08/22 21:19	1
Boron	0.65		0.10	0.080	mg/L		12/07/22 12:00	12/09/22 12:03	5
Cadmium	0.00028	J	0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:19	1
Calcium	70		1.0	0.58	mg/L		12/07/22 12:00	12/08/22 21:19	1
Chromium	0.088		0.0050	0.0025	mg/L		12/07/22 12:00	12/08/22 21:19	1
Cobalt	0.044		0.0010	0.00019	mg/L		12/07/22 12:00	12/08/22 21:19	1
Lead	0.056		0.0010	0.00045	mg/L		12/07/22 12:00	12/08/22 21:19	1
Lithium	0.13		0.0080	0.0017	mg/L		12/07/22 12:00	12/08/22 21:19	1
Molybdenum	0.0093		0.0050	0.0011	mg/L		12/07/22 12:00	12/08/22 21:19	1
Selenium	0.0021	J	0.0050	0.00089	mg/L		12/07/22 12:00	12/08/22 21:19	1
Thallium	0.00054	J	0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:19	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		12/07/22 12:00	12/08/22 17:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	930		10	10	mg/L			12/02/22 19:02	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	7.9	HF	0.1	0.1	SU			12/05/22 15:43	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.05		0.625	0.683	1.00	0.374	pCi/L	12/09/22 10:53	01/04/23 15:36	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.5*		*40 - 110*	*12/09/22 10:53*	*01/04/23 15:36*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	5.50	G	1.84	1.90	1.00	2.25	pCi/L	12/09/22 11:03	12/27/22 11:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.5*		*40 - 110*	*12/09/22 11:03*	*12/27/22 11:58*	*1*
Y Carrier	*79.3*		*40 - 110*	*12/09/22 11:03*	*12/27/22 11:58*	*1*

Client Sample ID: CCR-AP-1R

Lab Sample ID: 180-148606-1

Date Collected: 11/29/22 08:45
Matrix: Water
Date Received: 12/01/22 10:35

Method: TAL-STL 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	8.55		1.94	2.02	5.00	2.25	pCi/L		01/06/23 16:50	1

Client Sample ID: CCR-AP-2

Lab Sample ID: 180-148606-2

Date Collected: 11/29/22 10:20
Matrix: Water
Date Received: 12/01/22 10:35

Method: SW846 EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	240	^2	1.0	0.71	mg/L			12/03/22 22:26	1
Fluoride	0.55		0.10	0.026	mg/L			12/03/22 22:26	1
Sulfate	310		1.0	0.76	mg/L			12/03/22 22:26	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0079		0.0020	0.00057	mg/L		12/07/22 12:00	12/08/22 21:31	1
Arsenic	0.013		0.0050	0.00075	mg/L		12/07/22 12:00	12/08/22 21:31	1
Barium	0.23		0.0050	0.0022	mg/L		12/07/22 12:00	12/08/22 21:31	1
Beryllium	0.0013		0.0010	0.00062	mg/L		12/07/22 12:00	12/08/22 21:31	1
Boron	6.2		1.0	0.80	mg/L		12/07/22 12:00	12/09/22 12:15	50
Cadmium	0.00070	J	0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:31	1
Calcium	180		1.0	0.58	mg/L		12/07/22 12:00	12/08/22 21:31	1
Chromium	0.035		0.0050	0.0025	mg/L		12/07/22 12:00	12/08/22 21:31	1
Cobalt	0.021		0.0010	0.00019	mg/L		12/07/22 12:00	12/08/22 21:31	1
Lead	0.019		0.0010	0.00045	mg/L		12/07/22 12:00	12/08/22 21:31	1
Lithium	0.028		0.0080	0.0017	mg/L		12/07/22 12:00	12/08/22 21:31	1
Molybdenum	0.0067		0.0050	0.0011	mg/L		12/07/22 12:00	12/08/22 21:31	1
Selenium	0.0026	J	0.0050	0.00089	mg/L		12/07/22 12:00	12/08/22 21:31	1
Thallium	0.00086	J	0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:31	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.00017	J F1	0.00020	0.00013	mg/L		12/07/22 12:00	12/08/22 17:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	1300		10	10	mg/L			12/02/22 19:02	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	6.9	HF	0.1	0.1	SU			12/05/22 15:49	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.09		0.561	0.570	1.00	0.715	pCi/L	12/07/22 09:40	12/29/22 10:42	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*62.6*		*40 - 110*	*12/07/22 09:40*	*12/29/22 10:42*	*1*

Client Sample ID: CCR-AP-2

Date Collected: 11/29/22 10:20
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-2

Matrix: Water

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.06	U G	1.61	1.61	1.00	2.73	pCi/L	12/07/22 10:05	12/21/22 11:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*62.6*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:38*	*1*
Y Carrier	*83.4*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:38*	*1*

Method: TAL-STL 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	2.16	U	1.70	1.71	5.00	2.73	pCi/L		01/06/23 16:51	1

Client Sample ID: CCR-AP-3R

Date Collected: 11/29/22 11:40
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-3

Matrix: Water

Method: SW846 EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**27**	**^2**	1.0	0.71	mg/L			12/03/22 22:40	1
Fluoride	**0.21**		0.10	0.026	mg/L			12/03/22 22:40	1
Sulfate	**1.3**		1.0	0.76	mg/L			12/03/22 22:40	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.0021**		0.0020	0.00057	mg/L		12/07/22 12:00	12/08/22 21:33	1
Arsenic	**0.073**		0.0050	0.00075	mg/L		12/07/22 12:00	12/08/22 21:33	1
Barium	**0.40**		0.0050	0.0022	mg/L		12/07/22 12:00	12/08/22 21:33	1
Beryllium	ND		0.0010	0.00062	mg/L		12/07/22 12:00	12/08/22 21:33	1
Boron	**0.15**		0.020	0.016	mg/L		12/07/22 12:00	12/09/22 12:17	1
Cadmium	ND		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:33	1
Calcium	**180**		1.0	0.58	mg/L		12/07/22 12:00	12/08/22 21:33	1
Chromium	**0.0028**	**J**	0.0050	0.0025	mg/L		12/07/22 12:00	12/08/22 21:33	1
Cobalt	**0.0040**		0.0010	0.00019	mg/L		12/07/22 12:00	12/08/22 21:33	1
Lead	**0.0013**		0.0010	0.00045	mg/L		12/07/22 12:00	12/08/22 21:33	1
Lithium	**0.0022**	**J**	0.0080	0.0017	mg/L		12/07/22 12:00	12/08/22 21:33	1
Molybdenum	**0.0066**		0.0050	0.0011	mg/L		12/07/22 12:00	12/08/22 21:33	1
Selenium	**0.0019**	**J**	0.0050	0.00089	mg/L		12/07/22 12:00	12/08/22 21:33	1
Thallium	ND		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:33	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		12/07/22 12:00	12/08/22 17:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**1000**		10	10	mg/L			12/02/22 19:02	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**7.4**	**HF**	0.1	0.1	SU			12/05/22 15:55	1

Client Sample ID: CCR-AP-3R
Lab Sample ID: 180-148606-3
Date Collected: 11/29/22 11:40
Matrix: Water
Date Received: 12/01/22 10:35

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.26		0.536	0.548	1.00	0.564	pCi/L	12/07/22 09:40	12/29/22 10:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*60.2*		*40 - 110*	*12/07/22 09:40*	*12/29/22 10:46*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	3.60	G	2.10	2.13	1.00	3.00	pCi/L	12/07/22 10:05	12/21/22 11:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*60.2*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:38*	*1*
Y Carrier	*82.6*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:38*	*1*

Method: TAL-STL 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	4.87		2.17	2.20	5.00	3.00	pCi/L		01/06/23 16:51	1

Client Sample ID: CCR-AP-4R
Lab Sample ID: 180-148606-4
Date Collected: 11/29/22 09:40
Matrix: Water
Date Received: 12/01/22 10:35

Method: SW846 EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	20	^2	1.0	0.71	mg/L			12/03/22 22:54	1
Fluoride	0.39		0.10	0.026	mg/L			12/03/22 22:54	1
Sulfate	19		1.0	0.76	mg/L			12/03/22 22:54	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.028		0.0020	0.00057	mg/L		12/07/22 12:00	12/08/22 21:36	1
Arsenic	0.16		0.0050	0.00075	mg/L		12/07/22 12:00	12/08/22 21:36	1
Barium	0.89		0.0050	0.0022	mg/L		12/07/22 12:00	12/08/22 21:36	1
Beryllium	0.0013		0.0010	0.00062	mg/L		12/07/22 12:00	12/08/22 21:36	1
Boron	0.092		0.020	0.016	mg/L		12/07/22 12:00	12/09/22 12:20	1
Cadmium	0.00079	J	0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:36	1
Calcium	170		1.0	0.58	mg/L		12/07/22 12:00	12/08/22 21:36	1
Chromium	0.040		0.0050	0.0025	mg/L		12/07/22 12:00	12/08/22 21:36	1
Cobalt	0.020		0.0010	0.00019	mg/L		12/07/22 12:00	12/08/22 21:36	1
Lead	0.041		0.0010	0.00045	mg/L		12/07/22 12:00	12/08/22 21:36	1
Lithium	0.025		0.0080	0.0017	mg/L		12/07/22 12:00	12/08/22 21:36	1
Molybdenum	0.010		0.0050	0.0011	mg/L		12/07/22 12:00	12/08/22 21:36	1
Selenium	0.0020	J	0.0050	0.00089	mg/L		12/07/22 12:00	12/08/22 21:36	1
Thallium	0.00047	J	0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:36	1

Client Sample ID: CCR-AP-4R

Lab Sample ID: 180-148606-4
Date Collected: 11/29/22 09:40
Matrix: Water
Date Received: 12/01/22 10:35

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		12/07/22 12:00	12/08/22 17:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	830		10	10	mg/L			12/02/22 19:02	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	7.0	HF	0.1	0.1	SU			12/05/22 16:08	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.636		0.241	0.247	1.00	0.232	pCi/L	12/07/22 09:40	12/29/22 10:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*74.3*		*40 - 110*	*12/07/22 09:40*	*12/29/22 10:46*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	2.18	G	1.01	1.03	1.00	1.38	pCi/L	12/07/22 10:05	12/21/22 11:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*74.3*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:38*	*1*
Y Carrier	*82.2*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:38*	*1*

Method: TAL-STL 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	2.82		1.04	1.06	5.00	1.38	pCi/L		01/06/23 16:51	1

Client Sample ID: CCR-AP-5

Lab Sample ID: 180-148606-5
Date Collected: 11/29/22 13:00
Matrix: Water
Date Received: 12/01/22 10:35

Method: SW846 EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	140	^2	1.0	0.71	mg/L			12/03/22 23:08	1
Fluoride	2.0		0.10	0.026	mg/L			12/03/22 23:08	1
Sulfate	630		1.0	0.76	mg/L			12/03/22 23:08	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0047		0.0020	0.00057	mg/L		12/07/22 12:00	12/08/22 21:43	1
Arsenic	0.024		0.0050	0.00075	mg/L		12/07/22 12:00	12/08/22 21:43	1
Barium	0.15		0.0050	0.0022	mg/L		12/07/22 12:00	12/08/22 21:43	1
Beryllium	ND		0.0010	0.00062	mg/L		12/07/22 12:00	12/08/22 21:43	1
Boron	11		1.0	0.80	mg/L		12/07/22 12:00	12/09/22 12:27	50
Cadmium	0.00080	J	0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:43	1

Client Sample ID: CCR-AP-5

Date Collected: 11/29/22 13:00
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-5

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	260		1.0	0.58	mg/L		12/07/22 12:00	12/08/22 21:43	1
Chromium	0.027		0.0050	0.0025	mg/L		12/07/22 12:00	12/08/22 21:43	1
Cobalt	0.0041		0.0010	0.00019	mg/L		12/07/22 12:00	12/08/22 21:43	1
Lead	0.0082		0.0010	0.00045	mg/L		12/07/22 12:00	12/08/22 21:43	1
Lithium	0.069		0.0080	0.0017	mg/L		12/07/22 12:00	12/08/22 21:43	1
Molybdenum	0.24		0.0050	0.0011	mg/L		12/07/22 12:00	12/08/22 21:43	1
Selenium	0.0073		0.0050	0.00089	mg/L		12/07/22 12:00	12/08/22 21:43	1
Thallium	0.00027	J	0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:43	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.00090		0.00020	0.00013	mg/L		12/07/22 12:00	12/08/22 17:22	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	1500		10	10	mg/L			12/02/22 19:02	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	7.6	HF	0.1	0.1	SU			12/05/22 16:20	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	2.08		0.734	0.757	1.00	0.806	pCi/L	12/07/22 09:40	12/29/22 10:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*57.0*		*40 - 110*	*12/07/22 09:40*	*12/29/22 10:46*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0411	U G	1.75	1.75	1.00	3.27	pCi/L	12/07/22 10:05	12/21/22 11:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*57.0*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:38*	*1*
Y Carrier	*83.7*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:38*	*1*

Method: TAL-STL 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	2.12	U	1.90	1.91	5.00	3.27	pCi/L		01/06/23 16:51	1

Client Sample ID: CCR-AP-5I

Date Collected: 11/29/22 13:50
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-6

Matrix: Water

Method: SW846 EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	280	^2	2.5	1.8	mg/L			12/03/22 23:36	2.5

Client Sample ID: CCR-AP-5I

Date Collected: 11/29/22 13:50
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-6

Matrix: Water

Method: SW846 EPA 9056A - Anions, Ion Chromatography (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**0.58**		0.25	0.065	mg/L			12/03/22 23:36	2.5
Sulfate	**660**		2.5	1.9	mg/L			12/03/22 23:36	2.5

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		12/07/22 12:00	12/08/22 21:46	1
Arsenic	ND		0.0050	0.00075	mg/L		12/07/22 12:00	12/08/22 21:46	1
Barium	**0.051**		0.0050	0.0022	mg/L		12/07/22 12:00	12/08/22 21:46	1
Beryllium	ND		0.0010	0.00062	mg/L		12/07/22 12:00	12/08/22 21:46	1
Boron	**11**		1.0	0.80	mg/L		12/07/22 12:00	12/09/22 12:30	50
Cadmium	ND		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:46	1
Calcium	**230**		1.0	0.58	mg/L		12/07/22 12:00	12/08/22 21:46	1
Chromium	ND		0.0050	0.0025	mg/L		12/07/22 12:00	12/08/22 21:46	1
Cobalt	**0.00050**	**J**	0.0010	0.00019	mg/L		12/07/22 12:00	12/08/22 21:46	1
Lead	ND		0.0010	0.00045	mg/L		12/07/22 12:00	12/08/22 21:46	1
Lithium	**0.035**		0.0080	0.0017	mg/L		12/07/22 12:00	12/08/22 21:46	1
Molybdenum	**0.0024**	**J**	0.0050	0.0011	mg/L		12/07/22 12:00	12/08/22 21:46	1
Selenium	ND		0.0050	0.00089	mg/L		12/07/22 12:00	12/08/22 21:46	1
Thallium	ND		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:46	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		12/07/22 12:00	12/08/22 17:24	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**1700**		20	20	mg/L			12/02/22 19:02	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**7.4**	**HF**	0.1	0.1	SU			12/05/22 16:25	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.316**		0.125	0.128	1.00	0.140	pCi/L	12/07/22 09:40	12/29/22 10:47	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*80.3*		*40 - 110*	*12/07/22 09:40*	*12/29/22 10:47*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.14**		0.524	0.534	1.00	0.733	pCi/L	12/07/22 10:05	12/21/22 11:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*80.3*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:38*	*1*
Y Carrier	*82.6*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:38*	*1*

Client Sample ID: CCR-AP-5I
Lab Sample ID: 180-148606-6
Date Collected: 11/29/22 13:50
Matrix: Water
Date Received: 12/01/22 10:35

Method: TAL-STL 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	1.45		0.539	0.549	5.00	0.733	pCi/L		01/06/23 16:51	1

Client Sample ID: CCR-AP-6
Lab Sample ID: 180-148606-7
Date Collected: 11/29/22 11:55
Matrix: Water
Date Received: 12/01/22 10:35

Method: SW846 EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	42		1.0	0.71	mg/L			12/04/22 00:59	1
Fluoride	0.48		0.10	0.026	mg/L			12/04/22 00:59	1
Sulfate	15		1.0	0.76	mg/L			12/04/22 00:59	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.018		0.0020	0.00057	mg/L		12/07/22 12:00	12/08/22 21:48	1
Arsenic	0.12		0.0050	0.00075	mg/L		12/07/22 12:00	12/08/22 21:48	1
Barium	0.69		0.0050	0.0022	mg/L		12/07/22 12:00	12/08/22 21:48	1
Beryllium	0.00096	J	0.0010	0.00062	mg/L		12/07/22 12:00	12/08/22 21:48	1
Boron	0.64		0.10	0.080	mg/L		12/07/22 12:00	12/09/22 12:32	5
Cadmium	0.0011		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:48	1
Calcium	430		1.0	0.58	mg/L		12/07/22 12:00	12/08/22 21:48	1
Chromium	0.043		0.0050	0.0025	mg/L		12/07/22 12:00	12/08/22 21:48	1
Cobalt	0.019		0.0010	0.00019	mg/L		12/07/22 12:00	12/08/22 21:48	1
Lead	0.041		0.0010	0.00045	mg/L		12/07/22 12:00	12/08/22 21:48	1
Lithium	0.018		0.0080	0.0017	mg/L		12/07/22 12:00	12/08/22 21:48	1
Molybdenum	0.037		0.0050	0.0011	mg/L		12/07/22 12:00	12/08/22 21:48	1
Selenium	0.0030	J	0.0050	0.00089	mg/L		12/07/22 12:00	12/08/22 21:48	1
Thallium	ND		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:48	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.00017	J	0.00020	0.00013	mg/L		12/07/22 12:00	12/08/22 17:26	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	1000		10	10	mg/L			12/02/22 19:02	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	7.6	HF	0.1	0.1	SU			12/05/22 16:31	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.699		0.259	0.267	1.00	0.238	pCi/L	12/07/22 09:40	12/29/22 11:51	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*65.5*		*40 - 110*	*12/07/22 09:40*	*12/29/22 11:51*	*1*

Client Sample ID: CCR-AP-6

Date Collected: 11/29/22 11:55
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-7

Matrix: Water

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	2.00	G	1.03	1.04	1.00	1.43	pCi/L	12/07/22 10:05	12/21/22 11:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*65.5*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:39*	*1*
Y Carrier	*84.1*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:39*	*1*

Method: TAL-STL 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	2.70		1.06	1.07	5.00	1.43	pCi/L		01/06/23 16:51	1

Client Sample ID: CCR-AP-6I

Date Collected: 11/30/22 09:40
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-8

Matrix: Water

Method: SW846 EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	260		2.5	1.8	mg/L			12/04/22 01:13	2.5
Fluoride	0.12	J	0.25	0.065	mg/L			12/04/22 01:13	2.5
Sulfate	1500		2.5	1.9	mg/L			12/04/22 01:13	2.5

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		12/07/22 12:00	12/08/22 21:51	1
Arsenic	0.0032	J	0.0050	0.00075	mg/L		12/07/22 12:00	12/08/22 21:51	1
Barium	0.035		0.0050	0.0022	mg/L		12/07/22 12:00	12/08/22 21:51	1
Beryllium	ND		0.0010	0.00062	mg/L		12/07/22 12:00	12/08/22 21:51	1
Boron	18		2.0	1.6	mg/L		12/07/22 12:00	12/09/22 12:35	100
Cadmium	ND		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:51	1
Calcium	540		1.0	0.58	mg/L		12/07/22 12:00	12/08/22 21:51	1
Chromium	ND		0.0050	0.0025	mg/L		12/07/22 12:00	12/08/22 21:51	1
Cobalt	0.0018		0.0010	0.00019	mg/L		12/07/22 12:00	12/08/22 21:51	1
Lead	ND		0.0010	0.00045	mg/L		12/07/22 12:00	12/08/22 21:51	1
Lithium	0.058		0.0080	0.0017	mg/L		12/07/22 12:00	12/08/22 21:51	1
Molybdenum	0.66		0.0050	0.0011	mg/L		12/07/22 12:00	12/08/22 21:51	1
Selenium	ND		0.0050	0.00089	mg/L		12/07/22 12:00	12/08/22 21:51	1
Thallium	ND		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:51	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		12/07/22 12:00	12/08/22 17:28	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	2600		20	20	mg/L			12/05/22 17:39	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	7.7	HF	0.1	0.1	SU			12/05/22 16:37	1

Client Sample ID: CCR-AP-6I

Lab Sample ID: 180-148606-8

Date Collected: 11/30/22 09:40
Matrix: Water
Date Received: 12/01/22 10:35

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.193		0.0899	0.0916	1.00	0.0973	pCi/L	12/07/22 09:40	12/29/22 11:52	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*87.1*		*40 - 110*	*12/07/22 09:40*	*12/29/22 11:52*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.06		0.480	0.490	1.00	0.672	pCi/L	12/07/22 10:05	12/21/22 11:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*87.1*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:39*	*1*
Y Carrier	*84.5*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:39*	*1*

Method: TAL-STL 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	1.25		0.488	0.498	5.00	0.672	pCi/L		01/06/23 16:51	1

Client Sample ID: CCR-AP-8

Lab Sample ID: 180-148606-9

Date Collected: 11/29/22 11:10
Matrix: Water
Date Received: 12/01/22 10:35

Method: SW846 EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	18		1.0	0.71	mg/L			12/04/22 01:27	1
Fluoride	0.36		0.10	0.026	mg/L			12/04/22 01:27	1
Sulfate	10		1.0	0.76	mg/L			12/04/22 01:27	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0046		0.0020	0.00057	mg/L		12/07/22 12:00	12/08/22 21:53	1
Arsenic	0.10		0.0050	0.00075	mg/L		12/07/22 12:00	12/08/22 21:53	1
Barium	0.37		0.0050	0.0022	mg/L		12/07/22 12:00	12/08/22 21:53	1
Beryllium	ND		0.0010	0.00062	mg/L		12/07/22 12:00	12/08/22 21:53	1
Boron	0.050		0.020	0.016	mg/L		12/07/22 12:00	12/09/22 12:37	1
Cadmium	0.00064	J	0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:53	1
Calcium	190		1.0	0.58	mg/L		12/07/22 12:00	12/08/22 21:53	1
Chromium	0.014		0.0050	0.0025	mg/L		12/07/22 12:00	12/08/22 21:53	1
Cobalt	0.0080		0.0010	0.00019	mg/L		12/07/22 12:00	12/08/22 21:53	1
Lead	0.0061		0.0010	0.00045	mg/L		12/07/22 12:00	12/08/22 21:53	1
Lithium	0.0067	J	0.0080	0.0017	mg/L		12/07/22 12:00	12/08/22 21:53	1
Molybdenum	0.029		0.0050	0.0011	mg/L		12/07/22 12:00	12/08/22 21:53	1
Selenium	0.0051		0.0050	0.00089	mg/L		12/07/22 12:00	12/08/22 21:53	1
Thallium	ND		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:53	1

Client Sample ID: CCR-AP-8

Lab Sample ID: 180-148606-9

Date Collected: 11/29/22 11:10

Matrix: Water

Date Received: 12/01/22 10:35

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.00026**		0.00020	0.00013	mg/L		12/07/22 12:00	12/08/22 17:30	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**1100**		10	10	mg/L			12/02/22 19:02	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**7.3**	**HF**	0.1	0.1	SU			12/05/22 16:43	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.557**		0.230	0.235	1.00	0.248	pCi/L	12/07/22 09:40	12/29/22 11:52	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*79.9*		*40 - 110*	*12/07/22 09:40*	*12/29/22 11:52*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.512	U G	0.791	0.792	1.00	1.34	pCi/L	12/07/22 10:05	12/21/22 11:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*79.9*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:40*	*1*
Y Carrier	*80.7*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:40*	*1*

Method: TAL-STL 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	1.07	U	0.824	0.826	5.00	1.34	pCi/L		01/06/23 16:51	1

Client Sample ID: CCR-AP-8I

Lab Sample ID: 180-148606-10

Date Collected: 11/30/22 10:20

Matrix: Water

Date Received: 12/01/22 10:35

Method: SW846 EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**560**		2.5	1.8	mg/L			12/04/22 01:41	2.5
Fluoride	**0.21**	**J**	0.25	0.065	mg/L			12/04/22 01:41	2.5
Sulfate	**1100**		2.5	1.9	mg/L			12/04/22 01:41	2.5

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		12/07/22 12:00	12/08/22 21:56	1
Arsenic	**0.0017**	**J**	0.0050	0.00075	mg/L		12/07/22 12:00	12/08/22 21:56	1
Barium	**0.19**		0.0050	0.0022	mg/L		12/07/22 12:00	12/08/22 21:56	1
Beryllium	ND		0.0010	0.00062	mg/L		12/07/22 12:00	12/08/22 21:56	1
Boron	**12**		1.0	0.80	mg/L		12/07/22 12:00	12/09/22 12:40	50
Cadmium	ND		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:56	1

Client Sample ID: CCR-AP-8I

Date Collected: 11/30/22 10:20
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-10

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	**410**		1.0	0.58	mg/L		12/07/22 12:00	12/08/22 21:56	1
Chromium	ND		0.0050	0.0025	mg/L		12/07/22 12:00	12/08/22 21:56	1
Cobalt	ND		0.0010	0.00019	mg/L		12/07/22 12:00	12/08/22 21:56	1
Lead	ND		0.0010	0.00045	mg/L		12/07/22 12:00	12/08/22 21:56	1
Lithium	**0.42**		0.0080	0.0017	mg/L		12/07/22 12:00	12/08/22 21:56	1
Molybdenum	**0.33**		0.0050	0.0011	mg/L		12/07/22 12:00	12/08/22 21:56	1
Selenium	ND		0.0050	0.00089	mg/L		12/07/22 12:00	12/08/22 21:56	1
Thallium	ND		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:56	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		12/07/22 12:00	12/09/22 11:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**2800**		20	20	mg/L			12/05/22 17:39	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**7.3**	**HF**	0.1	0.1	SU			12/05/22 16:48	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**1.35**		0.222	0.253	1.00	0.109	pCi/L	12/07/22 09:40	12/29/22 11:52	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*79.6*		*40 - 110*	*12/07/22 09:40*	*12/29/22 11:52*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**2.05**		0.546	0.578	1.00	0.586	pCi/L	12/07/22 10:05	12/21/22 11:41	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*79.6*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:41*	*1*
Y Carrier	*85.6*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:41*	*1*

Method: TAL-STL 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	**3.41**		0.589	0.631	5.00	0.586	pCi/L		01/06/23 16:51	1

Client Sample ID: CCR-AP-9

Date Collected: 11/29/22 08:05
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-11

Matrix: Water

Method: SW846 EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**11**		1.0	0.71	mg/L			12/04/22 02:50	1

Client Sample ID: CCR-AP-9
Lab Sample ID: 180-148606-11

Date Collected: 11/29/22 08:05
Matrix: Water
Date Received: 12/01/22 10:35

Method: SW846 EPA 9056A - Anions, Ion Chromatography (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.39		0.10	0.026	mg/L			12/04/22 02:50	1
Sulfate	120		1.0	0.76	mg/L			12/04/22 02:50	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0012	J	0.0020	0.00057	mg/L		12/07/22 12:00	12/08/22 21:58	1
Arsenic	0.013		0.0050	0.00075	mg/L		12/07/22 12:00	12/08/22 21:58	1
Barium	0.39		0.0050	0.0022	mg/L		12/07/22 12:00	12/08/22 21:58	1
Beryllium	0.0018		0.0010	0.00062	mg/L		12/07/22 12:00	12/08/22 21:58	1
Boron	0.38		0.040	0.032	mg/L		12/07/22 12:00	12/09/22 12:47	2
Cadmium	0.00020	J	0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:58	1
Calcium	160		1.0	0.58	mg/L		12/07/22 12:00	12/08/22 21:58	1
Chromium	0.045		0.0050	0.0025	mg/L		12/07/22 12:00	12/08/22 21:58	1
Cobalt	0.019		0.0010	0.00019	mg/L		12/07/22 12:00	12/08/22 21:58	1
Lead	0.024		0.0010	0.00045	mg/L		12/07/22 12:00	12/08/22 21:58	1
Lithium	0.064		0.0080	0.0017	mg/L		12/07/22 12:00	12/08/22 21:58	1
Molybdenum	0.0037	J	0.0050	0.0011	mg/L		12/07/22 12:00	12/08/22 21:58	1
Selenium	0.0010	J	0.0050	0.00089	mg/L		12/07/22 12:00	12/08/22 21:58	1
Thallium	ND		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:58	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		12/07/22 12:00	12/08/22 17:34	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	830		10	10	mg/L			12/02/22 19:02	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	7.7	HF	0.1	0.1	SU			12/05/22 16:53	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	6.01		0.990	1.13	1.00	0.482	pCi/L	12/07/22 09:40	12/29/22 11:52	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*68.9*		*40 - 110*	*12/07/22 09:40*	*12/29/22 11:52*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	2.39	U G	1.79	1.80	1.00	2.72	pCi/L	12/07/22 10:05	12/21/22 11:41	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*68.9*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:41*	*1*
Y Carrier	*82.6*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:41*	*1*

Client Sample ID: CCR-AP-9

Date Collected: 11/29/22 08:05
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-11

Matrix: Water

Method: TAL-STL 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	8.41		2.05	2.13	5.00	2.72	pCi/L		01/06/23 16:51	1

Client Sample ID: CCR-AP-11

Date Collected: 11/29/22 10:11
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-12

Matrix: Water

Method: SW846 EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	24		1.0	0.71	mg/L			12/04/22 01:55	1
Fluoride	0.37		0.10	0.026	mg/L			12/04/22 01:55	1
Sulfate	450		1.0	0.76	mg/L			12/04/22 01:55	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		12/07/22 12:00	12/08/22 22:01	1
Arsenic	0.044		0.0050	0.00075	mg/L		12/07/22 12:00	12/08/22 22:01	1
Barium	0.20		0.0050	0.0022	mg/L		12/07/22 12:00	12/08/22 22:01	1
Beryllium	ND		0.0010	0.00062	mg/L		12/07/22 12:00	12/08/22 22:01	1
Boron	0.21		0.020	0.016	mg/L		12/07/22 12:00	12/09/22 12:50	1
Cadmium	ND		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 22:01	1
Calcium	110		1.0	0.58	mg/L		12/07/22 12:00	12/08/22 22:01	1
Chromium	ND		0.0050	0.0025	mg/L		12/07/22 12:00	12/08/22 22:01	1
Cobalt	0.037		0.0010	0.00019	mg/L		12/07/22 12:00	12/08/22 22:01	1
Lead	0.00097	J	0.0010	0.00045	mg/L		12/07/22 12:00	12/08/22 22:01	1
Lithium	0.0049	J	0.0080	0.0017	mg/L		12/07/22 12:00	12/08/22 22:01	1
Molybdenum	ND		0.0050	0.0011	mg/L		12/07/22 12:00	12/08/22 22:01	1
Selenium	ND		0.0050	0.00089	mg/L		12/07/22 12:00	12/08/22 22:01	1
Thallium	ND		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 22:01	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		12/07/22 12:00	12/08/22 17:36	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	860		10	10	mg/L			12/02/22 19:02	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	7.0	HF	0.1	0.1	SU			12/05/22 16:59	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.223		0.127	0.129	1.00	0.166	pCi/L	12/07/22 09:40	12/29/22 11:52	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.1*		*40 - 110*	*12/07/22 09:40*	*12/29/22 11:52*	*1*

Client Sample ID: CCR-AP-11

Lab Sample ID: 180-148606-12

Date Collected: 11/29/22 10:11

Matrix: Water

Date Received: 12/01/22 10:35

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.289	U	0.378	0.379	1.00	0.632	pCi/L	12/07/22 10:05	12/21/22 11:29	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.1*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:29*	*1*
Y Carrier	*86.7*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:29*	*1*

Method: TAL-STL 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	0.512	U	0.399	0.400	5.00	0.632	pCi/L		01/06/23 16:51	1

Client Sample ID: DUP-1

Lab Sample ID: 180-148606-13

Date Collected: 11/29/22 00:01

Matrix: Water

Date Received: 12/01/22 10:35

Method: SW846 EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**130**		1.0	0.71	mg/L			12/04/22 02:09	1
Fluoride	**1.9**		0.10	0.026	mg/L			12/04/22 02:09	1
Sulfate	**600**		1.0	0.76	mg/L			12/04/22 02:09	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.0046**		0.0020	0.00057	mg/L		12/07/22 12:00	12/08/22 22:03	1
Arsenic	**0.025**		0.0050	0.00075	mg/L		12/07/22 12:00	12/08/22 22:03	1
Barium	**0.15**		0.0050	0.0022	mg/L		12/07/22 12:00	12/08/22 22:03	1
Beryllium	ND		0.0010	0.00062	mg/L		12/07/22 12:00	12/08/22 22:03	1
Boron	**10**		1.0	0.80	mg/L		12/07/22 12:00	12/09/22 12:57	50
Cadmium	**0.00079**	**J**	0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 22:03	1
Calcium	**250**		1.0	0.58	mg/L		12/07/22 12:00	12/08/22 22:03	1
Chromium	**0.029**		0.0050	0.0025	mg/L		12/07/22 12:00	12/08/22 22:03	1
Cobalt	**0.0040**		0.0010	0.00019	mg/L		12/07/22 12:00	12/08/22 22:03	1
Lead	**0.0085**		0.0010	0.00045	mg/L		12/07/22 12:00	12/08/22 22:03	1
Lithium	**0.069**		0.0080	0.0017	mg/L		12/07/22 12:00	12/08/22 22:03	1
Molybdenum	**0.23**		0.0050	0.0011	mg/L		12/07/22 12:00	12/08/22 22:03	1
Selenium	**0.0072**		0.0050	0.00089	mg/L		12/07/22 12:00	12/08/22 22:03	1
Thallium	**0.00023**	**J**	0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 22:03	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.0010**		0.00020	0.00013	mg/L		12/07/22 12:00	12/08/22 17:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**1500**		10	10	mg/L			12/02/22 19:02	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	**7.6**	**HF**	0.1	0.1	SU			12/05/22 17:09	1

Client Sample ID: DUP-1
Lab Sample ID: 180-148606-13

Date Collected: 11/29/22 00:01
Matrix: Water
Date Received: 12/01/22 10:35

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	4.19		0.814	0.897	1.00	0.560	pCi/L	12/09/22 10:53	01/04/23 15:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*76.9*		*40 - 110*	*12/09/22 10:53*	*01/04/23 15:37*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.55	U G	1.65	1.66	1.00	2.68	pCi/L	12/09/22 11:03	12/27/22 11:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*76.9*		*40 - 110*	*12/09/22 11:03*	*12/27/22 11:59*	*1*
Y Carrier	*78.1*		*40 - 110*	*12/09/22 11:03*	*12/27/22 11:59*	*1*

Method: TAL-STL 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	5.74		1.84	1.89	5.00	2.68	pCi/L		01/06/23 16:50	1

Client Sample ID: FB-1
Lab Sample ID: 180-148606-14

Date Collected: 11/30/22 10:00
Matrix: Water
Date Received: 12/01/22 10:35

Method: SW846 EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.71	mg/L			12/04/22 02:36	1
Fluoride	ND		0.10	0.026	mg/L			12/04/22 02:36	1
Sulfate	ND		1.0	0.76	mg/L			12/04/22 02:36	1

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		12/07/22 12:00	12/08/22 22:06	1
Arsenic	ND		0.0050	0.00075	mg/L		12/07/22 12:00	12/08/22 22:06	1
Barium	ND		0.0050	0.0022	mg/L		12/07/22 12:00	12/08/22 22:06	1
Beryllium	ND		0.0010	0.00062	mg/L		12/07/22 12:00	12/08/22 22:06	1
Boron	ND		0.020	0.016	mg/L		12/07/22 12:00	12/09/22 13:00	1
Cadmium	ND		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 22:06	1
Calcium	ND		1.0	0.58	mg/L		12/07/22 12:00	12/08/22 22:06	1
Chromium	ND		0.0050	0.0025	mg/L		12/07/22 12:00	12/08/22 22:06	1
Cobalt	ND		0.0010	0.00019	mg/L		12/07/22 12:00	12/08/22 22:06	1
Lead	ND		0.0010	0.00045	mg/L		12/07/22 12:00	12/08/22 22:06	1
Lithium	ND		0.0080	0.0017	mg/L		12/07/22 12:00	12/08/22 22:06	1
Molybdenum	ND		0.0050	0.0011	mg/L		12/07/22 12:00	12/08/22 22:06	1
Selenium	ND		0.0050	0.00089	mg/L		12/07/22 12:00	12/08/22 22:06	1
Thallium	ND		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 22:06	1

Client: Haley & Aldrich, Inc.
Project/Site: CCR Groundwater Monitoring FB Culley

Job ID: 180-148606-1
SDG: Culley East

Client Sample ID: FB-1

Date Collected: 11/30/22 10:00
Date Received: 12/01/22 10:35

Lab Sample ID: 180-148606-14

Matrix: Water

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		12/07/22 12:00	12/08/22 17:40	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	16		10	10	mg/L			12/05/22 16:53	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 EPA 9040C)	5.9	HF	0.1	0.1	SU			12/05/22 17:19	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0157	U	0.0539	0.0539	1.00	0.104	pCi/L	12/07/22 09:40	12/29/22 11:52	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.3*		*40 - 110*	*12/07/22 09:40*	*12/29/22 11:52*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0233	U	0.219	0.219	1.00	0.412	pCi/L	12/07/22 10:05	12/21/22 11:29	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.3*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:29*	*1*
Y Carrier	*86.7*		*40 - 110*	*12/07/22 10:05*	*12/21/22 11:29*	*1*

Method: TAL-STL 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	0.0390	U	0.226	0.226	5.00	0.412	pCi/L		01/06/23 16:51	1

Method: EPA 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 180-419730/6
Matrix: Water
Analysis Batch: 419730

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			12/03/22 15:05	1
Fluoride	ND		0.10	0.026	mg/L			12/03/22 15:05	1
Sulfate	ND		1.0	0.76	mg/L			12/03/22 15:05	1

Lab Sample ID: LCS 180-419730/7
Matrix: Water
Analysis Batch: 419730

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	50.0	51.8		mg/L		104	80 - 120
Fluoride	2.50	2.71		mg/L		108	80 - 120
Sulfate	50.0	54.0		mg/L		108	80 - 120

Lab Sample ID: 180-148606-1 MS
Matrix: Water
Analysis Batch: 419730

Client Sample ID: CCR-AP-1R
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	17	^2	50.0	70.5		mg/L		107	80 - 120
Fluoride	0.47		2.50	3.33		mg/L		114	80 - 120
Sulfate	250		50.0	307	4	mg/L		121	80 - 120

Lab Sample ID: 180-148606-1 MSD
Matrix: Water
Analysis Batch: 419730

Client Sample ID: CCR-AP-1R
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	17	^2	50.0	66.7		mg/L		100	80 - 120	6	15
Fluoride	0.47		2.50	3.15		mg/L		107	80 - 120	6	15
Sulfate	250		50.0	287	4	mg/L		81	80 - 120	7	15

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-554956/1-A
Matrix: Water
Analysis Batch: 555197

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 554956

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		12/07/22 12:00	12/08/22 21:14	1
Arsenic	ND		0.0050	0.00075	mg/L		12/07/22 12:00	12/08/22 21:14	1
Barium	ND		0.0050	0.0022	mg/L		12/07/22 12:00	12/08/22 21:14	1
Beryllium	ND		0.0010	0.00062	mg/L		12/07/22 12:00	12/08/22 21:14	1
Cadmium	ND		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:14	1
Calcium	ND		1.0	0.58	mg/L		12/07/22 12:00	12/08/22 21:14	1
Chromium	ND		0.0050	0.0025	mg/L		12/07/22 12:00	12/08/22 21:14	1
Cobalt	ND		0.0010	0.00019	mg/L		12/07/22 12:00	12/08/22 21:14	1
Lead	ND		0.0010	0.00045	mg/L		12/07/22 12:00	12/08/22 21:14	1
Lithium	ND		0.0080	0.0017	mg/L		12/07/22 12:00	12/08/22 21:14	1
Molybdenum	ND		0.0050	0.0011	mg/L		12/07/22 12:00	12/08/22 21:14	1
Selenium	ND		0.0050	0.00089	mg/L		12/07/22 12:00	12/08/22 21:14	1

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

Lab Sample ID: MB 240-554956/1-A
Matrix: Water
Analysis Batch: 555197

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 554956

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thallium	ND		0.0010	0.00020	mg/L		12/07/22 12:00	12/08/22 21:14	1

Lab Sample ID: MB 240-554956/1-A
Matrix: Water
Analysis Batch: 555430

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 554956

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.020	0.016	mg/L		12/07/22 12:00	12/09/22 11:58	1

Lab Sample ID: LCS 240-554956/2-A
Matrix: Water
Analysis Batch: 555197

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 554956

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.100	0.0951		mg/L		95	80 - 120
Arsenic	1.00	0.894		mg/L		89	80 - 120
Barium	1.00	0.910		mg/L		91	80 - 120
Beryllium	0.500	0.436		mg/L		87	80 - 120
Cadmium	0.500	0.467		mg/L		93	80 - 120
Calcium	25.0	23.6		mg/L		94	80 - 120
Chromium	0.500	0.484		mg/L		97	80 - 120
Cobalt	0.500	0.432		mg/L		86	80 - 120
Lead	0.500	0.512		mg/L		102	80 - 120
Lithium	0.500	0.484		mg/L		97	80 - 120
Molybdenum	0.500	0.444		mg/L		89	80 - 120
Selenium	1.00	0.957		mg/L		96	80 - 120
Thallium	1.00	0.945		mg/L		95	80 - 120

Lab Sample ID: LCS 240-554956/2-A
Matrix: Water
Analysis Batch: 555430

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 554956

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	0.100	0.0882		mg/L		88	80 - 120

Lab Sample ID: 180-148606-1 MS
Matrix: Water
Analysis Batch: 555197

Client Sample ID: CCR-AP-1R
Prep Type: Total Recoverable
Prep Batch: 554956

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.0014	J	0.100	0.0883		mg/L		87	75 - 125
Arsenic	0.018		1.00	0.940		mg/L		92	75 - 125
Barium	0.27		1.00	1.25		mg/L		99	75 - 125
Beryllium	0.0040		0.500	0.441		mg/L		87	75 - 125
Cadmium	0.00028	J	0.500	0.477		mg/L		95	75 - 125
Calcium	70		25.0	94.8		mg/L		99	75 - 125
Chromium	0.088		0.500	0.598		mg/L		102	75 - 125
Cobalt	0.044		0.500	0.498		mg/L		91	75 - 125
Lead	0.056		0.500	0.570		mg/L		103	75 - 125
Lithium	0.13		0.500	0.657		mg/L		105	75 - 125

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

Lab Sample ID: 180-148606-1 MS
Matrix: Water
Analysis Batch: 555197

Client Sample ID: CCR-AP-1R
Prep Type: Total Recoverable
Prep Batch: 554956

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Molybdenum	0.0093		0.500	0.483		mg/L		95	75 - 125
Selenium	0.0021	J	1.00	0.952		mg/L		95	75 - 125
Thallium	0.00054	J	1.00	0.931		mg/L		93	75 - 125

Lab Sample ID: 180-148606-1 MS
Matrix: Water
Analysis Batch: 555430

Client Sample ID: CCR-AP-1R
Prep Type: Total Recoverable
Prep Batch: 554956

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	0.65		0.100	0.797	4	mg/L		146	75 - 125

Lab Sample ID: 180-148606-1 MSD
Matrix: Water
Analysis Batch: 555197

Client Sample ID: CCR-AP-1R
Prep Type: Total Recoverable
Prep Batch: 554956

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Antimony	0.0014	J	0.100	0.0843		mg/L		83	75 - 125	5	20
Arsenic	0.018		1.00	0.922		mg/L		90	75 - 125	2	20
Barium	0.27		1.00	1.26		mg/L		100	75 - 125	1	20
Beryllium	0.0040		0.500	0.445		mg/L		88	75 - 125	1	20
Cadmium	0.00028	J	0.500	0.479		mg/L		96	75 - 125	0	20
Calcium	70		25.0	93.4		mg/L		93	75 - 125	1	20
Chromium	0.088		0.500	0.576		mg/L		98	75 - 125	4	20
Cobalt	0.044		0.500	0.494		mg/L		90	75 - 125	1	20
Lead	0.056		0.500	0.567		mg/L		102	75 - 125	0	20
Lithium	0.13		0.500	0.651		mg/L		104	75 - 125	1	20
Molybdenum	0.0093		0.500	0.481		mg/L		94	75 - 125	1	20
Selenium	0.0021	J	1.00	0.951		mg/L		95	75 - 125	0	20
Thallium	0.00054	J	1.00	0.932		mg/L		93	75 - 125	0	20

Lab Sample ID: 180-148606-1 MSD
Matrix: Water
Analysis Batch: 555430

Client Sample ID: CCR-AP-1R
Prep Type: Total Recoverable
Prep Batch: 554956

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Boron	0.65		0.100	0.796	4	mg/L		144	75 - 125	0	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-554957/1-A
Matrix: Water
Analysis Batch: 555245

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 554957

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00013	mg/L		12/07/22 12:00	12/08/22 17:00	1

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 240-554957/2-A
Matrix: Water
Analysis Batch: 555245

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 554957

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury			0.00500	0.00552		mg/L		110	80 - 120		

Lab Sample ID: 180-148606-2 MS
Matrix: Water
Analysis Batch: 555245

Client Sample ID: CCR-AP-2
Prep Type: Total/NA
Prep Batch: 554957

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury	0.00017	J F1	0.00100	0.000995		mg/L		82	80 - 120		

Lab Sample ID: 180-148606-2 MSD
Matrix: Water
Analysis Batch: 555245

Client Sample ID: CCR-AP-2
Prep Type: Total/NA
Prep Batch: 554957

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.00017	J F1	0.00100	0.000921	F1	mg/L		75	80 - 120	8	20

Method: EPA 9040C - pH

Lab Sample ID: LCS 180-419938/27
Matrix: Water
Analysis Batch: 419938

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
pH			7.00	7.0		SU		100	99 - 101		

Lab Sample ID: LCS 180-419938/50
Matrix: Water
Analysis Batch: 419938

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
pH			7.00	7.0		SU		100	99 - 101		

Lab Sample ID: 180-148606-4 DU
Matrix: Water
Analysis Batch: 419938

Client Sample ID: CCR-AP-4R
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.0	HF		7.0		SU				0.3	2

Lab Sample ID: 180-148606-13 DU
Matrix: Water
Analysis Batch: 419938

Client Sample ID: DUP-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.6	HF		7.7		SU				0.4	2

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

Lab Sample ID: MB 180-419719/1
Matrix: Water
Analysis Batch: 419719

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			12/02/22 19:02	1

Lab Sample ID: LCS 180-419719/2
Matrix: Water
Analysis Batch: 419719

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	388	378		mg/L		97	85 - 115

Lab Sample ID: 180-148606-3 DU
Matrix: Water
Analysis Batch: 419719

Client Sample ID: CCR-AP-3R
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	1000		1020		mg/L		0.1	10

Lab Sample ID: MB 180-419866/1
Matrix: Water
Analysis Batch: 419866

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			12/05/22 16:53	1

Lab Sample ID: LCS 180-419866/2
Matrix: Water
Analysis Batch: 419866

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	388	402		mg/L		104	85 - 115

Lab Sample ID: MB 180-419868/1
Matrix: Water
Analysis Batch: 419868

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			12/05/22 17:39	1

Lab Sample ID: LCS 180-419868/2
Matrix: Water
Analysis Batch: 419868

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	388	380		mg/L		98	85 - 115

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-592635/1-A
Matrix: Water
Analysis Batch: 595082

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 592635

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.01504	U	0.0669	0.0669	1.00	0.126	pCi/L	12/07/22 09:40	12/29/22 10:44	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.0*		*40 - 110*	*12/07/22 09:40*	*12/29/22 10:44*	*1*

Lab Sample ID: LCS 160-592635/2-A
Matrix: Water
Analysis Batch: 595082

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 592635

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	10.01		1.05	1.00	0.111	pCi/L	88	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*95.4*		*40 - 110*

Lab Sample ID: MB 160-592977/1-A
Matrix: Water
Analysis Batch: 595481

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 592977

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.02282	U	0.0498	0.0498	1.00	0.0923	pCi/L	12/09/22 10:53	01/04/23 15:36	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.0*		*40 - 110*	*12/09/22 10:53*	*01/04/23 15:36*	*1*

Lab Sample ID: LCS 160-592977/2-A
Matrix: Water
Analysis Batch: 595481

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 592977

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	10.24		1.07	1.00	0.109	pCi/L	90	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*94.9*		*40 - 110*

Lab Sample ID: LCSD 160-592977/3-A
Matrix: Water
Analysis Batch: 595481

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 592977

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-226			11.3	10.75		1.12	1.00	0.0911	pCi/L	95	75 - 125	0.24	1

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

Lab Sample ID: LCSD 160-592977/3-A
Matrix: Water
Analysis Batch: 595481

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 592977

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	96.4		40 - 110

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-592637/1-A
Matrix: Water
Analysis Batch: 594468

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 592637

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.5092	U	0.346	0.349	1.00	0.515	pCi/L	12/07/22 10:05	12/21/22 11:37	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	90.0		40 - 110	12/07/22 10:05	12/21/22 11:37	1
Y Carrier	81.1		40 - 110	12/07/22 10:05	12/21/22 11:37	1

Lab Sample ID: LCS 160-592637/2-A
Matrix: Water
Analysis Batch: 594468

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 592637

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.34	10.02		1.32	1.00	0.458	pCi/L	120	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	95.4		40 - 110
Y Carrier	84.1		40 - 110

Lab Sample ID: MB 160-592979/1-A
Matrix: Water
Analysis Batch: 594847

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 592979

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.9105		0.387	0.396	1.00	0.503	pCi/L	12/09/22 11:03	12/27/22 11:58	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	92.0		40 - 110	12/09/22 11:03	12/27/22 11:58	1
Y Carrier	82.2		40 - 110	12/09/22 11:03	12/27/22 11:58	1

Lab Sample ID: LCS 160-592979/2-A
Matrix: Water
Analysis Batch: 594847

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 592979

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.33	10.67		1.40	1.00	0.494	pCi/L	128	75 - 125		

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-592979/2-A
Matrix: Water
Analysis Batch: 594847

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 592979

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	94.9		40 - 110
Y Carrier	79.3		40 - 110

Lab Sample ID: LCSD 160-592979/3-A
Matrix: Water
Analysis Batch: 594847

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 592979

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-228			8.33	9.619		1.29	1.00	0.473	pCi/L	116	75 - 125	0.39	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	96.4		40 - 110
Y Carrier	79.3		40 - 110

HPLC/IC

Analysis Batch: 419730

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-1	CCR-AP-1R	Total/NA	Water	EPA 9056A	
180-148606-2	CCR-AP-2	Total/NA	Water	EPA 9056A	
180-148606-3	CCR-AP-3R	Total/NA	Water	EPA 9056A	
180-148606-4	CCR-AP-4R	Total/NA	Water	EPA 9056A	
180-148606-5	CCR-AP-5	Total/NA	Water	EPA 9056A	
180-148606-6	CCR-AP-5I	Total/NA	Water	EPA 9056A	
180-148606-7	CCR-AP-6	Total/NA	Water	EPA 9056A	
180-148606-8	CCR-AP-6I	Total/NA	Water	EPA 9056A	
180-148606-9	CCR-AP-8	Total/NA	Water	EPA 9056A	
180-148606-10	CCR-AP-8I	Total/NA	Water	EPA 9056A	
180-148606-11	CCR-AP-9	Total/NA	Water	EPA 9056A	
180-148606-12	CCR-AP-11	Total/NA	Water	EPA 9056A	
180-148606-13	DUP-1	Total/NA	Water	EPA 9056A	
180-148606-14	FB-1	Total/NA	Water	EPA 9056A	
MB 180-419730/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-419730/7	Lab Control Sample	Total/NA	Water	EPA 9056A	
180-148606-1 MS	CCR-AP-1R	Total/NA	Water	EPA 9056A	
180-148606-1 MSD	CCR-AP-1R	Total/NA	Water	EPA 9056A	

Metals

Prep Batch: 554956

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-1	CCR-AP-1R	Total Recoverable	Water	3005A	
180-148606-2	CCR-AP-2	Total Recoverable	Water	3005A	
180-148606-3	CCR-AP-3R	Total Recoverable	Water	3005A	
180-148606-4	CCR-AP-4R	Total Recoverable	Water	3005A	
180-148606-5	CCR-AP-5	Total Recoverable	Water	3005A	
180-148606-6	CCR-AP-5I	Total Recoverable	Water	3005A	
180-148606-7	CCR-AP-6	Total Recoverable	Water	3005A	
180-148606-8	CCR-AP-6I	Total Recoverable	Water	3005A	
180-148606-9	CCR-AP-8	Total Recoverable	Water	3005A	
180-148606-10	CCR-AP-8I	Total Recoverable	Water	3005A	
180-148606-11	CCR-AP-9	Total Recoverable	Water	3005A	
180-148606-12	CCR-AP-11	Total Recoverable	Water	3005A	
180-148606-13	DUP-1	Total Recoverable	Water	3005A	
180-148606-14	FB-1	Total Recoverable	Water	3005A	
MB 240-554956/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-554956/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
180-148606-1 MS	CCR-AP-1R	Total Recoverable	Water	3005A	
180-148606-1 MSD	CCR-AP-1R	Total Recoverable	Water	3005A	

Prep Batch: 554957

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-1	CCR-AP-1R	Total/NA	Water	7470A	
180-148606-2	CCR-AP-2	Total/NA	Water	7470A	
180-148606-3	CCR-AP-3R	Total/NA	Water	7470A	
180-148606-4	CCR-AP-4R	Total/NA	Water	7470A	
180-148606-5	CCR-AP-5	Total/NA	Water	7470A	
180-148606-6	CCR-AP-5I	Total/NA	Water	7470A	
180-148606-7	CCR-AP-6	Total/NA	Water	7470A	

Metals (Continued)

Prep Batch: 554957 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-8	CCR-AP-6I	Total/NA	Water	7470A	
180-148606-9	CCR-AP-8	Total/NA	Water	7470A	
180-148606-10	CCR-AP-8I	Total/NA	Water	7470A	
180-148606-11	CCR-AP-9	Total/NA	Water	7470A	
180-148606-12	CCR-AP-11	Total/NA	Water	7470A	
180-148606-13	DUP-1	Total/NA	Water	7470A	
180-148606-14	FB-1	Total/NA	Water	7470A	
MB 240-554957/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-554957/2-A	Lab Control Sample	Total/NA	Water	7470A	
180-148606-2 MS	CCR-AP-2	Total/NA	Water	7470A	
180-148606-2 MSD	CCR-AP-2	Total/NA	Water	7470A	

Analysis Batch: 555197

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-1	CCR-AP-1R	Total Recoverable	Water	6020A	554956
180-148606-2	CCR-AP-2	Total Recoverable	Water	6020A	554956
180-148606-3	CCR-AP-3R	Total Recoverable	Water	6020A	554956
180-148606-4	CCR-AP-4R	Total Recoverable	Water	6020A	554956
180-148606-5	CCR-AP-5	Total Recoverable	Water	6020A	554956
180-148606-6	CCR-AP-5I	Total Recoverable	Water	6020A	554956
180-148606-7	CCR-AP-6	Total Recoverable	Water	6020A	554956
180-148606-8	CCR-AP-6I	Total Recoverable	Water	6020A	554956
180-148606-9	CCR-AP-8	Total Recoverable	Water	6020A	554956
180-148606-10	CCR-AP-8I	Total Recoverable	Water	6020A	554956
180-148606-11	CCR-AP-9	Total Recoverable	Water	6020A	554956
180-148606-12	CCR-AP-11	Total Recoverable	Water	6020A	554956
180-148606-13	DUP-1	Total Recoverable	Water	6020A	554956
180-148606-14	FB-1	Total Recoverable	Water	6020A	554956
MB 240-554956/1-A	Method Blank	Total Recoverable	Water	6020A	554956
LCS 240-554956/2-A	Lab Control Sample	Total Recoverable	Water	6020A	554956
180-148606-1 MS	CCR-AP-1R	Total Recoverable	Water	6020A	554956
180-148606-1 MSD	CCR-AP-1R	Total Recoverable	Water	6020A	554956

Analysis Batch: 555245

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-1	CCR-AP-1R	Total/NA	Water	7470A	554957
180-148606-2	CCR-AP-2	Total/NA	Water	7470A	554957
180-148606-3	CCR-AP-3R	Total/NA	Water	7470A	554957
180-148606-4	CCR-AP-4R	Total/NA	Water	7470A	554957
180-148606-5	CCR-AP-5	Total/NA	Water	7470A	554957
180-148606-6	CCR-AP-5I	Total/NA	Water	7470A	554957
180-148606-7	CCR-AP-6	Total/NA	Water	7470A	554957
180-148606-8	CCR-AP-6I	Total/NA	Water	7470A	554957
180-148606-9	CCR-AP-8	Total/NA	Water	7470A	554957
180-148606-11	CCR-AP-9	Total/NA	Water	7470A	554957
180-148606-12	CCR-AP-11	Total/NA	Water	7470A	554957
180-148606-13	DUP-1	Total/NA	Water	7470A	554957
180-148606-14	FB-1	Total/NA	Water	7470A	554957
MB 240-554957/1-A	Method Blank	Total/NA	Water	7470A	554957
LCS 240-554957/2-A	Lab Control Sample	Total/NA	Water	7470A	554957
180-148606-2 MS	CCR-AP-2	Total/NA	Water	7470A	554957

Metals (Continued)

Analysis Batch: 555245 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-2 MSD	CCR-AP-2	Total/NA	Water	7470A	554957

Analysis Batch: 555430

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-1	CCR-AP-1R	Total Recoverable	Water	6020A	554956
180-148606-2	CCR-AP-2	Total Recoverable	Water	6020A	554956
180-148606-3	CCR-AP-3R	Total Recoverable	Water	6020A	554956
180-148606-4	CCR-AP-4R	Total Recoverable	Water	6020A	554956
180-148606-5	CCR-AP-5	Total Recoverable	Water	6020A	554956
180-148606-6	CCR-AP-5I	Total Recoverable	Water	6020A	554956
180-148606-7	CCR-AP-6	Total Recoverable	Water	6020A	554956
180-148606-8	CCR-AP-6I	Total Recoverable	Water	6020A	554956
180-148606-9	CCR-AP-8	Total Recoverable	Water	6020A	554956
180-148606-10	CCR-AP-8I	Total Recoverable	Water	6020A	554956
180-148606-11	CCR-AP-9	Total Recoverable	Water	6020A	554956
180-148606-12	CCR-AP-11	Total Recoverable	Water	6020A	554956
180-148606-13	DUP-1	Total Recoverable	Water	6020A	554956
180-148606-14	FB-1	Total Recoverable	Water	6020A	554956
MB 240-554956/1-A	Method Blank	Total Recoverable	Water	6020A	554956
LCS 240-554956/2-A	Lab Control Sample	Total Recoverable	Water	6020A	554956
180-148606-1 MS	CCR-AP-1R	Total Recoverable	Water	6020A	554956
180-148606-1 MSD	CCR-AP-1R	Total Recoverable	Water	6020A	554956

Analysis Batch: 555447

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-10	CCR-AP-8I	Total/NA	Water	7470A	554957

General Chemistry

Analysis Batch: 419719

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-1	CCR-AP-1R	Total/NA	Water	SM 2540C	
180-148606-2	CCR-AP-2	Total/NA	Water	SM 2540C	
180-148606-3	CCR-AP-3R	Total/NA	Water	SM 2540C	
180-148606-4	CCR-AP-4R	Total/NA	Water	SM 2540C	
180-148606-5	CCR-AP-5	Total/NA	Water	SM 2540C	
180-148606-6	CCR-AP-5I	Total/NA	Water	SM 2540C	
180-148606-7	CCR-AP-6	Total/NA	Water	SM 2540C	
180-148606-9	CCR-AP-8	Total/NA	Water	SM 2540C	
180-148606-11	CCR-AP-9	Total/NA	Water	SM 2540C	
180-148606-12	CCR-AP-11	Total/NA	Water	SM 2540C	
180-148606-13	DUP-1	Total/NA	Water	SM 2540C	
MB 180-419719/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-419719/2	Lab Control Sample	Total/NA	Water	SM 2540C	
180-148606-3 DU	CCR-AP-3R	Total/NA	Water	SM 2540C	

Analysis Batch: 419866

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-14	FB-1	Total/NA	Water	SM 2540C	
MB 180-419866/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-419866/2	Lab Control Sample	Total/NA	Water	SM 2540C	

General Chemistry

Analysis Batch: 419868

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-8	CCR-AP-6I	Total/NA	Water	SM 2540C	
180-148606-10	CCR-AP-8I	Total/NA	Water	SM 2540C	
MB 180-419868/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-419868/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 419938

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-1	CCR-AP-1R	Total/NA	Water	EPA 9040C	
180-148606-2	CCR-AP-2	Total/NA	Water	EPA 9040C	
180-148606-3	CCR-AP-3R	Total/NA	Water	EPA 9040C	
180-148606-4	CCR-AP-4R	Total/NA	Water	EPA 9040C	
180-148606-5	CCR-AP-5	Total/NA	Water	EPA 9040C	
180-148606-6	CCR-AP-5I	Total/NA	Water	EPA 9040C	
180-148606-7	CCR-AP-6	Total/NA	Water	EPA 9040C	
180-148606-8	CCR-AP-6I	Total/NA	Water	EPA 9040C	
180-148606-9	CCR-AP-8	Total/NA	Water	EPA 9040C	
180-148606-10	CCR-AP-8I	Total/NA	Water	EPA 9040C	
180-148606-11	CCR-AP-9	Total/NA	Water	EPA 9040C	
180-148606-12	CCR-AP-11	Total/NA	Water	EPA 9040C	
180-148606-13	DUP-1	Total/NA	Water	EPA 9040C	
180-148606-14	FB-1	Total/NA	Water	EPA 9040C	
LCS 180-419938/27	Lab Control Sample	Total/NA	Water	EPA 9040C	
LCS 180-419938/50	Lab Control Sample	Total/NA	Water	EPA 9040C	
180-148606-4 DU	CCR-AP-4R	Total/NA	Water	EPA 9040C	
180-148606-13 DU	DUP-1	Total/NA	Water	EPA 9040C	

Rad

Prep Batch: 592635

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-2	CCR-AP-2	Total/NA	Water	PrecSep-21	
180-148606-3	CCR-AP-3R	Total/NA	Water	PrecSep-21	
180-148606-4	CCR-AP-4R	Total/NA	Water	PrecSep-21	
180-148606-5	CCR-AP-5	Total/NA	Water	PrecSep-21	
180-148606-6	CCR-AP-5I	Total/NA	Water	PrecSep-21	
180-148606-7	CCR-AP-6	Total/NA	Water	PrecSep-21	
180-148606-8	CCR-AP-6I	Total/NA	Water	PrecSep-21	
180-148606-9	CCR-AP-8	Total/NA	Water	PrecSep-21	
180-148606-10	CCR-AP-8I	Total/NA	Water	PrecSep-21	
180-148606-11	CCR-AP-9	Total/NA	Water	PrecSep-21	
180-148606-12	CCR-AP-11	Total/NA	Water	PrecSep-21	
180-148606-14	FB-1	Total/NA	Water	PrecSep-21	
MB 160-592635/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-592635/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 592637

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-2	CCR-AP-2	Total/NA	Water	PrecSep_0	
180-148606-3	CCR-AP-3R	Total/NA	Water	PrecSep_0	
180-148606-4	CCR-AP-4R	Total/NA	Water	PrecSep_0	
180-148606-5	CCR-AP-5	Total/NA	Water	PrecSep_0	

Rad (Continued)

Prep Batch: 592637 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-6	CCR-AP-5I	Total/NA	Water	PrecSep_0	
180-148606-7	CCR-AP-6	Total/NA	Water	PrecSep_0	
180-148606-8	CCR-AP-6I	Total/NA	Water	PrecSep_0	
180-148606-9	CCR-AP-8	Total/NA	Water	PrecSep_0	
180-148606-10	CCR-AP-8I	Total/NA	Water	PrecSep_0	
180-148606-11	CCR-AP-9	Total/NA	Water	PrecSep_0	
180-148606-12	CCR-AP-11	Total/NA	Water	PrecSep_0	
180-148606-14	FB-1	Total/NA	Water	PrecSep_0	
MB 160-592637/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-592637/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Prep Batch: 592977

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-1	CCR-AP-1R	Total/NA	Water	PrecSep-21	
180-148606-13	DUP-1	Total/NA	Water	PrecSep-21	
MB 160-592977/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-592977/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-592977/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 592979

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-148606-1	CCR-AP-1R	Total/NA	Water	PrecSep_0	
180-148606-13	DUP-1	Total/NA	Water	PrecSep_0	
MB 160-592979/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-592979/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-592979/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

370472 HARRISBURG PA

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1/11/2023

Client Information	Sampler: Jon Hill / Lee	Lab PM: Hayes, Ken	Carrier Tracking No(s):	COC No: 180-85680-14505.2
Client Contact: Mark Breting	Phone: 317.473.1325	E-Mail: Ken.Hayes@et.eurofinsus.com	State of Origin: IN	Page: Page 2 of 2
Company: Atlas Technical Consultants LLC	PWSID:	Analysis Requested		Job #:
Address: 7988 Centerpoint Drive Suite 100	Due Date 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, Y - Trizma, Z - other (specify)
City: Indianapolis	TAT Requested (days): standard			
State, Zip: IN, 46256	Compliance Project: Δ Yes Δ No			
Phone: 864-214-8750(Tel)	PO #: FB-242026. AB-241410			
Email: mark.breting@atcassociates.com	WO #:			
Project Name: CCR Groundwater Monitoring FB Culley	Project #: 18016014			
Site: Culley East	SSOW#:			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)	9040C, 9056A_ORGFM_28D	6020A, 7470A	2540C_Calcd - TDS	9315_Ra226, 9320_Ra228	Special Instructions/Note:
CCR-AP-1R *	11.29.22	845	G	W					
CCR-AP-2 *		1020							* - (1) 1L only
CCR-AP-3R *		1140							For RAD analysis
CCR-AP-4R *		940							
CCR-AP-5		1300							
CCR-AP-5I		1350							
CCR-AP-6 *		1155							
CCR-AP-6I	11.30.22	940							
CCR-AP-8 *	11.29.22	1110							
CCR-AP-8I	11.30.22	1020							
CCR-AP-9 *	11.29.22	805							

180-148606 Chain of Custody

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
	Lee Hill	11.30.22 / 1300	Atlas	SC	12 / 1038	FTA
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Ver: 06/08/2021

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

370472
HARRISBURG PA

eurofins Environment Testing America

1/11/2023

Client Information	Sampler: Jon Hill	Lab PM: Hayes, Ken	Carrier Tracking No(s):	COC No: 180-85680-14505.1
Client Contact: Mark Breting	Phone: 317.473.1325	E-Mail: Ken.Hayes@et.eurofinsus.com	State of Origin: IN	Page: Page 1 of 2
Company: Atlas Technical Consultants LLC	PWSID:			Job #:
Address: 7988 Centerpoint Drive Suite 100	Due Date Requested:			
City: Indianapolis	TAT Requested (days): stnD a-D			
State, Zip: IN, 46256	Compliance Project: Δ Yes Δ No			
Phone: 864-214-8750(Tel)	PO #: FB-242026. AB-241410			
Email: mark.breting@atcassociates.com	WO #:			
Project Name: CCR Groundwater Monitoring FB Culley	Project #: 18016014			
Site: Culley East	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, Y - Trizma, 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)	9040C, 9056A_ORGFM_28D	6020A, 7470A	2540C_Calcd - TDS	9315_Ra226, 9320_Ra228	Special Instructions/Note:
CCR-AP-11	11.29.22	1011	G	W	↓	↓	↓	↓	
Dup-1	11.29.22	—	↓	↓					
FB-1	11.30.22	1000	↓	↓					

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
J Hill	11.30.22/1300	ATLS	SC	12-1 10 35	ET
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Ver: 06 08 2021

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Hayes, Ken	Carrier Tracking No(s):	COC No: 180-475527.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Ken.Hayes@et.eurofinsus.com	State of Origin: Indiana	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 180-148606-2
Address: 13715 Rider Trail North, ,	Due Date Requested: 1/9/2023	Analysis Requested		Preservation Codes:
City: Earth City	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, Y - Trizma, Z - other (specify)
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			Other:
Email:	WO #:			
Project Name: CCR Groundwater Monitoring FB Culley	Project #: 18016014			
Site:	SSOW#:			

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Standard Target List	9320_Ra228/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
CCR-AP-1R (180-148606-1)	11/29/22	08:45 Eastern		Water			X	X	X	1	
CCR-AP-2 (180-148606-2)	11/29/22	10:20 Eastern		Water			X	X	X	1	
CCR-AP-3R (180-148606-3)	11/29/22	11:40 Eastern		Water			X	X	X	1	
CCR-AP-4R (180-148606-4)	11/29/22	09:40 Eastern		Water			X	X	X	1	
CCR-AP-5 (180-148606-5)	11/29/22	13:00 Eastern		Water			X	X	X	2	
CCR-AP-5I (180-148606-6)	11/29/22	13:50 Eastern		Water			X	X	X	2	
CCR-AP-6 (180-148606-7)	11/29/22	11:55 Eastern		Water			X	X	X	1	
CCR-AP-6I (180-148606-8)	11/30/22	09:40 Eastern		Water			X	X	X	2	
CCR-AP-8 (180-148606-9)	11/29/22	11:10 Eastern		Water			X	X	X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Pittsburgh places the ownership of method, analyte & accreditation compliance upon our 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 Eurofins Pittsburgh laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Pittsburgh attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Pittsburgh.

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

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

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1		12-5-22 1800	CONE			
2	FED EX					
3					DEC 06 2022 0800	ETASTL
4						

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

Ver: 06/08/2021

Eurofins Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Hayes, Ken	Carrier Tracking No(s):	COC No: 180-475527.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: Ken.Hayes@et.eurofinsus.com	State of Origin: Indiana	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 180-148606-2
Address: 13715 Rider Trail North, ,	Due Date Requested: 1/9/2023	Analysis Requested		Preservation Codes:
City: Earth City	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, Y - Trizma, Z - other (specify)
State, Zip: MO, 63045				Other:
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: CCR Groundwater Monitoring FB Culley	Project #: 18016014			
Site:	SSOW#:			

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Standard Target List	9320_Ra228/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
CCR-AP-8I (180-148606-10)	11/30/22	10:20 Eastern		Water			X	X	X	2	
CCR-AP-9 (180-148606-11)	11/29/22	08:05 Eastern		Water			X	X	X	1	
CCR-AP-11 (180-148606-12)	11/29/22	10:11 Eastern		Water			X	X	X	2	
DUP-1 (180-148606-13)	11/29/22	00:01 Eastern		Water			X	X	X	2	
FB-1 (180-148606-14)	11/30/22	10:00 Eastern		Water			X	X	X	2	

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

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

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		12-5-22 1800	ONE	FED EX		
2	FED EX				DEC 06 2022 0900	ETAST
3						

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

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 180-148606-2
SDG Number: Culley East

Login Number: 148606
List Number: 1
Creator: Abernathy, Eric L

List Source: Eurofins Pittsburgh

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?	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: 180-148606-2
SDG Number: Culley East

Login Number: 148606
List Number: 2
Creator: Bohlmann, Jessica M

List Source: Eurofins St. Louis
List Creation: 12/06/22 12:37 PM

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.	N/A	
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	