

Annual Groundwater Monitoring Report

Southwestern Electric Power Company

H. W. Pirkey Power Plant

FGD Stackout Area CCR Unit

CN600126767; RN100214287

Registration No: CCR104

Hallsville, Texas

January 31, 2025

Prepared by:

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Abbreviations:

- ASD - Alternate Source Demonstration
- CCR – Coal Combustion Residual
- GWPS - Groundwater protection standards
- SSI - Statistically Significant Increase
- SSL - Statistically Significant Level
- TCEQ – Texas Commission on Environmental Quality

I. Summary

This *Annual Groundwater Monitoring Report* (Report) has been prepared to report the status of activities for the preceding year at the FGD Stackout Area (FGDSA) Coal Combustion Residual (CCR) unit at Pirkey Power Plant. Southwestern Electric Power Company is wholly-owned subsidiary of American Electric Power Company (AEP). The Texas Commission on Environmental Quality's (TCEQ's) CCR rules require that the Annual Groundwater Monitoring Report be posted to the operating record for the preceding year no later than January 31, 2025.

In general, the following activities were completed:

- At the start of the current annual reporting period, the FGDSA was operating under the Assessment monitoring program.
- At the end of the current annual reporting period, the FGDSA was operating under the Assessment monitoring program.
- The FGDSA initiated an assessment monitoring program on April 3, 2018.
- Groundwater samples were collected for AD-7R, AD-12, AD-13, AD-22, and AD-33 in February, April, and September 2024 analyzed for 30 TAC §352 Appendix III and Appendix IV constituents, as specified in 30 TAC §352.951 *et seq.* and AEP's *Groundwater Sampling and Analysis Plan (2021)*;
- Groundwater data underwent various validation tests, including tests for completeness, valid values, transcription errors, and consistent units;
- A successful ASD for the 2nd semi-annual 2023 potential SSLs cobalt, beryllium, and mercury was certified on February 6, 2024, and submitted to for approval.
- During the 1st semi-annual sampling event held in April 2024:

The following Appendix IV parameters exceeded established GWPS:

- Cobalt at AD-22
- Beryllium at AD-22
- Mercury at AD-33

The following Appendix III parameters exceeded background:

- Boron at AD-33
- Chloride at AD-22
- Fluoride at AD-22
- pH at AD-7R

- Sulfate at AD-22
- A successful ASD for 1st semi-annual 2024 potential SSLs for cobalt, beryllium, and mercury was certified December 6, 2024, and submitted to TCEQ for approval.
- During the 2nd semi-annual sampling event held in September 2024:

The following Appendix IV parameters exceeded established GWPS:

- Cobalt at AD-22
- Beryllium at AD-22
- Lead at AD-33
- Mercury at AD-33

The following Appendix III parameters exceeded background:

- Boron at AD-7R and AD-33
- Chloride at AD-22
- Sulfate at AD-22
- Pirkey Power Plant submitted a Notice of SSL above GWPS to TCEQ (December 31, 2024) which indicated an alternative source demonstration would be conducted. An alternative source demonstration report will be prepared and certified and submitted to TCEQ's Executive Director for review within 90 days of the SSL determination.
- Because an alternate source for the SSL(s) was identified, but no alternate source for the SSI(s) was identified, FGDSA remained in Assessment Monitoring.
- A statistical process in accordance with 30 TAC §352.931 to evaluate groundwater data was updated, certified, and posted to AEP's CCR website in 2021 titled: AEP's *Statistical Analysis Plan* (Geosyntec 2021). The statistical process was guided by USEPA's *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* ("Unified Guidance," USEPA, 2009).
- On September 1, 2023, FGD Stackout Area removed the last known final volume of CCR from the CCR unit for the purpose of beneficial reuse and commenced closure by removal for this CCR Unit in accordance with the certified closure plan.
- An additional 12 inches of soil was then removed, finishing in September of 2023. The last inspection for the removal was completed on September 18, 2023.

The major components of this annual report, to the extent applicable at this time, are presented in sections that follow:

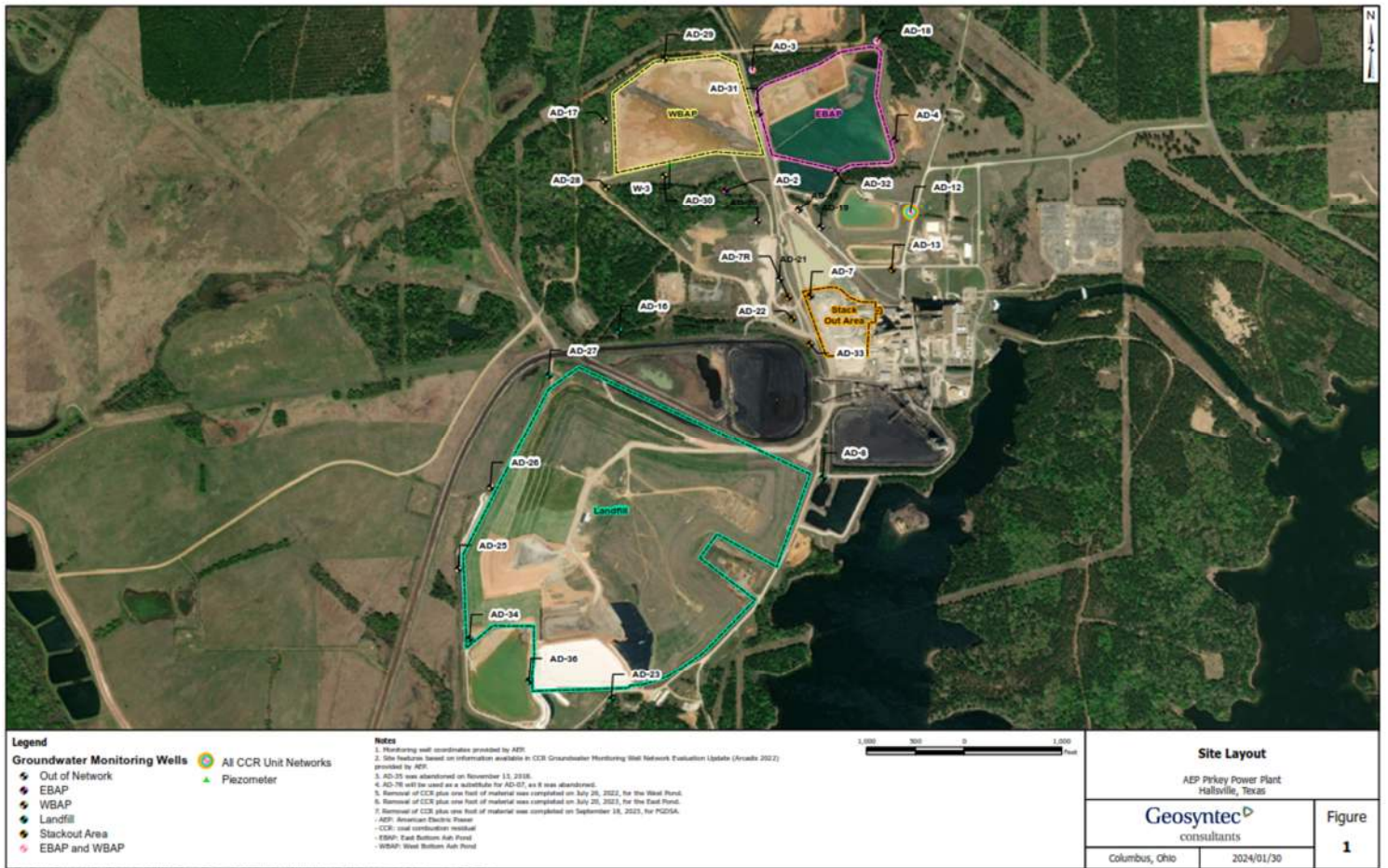
- A map, aerial photograph or a drawing showing the CCR unit, all groundwater monitoring wells and monitoring well identification numbers;
- All of the monitoring data collected, including the rate and direction of groundwater flow, plus a summary showing the number of samples collected per monitoring well, the dates the samples were collected and whether the sample was collected as part of detection monitoring or assessment monitoring programs (Attached as **Appendix 1**);
- Statistical comparison of monitoring data to determine if there have been SSI(s) or SSL(s) (Attached as **Appendix 2**);
- A discussion of whether any alternate source demonstrations were performed, and the conclusions (Attached as **Appendix 3**);
- A summary of any transition between monitoring programs, or an alternate monitoring frequency, for example the date and circumstances for transitioning from detection monitoring to assessment monitoring, in addition to identifying the constituents detected at a SSI over background concentrations (where applicable);
- Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a statement as to why that happened (Attached as **Appendix 6**);
- Other information required to be included in the annual report such as field sheets, analytical reports, etc. (Attached as **Appendix 4 and 5**)

In addition, this report summarizes key actions completed, and where applicable, describes any problems encountered and actions taken to resolve those problems. The report includes a projection of key activities for the upcoming year.

II. Groundwater Monitoring Well Locations and Identification Numbers

The figure that follows depicts the PE-certified groundwater monitoring network, the monitoring well locations and their corresponding identification numbers.

FGD Stackout Area Monitoring Wells	
Upgradient	Downgradient
AD-12	AD-7 (Plugged Sept 2023)
AD-13	AD-7R
	AD-22
	AD-33



III. Monitoring Wells Installed or Decommissioned

There were no new groundwater monitoring wells installed during 2024. The network design is

summarized in *Groundwater Monitoring Network Design Report* (December 11, 2023) and as posted on the CCR website for Pirkey Power Plant's FGDSA. That network design report, viewable on the AEP CCR web site, discusses the facility location, the hydrogeological setting, the hydrostratigraphic units, the uppermost aquifer, downgradient monitoring well locations and the upgradient monitoring well locations.

IV. Groundwater Quality Data and Static Water Elevation Data, With Flow Rate and Direction and Discussion

Appendix 1 contains tables showing the groundwater quality data collected during the establishment of background quality, and during detection and assessment monitoring. Static water elevation data from each monitoring event also are shown in **Appendix 1**, along with the groundwater velocity calculations, groundwater flow direction and potentiometric maps developed after each sampling event.

The sampling event conducted February 2024 satisfies the annual screening sampling requirements of 30 TAC §352.951.

V. Groundwater Quality Data Statistical Analysis

Appendix 2 contains the statistical analysis report(s).

During the 1st semi-annual sampling event held in April 2024:

The following Appendix IV parameters exceeded established GWPS:

- Cobalt at AD-22
- Beryllium at AD-22
- Mercury at AD-33

The following Appendix III parameters exceeded background:

- Boron at AD-33
- Chloride at AD-22
- Fluoride at AD-22
- pH at AD-7R
- Sulfate at AD-22

During the 2nd semi-annual sampling event held in September 2024:

The following Appendix IV parameters exceeded established GWPS:

- Cobalt at AD-22
- Beryllium at AD-22

- Lead at AD-33
- Mercury at AD-33

The following Appendix III parameters exceeded background:

- Boron at AD-7R and AD-33
- Chloride at AD-22
- Sulfate at AD-22

VI. Alternate Source Demonstration

A successful ASD for the 2nd semi-annual 2023 potential SSLs cobalt, beryllium, and mercury was certified on February 6, 2024, and submitted to TCEQ for approval.

A successful ASD for 1st semi-annual 2024 potential SSLs for cobalt, beryllium, and mercury was certified December 6, 2024, and submitted to TCEQ for approval.

Pirkey Power Plant intends to submit an alternative source demonstration for the 2nd semi-annual 2024 potential SSLs cobalt, beryllium, lead, and mercury.

The successful ASDs are found in **Appendix 3**.

Because an alternate source for the SSL(s) was identified, but no alternate source for the SSI(s) was identified, FGDSA remained in Assessment Monitoring.

VII. Discussion About Transition Between Monitoring Requirements or Alternate Monitoring Frequency

The FGDSA will remain in assessment monitoring unless all Appendix III and IV parameters are below background values for two consecutive monitoring events (return to detection monitoring) as prescribed by 30 TAC §352.951(c). If an Appendix IV parameter exceeds its respective GWPS due to a release from the FGDSA, an assessment of corrective measures will be undertaken as required by 30 TAC §352.961.

Regarding defining an alternate monitoring frequency, the groundwater velocity and monitoring well production are high enough at this facility that no modification to the semiannual assessment monitoring frequency is needed.

VIII. Other Information Required

As required by the CCR assessment monitoring rules in 30 TAC §352.951, sampling all CCR wells for the required Appendix III and IV parameters was completed in 2024.

A statistical process in accordance with 30 TAC §352.931 to evaluate groundwater data was updated, certified, and posted to AEP's CCR website in 2021 titled: AEP's *Statistical Analysis Plan* (Geosyntec 2021). The statistical process was guided by USEPA's *Statistical Analysis of*

Groundwater Monitoring Data at RCRA Facilities, Unified Guidance (“Unified Guidance,” USEPA, 2009).

On September 1, 2023, FGD Stackout Area removed the last known final volume of CCR from the CCR unit for the purpose of beneficial reuse and commenced closure by removal for this CCR Unit in accordance with the certified closure plan.

An additional 12 inches of soil was then removed, finishing in September of 2023. The last inspection for the removal was completed on September 18, 2023.

IX. Description of Any Problems Encountered in 2024 and Actions Taken

No significant problems were encountered. The low flow sampling effort went smoothly, and the schedule was met to support the annual groundwater report preparation covering the year 2024 groundwater monitoring activities.

X. A Projection of Key Activities for the Upcoming Year

Key activities for next year will include:

- Assessment monitoring sampling will be conducted.
- Conduct the annual groundwater sampling event for all constituents listed in 30 TAC §352 Appendix III and IV as required by 30 TAC §352.951.
- Perform statistical analysis on the sampling results for the 30 TAC §352 Appendix III and Appendix IV parameters as required by 30 TAC §352.951.
- Determine applicable GWPSs for the 30 TAC §352 Appendix IV parameters and compare the calculated confidence limits for the Appendix IV constituents to the GWPSs.
- If no GWPSs are exceeded, the FGDSA will remain in assessment monitoring.
- If any SSL are identified, then an alternate source demonstration will be completed.
- Responding to any new data received in light of TCEQ CCR rule requirements.
- Preparation of the next annual groundwater report until TCEQ’s Executive Director issues a closure certification.

APPENDIX 1- Groundwater Data Tables and Figures

Figures and Tables follow, showing the groundwater monitoring data collected, the rate and direction of groundwater flow, and a summary showing the number of samples collected per monitoring well. The dates that the samples were collected also is shown.

**Table 1. Groundwater Data Summary: AD-7
Pirkey - Stackout
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/11/2016	Background	2.39	6.58	28	0.6493 J1	4.0	92	302
7/13/2016	Background	0.716	2.97	16	< 0.083 U1	3.6	40	204
9/7/2016	Background	0.978	3.15	18	< 0.083 U1	4.1	42	208
10/13/2016	Background	0.67	2.81	17	< 0.083 U1	3.8	38	212
11/14/2016	Background	0.682	2.63	16	< 0.083 U1	4.0	38	216
1/11/2017	Background	1.39	3.92	19	< 0.083 U1	3.5	46	204
2/28/2017	Background	1.51	4.78	20	< 0.083 U1	3.7	46	240
4/10/2017	Background	3.24	5.06	28	0.4117 J1	3.6	65	322
8/24/2017	Detection	0.943	2.99	18	2.994	3.7	51	176
12/21/2017	Detection	0.718	3.26	19	< 0.083 U1	--	39	176
3/21/2018	Assessment	2.47	5.37	20	< 0.083 U1	3.6	90	266
8/20/2018	Assessment	1.36	3.76	33	< 0.083 U1	4.3	54	180
2/27/2019	Assessment	2.10	5.20	29.9	0.50	2.9	69.1	268
5/22/2019	Assessment	0.195	5.77	28.0	0.58	3.4	91.6	334
8/12/2019	Assessment	3.54	4.20	36.7	0.30	4.0	59.6	266
3/10/2020	Assessment	1.99	4.86	28.7	0.57	3.5	88.5	254
6/2/2020	Assessment	1.93	4.98	29.1	0.58	3.3	74.4	303
11/3/2020	Assessment	4.19	4.10	38.2	0.27	3.3	60.2	236
3/9/2021	Assessment	2.12	4.54	29.3	0.55	3.6	71.5	283
5/25/2021	Assessment	1.84	4.4	28.4	0.54	3.2	64.6	250
11/16/2021	Assessment	2.24	4.56	33.6	0.44	3.1	62.6	260
3/28/2022	Assessment	3.78	4.33	40.8	0.36	3.6	49.9	230 L1
6/21/2022	Assessment	6.13	5.4	53.1	0.30	3.5	71.1	290
11/16/2022	Assessment	9.38	5.20	69.7	0.23	3.6	60.5	300
2/28/2023	Assessment	1.90	5.06	30.9	0.53	3.6	77.5	270
6/27/2023	Assessment	2.02	5.73	31.2	0.40	3.8	74.6	290

**Table 1. Groundwater Data Summary: AD-7
Pirkey - Stackout
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/11/2016	Background	< 0.93 U1	1.38216 J1	37	8	0.87394 J1	0.766043 J1	52	4.344	0.6493 J1	< 0.68 U1	0.044	0.309	< 0.29 U1	1.04661 J1	< 0.86 U1
7/13/2016	Background	< 0.93 U1	1.18444 J1	50	3	0.66774 J1	1	24	0.942	< 0.083 U1	< 0.68 U1	0.099	0.261	< 0.29 U1	< 0.99 U1	1.03212 J1
9/7/2016	Background	< 0.93 U1	< 1.05 U1	50	4	0.730872 J1	0.316008 J1	27	3.132	< 0.083 U1	< 0.68 U1	0.099	0.059	< 0.29 U1	< 0.99 U1	< 0.86 U1
10/13/2016	Background	< 0.93 U1	1.08028 J1	61	4	0.858417 J1	1	23	3.81	< 0.083 U1	< 0.68 U1	0.101	0.154	< 0.29 U1	< 0.99 U1	< 0.86 U1
11/14/2016	Background	< 0.93 U1	< 1.05 U1	60	4	1	< 0.23 U1	22	3.538	< 0.083 U1	< 0.68 U1	0.099	0.039	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/11/2017	Background	< 0.93 U1	< 1.05 U1	58	5	0.756968 J1	< 0.23 U1	31	3.77	< 0.083 U1	< 0.68 U1	0.101	0.02275 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
2/28/2017	Background	< 0.93 U1	< 1.05 U1	53	5	0.838869 J1	< 0.23 U1	34	3.92	< 0.083 U1	< 0.68 U1	0.101	0.185	< 0.29 U1	< 0.99 U1	< 0.86 U1
4/10/2017	Background	< 0.93 U1	< 1.05 U1	51	7	0.723565 J1	0.295188 J1	44	4.35	0.4117 J1	< 0.68 U1	0.111	0.191	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/21/2018	Assessment	< 0.93 U1	< 1.05 U1	40.31	6.81	0.82 J1	< 0.23 U1	45.34	3.99	< 0.083 U1	< 0.68 U1	0.108	0.117	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/20/2018	Assessment	0.01 J1	0.47	51.6	2.07	0.68	0.075	25.6	0.787	< 0.083 U1	0.362	0.0877	0.006 J1	< 0.02 U1	1.0	0.179
2/27/2019	Assessment	< 0.4 U1	2.12	42.9	7.01	0.73	0.225	41.0	4.75	0.50	1 J1	0.106	0.201	< 0.4 U1	7.1	< 2 U1
5/22/2019	Assessment	< 0.4 U1	2 J1	37.8	6.47	0.6 J1	< 0.8 U1	46.0	4.72	0.58	0.8 J1	0.0975	0.26	< 8 U1	3 J1	< 0.1 U1
8/12/2019	Assessment	< 0.02 U1	0.64	41.9	3.24	0.75	0.1 J1	29.7	3.278	0.30	0.529	0.102	0.09	< 0.4 U1	1.7	0.2 J1
3/10/2020	Assessment	< 0.02 U1	1.54	31.0	5.29	0.72	0.212	42.1	5.283	0.57	0.943	0.0781	0.179	< 0.4 U1	5.5	0.2 J1
6/2/2020	Assessment	< 0.02 U1	1.29	38.9	5.14	0.69	0.241	39.6	4.10	0.58	0.876	0.0720	0.349	< 0.4 U1	5.0	0.2 J1
11/3/2020	Assessment	< 0.02 U1	0.61	47.9	2.97	0.78	0.236	31.5	2.957	0.27	0.783	0.0752	0.085	< 0.4 U1	2.1	0.2 J1
3/9/2021	Assessment	< 0.02 U1	1.32	44.1	4.80	0.65	0.402	37.5	3.099	0.55	0.997	0.0684	0.341	< 0.1 U1	4.9	0.2 J1
5/25/2021	Assessment	< 0.02 U1	0.82	36.1	4.11	0.642	0.40	36.1	3.30	0.54	0.92	0.0634	0.300 J1	0.1 J1	2.91	0.23
11/16/2021	Assessment	< 0.02 U1	1.05	37.3	4.86	0.734	0.37	38.3	5.59	0.44	0.80	0.0760	0.480	< 0.1 U1	3.47	0.26
3/28/2022	Assessment	< 0.04 U1	1.08	58.8	5.59	0.998	4.78	33.6	4.59	0.36	0.8	0.0967	0.400 J1	< 0.2 U1	3.5	0.20 J1
6/21/2022	Assessment	< 0.1 U1	1.3	58.7	4.66	0.95	0.4 J1	36.4	4.82	0.30	1.0	0.113	< 0.400 U1	< 0.5 U1	2.3 J1	0.2 J1
11/16/2022	Assessment	< 0.02 U1	0.43	55.2	2.49	0.880	0.35	31.8	4.13	0.23	0.27	0.110	0.037	< 0.1 U1	1.49	0.19 J1
2/28/2023	Assessment	< 0.02 U1	1.09	44.6	5.41	0.704	0.37	41.1	4.93	0.53	0.85	0.0804	1.520	< 0.1 U1	3.46	0.20
6/27/2023	Assessment	< 0.008 U1	1.14	40.3	5.11	0.691	0.47	39.3	4.69	0.40	0.88	0.0780	1.220	< 0.1 U1	4.53	0.20

**Table 1. Groundwater Data Summary: AD-7R
Pirkey - Stackout
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
6/2/2020	Assessment	0.04 J1	3.97	15.6	0.18	5.1	85.6	254
11/2/2020	Assessment	0.04 J1	4.01	20.8	0.14	4.8	40.5	183
5/24/2021	Assessment	0.037 J1	4.0	15.3	0.20	4.3	81.6	240
11/15/2021	Assessment	< 0.05 U1	3.6	23.7	0.15	4.4	43.3	180
6/20/2022	Assessment	0.025 J1	2.80	24.2	0.16	4.6	44.7	200
11/15/2022	Assessment	0.022 J1	2.81	26.1	0.15	4.9	37.2	180
6/26/2023	Assessment	0.029 J1	3.38	20.0	0.10	4.9	60.7	220
10/17/2023	Assessment	0.089	2.70	24.1	0.16	5.6	39.9	190
2/19/2024	Assessment	0.066	3.32	21.3	0.15	5.4	57.8	210
4/22/2024	Assessment	0.049 J1	3.37	20.6	0.16	4.5	73.6	220
9/16/2024	Assessment	0.241	2.68	24.5	0.12	4.7	43.3	190

**Table 1. Groundwater Data Summary: AD-7R
Pirkey - Stackout
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
6/2/2020	Assessment	0.05 J1	1.95	34.0	1.71	0.23	1.37	18.8	0.939	0.18	0.308	0.0722	0.012	< 0.4 U1	0.5	< 0.1 U1
11/2/2020	Assessment	0.02 J1	0.37	72.8	2.11	0.34	0.200	20.0	3.114	0.14	< 0.05 U1	0.0563	0.025	< 0.4 U1	0.4	< 0.1 U1
5/24/2021	Assessment	< 0.02 U1	0.63	42.2	1.73 M1	0.217	0.29	21.3	3.83	0.20	< 0.05 U1	0.0635 M1	0.002 J1	< 0.1 U1	0.22 J1	0.10 J1
11/15/2021	Assessment	< 0.1 U1	1.4	65.4	2.35	0.34	0.4 J1	18.5	2.70	0.15	< 0.3 U1	0.0547	0.182	< 0.5 U1	1 J1	< 0.2 U1
6/20/2022	Assessment	0.03 J1	2.59	61.4	2.28	0.393	2.92	17.8	3.41	0.16	0.68	0.0437	0.042	0.1 J1	1.36	0.14 J1
11/15/2022	Assessment	< 0.02 U1	0.72	67.2	1.77	0.378	0.39	16.3	3.19	0.15	0.25	0.0424	0.011	< 0.1 U1	2.15	0.14 J1
6/26/2023	Assessment	0.009 J1	0.53	36.8	1.05	0.213	0.36	19.3	1.83	0.10	0.07 J1	0.0558	0.039	< 0.1 U1	0.68	0.13 J1
10/17/2023	Assessment	0.009 J1	1.22	64.2	1.64	0.324	0.64	14.2	3.25	0.16	0.22	0.0402	0.041	< 0.1 U1	2.90	0.14 J1
2/19/2024	Assessment	< 0.008 U1	0.29	50.7	1.93	0.330	0.23 J1	19.4	3.26	0.15	0.07 J1	0.0616	0.126	< 0.1 U1	0.73	0.15 J1
4/22/2024	Assessment	< 0.008 U1	0.38	41.3	2.37	0.310	0.23 J1	20.9	2.62	0.16	< 0.05 U1	0.0790	< 0.004 U1	< 0.1 U1	1.00	0.14 J1
9/16/2024	Assessment	< 0.008 U1	0.66	57.9	2.0 J1	0.336	0.30	16.0	4.77	0.12	0.08 J1	0.053	0.023	< 0.1 U1	0.64	0.11 J1

**Table 1. Groundwater Data Summary: AD-12
Pirkey - Stackout
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/11/2016	Background	0.03	0.362	5	< 0.083 U1	4.4	4	94
7/13/2016	Background	0.03	0.26	6	< 0.083 U1	3.1	4	75
9/7/2016	Background	0.04	0.343	6	< 0.083 U1	3.9	7	63
10/12/2016	Background	0.03	0.271	7	1	3.4	8	92
11/14/2016	Background	0.04	0.331	8	< 0.083 U1	2.6	6	80
1/11/2017	Background	0.03	0.315	7	< 0.083 U1	4.8	6	76
2/28/2017	Background	0.04	0.434	5	< 0.083 U1	3.6	4	50
4/11/2017	Background	0.05	0.299	6	0.2565 J1	4.7	7	72
8/23/2017	Detection	0.0495	0.245	6	0.213 J1	4.8	6	52
3/21/2018	Assessment	0.01397	0.269	5	< 0.083 U1	4.2	3	< 2 U1
8/20/2018	Assessment	0.017	0.338	10	< 0.083 U1	4.4	4	94
2/27/2019	Assessment	0.03 J1	0.4 J1	6.08	0.09	5.2	3.6	36
5/21/2019	Assessment	0.020	0.3 J1	6.30	0.09	4.1	4.0	80
8/12/2019	Assessment	< 0.02 U1	0.278	7.24	0.06 J1	4.9	2.6	90
3/10/2020	Assessment	0.02 J1	0.3 J1	6.08	0.10	4.9	3.7	62
6/2/2020	Assessment	< 0.02 U1	0.2 J1	5.63	0.10	4.0	3.9	91
11/2/2020	Assessment	0.03 J1	0.3 J1	4.65	0.08	4.3	3.3	74
3/8/2021	Assessment	0.01 J1	0.2 J1	6.46	0.11	4.1	3.8	68
5/24/2021	Assessment	0.032 J1	0.2 J1	5.54	0.12	4.2	5.46	70
11/15/2021	Assessment	0.012 J1	0.28	8.03	0.07	3.5	2.90	90
3/28/2022	Assessment	0.021 J1	0.20	6.10	0.07	3.9	3.80	60 L1
6/20/2022	Assessment	0.042 J1	0.32	7.59	0.09	4.3	4.81	80
11/15/2022	Assessment	0.013 J1	0.36	8.03	0.08	4.7	3.39	70
2/27/2023	Assessment	0.021 J1	0.34	6.51	0.07	3.8	3.90	70
6/26/2023	Assessment	0.019 J1	0.21	4.68	0.06	4.6	2.9	80
8/23/2023	Assessment	0.017 J1	0.22	4.74	0.07	3.8	3.5	75
10/17/2023	Assessment	0.015 J1	0.27	6.74	0.07	3.8	2.7	58
2/19/2024	Assessment	0.016 J1	0.27	5.87	0.11	3.2	3.1	60
4/22/2024	Assessment	0.015 J1	0.18	4.86	0.08	3.4	4.2	60
9/16/2024	Assessment	0.018 J1	0.23	4.45	0.07	3.0	3.1	60

Table 1. Groundwater Data Summary: AD-12

Pirkey - Stackout

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/11/2016	Background	< 0.93 U1	< 1.05 U1	26	0.219521 J1	< 0.07 U1	0.710981 J1	1.58207 J1	0.2073	< 0.083 U1	< 0.68 U1	< 0.00013 U1	< 0.005 U1	< 0.29 U1	1.73953 J1	< 0.86 U1
7/13/2016	Background	< 0.93 U1	< 1.05 U1	23	0.190337 J1	< 0.07 U1	0.68835 J1	1.29444 J1	2.909	< 0.083 U1	< 0.68 U1	0.008	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
9/7/2016	Background	< 0.93 U1	< 1.05 U1	30	0.232192 J1	< 0.07 U1	0.353544 J1	1.66591 J1	0.881	< 0.083 U1	< 0.68 U1	0.01	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
10/12/2016	Background	< 0.93 U1	< 1.05 U1	27	0.149553 J1	< 0.07 U1	0.529033 J1	1.56632 J1	0.257	1	< 0.68 U1	0.012	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
11/14/2016	Background	< 0.93 U1	< 1.05 U1	28	0.152375 J1	< 0.07 U1	0.32826 J1	1.47282 J1	0.767	< 0.083 U1	< 0.68 U1	0.013	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/11/2017	Background	< 0.93 U1	< 1.05 U1	23	0.126621 J1	< 0.07 U1	0.650158 J1	1.09495 J1	1.536	< 0.083 U1	< 0.68 U1	0.01	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
2/28/2017	Background	< 0.93 U1	< 1.05 U1	26	0.149219 J1	< 0.07 U1	0.325811 J1	1.29984 J1	0.416	< 0.083 U1	< 0.68 U1	0.009	< 0.005 U1	< 0.29 U1	< 0.99 U1	0.994913 J1
4/11/2017	Background	< 0.93 U1	< 1.05 U1	24	0.159412 J1	< 0.07 U1	0.416007 J1	1.33344 J1	0.3895	0.2565 J1	< 0.68 U1	0.008	0.01364 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/21/2018	Assessment	< 0.93 U1	< 1.05 U1	25.82	0.16 J1	< 0.07 U1	1.05	1.49 J1	0.784	< 0.083 U1	< 0.68 U1	0.00722	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/20/2018	Assessment	< 0.01 U1	0.11	27.8	0.159	0.01 J1	0.330	1.72	1.128	< 0.083 U1	0.089	0.0143	< 0.005 U1	0.04 J1	0.1	0.04 J1
2/27/2019	Assessment	< 0.4 U1	< 0.6 U1	22.5	< 0.4 U1	< 0.2 U1	< 0.8 U1	1.37	0.225	0.09	< 0.4 U1	0.00688	< 0.005 U1	< 8 U1	< 0.6 U1	< 2 U1
5/21/2019	Assessment	< 0.4 U1	< 0.6 U1	21.7	< 0.4 U1	< 0.2 U1	< 0.8 U1	1.15	0.201	0.09	< 0.4 U1	0.00576	< 0.005 U1	< 8 U1	< 0.6 U1	< 0.1 U1
8/12/2019	Assessment	< 0.02 U1	0.07 J1	23.8	0.154	< 0.01 U1	0.204	1.30	0.237	0.06 J1	0.08 J1	0.00829	< 0.005 U1	< 0.4 U1	0.2 J1	< 0.1 U1
3/10/2020	Assessment	< 0.02 U1	0.09 J1	21.7	0.139	0.01 J1	0.2 J1	1.21	3.0706	0.10	0.09 J1	0.00547	< 0.002 U1	< 0.4 U1	0.2	< 0.1 U1
6/2/2020	Assessment	< 0.02 U1	0.09 J1	19.0	0.132	< 0.01 U1	0.208	1.02	0.799	0.10	0.09 J1	0.00505	< 0.002 U1	< 0.4 U1	0.3	< 0.1 U1
11/2/2020	Assessment	0.05 J1	0.09 J1	18.9	0.122	< 0.01 U1	0.204	1.04	0.929	0.08	0.09 J1	0.00510	< 0.002 U1	< 0.4 U1	0.3	< 0.1 U1
3/8/2021	Assessment	< 0.02 U1	0.07 J1	22.9	0.150	0.007 J1	0.2 J1	1.19	0.214	0.11	0.07 J1	0.00570	< 0.002 U1	< 0.1 U1	0.2 J1	< 0.04 U1
5/24/2021	Assessment	< 0.02 U1	0.08 J1	23.1	0.136	0.005 J1	0.24	1.19	0.60	0.12	0.07 J1	0.00500	< 0.002 U1	< 0.1 U1	0.31 J1	< 0.04 U1
11/15/2021	Assessment	< 0.02 U1	0.05 J1	26.5	0.148	0.01 J1	0.30	1.38	1.76	0.07	0.07 J1	0.0110	< 0.002 U1	< 0.1 U1	0.10 J1	< 0.04 U1
3/28/2022	Assessment	< 0.02 U1	0.09 J1	20.2	0.127	0.009 J1	0.35	1.01	0.76	0.07	0.09 J1	0.00604	< 0.002 U1	< 0.1 U1	0.33 J1	< 0.04 U1
6/20/2022	Assessment	< 0.02 U1	0.08 J1	24.2	0.135	0.008 J1	0.63	1.35	0.63	0.09	0.08 J1	0.00949	< 0.002 U1	< 0.1 U1	0.16 J1	< 0.04 U1
11/15/2022	Assessment	< 0.02 U1	0.06 J1	30.6	0.153	0.007 J1	0.45	1.59	1.46	0.08	0.08 J1	0.0119	< 0.002 U1	< 0.1 U1	0.23 J1	< 0.04 U1
2/27/2023	Assessment	< 0.02 U1	0.07 J1	27.5	0.155	0.013 J1	0.36	1.50	1.17	0.07	0.1 J1	0.00885	< 0.002 U1	< 0.1 U1	0.35 J1	< 0.04 U1
6/26/2023	Assessment	0.015 J1	0.11	16.3	0.110	0.007 J1	0.45	0.932	0.45	0.06	0.11 J1	0.00487	< 0.002 U1	0.7	0.23 J1	< 0.02 U1
8/23/2023	Assessment	0.013 J1	0.10	15.6	0.129	0.007 J1	0.45	0.855	1.34	0.07	0.11 J1	0.00494	< 0.002 U1	0.5	0.23 J1	< 0.02 U1
10/17/2023	Assessment	0.01 J1	0.06 J1	23.6	0.142	0.006 J1	0.31	1.19	1.08	0.07	0.07 J1	0.00891	< 0.002 U1	< 0.1 U1	0.21 J1	< 0.02 U1
2/19/2024	Assessment	0.010 J1	0.07 J1	21.7	0.127	0.009 J1	0.50	1.13	1.00	0.11	0.06 J1	0.00547	0.002 J1	< 0.1 U1	0.19 J1	< 0.02 U1
4/22/2024	Assessment	0.009 J1	0.09 J1	19.3	0.121	0.007 J1	0.34	1.08	2.62	0.08	0.08 J1	0.00462	< 0.002 U1	< 0.1 U1	0.31 J1	< 0.02 U1
9/16/2024	Assessment	0.011 J1	0.09 J1	16.6	< 0.4 U1	0.007 J1	0.43	1.06	2.84	0.07	0.08 J1	0.006 J1	0.002 J1	< 0.1 U1	0.19 J1	0.02 J1

Table 1. Groundwater Data Summary: AD-13

Geosyntec Consultants, Inc.

**Pirkey - Stackout
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/11/2016	Background	0.06	8.77	28	0.748 J1	5.6	52	236
7/13/2016	Background	0.06	9.08	32	0.3474 J1	5.6	59	192
9/7/2016	Background	0.05	8.48	23	< 0.083 U1	5.2	41	228
10/13/2016	Background	0.06	7.53	26	0.6297 J1	5.8	47	236
11/14/2016	Background	0.06	7.21	26	0.3114 J1	6.1	47	250
1/11/2017	Background	0.04	6.14	22	< 0.083 U1	5.8	37	188
2/28/2017	Background	0.07	7.88	28	< 0.083 U1	5.9	56	172
4/11/2017	Background	0.08	9.11	32	0.4278 J1	5.2	58	200
8/23/2017	Detection	0.07408	9.5	21	0.344 J1	6.0	38	160
3/21/2018	Assessment	0.07169	10.3	25	< 0.083 U1	5.9	48	176
8/20/2018	Assessment	0.065	8.40	39	0.0845 J1	5.9	66	210
2/27/2019	Assessment	0.08 J1	11.0	40.8	0.25	5.2	80.8	176
5/21/2019	Assessment	0.061	10.1	34.8	0.40	5.3	69.5	190
8/12/2019	Assessment	0.064	8.68	42.3	0.39	5.9	73.6	310
3/10/2020	Assessment	0.067	10.7	41.1	0.32	6.4	82.7	216
6/2/2020	Assessment	0.065	10.9	41.4	0.45	6.4	83.4	322
11/2/2020	Assessment	0.052	5.90	22.6	0.38	6.4	39.1	204
3/8/2021	Assessment	0.067	13.2	41.2	0.36	4.9	74.6	229
5/24/2021	Assessment	0.078	13.6	41.6	0.48	5.5	78.6	60
11/15/2021	Assessment	0.063	8.61	42.3	0.26	5.5	70.8	220
3/28/2022	Assessment	0.065	13.3	46.5	0.34	5.3	79.2	230 L1
6/20/2022	Assessment	0.075	11.1	54.5	0.26	5.7	138	270
11/15/2022	Assessment	0.095	8.57	41.3	0.36	5.8	69.6	260
2/27/2023	Assessment	0.080	15.1	51.8	0.26	4.8	98.5	250
6/26/2023	Assessment	0.067	10.6	48.7	0.23	5.5	112	280
10/17/2023	Assessment	0.068	9.49	42.9	0.45	5.5	86.9	280
2/19/2024	Assessment	0.068	10.6	35.5	0.42	5.7	70.5	210
4/22/2024	Assessment	0.066	10.6	42.2	0.34	6.0	84.9	220
9/16/2024	Assessment	0.052	8.21	29.0	0.35	5.8	54.1	210

Table 1. Groundwater Data Summary: AD-13

Pirkey - Stackout

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/11/2016	Background	< 0.93 U1	4.25914 J1	38	0.586539 J1	0.293832 J1	< 0.23 U1	42	0.989	0.748 J1	< 0.68 U1	0.081	0.00969 J1	< 0.29 U1	< 0.99 U1	1.11268 J1
7/13/2016	Background	< 0.93 U1	9	44	2	0.0875208 J1	< 0.23 U1	47	2.332	0.3474 J1	< 0.68 U1	0.158	0.01928 J1	< 0.29 U1	3.63671 J1	0.928756 J1
9/7/2016	Background	< 0.93 U1	< 1.05 U1	47	0.631177 J1	0.219799 J1	< 0.23 U1	38	1.219	< 0.083 U1	< 0.68 U1	0.139	< 0.005 U1	< 0.29 U1	< 0.99 U1	1.44332 J1
10/13/2016	Background	< 0.93 U1	7	43	0.963478 J1	< 0.07 U1	< 0.23 U1	42	2.422	0.6297 J1	< 0.68 U1	0.142	< 0.005 U1	< 0.29 U1	2.59885 J1	< 0.86 U1
11/14/2016	Background	< 0.93 U1	2.07189 J1	39	0.717704 J1	0.310257 J1	< 0.23 U1	42	1.723	0.3114 J1	< 0.68 U1	0.136	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/11/2017	Background	< 0.93 U1	2.73936 J1	39	0.302907 J1	0.11238 J1	< 0.23 U1	32	1.844	< 0.083 U1	< 0.68 U1	0.133	0.00732 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
2/28/2017	Background	< 0.93 U1	1.64435 J1	34	0.290018 J1	< 0.07 U1	< 0.23 U1	44	1.728	< 0.083 U1	< 0.68 U1	0.153	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
4/11/2017	Background	< 0.93 U1	4.43115 J1	45	0.736525 J1	2	< 0.23 U1	56	1.309	0.4278 J1	< 0.68 U1	0.156	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/21/2018	Assessment	< 0.93 U1	3.23 J1	42.23	0.46 J1	0.86 J1	< 0.23 U1	39.91	2.093	< 0.083 U1	< 0.68 U1	0.145	< 0.005 U1	< 0.29 U1	3.86 J1	< 0.86 U1
8/20/2018	Assessment	0.01 J1	5.79	40.9	0.648	< 0.005 U1	0.103	48.8	1.735	0.0845 J1	0.01 J1	0.146	< 0.005 U1	< 0.02 U1	0.2	0.03 J1
2/27/2019	Assessment	< 0.4 U1	2.17	38.5	< 0.4 U1	< 0.2 U1	< 0.8 U1	48.7	0.909	0.25	< 0.4 U1	0.165	< 0.005 U1	< 8 U1	< 0.6 U1	< 2 U1
5/21/2019	Assessment	< 0.4 U1	2 J1	35.0	< 0.4 U1	< 0.2 U1	< 0.8 U1	44.7	0.875	0.40	< 0.4 U1	0.153	< 0.005 U1	< 8 U1	< 0.6 U1	< 0.1 U1
8/12/2019	Assessment	< 0.02 U1	1.64	35.0	0.235	< 0.01 U1	0.06 J1	44.5	1.642	0.39	< 0.05 U1	0.139	< 0.005 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
3/10/2020	Assessment	< 0.02 U1	1.58	38.4	0.327	< 0.01 U1	0.06 J1	44.7	1.382	0.32	< 0.05 U1	0.145	< 0.002 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
6/2/2020	Assessment	< 0.02 U1	1.39	35.6	0.222	< 0.01 U1	0.07 J1	43.7	1.116	0.45	< 0.05 U1	0.140	< 0.002 U1	< 0.4 U1	0.04 J1	< 0.1 U1
11/2/2020	Assessment	< 0.02 U1	3.40	34.5	0.270	< 0.01 U1	0.2 J1	35.4	1.729	0.38	< 0.05 U1	0.109	< 0.002 U1	< 0.4 U1	0.07 J1	< 0.1 U1
3/8/2021	Assessment	< 0.02 U1	0.44	56.7	1.20	< 0.004 U1	0.2 J1	46.3	1.354	0.36	< 0.05 U1	0.132	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
5/24/2021	Assessment	< 0.02 U1	0.89	36.6	0.119	< 0.004 U1	0.24	43.9	1.44	0.48	< 0.05 U1	0.134	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
11/15/2021	Assessment	< 0.02 U1	4.39	41.7	0.344	< 0.004 U1	0.34	45.9 M1	1.56	0.26	< 0.05 U1	0.135 M1	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
3/28/2022	Assessment	< 0.02 U1	2.18	52.1	0.579	< 0.004 U1	0.52	46.9	2.95	0.34	< 0.05 U1	0.138	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
6/20/2022	Assessment	< 0.02 U1	4.30	41.4	0.409	< 0.004 U1	0.31	56.2 M1	2.22	0.26	< 0.05 U1	0.150 M1	< 0.002 U1	1.1	0.1 J1	< 0.04 U1
11/15/2022	Assessment	< 0.02 U1	1.62	44.2	0.131	< 0.004 U1	0.35	45.9	1.55	0.36	< 0.05 U1	0.141	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
2/27/2023	Assessment	< 0.02 U1	0.39	66.8	1.23	< 0.004 U1	0.26	60.0	3.76	0.26	< 0.05 U1	0.161	< 0.020 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
6/26/2023	Assessment	< 0.008 U1	1.56	39.8	0.234	< 0.004 U1	0.31	51.5	1.61	0.23	< 0.05 U1	0.142	< 0.002 U1	< 0.1 U1	< 0.04 U1	0.03 J1
10/17/2023	Assessment	< 0.008 U1	5.71	41.2	0.559	< 0.004 U1	0.22 J1	47.6	1.05	0.45	< 0.05 U1	0.137	< 0.002 U1	< 0.1 U1	0.13 J1	0.02 J1
2/19/2024	Assessment	< 0.008 U1	0.74	45.1	0.290	< 0.004 U1	0.29 J1	41.9	1.97	0.42	< 0.05 U1	0.134	< 0.002 U1	< 0.1 U1	< 0.04 U1	0.02 J1
4/22/2024	Assessment	< 0.008 U1	0.54	34.9	0.163	< 0.004 U1	0.22 J1	46.2	2.67	0.34	< 0.05 U1	0.135	< 0.002 U1	< 0.1 U1	< 0.04 U1	0.03 J1
9/16/2024	Assessment	< 0.008 U1	1.53	34.0	< 0.4 U1	< 0.004 U1	0.28 J1	35.6	2.13	0.35	< 0.05 U1	0.155	< 0.002 U1	< 0.1 U1	< 0.04 U1	< 0.02 U1

Table 1. Groundwater Data Summary: AD-22

Geosyntec Consultants, Inc.

Pirkey - Stackout

Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/11/2016	Background	0.08	15.3	76	1.266	4.0	284	672
7/14/2016	Background	0.04	9.5	52	0.3891 J1	3.9	162	412
9/7/2016	Background	0.04	6.95	42	< 0.083 U1	4.1	114	341
10/12/2016	Background	0.03	7.68	52	0.473 J1	4.7	148	388
11/14/2016	Background	0.04	7.55	48	0.2834 J1	4.4	177	362
1/12/2017	Background	0.02	6.47	51	< 0.083 U1	4.2	137	344
3/1/2017	Background	0.05	13.6	69	< 0.083 U1	4.1	266	624
4/11/2017	Background	0.04	10.8	72	0.5041 J1	4.1	215	446
8/23/2017	Detection	0.05075	7.77	54	1.196	4.6	121	350
12/21/2017	Detection	0.06278	7.29	61	< 0.083 U1	--	120	344
3/21/2018	Assessment	0.0818	15.2	79	< 0.083 U1	3.9	377	656
8/20/2018	Assessment	0.031	9.43	92	< 0.083 U1	4.2	184	476
2/27/2019	Assessment	0.07 J1	15.2	76.7	1.33	4.9	337	584
5/22/2019	Assessment	0.073	16.5	63.3	1.06	5.1	360	506
8/12/2019	Assessment	0.03 J1	8.96	79.6	0.45	4.8	198	484
3/10/2020	Assessment	0.067	12.7	73.6	1.25	3.8	364	654
6/2/2020	Assessment	0.062	13.1	74.0	1.25	3.6	369	682
11/2/2020	Assessment	0.03 J1	8.60	84.0	0.28	4.8	190	468
3/8/2021	Assessment	0.069	12.5	71.1	1.03	4.0	337	692
5/24/2021	Assessment	0.076	12.7	60.6	1.24	3.5	327	290
11/15/2021	Assessment	0.030 J1	11.7	108	0.35	4.4	236	570
3/28/2022	Assessment	0.068	16.4	88.8	0.96	4.3	385	720 L1
6/20/2022	Assessment	0.028 J1	11.9	107	0.32	4.5	293	580
11/14/2022	Assessment	0.021 J1	10.5	101	0.28	4.8	251	570
2/27/2023	Assessment	0.068	14.9	--	--	4.1	--	--
3/22/2023	Assessment	--	--	72.4	0.90	3.8	357	680 S7
6/26/2023	Assessment	0.06 J1	15.5	93.9	0.63	4.1	350	680
10/17/2023	Assessment	0.020 J1	9.26	80.5	0.26	4.0	212	480
2/19/2024	Assessment	0.050	13.7	87.7	0.55	4.1	291	620
4/22/2024	Assessment	0.064	13.5	70.5	0.75	4.0	360	610
9/16/2024	Assessment	0.028 J1	12.3 M1	108	0.22	4.3	276	620

Table 1. Groundwater Data Summary: AD-22

Pirkey - Stackout

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/11/2016	Background	< 0.93 U1	23	71	13	2	24	129	6.994	1.266	0.97266 J1	0.139	13.41	< 0.29 U1	1.97127 J1	1.16089 J1
7/14/2016	Background	< 0.93 U1	12	48	6	0.674427 J1	12	67	2.325	0.3891 J1	< 0.68 U1	0.169	17	< 0.29 U1	< 0.99 U1	0.895409 J1
9/7/2016	Background	< 0.93 U1	23	108	5	0.833408 J1	33	54	3.412	< 0.083 U1	2.72959 J1	0.131	19.829	< 0.29 U1	< 0.99 U1	1.25036 J1
10/12/2016	Background	< 0.93 U1	10	54	4	0.333745 J1	7	54	3.39	0.473 J1	< 0.68 U1	0.14	7.984	< 0.29 U1	< 0.99 U1	< 0.86 U1
11/14/2016	Background	< 0.93 U1	3.69822 J1	66	4	0.596378 J1	2	47	3.63	0.2834 J1	< 0.68 U1	0.115	8.634	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/12/2017	Background	< 0.93 U1	6	67	4	0.385609 J1	2	43	3.173	< 0.083 U1	< 0.68 U1	0.104	13.32	< 0.29 U1	1.09664 J1	< 0.86 U1
3/1/2017	Background	< 0.93 U1	1.61319 J1	29	10	1	< 0.23 U1	105	4.385	< 0.083 U1	< 0.68 U1	0.218	0.22	< 0.29 U1	< 0.99 U1	< 0.86 U1
4/11/2017	Background	< 0.93 U1	11	130	6	2	5	78	3.045	0.5041 J1	1.89388 J1	0.176	7.201	< 0.29 U1	1.86563 J1	< 0.86 U1
3/21/2018	Assessment	< 0.93 U1	3.56 J1	24.13	12.1	1.87	< 0.23 U1	121	6.22	< 0.083 U1	< 0.68 U1	0.277	1.206	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/20/2018	Assessment	0.02 J1	5.18	22.7	3.30	0.46	0.829	62.9	3.088	< 0.083 U1	0.386	0.132	1.448	0.07 J1	2.5	0.162
2/27/2019	Assessment	< 0.4 U1	6.30	17.0	13.3	1.55	0.8 J1	123	5.99	1.33	0.5 J1	0.269	0.642	< 8 U1	16.7	< 2 U1
5/22/2019	Assessment	< 0.4 U1	5.89	16.7	12.5	1.52	< 0.8 U1	129	6.71	1.06	< 0.4 U1	0.288	0.837	< 8 U1	5.9	0.2 J1
8/12/2019	Assessment	< 0.02 U1	2.19	15.3	3.38	0.44	0.2 J1	57.5	3.088	0.45	0.1 J1	0.151	0.325	< 0.4 U1	2.0	0.2 J1
3/10/2020	Assessment	< 0.02 U1	4.26	18.2	10.1	1.41	0.398	108	7.68	1.25	0.346	0.222	1.58	< 0.4 U1	10.5	0.2 J1
6/2/2020	Assessment	< 0.02 U1	3.53	14.4	8.00	1.43	0.376	101	4.334	1.25	0.261	0.185	0.171	< 0.4 U1	10.7	0.3 J1
11/2/2020	Assessment	< 0.02 U1	1.92	20.4	2.39	0.47	0.2 J1	60.0	3.338	0.28	0.2 J1	0.101	0.184	< 0.4 U1	2.4	0.1 J1
3/8/2021	Assessment	< 0.02 U1	3.05	19.2	8.52	1.42	0.395	107	6.007	1.03	0.277	0.164	0.045	< 0.1 U1	11.7	0.2 J1
5/24/2021	Assessment	< 0.02 U1	2.05	16.0	6.83	1.25	0.56	99.1	5.27	1.24	0.24	0.166	0.084	< 0.1 U1	7.43	0.21
11/15/2021	Assessment	< 0.02 U1	1.85	17.9	2.50	0.502	0.27	69.9	2.88	0.35	0.09 J1	0.122	0.056	< 0.1 U1	1.92	0.14 J1
3/28/2022	Assessment	< 0.02 U1	3.21	19.3	8.78	1.27	0.43	109	4.24	0.96	0.15 J1	0.170	< 0.004 U1	< 0.1 U1	9.20	0.19 J1
6/20/2022	Assessment	< 0.02 U1	3.02	16.2	2.11	0.587	0.66	69.6	3.95	0.32	0.18 J1	0.110	0.460	0.1 J1	2.01	0.15 J1
11/14/2022	Assessment	< 0.02 U1	2.40	20.8	2.16	0.494	0.47	60.3	2.70	0.28	0.22	0.0905	0.410	< 0.1 U1	1.93	0.14 J1
2/27/2023	Assessment	< 0.02 U1	3.66	18.0	10.2	1.37	0.46	113	4.86	--	0.21	0.194	0.040 J1	< 0.1 U1	7.39	0.24
3/22/2023	Assessment	--	--	--	--	--	--	--	--	0.90	--	--	--	--	--	--
6/26/2023	Assessment	< 0.04 U1	3.4	13.5	7.71	1.09	0.7 J1	109	3.77	0.63	< 0.3 U1	0.236	0.029	< 0.5 U1	7.0	0.2 J1
10/17/2023	Assessment	< 0.008 U1	1.57	19.1	2.65	0.551	0.33	55.3	2.61	0.26	0.18 J1	0.0772	0.301	< 0.1 U1	4.78	0.15 J1
2/19/2024	Assessment	< 0.008 U1	1.20	20.1	4.23	0.922	0.39	86.9	3.29	0.55	0.23	0.128	0.262	< 0.1 U1	4.57	0.18 J1
4/22/2024	Assessment	< 0.008 U1	3.54	16.2	7.53 M1	1.22	0.43	99.3 M1	3.02	0.75	0.23	0.146 M1	0.066	< 0.1 U1	11.9	0.20
9/16/2024	Assessment	< 0.008 U1	1.11	17.0	2.56	0.531	0.40	74.3 M1	2.76	0.22	0.08 J1	0.125 M1	0.093	< 0.1 U1	2.37	0.16 J1

**Table 1. Groundwater Data Summary: AD-33
Pirkey - Stackout
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/11/2016	Background	0.126	2.44	8	< 0.083 U1	4.1	56	326
7/14/2016	Background	0.173	1.69	16	< 0.083 U1	3.1	108	176
9/7/2016	Background	0.152	1.81	10	< 0.083 U1	3.6	64	176
10/12/2016	Background	0.162	1.39	9	0.357 J1	3.4	46	180
11/14/2016	Background	0.182	1.63	8	< 0.083 U1	3.1	54	190
1/12/2017	Background	0.144	1.26	10	< 0.083 U1	4.3	58	168
2/28/2017	Background	0.14	1.25	7	< 0.083 U1	3.9	51	146
4/10/2017	Background	0.114	1.29	9	< 0.083 U1	3.4	49	178
8/23/2017	Detection	0.07952	1.06	9	0.67 J1	4.4	40	132
12/21/2017	Detection	0.09993	0.946	--	--	--	--	--
3/21/2018	Assessment	0.115	1.42	7	< 0.083 U1	4.4	58	160
8/21/2018	Assessment	0.098	1.09	12	< 0.083 U1	3.6	48	156
2/27/2019	Assessment	0.134	1.73	8.89	0.25	3.3	62.8	146
5/22/2019	Assessment	0.111	1.65	8.57	0.23	4.1	60.4	204
8/12/2019	Assessment	0.097	1.03	8.85	0.19	4.2	44.3	156
3/10/2020	Assessment	0.132	1.61	8.81	0.25	4.0	64.5	172
6/2/2020	Assessment	0.112	1.49	8.89	0.28	3.9	63.1	206
11/2/2020	Assessment	0.115	0.980	8.49	0.16	3.9	44.8	162
3/8/2021	Assessment	0.159	1.96	8.65	0.42	4.1	70.1	213
5/24/2021	Assessment	0.121	1.5	8.56	0.29	4.0	60.4	100
11/15/2021	Assessment	0.093	0.98	8.60	0.17	3.6	41.9	150
3/28/2022	Assessment	0.146	2.28	8.88	0.30	4.0	67.0	190 L1
6/20/2022	Assessment	0.093	1.06	8.49	0.19	4.4	57.7	150
11/15/2022	Assessment	0.086	0.90	9.18	0.16	4.0	42.7	140
2/27/2023	Assessment	0.179	2.48	10.9	0.34	4.1	74.5	190
6/26/2023	Assessment	0.114	1.73	9.50	0.21	4.1	58.4	200
10/17/2023	Assessment	0.094	1.15	9.03	0.18	4.0	41.7	130
2/19/2024	Assessment	0.158	2.35	9.41	0.30	4.1	58.6	160
4/22/2024	Assessment	0.141	2.08	9.97	0.27	4.2	65.7	180
9/16/2024	Assessment	0.122	1.54	10.1	0.20	4.0	54.4	170

Table 1. Groundwater Data Summary: AD-33

Pirkey - Stackout

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/11/2016	Background	< 0.93 U1	2.53645 J1	60	2	< 0.07 U1	4	12	1.303	< 0.083 U1	< 0.68 U1	< 0.00013 U1	0.288	< 0.29 U1	< 0.99 U1	< 0.86 U1
7/14/2016	Background	< 0.93 U1	4.91616 J1	64	2	< 0.07 U1	9	12	4.28	< 0.083 U1	< 0.68 U1	0.029	0.707	< 0.29 U1	< 0.99 U1	1.19199 J1
9/7/2016	Background	< 0.93 U1	67	163	4	0.984692 J1	125	33	3.461	< 0.083 U1	14	0.048	1.826	0.736517 J1	1.61343 J1	< 0.86 U1
10/12/2016	Background	< 0.93 U1	2.15866 J1	59	1	< 0.07 U1	4	10	2.208	0.357 J1	< 0.68 U1	0.027	0.145	< 0.29 U1	< 0.99 U1	1.56738 J1
11/14/2016	Background	< 0.93 U1	1.46353 J1	52	1	< 0.07 U1	1	9	1.953	< 0.083 U1	< 0.68 U1	0.024	0.197	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/12/2017	Background	< 0.93 U1	1.12979 J1	56	1	< 0.07 U1	2	9	2.596	< 0.083 U1	< 0.68 U1	0.027	0.36	< 0.29 U1	< 0.99 U1	< 0.86 U1
2/28/2017	Background	< 0.93 U1	1.069 J1	55	1	< 0.07 U1	< 0.23 U1	9	0.942	< 0.083 U1	< 0.68 U1	0.026	0.41	< 0.29 U1	< 0.99 U1	< 0.86 U1
4/10/2017	Background	< 0.93 U1	< 1.05 U1	55	1	< 0.07 U1	3	10	9.024	< 0.083 U1	< 0.68 U1	0.027	0.341	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/21/2018	Assessment	< 0.93 U1	1.78 J1	57.26	1.4	0.15 J1	4.64	10.42	1.643	< 0.083 U1	< 0.68 U1	0.02669	0.825	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/21/2018	Assessment	0.01 J1	0.65	43.8	0.905	0.04	0.147	7.72	6.32	< 0.083 U1	0.151	0.0178	0.745	< 0.02 U1	1.7	0.05 J1
2/27/2019	Assessment	< 0.4 U1	1 J1	49.5	1 J1	< 0.2 U1	< 0.8 U1	10.5	2.235	0.25	< 0.4 U1	0.0262	0.464	< 8 U1	3 J1	< 2 U1
5/22/2019	Assessment	< 0.4 U1	< 0.6 U1	52.4	1 J1	< 0.2 U1	< 0.8 U1	10.5	1.178	0.23	< 0.4 U1	0.0245	0.481	< 8 U1	1 J1	< 0.1 U1
8/12/2019	Assessment	< 0.02 U1	0.41	38.6	1.00	0.04 J1	0.1 J1	7.02	1.141	0.19	0.1 J1	0.0233	0.564	< 0.4 U1	1.1	< 0.1 U1
3/10/2020	Assessment	< 0.02 U1	0.63	45.3	1.18	0.06	0.1 J1	9.67	2.479	0.25	0.208	0.0197	2.45	< 0.4 U1	2.0	< 0.1 U1
6/2/2020	Assessment	< 0.02 U1	0.61	41.3	1.15	0.05 J1	0.2 J1	8.78	1.477	0.28	0.2 J1	0.0188	2.52	< 0.4 U1	2.1	< 0.1 U1
11/2/2020	Assessment	< 0.02 U1	0.39	45.1	0.858	0.04 J1	0.1 J1	7.86	1.443	0.16	0.2 J1	0.0175	4.30	< 0.4 U1	1.1	< 0.1 U1
3/8/2021	Assessment	< 0.02 U1	1.01	47.5	1.51	0.06	0.373	12.4	1.312	0.42	0.286	0.0232	3.13	< 0.1 U1	3.4	< 0.04 U1
5/24/2021	Assessment	< 0.02 U1	0.43	43.8	1.04	0.048	0.28	9.85	1.40	0.29	0.22	0.0188	2.000	< 0.1 U1	1.39	0.05 J1
11/15/2021	Assessment	< 0.02 U1	0.40	45.1	0.916	0.043	0.28	6.75	1.65	0.17	0.23	0.0177	14.600	< 0.1 U1	1.0	< 0.04 U1
3/28/2022	Assessment	< 0.02 U1	0.87	45.0	1.35	0.057	0.47	9.82	2.28	0.30	0.32	0.0219	4.600	< 0.1 U1	2.68	< 0.04 U1
6/20/2022	Assessment	0.04 J1	1.19	42.0	0.939	0.039	0.64	7.81	3.37	0.19	0.27	0.0166	3.000	< 0.1 U1	1.27	< 0.04 U1
11/15/2022	Assessment	< 0.02 U1	0.37	49.4	0.945	0.038	0.44	6.83	3.66	0.16	0.22	0.0185	5.900	< 0.1 U1	0.96	< 0.04 U1
2/27/2023	Assessment	< 0.02 U1	0.76	44.4	1.50	0.064	0.31	12.4	2.85	0.34	0.32	0.0233	6.000	< 0.1 U1	2.54	0.04 J1
6/26/2023	Assessment	0.021 J1	1.08	41.4	1.48	0.056	0.39	10.7	1.96	0.21	0.48	0.0246	5.610	< 0.1 U1	4.21	0.03 J1
10/17/2023	Assessment	0.009 J1	0.58	45.9	1.00	0.037	0.33	7.51	1.79	0.18	0.22	0.0194	6.120	< 0.1 U1	1.97	0.04 J1
2/19/2024	Assessment	< 0.008 U1	0.67	46.5	1.28	0.059	0.38	11.1	3.10	0.30	0.27	0.0205	7.100	< 0.1 U1	2.65	0.04 J1
4/22/2024	Assessment	< 0.008 U1	1.00	42.2	1.31	0.058	0.23 J1	11.0	1.61	0.27	0.27	0.0199	6.600	< 0.1 U1	3.18	0.04 J1
9/16/2024	Assessment	< 0.008 U1	0.54	43.2	1.30	0.049	0.39	9.82	2.34	0.20	0.28	0.0224	6.500	< 0.1 U1	1.73	0.06 J1

**Table 1. Groundwater Data Summary
Pirkey - Stackout Pad**

Geosyntec Consultants, Inc.

Notes:

1. Combined radium values were calculated from the sum of the reported radium-226 and radium-228 results.

Radium data quality flags were not included. Reported negative radium-226 or radium-228 results were replaced with zero.

--: Not analyzed

<: Non-detect value. Analytes which were not detected are shown as less than the method detection limit (MDL) followed by a 'U1' flag.

In analytical data prior to 5/18/2021, U1 flags were reported as U in the analytical report.

J1: Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

In analytical data prior to 5/18/2021, J1 flags were reported as J in the analytical report.

L1: The associated laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) recovery was outside acceptance limits.

M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.

mg/L: milligrams per liter

pCi/L: picocuries per liter

S7: Sample did not achieve constant weight.

SU: standard unit

µg/L: micrograms per liter

**Table 1. Groundwater Elevation Data Summary
Pirkey Power Plant**

Unit	All Units	East Bottom Ash Pond					West Bottom Ash Pond				
		Upgradient		Downgradient			Upgradient		Downgradient		
Well	AD-12	AD-4	AD-18	AD-2	AD-31	AD-32	AD-3	AD-18	AD-17	AD-28	AD-30
Jan-2016	371.05	359.16	360.52	328.55	346.60	352.32	347.03	360.52	--	321.39	323.70
May-2016	372.17	360.07	359.26	328.35	348.21	352.74	348.04	359.26	329.38	321.82	324.26
Jul-2016	365.68	352.34	356.99	327.46	345.46	348.53	346.00	356.99	325.93	320.44	322.49
Jan-2017	365.11	353.27	357.06	327.65	343.78	347.44	344.19	357.06	324.70	320.27	322.23
Feb-2017	368.79	355.32	359.21	327.96	344.53	348.44	345.53	359.21	326.27	320.59	322.88
Apr-2017	372.97	356.62	358.63	329.09	344.58	349.09	345.53	358.63	326.27	320.69	322.88
Aug-2017	367.68	353.58	358.23	327.63	343.57	349.73	343.49	358.23	324.18	320.07	322.04
Mar-2018	370.57	359.04	360.00	328.36	344.10	351.42	344.56	360.00	327.13	321.79	323.29
Aug-2018	357.99	350.39	355.99	326.99	342.73	347.58	343.28	355.99	324.12	319.93	321.70
Feb-2019	372.43	360.40	354.61	329.21	348.31	352.86	348.36	354.61	331.11	321.86	324.54
May-2019	373.12	361.18	360.74	328.91	349.68	354.14	349.37	360.74	331.66	322.61	325.21
Aug-2019	361.90	354.10	357.09	327.60	346.63	353.12	346.08	357.09	326.45	320.40	322.63
Mar-2020	373.10	360.56	360.58	329.23	346.95	352.55	347.22	360.58	336.07	321.98	323.94
Jun-2020	381.55	360.25	359.98	328.06	347.95	352.87	347.76	359.98	328.04	321.28	323.40
Nov-2020	361.86	349.70	354.98	327.57	342.84	346.13	342.89	354.98	324.36	319.99	321.90
Mar-2021	373.52	359.14	359.99	329.00	346.24	350.30	346.58	359.99	329.37	322.06	324.19
May-2021	375.56	360.45	360.46	329.57	347.27	351.28	347.46	360.46	329.03	323.10	324.94
Jul-2021	--	--	--	--	--	--	--	--	--	--	--
Nov-2021	358.32	351.40	355.55	327.36	342.79	348.72	342.60	355.55	323.77	319.98	321.80
Jan-2022	--	--	--	--	--	--	--	--	--	--	--
Mar-2022	373.28	359.58	359.17	328.17	344.58	351.73	344.19	359.17	325.80	321.05	323.14
Jun-2022	360.55	351.31	356.01	327.07	342.36	349.94	342.22	356.01	323.48	320.11	321.54
Aug-2022	--	--	--	--	--	--	341.84	--	--	--	--
Nov-2022	363.46	351.15	355.11	327.52	341.97	348.00	340.85	355.11	322.61	319.73	321.81
Feb-2023	368.74	356.04	359.57	328.12	344.34	349.48	--	359.57	--	--	--
Mar-2023	--	--	--	--	--	--	--	--	--	--	--
Jun-2023	369.17	352.66	357.96	327.55	340.46	343.36	341.82	357.96	325.13	320.45	322.07
Aug-2023	362.47	347.25	354.17	326.59	337.74	341.46	--	354.17	--	--	--
Oct-2023	360.29	--	352.80	--	--	--	338.07	352.80	322.93	319.77	321.28
Feb-2024	373.17	355.11	358.88	328.15	339.09	343.76	340.74	358.88	325.69	321.50	323.96
Apr-2024	375.35	356.26	360.33	330.10	340.14	344.98	342.34	360.33	329.88	323.20	324.88
Jun-2024	--	--	--	--	--	--	--	--	--	--	--
Sep-2024	365.57	347.56	354.66	327.11	337.52	342.02	339.08	354.66	323.59	320.21	321.42
Nov-2024	--	--	--	--	--	--	--	--	--	--	--

**Table 1. Groundwater Elevation Data Summary
Pirkey Power Plant**

Unit	FGD Stackout Area					Landfill					
	Upgradient	Downgradient			Upgradient			Downgradient			
Well	AD-13	AD-7	AD-7R	AD-22	AD-33	AD-8	AD-16	AD-27	AD-23	AD-34	AD-36
Jan-2016	354.15	349.31		350.29	351.13	347.21	347.68	--	321.23	307.61	--
May-2016	355.11	349.98		350.83	351.62	348.03	350.97	335.29	321.98	307.61	--
Jul-2016	352.31	347.54		347.55	349.88	347.10	343.32	331.47	321.97	307.61	--
Jan-2017	352.01	347.04		347.20	348.56	345.74	343.09	330.04	320.99	307.61	--
Feb-2017	352.81	347.96		348.52	349.32	346.00	344.54	331.59	321.00	307.61	--
Apr-2017	352.68	347.87		348.45	349.25	345.81	344.69	331.24	320.85	307.61	--
Aug-2017	352.62	347.40		347.37	349.31	346.31	342.71	330.05	320.77	307.61	--
Mar-2018	353.25	348.46		349.62	350.10	346.11	344.63	332.49	320.17	307.61	--
Aug-2018	349.14	344.57		344.05	347.23	345.24	340.03	328.61	320.31	306.66	--
Feb-2019	355.63	350.21		350.90	351.99	348.05	351.21	335.03	320.88	307.61	--
May-2019	355.87	350.82		351.99	352.95	348.60	351.92	336.53	320.99	307.61	--
Aug-2019	350.87	346.85		346.70	349.96	347.33	343.92	330.71	321.29	305.87	303.16
Mar-2020	355.71	350.64		351.80	352.68	--	--	--	--	307.61	303.21
Jun-2020	355.17	350.25		350.95	352.54	348.61	349.39	--	320.79	307.61	303.78
Nov-2020	350.93	346.45		346.12	348.71	346.63	343.07	329.77	320.83	307.00	302.88
Mar-2021	355.22	350.13		351.33	351.84	--	--	--	--	--	--
May-2021	356.42	350.97		352.31	352.95	348.58	350.52	337.25	320.32	307.61	302.22
Jul-2021	--	--		--	--	--	--	--	--	307.61	302.42
Nov-2021	349.43	345.08		345.25	348.40	346.48	341.99	329.69	320.49	307.20	301.66
Jan-2022	--	--		--	--	--	--	--	320.00	307.61	--
Mar-2022	353.99	348.66		349.66	350.15	--	--	--	--	307.61	--
Jun-2022	349.75	345.35		345.49	348.35	346.27	342.41	330.10	319.87	307.00	301.49
Aug-2022	--	--		--	--	--	--	--	319.81	306.84	301.35
Nov-2022	349.93	345.56		345.20	347.43	344.23	341.65	328.48	319.72	307.61	301.35
Feb-2023	353.36	348.68		349.47	350.18	--	--	--	319.56	307.61	301.51
Mar-2023	354.24	--		350.03	350.48	--	--	--	--	--	--
Jun-2023	352.47	347.83		348.29	349.81	346.88	342.44	332.67	320.13	307.61	299.99
Aug-2023	--	--		--	--	--	--	--	320.39	307.61	302.91
Oct-2023	348.85	--		344.70	346.93	345.07	339.45	328.43	320.35	307.61	300.48
Feb-2024	354.43	--	355.99	350.17	350.60	347.86	--	--	--	--	302.62
Apr-2024	356.13	--	357.60	351.90	352.28	347.98	347.96	336.50	319.87	--	303.95
Jun-2024	--	--	--	--	--	--	--	--	320.44	--	303.81
Sep-2024	351.47	--	354.12	347.55	349.73	347.02	342.00	329.87	320.82	--	303.37
Nov-2024	--	--	--	346.93	--	--	--	--	320.61	--	303.31

Notes:

1. Groundwater elevation measured in feet above mean sea level.
2. AD-7R added to the FGD Stackout Area certified monitoring network in December 2023.

**Table 1: Residence Time Calculation Summary
Pirkey Plant - Stackout Area**

Geosyntec Consultants, Inc.

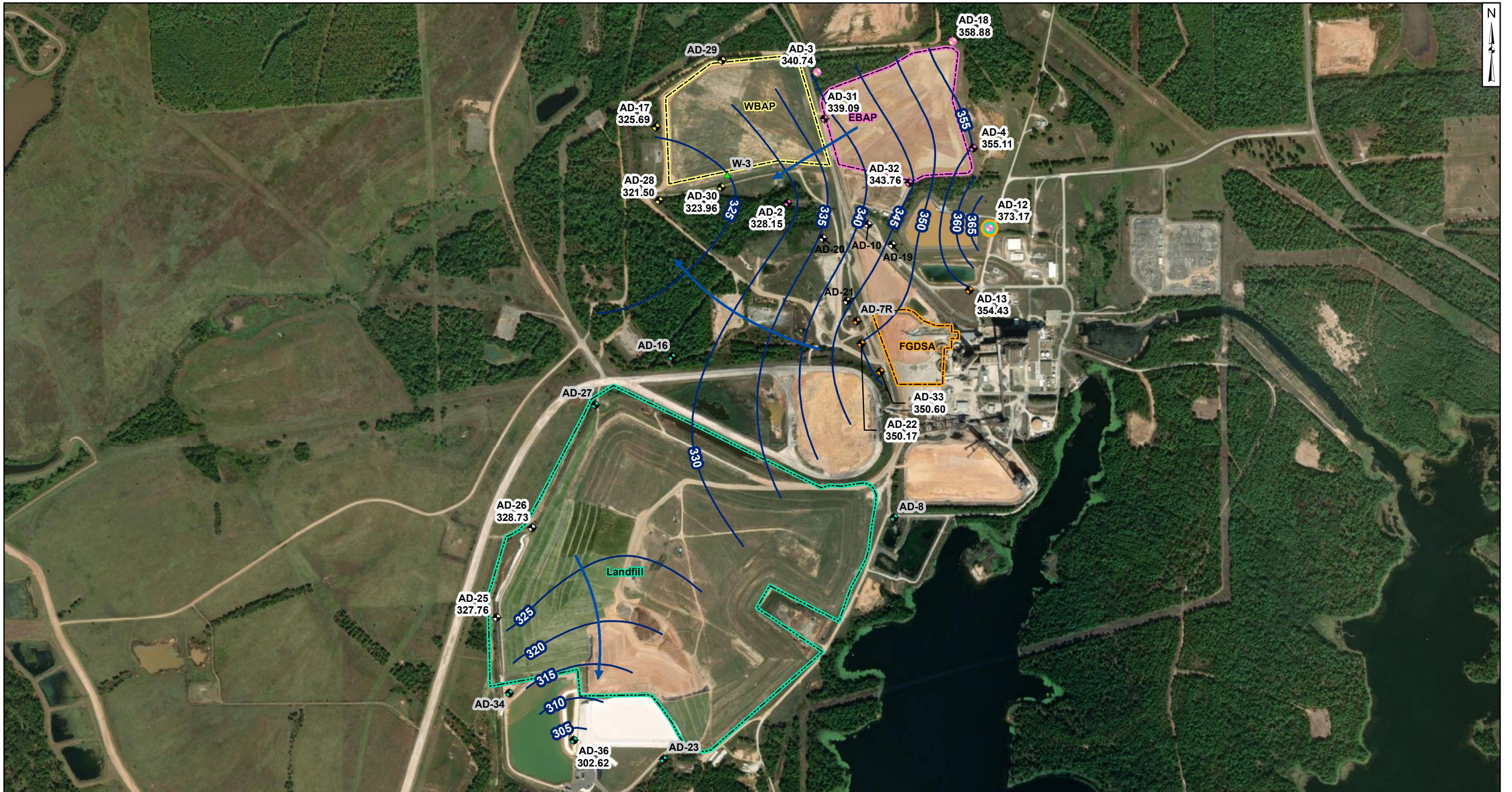
CCR Management Unit	Monitoring Well	Well Diameter (inches)	2024-02		2024-04		2024-09	
			Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Stack Out Area	AD-7R ^[2]	4.0	NC	NC	28.9	4.2	NC	NC
	AD-12 ^[1]	4.0	46.3	2.6	47.3	2.6	37.5	3.2
	AD-13 ^[1]	4.0	8.2	14.8	7.1	17.2	7.9	15.3
	AD-22 ^[2]	2.0	21.0	2.9	15.2	4.0	14.7	4.1
	AD-33 ^[2]	2.0	10.0	6.1	9.4	6.5	10.1	6.0

Notes:

[1] - Background Well

[2] - Downgradient Well

NC - Not Calculated



- Legend**
- Groundwater Monitoring Wells**
- ◆ Out of Network
 - ◆ East Bottom Ash Pond (EBAP)
 - ◆ West Bottom Ash Pond (WBAP)
 - ◆ Landfill
 - ◆ Flue Gas Desulfurization Stackout Area (FGDSA)
 - ◆ EBAP and WBAP

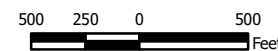
- All CCR Unit Networks
- ▲ Piezometer
- Groundwater Elevation Contour
- Approximate Groundwater Flow Direction

Notes

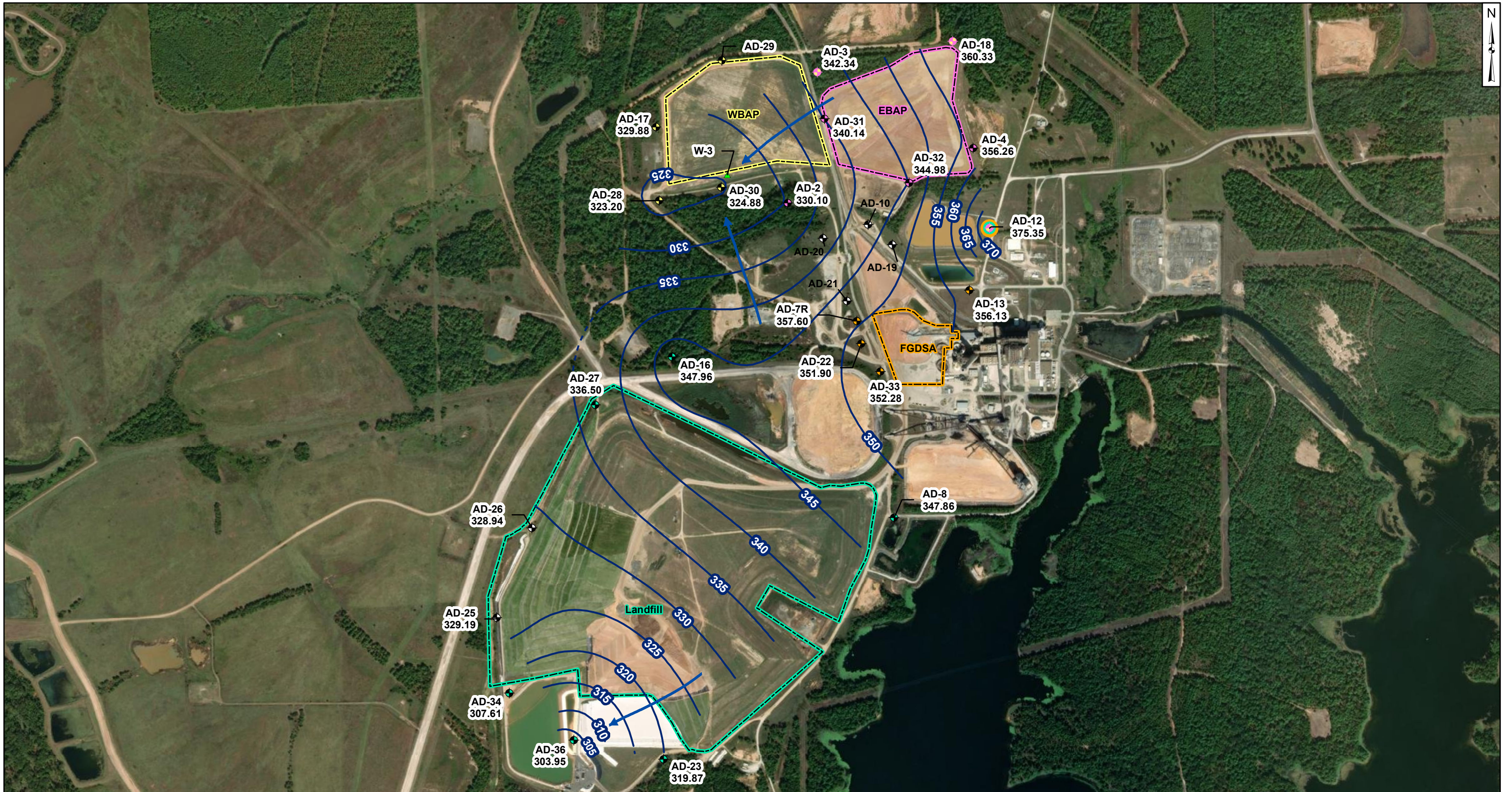
1. Monitoring well coordinates and water level data (collected on February 19 and 20, 2024) provided by AEP.
2. Site features based on information available in coal combustion residual (CCR) Groundwater Monitoring Well Network Evaluation Update (Arcadis 2022) provided by AEP.
3. Groundwater elevation units are feet above mean sea level (ft msl).
4. AD-08, AD-10, AD-16, AD-19, AD-20, AD-21, AD-23, AD-27, AD-29, AD-34, and W-3 were not gauged during the February 2024 event.
5. AD-7R replaced AD-7, which was abandoned.
6. AD-7R (355.99 ft msl) was not used for contouring due to an anomalous reading.
7. Wells shaded in grey were not used for contouring.
8. AD-35 was abandoned on November 13, 2018.
9. Removal of CCR plus one foot of material for the WBAP was completed on July 26, 2022.
10. Removal of CCR plus one foot of material for the EBAP was completed on July 20, 2023.
11. Removal of CCR plus one foot of material for the FGDSA was completed on September 18, 2023.
12. Map is updated to incorporate Landfill survey data collected on May 1, 2024.
13. Aerial imagery provided by ESRI, dated September 19, 2023.

December 11, 2024
Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Beth Ann Gross



Potentiometric Contours: Uppermost Aquifer February 2024	
AEP Pirkey Power Plant Hallsville, Texas	
Columbus, Ohio	2024/12/02
Figure 1	



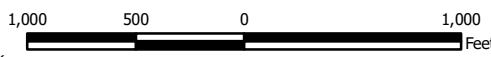
Legend
Groundwater Monitoring Wells

- ⬮ Out of Network
- ⬮ East Bottom Ash Pond (EBAP)
- ⬮ West Bottom Ash Pond (WBAP)
- ⬮ Landfill
- ⬮ Flue Gas Desulfurization Stackout Area (FGDSA)
- ⬮ EBAP and WBAP

- ⬮ All CCR Unit Networks
- ⬮ Piezometer
- Groundwater Elevation Contour
- - - Groundwater Elevation Contour (Inferred)
- ➔ Approximate Groundwater Flow Direction

Notes

1. Monitoring well coordinates and water level data (collected on April 22, 23 and 24, 2024) provided by AEP.
2. Site features based on information available in coal combustion residual (CCR) Groundwater Monitoring Well Network Evaluation Update (Arcadis 2022) provided by AEP.
3. Groundwater elevation units are feet above mean sea level (ft msl).
4. AD-10, AD-19, AD-20, AD-21, AD-29, and W-3 were not gauged during the April 2024 event.
5. AD-7R replaced AD-7, which was abandoned.
6. AD-7R (357.60 ft msl) was not used for contouring due to an anomalous reading.
7. Wells shaded in grey were not used for contouring.
8. AD-35 was abandoned on November 13, 2018.
9. Removal of CCR plus one foot of material for the WBAP was completed for on July 26, 2022.
10. Removal of CCR plus one foot of material for the EBAP was completed on July 20, 2023, for the East Pond.
11. Removal of CCR plus one foot of material was completed for the FGDSA on September 18, 2023.
12. Map is updated to incorporate Landfill survey data collected on May 1, 2024.
13. Aerial imagery provided by ESRI, dated September 19, 2023.



December 11, 2024
Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Beth Ann Gross



**Potentiometric Contours: Uppermost Aquifer
April 2024**

AEP Pirkey Power Plant
Hallsville, Texas

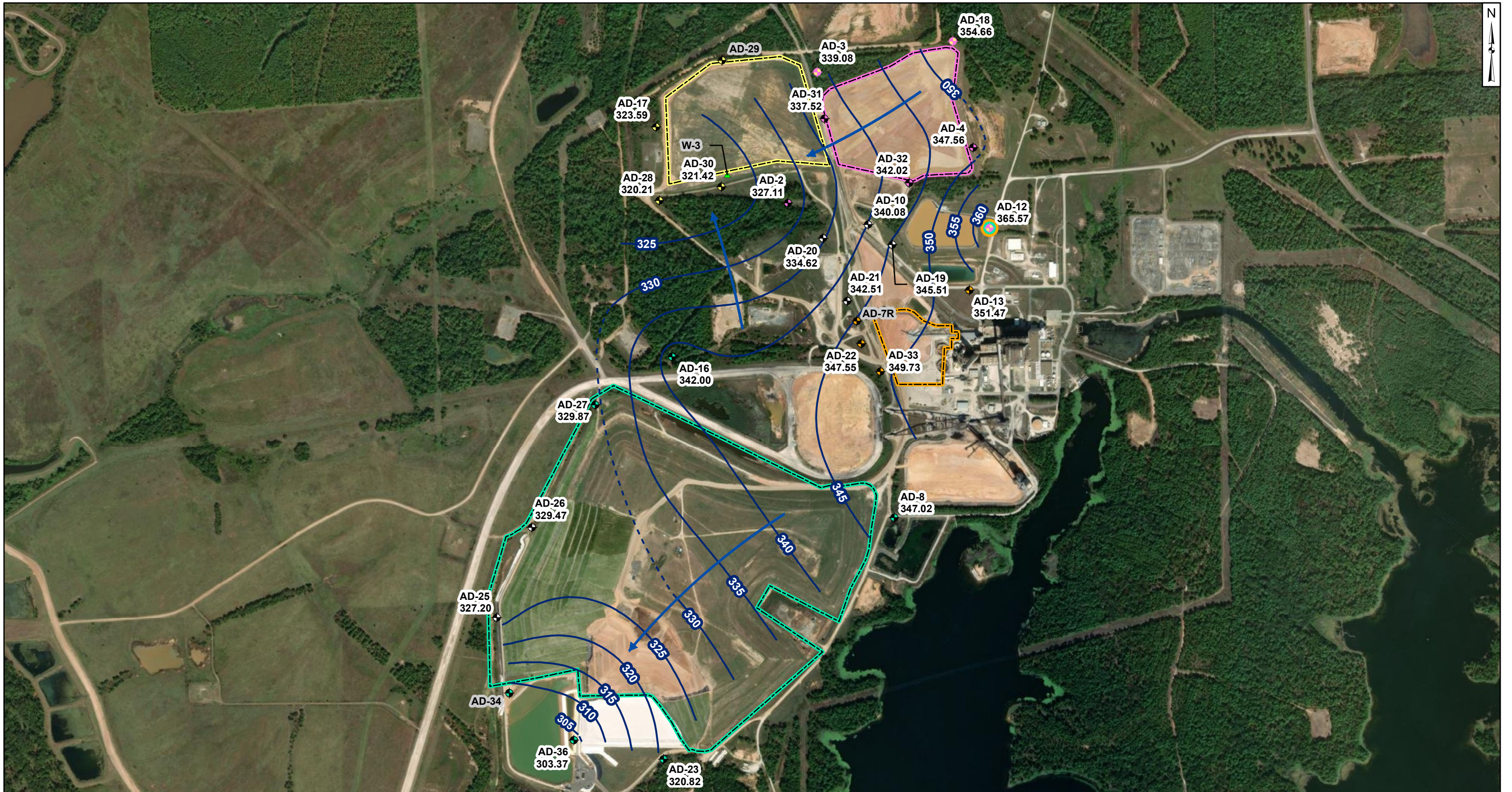
Geosyntec
consultants

Columbus, Ohio

2024/12/02

Figure

2



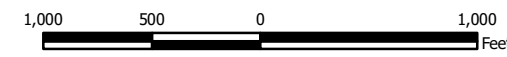
Legend
Groundwater Monitoring Wells

- Out of Network
- East Bottom Ash Pond (EBAP)
- West Bottom Ash Pond (WBAP)
- Landfill
- Flue Gas Desulfurization Stackout Area (FGDSA)
- EBAP and WBAP

- All CCR Unit Networks
- Piezometer
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction

Notes

1. Monitoring well coordinates and water levels (collected on September 16, 17, and 18, 2024) provided by AEP.
2. Site features based on information available in coal combustion residuals (CCR) Groundwater Monitoring Well Network Evaluation Update (Arcadis 2022) provided by AEP.
3. Groundwater elevation units are feet above mean sea level (ft msl).
4. Wells AD-29 and W-3 were not gauged during the September 2024 event.
5. AD-7R replaced AD-7, which was abandoned on September 12, 2023.
6. Wells shaded in gray were not used for contouring.
7. Well AD-34 had artesian characteristics during this event and was not used for contouring.
8. AD-35 was abandoned on November 13, 2018 and is not shown on the map.
9. Removal of CCR plus one foot of material for the WBAP was completed for on July 26, 2022.
10. Removal of CCR plus one foot of material for the EBAP was completed on July 20, 2023, for the East Pond.
11. Removal of CCR plus one foot of material for the FGDSA was completed on September 18, 2023.
12. Map is updated to incorporate Landfill survey data collected on May 1, 2024.
13. Aerial imagery provided by ESRI, dated September 19, 2023.



Beth Ann Gross

January 10, 2025
Geosyntec Consultants, Inc.
Texas Firm Registration
No. 1182



**Potentiometric Contours: Uppermost Aquifer
September 2024**

AEP Pirkey Power Plant
Hallsville, Texas

Geosyntec
consultants

Figure

3

Columbus, Ohio

2024/12/24

APPENDIX 2- Statistical Analyses

The reports summarizing the statistical evaluation follow.

STATISTICAL ANALYSIS SUMMARY 2024 1ST SEMIANNUAL EVENT FLUE GAS DESULFURIZATION (FGD) STACKOUT AREA

**H.W. Pirkey Power Plant
Hallsville, Texas**

Prepared for

American Electric Power
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Columbus, Ohio 43215-2372

Prepared by

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500 West Wilson Bridge Road, Suite 250
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Project Number: CHA8500B

September 5, 2024

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Table 3: Appendix III Data Summary

LIST OF ATTACHMENTS

Attachment A: Certification by Qualified Professional Engineer

Attachment B: Data Quality Review Memoranda

Attachment C: Statistical Analysis Output

ACRONYMS AND ABBREVIATIONS

ASD	alternative source demonstration
CCR	coal combustion residuals
FGD	Flue Gas Desulfurization
GWPS	groundwater protection standard
LCL	lower confidence limit
mg/L	milligrams per liter
QA/QC	quality assurance and quality control
SSI	statistically significant increase
SSL	statistically significant level
SU	standard units
TCEQ	Texas Commission on Environmental Quality
UPL	upper prediction limit

1. INTRODUCTION

In accordance with Texas Commission on Environmental Quality (TCEQ) regulations regarding the disposal of coal combustion residuals (CCRs) in landfills and surface impoundments (Texas Administrative Code [TAC] Title 30, Chapter 352), groundwater monitoring has been conducted at the Flue Gas Desulfurization (FGD) Stackout Area, an existing CCR unit at the Pirkey Power Plant in Hallsville, Texas. Recent groundwater monitoring results were used to identify concentrations of Appendix IV constituents that are above site-specific groundwater protection standards (GWPSs).

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for boron, chloride, and sulfate at the FGD Stackout Area. An alternative source was not identified at the time, so assessment monitoring was initiated and GWPSs were set in accordance with § 352.951(b). Two assessment monitoring events were conducted at the FGD Stackout Area in February and April 2024 in accordance with § 352.951(a). The results of these annual and semiannual assessment events are documented in this report.

Prior to conducting the statistical analyses, the groundwater data underwent several validation tests, including those for completeness, sample tracking accuracy, transcription errors, and consistent use of measurement units. No data quality issues were identified which would impact data usability.

The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. Confidence intervals were calculated for Appendix IV parameters at the compliance wells to assess whether Appendix IV parameters were present at statistically significant levels (SSLs) above previously established GWPSs. SSLs were identified for beryllium, cobalt, and mercury. Therefore, either the unit will move to an assessment of corrective measures or an alternative source demonstration (ASD) will be conducted to evaluate if the unit can remain in assessment monitoring. Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A.

2. FGD STACKOUT AREA EVALUATION

2.1 Data Validation and QA/QC

Samples were collected for analysis from each background and compliance well to meet the requirements of § 352.951(a) in February and April 2024. Samples from both sampling events were analyzed for all Appendix III and Appendix IV parameters. A summary of data collected during these assessment monitoring events are presented in Table 1.

Chemical analysis was completed by a National Environmental Laboratory Accreditation Program–certified analytical laboratory. The laboratory completed analysis of quality assurance and quality control (QA/QC) samples such as laboratory reagent blanks, continuing calibration verification samples, and laboratory fortified blanks.

A data quality review was completed to assess if the data met the objectives outlined in TCEQ Draft Technical Guidance No. 32 related to groundwater sampling and analysis (TCEQ 2020). The data were determined usable for supporting project objectives, as documented in the review memoranda provided in Attachment B. The analytical data were imported into a Microsoft Access database, where checks were completed to assess the accuracy of sample location identification and analyte identification. Where necessary, unit conversions were applied to standardize reported units across all sampling events. Exported data files were created for use with the Sanitas™ v.10.0.19 statistics software. The export file was checked against the analytical data for transcription errors and completeness.

2.2 Statistical Analysis

Statistical analyses for the FGD Stackout Area were conducted in accordance with the November 2021 *Statistical Analysis Plan* (Geosyntec 2021). Time series plots and results for all completed statistical tests are provided in Attachment C. The data obtained in February and April 2024 were screened for potential outliers. No outliers were identified for these events.

2.2.1 Evaluation of Potential Appendix IV SSLs

A confidence interval was constructed for each Appendix IV parameter at each compliance well. Confidence limits were generally calculated parametrically ($\alpha = 0.01$); however, nonparametric confidence limits were calculated in some cases (e.g., when the data did not appear to be normally distributed or when the nondetect frequency was too high).

Seasonal patterns were observed for several parameters at AD-22 based on the time series graphs (Attachment C). Kruskal Wallis tests were performed during the previous statistical evaluation to test whether differences between the results from different seasons were statistically significant for all Appendix IV constituents at AD-22 (Geosyntec 2024). Statistically significant differences were found for beryllium, cadmium, cobalt, combined radium, fluoride, lithium, and selenium at AD-22. Where the Kruskal-Wallis test found significant seasonal effects, the data for these well/parameter pairs were deseasonalized so that the resulting confidence limits correctly account for seasonality as a predictable pattern rather than a random variation or a release. The results of the Kruskal-Wallis tests are provided in Attachment C. The tests will be rerun on an annual basis if apparent season patterns continue to be observed in the data.

An SSL was concluded if the lower confidence limit (LCL) was above the GWPS (i.e., if the entire confidence interval was above the GWPS). The calculated confidence limits (Attachment C) were compared to the GWPSs provided in Table 2. The GWPSs were established during a previous statistical analysis as either the greater value of the background concentration or the maximum contaminant level (Geosyntec 2024).

The following SSLs was identified at the Pirkey FGD Stackout Area:

- The deseasonalized LCL for beryllium was above the GWPS of 0.00400 milligrams per liter (mg/L) at AD-22 (0.00541 mg/L).
- The deseasonalized LCL for cobalt was above the GWPS of 0.0600 mg/L at AD-22 (0.0799 mg/L).
- The LCL for mercury was above the GWPS of 0.00200 mg/L at AD-33 (0.00317 mg/L).

As a result, the Pirkey FGD Stackout Area will either move to an assessment of corrective measures or an ASD will be conducted to evaluate if the unit can remain in assessment monitoring.

2.2.2 Evaluation of Potential Appendix III SSIs

While SSLs were identified, a review of the Appendix III results were also completed to assess whether concentrations of Appendix III parameters at the compliance wells were above background concentrations. Data collected during the April 2024 assessment monitoring event from each compliance well were compared to previously established prediction limits to assess whether the results are above background values (Table 3). The following concentrations were above the upper prediction limits (UPLs):

- The boron concentration was above the interwell UPL of 0.0864 mg/L at AD-33 (0.141 mg/L).
- The chloride concentration was above the interwell UPL of 54.5 mg/L at AD-22 (70.5 mg/L).
- The fluoride concentration was above the interwell UPL of 0.748 mg/L at AD-22 (0.75 mg/L).
- The pH value was above the intrawell UPL of 4.2 standard units (SU) at AD-7R (4.5 SU).
- The sulfate concentration was above the interwell UPL of 138 mg/L at AD-22 (360 mg/L).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the April 2024 sample was above the UPL or below the lower prediction limit in the case of pH. Based on these results, concentrations of Appendix III constituents appear to be above background concentrations.

2.3 Conclusions

Annual and semiannual assessment monitoring events were conducted in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, and no QA/QC issues that impacted data usability were identified. A review of outliers identified no potential outliers in the February and April 2024 data. A confidence interval was constructed at each compliance well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval was above the GWPS. SSLs were identified for beryllium, cobalt, and mercury. Appendix III parameters were compared to calculated prediction limits, with exceedances identified for boron, chloride, fluoride, pH, and sulfate.

Based on this evaluation, the Pirkey FGD Stackout Area CCR unit will either move to an assessment of corrective measures or an ASD will be conducted to evaluate if the unit can remain in assessment monitoring.

3. REFERENCES

Geosyntec. 2021. Statistical Analysis Plan – H.W. Pirkey Power Plant. Geosyntec Consultants, Inc. November.

Geosyntec. 2024. Statistical Analysis Summary – Flue Gas Desulfurization Stackout Area, Pirkey, Hallsville, Texas. Geosyntec Consultants, Inc. January.

Texas Commission on Environmental Quality (TCEQ). 2020. Draft Technical Guidance No. 32. Coal Combustion Residuals Groundwater Monitoring and Corrective Action. May.

TABLES

**Table 1. Groundwater Data Summary
Statistical Analysis Summary
Pirkey Plant – Flue Gas Desulfurization Stackout Pad**

Parameter	Unit	AD-12		AD-13		AD-22		AD-33		AD-7R	
		2/19/2024	4/22/2024	2/19/2024	4/22/2024	2/19/2024	4/22/2024	2/19/2024	4/22/2024	2/19/2024	4/22/2024
Antimony	µg/L	0.010 J1	0.009 J1	0.1 U1	0.1 U1	0.1 U1	0.1 U1	0.1 U1	0.1 U1	0.1 U1	0.1 U1
Arsenic	µg/L	0.07 J1	0.09 J1	0.74	0.54	1.20	3.54	0.67	1.00	0.29	0.38
Barium	µg/L	21.7	19.3	45.1	34.9	20.1	16.2	46.5	42.2	50.7	41.3
Beryllium	µg/L	0.127	0.121	0.290	0.163	4.23	7.53 M1	1.28	1.31	1.93	2.37
Boron	mg/L	0.016 J1	0.015 J1	0.068	0.066	0.050	0.064	0.158	0.141	0.066	0.049 J1
Cadmium	µg/L	0.009 J1	0.007 J1	0.02 U1	0.02 U1	0.922	1.22	0.059	0.058	0.330	0.310
Calcium	mg/L	0.27	0.18	10.6	10.6	13.7	13.5	2.35	2.08	3.32	3.37
Chloride	mg/L	5.87	4.86	35.5	42.2	87.7	70.5	9.41	9.97	21.3	20.6
Chromium	µg/L	0.50	0.34	0.29 J1	0.22 J1	0.39	0.43	0.38	0.23 J1	0.23 J1	0.23 J1
Cobalt	µg/L	1.13	1.08	41.9	46.2	86.9	99.3 M1	11.1	11.0	19.4	20.9
Combined Radium	pCi/L	1.00	2.62	1.97	2.67	3.29	3.02	3.10	1.61	3.26	2.62
Fluoride	mg/L	0.11	0.08	0.42	0.34	0.55	0.75	0.30	0.27	0.15	0.16
Lead	µg/L	0.06 J1	0.08 J1	0.2 U1	0.2 U1	0.23	0.23	0.27	0.27	0.07 J1	0.2 U1
Lithium	mg/L	0.00547	0.00462	0.134	0.135	0.128	0.146 M1	0.0205	0.0199	0.0616	0.0790
Mercury	µg/L	0.002 J1	0.005 U1	0.005 U1	0.005 U1	0.262	0.066	7.100	6.600	0.126	0.01 U1
Molybdenum	µg/L	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1
Selenium	µg/L	0.19 J1	0.31 J1	0.5 U1	0.5 U1	4.57	11.9	2.65	3.18	0.73	1.00
Sulfate	mg/L	3.1	4.2	70.5	84.9	291	360	58.6	65.7	57.8	73.6
Thallium	µg/L	0.2 U1	0.2 U1	0.02 J1	0.03 J1	0.18 J1	0.20	0.04 J1	0.04 J1	0.15 J1	0.14 J1
Total Dissolved Solids	mg/L	60	60	210	220	620	610	160	180	210	220
pH	SU	3.2	3.4	5.7	6.0	4.1	4.0	4.1	4.2	5.4	4.5

Notes:

J1: Estimated value. Parameter was detected in concentrations below the reporting limit.

M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U1: Non-detect value. For statistical analysis, parameters which were not detected were replaced with the reporting limit.

µg/L: micrograms per liter

**Table 2. Appendix IV Groundwater Protection Standards
Statistical Analysis Summary
Pirkey Plant – Flue Gas Desulfurization Stackout Pad**

Constituent Name	MCL	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600	0.000100	0.00600
Arsenic, Total (mg/L)	0.0100	0.00900	0.0100
Barium, Total (mg/L)	2.00	0.0552	2.00
Beryllium, Total (mg/L)	0.00400	0.00200	0.00400
Cadmium, Total (mg/L)	0.00500	0.000860	0.00500
Chromium, Total (mg/L)	0.100	0.00400	0.100
Cobalt, Total (mg/L)	n/a	0.0600	0.0600
Combined Radium, Total (pCi/L)	5.00	2.98	5.00
Fluoride, Total (mg/L)	4.00	0.748	4.00
Lead, Total (mg/L)	n/a	0.00500	0.00500
Lithium, Total (mg/L)	n/a	0.165	0.165
Mercury, Total (mg/L)	0.00200	0.0000193	0.00200
Molybdenum, Total (mg/L)	n/a	0.00500	0.00500
Selenium, Total (mg/L)	0.0500	0.00386	0.0500
Thallium, Total (mg/L)	0.00200	0.00144	0.00200

Notes:

1. Calculated UTL (Upper Tolerance Limit) represents site-specific background values.
2. Gray cells indicate the GWPS is based on the calculated UTL. Either the UTL is higher than the MCL or an MCL does not exist.

FGD: flue gas desulfurization

GWPS: groundwater protection standard

MCL: maximum contaminant level

mg/L: milligrams per liter

pCi/L: picocuries per liter

**Table 3. Appendix III Data Summary
Statistical Analysis Summary
Pirkey Plant – Flue Gas Desulfurization Stackout Pad**

Analyte	Unit	Description	AD-7R	AD-22	AD-33
			4/22/2024	4/22/2024	4/22/2024
Boron	mg/L	Interwell Background Value (UPL)	0.0864		
		Analytical Result	0.049	0.064	0.141
Calcium	mg/L	Intrawell Background Value (UPL)	6.3	15.3	2.22
		Analytical Result	3.37	13.5	2.08
Chloride	mg/L	Interwell Background Value (UPL)	54.5		
		Analytical Result	20.6	70.5	9.97
Fluoride	mg/L	Interwell Background Value (UPL)	0.748		
		Analytical Result	0.16	0.75	0.27
pH	SU	Intrawell Background Value (UPL)	4.2	5.0	4.6
		Intrawell Background Value (LPL)	3.0	3.5	3.1
		Analytical Result	4.5	4.0	4.2
Sulfate	mg/L	Interwell Background Value (UPL)	138		
		Analytical Result	73.6	360	65.7
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	332	716	217
		Analytical Result	220.0	610	180

Notes:

1. Bold values exceed the background value.

2. Background values are shaded gray.

LPL: lower prediction limit

mg/L: milligrams per liter

SU: standard units

UPL: upper prediction limit

ATTACHMENT A

Certification by Qualified Professional Engineer

Certification by Qualified Professional Engineer

I certify that selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Pirkey FGD Stackout Area CCR management area and that the requirements of § 352.931(a) have been met.

David Anthony Miller

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



112498

License Number

Texas

Licensing State

09.09.2024

Date

ATTACHMENT B

Data Quality Review Memoranda

Memorandum

Date: August 12, 2024
To: David Miller (AEP)
Copies to: Leslie Fuerschbach (AEP)
From: Allison Kreinberg (Geosyntec)
Subject: Data Quality Review – Pirkey Power Plant
February 2024 Sampling Event

This memorandum summarizes the findings of a data quality review for groundwater samples collected at the Pirkey Power Plant, located in Hallsville, Texas in February 2024. The groundwater samples were collected to comply with the Texas Commission on Environmental Quality’s (TCEQ’s) regulations regarding the disposal of coal combustion residuals (CCRs) in landfills and surface impoundments (Title 30 Chapter 352, “CCR Rule”). 40 CFR 257 Appendix III and IV constituents were analyzed.

The following sample data groups (SDGs) were associated with the groundwater samples collected during the February 2024 sampling event and are reviewed in this memorandum:

- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 240640
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 240666

The data included in these SDGs were reviewed to assess if they met the objectives outlined in TCEQ Draft Technical Guideline No. 32¹ prior to submittal of this data to TCEQ.

The following data quality issues were identified:

- The results for the “Field Blank” sample associated with laboratory number 240666-017 were marked as dissolved on the laboratory analytical report, but the chain of custody

¹ TCEQ. Topic: Coal Combustion Residuals (CCR) Groundwater Monitoring and Corrective Action: Technical Guidance No. 32. May 2020.

denoted that the sample was submitted to the laboratory unfiltered. SDG 240666 was reissued to correct the sample preparation for “Field Blank” from dissolved to total.

- As reported in SDG 240640, chloride and total dissolved solids (TDS) were detected in the field blank sample “Field Blank” collected on 2/20/24. The estimated detected TDS concentration in the field blank (40 mg/L) was more than 10% of the detected values for TDS in samples AD-3 (140 mg/L), AD-4 (19.9 mg/L), AD-7R (210 mg/L), AD-12 (60 mg/L), AD-13 (210 mg/L), AD-17 (50 mg/L), AD-18 (110 mg/L), AD-28 (90 mg/L), AD-30 (250 mg/L), AD-31 (250 mg/L), AD-32 (150 mg/L), AD-33 (160 mg/L), and “Duplicate” (170 mg/L), which could result in high bias in the TDS results for these samples.
- As reported in SDG 240666, chromium and cobalt were detected in the field blank sample “Field Blank” collected on 2/20/24. The estimated detected chromium concentration in the field blank (0.27 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias in the chromium results for all groundwater samples.
- As reported in SDG 240666, chromium and cobalt were detected in the equipment blank sample “Equipment Blank” collected on 2/19/24. The estimated detected chromium concentration in the equipment blank (0.25 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias in the chromium results for all groundwater samples.
- As reported in SDG 240666, the relative percent difference for the laboratory duplicate for radium-226 was above the acceptable limit of 25. The associated sample (AD-33) was flagged P1 for radium-226: the precision between duplicate results was above the acceptance limits. The AD-33 radium-226 result should be considered estimated.

Based on these findings, the majority of the data reported in these SDGs are considered accurate and complete. Although the QC failures mentioned above will result in some limitations of data use since the affected results are considered estimated or have elevated reporting limits, the data are considered usable for supporting project objectives.

Memorandum

Date: September 5, 2024
To: David Miller (AEP)
Copies to: Leslie Fuerschbach (AEP)
From: Allison Kreinberg (Geosyntec)
Subject: Data Quality Review – Pirkey Power Plant
April 2024 Sampling Event

This memorandum summarizes the findings of a data quality review for groundwater samples collected at the Pirkey Power Plant in Hallsville, Texas in April 2024. The groundwater samples were collected to comply with the Texas Commission on Environmental Quality’s (TCEQ’s) regulations regarding the disposal of coal combustion residuals (CCRs) in landfills and surface impoundments (Title 30 Chapter 352, “CCR Rule”). 40 CFR 257 Appendix III and IV constituents were analyzed.

The following sample data groups (SDGs) were associated with the groundwater samples collected during the June 2023 sampling event and are reviewed in this memorandum:

- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 241393
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 241410

The data included in these SDGs were reviewed to assess if they met the objectives outlined in TCEQ Draft Technical Guideline No. 32¹ prior to submittal of this data to TCEQ.

The following data quality issues were identified:

- As reported in SDG 241410, barium, chromium, and cobalt were detected in the field blank sample “Field Blank” collected on 4/23/24. The detected chromium concentration in the field blank (0.26 µg/L) was more than 10% of the detected values for chromium in all

¹ TCEQ. Topic: Coal Combustion Residuals (CCR) Groundwater Monitoring and Corrective Action: Technical Guidance No. 32. May 2020.

groundwater samples, which could result in high bias in the chromium results for all groundwater samples.

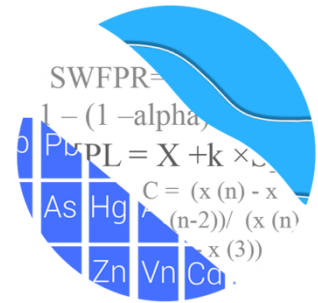
- As reported in SDG 241410, chromium and cobalt were detected in the equipment blank sample “Equipment Blank” collected on 4/23/24. The detected chromium concentration in the equipment blank (0.23 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias in the chromium results for all groundwater samples.
- As reported in SDG 241410, the relative percent difference (RPD) for lithium concentrations from parent sample “AD-7R” and duplicate sample “Duplicate 1” was 21%. The AD-7R result for lithium should be considered estimated.
- As reported in SDG 241410, matrix spike duplicate (MSD) recovery for beryllium (69%), cobalt (13.2%), and lithium (72.4%) were below the acceptable limit of 75%. The low percent recovery of cobalt was likely due to the high concentration in the original sample. The associated sample (AD-22) was flagged M1: the associated matrix spike (MS) or MSD recovery was outside acceptance limits. The AD-22 beryllium, cobalt, and lithium results should be considered estimated.
- The RPD for radium-228 in the laboratory control spike duplicate (LCSD) sample “PB24050222” (31) was above the acceptable limit of 25. Samples associated with that QC batch on SDG 241410 were flagged P2: the precision on the LCSD was above acceptance limits. Additional bottles for radium duplicates were not provided. Samples associated with this QC batch on SDG 241410 were flagged O2: client did not provide additional bottles; therefore, the MS and duplicate are missing in this batch. The associated results should be considered estimated.

Based on these findings, the majority of the data reported in these SDGs are considered accurate and complete. Although the QC failures mentioned above will result in some limitations of data use since the affected results are considered estimated or have elevated reporting limits, the data are considered usable for supporting project objectives.

ATTACHMENT C

Statistical Analysis Output

GROUNDWATER STATS CONSULTING



July 9, 2024

Geosyntec Consultants
Attn: Ms. Allison Kreinberg
500 W. Wilson Bridge Road, Ste. #250
Worthington, OH 43085

Re: Pirkey Stackout
Assessment Monitoring Event – February & April 2024

Dear Ms. Kreinberg,

Groundwater Stats Consulting (GSC), formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the statistical analysis of groundwater data for the February and April 2024 Assessment Monitoring sample events for American Electric Power Inc.'s Pirkey Stackout. The analysis complies with the Texas Commission of Environmental Quality rule 30 TAC 352 as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

Sampling began at the site for the Coal Combustion Residual (CCR) program in 2016. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** AD-12 and AD-13
- **Downgradient wells:** AD-22, AD-33, and AD-7R

Downgradient well AD-7 was previously in the well network but has been removed, and replacement well AD-7R has been sampled since June 2020. Appendix IV constituents are evaluated using confidence intervals, which require a minimum of 4 samples.

Data were sent electronically to GSC, and the statistical analysis was conducted according to the Statistical Analysis Plan and screening evaluation prepared by GSC and approved by Dr. Kirk Cameron, PhD Statistician with MacStat Consulting, primary author of the

USEPA Unified Guidance, and Senior Advisor to GSC. The analysis was reviewed by Andrew Collins, Project Manager of Groundwater Stats Consulting.

The CCR Assessment Monitoring program consists of the following constituents:

- **Appendix IV** (Assessment Monitoring) – antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226 + 228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium

Time series graphs for Appendix IV parameters are provided for all wells and are used to evaluate concentrations over the entire record (Figure A). Additionally, box plots are included for all constituents at upgradient and downgradient wells (Figure B). The time series plots are used to initially screen for suspected outliers and trends, while the box plots provide visual representation of variation within individual wells and between all wells. Values in background, which have previously been flagged as outliers, may be seen in a lighter font and disconnected symbol on the graphs. Additionally, a summary of flagged values follows this letter (Figure C).

Due to varying detection limits in background data sets, a substitution of the most recent reporting limit is used for all non-detects. In some cases, the reporting limit provided by the laboratory contains varying limits for a given parameter; therefore, the substitution may differ from well to well. This generally gives the most conservative limit in each case. Reporting limit changes may occur depending on laboratory capabilities and in the case of fluoride, elevated historic reporting limits were replaced by the most recent reporting limit of 0.06 mg/L and was substituted across all non-detects for all wells. Note that while the most recent PQL is used for non-detect values, the historic reporting limit of 0.005 mg/L was used for lead in order to maintain statistical limits that are conservative from a regulatory perspective.

A change in reported concentrations of more recent data was noted for mercury relative to historical concentrations in wells AD-22 and AD-33. The Sen's Slope/Mann Kendall trend test was previously used to evaluate the entire record of data for mercury at these wells to identify whether data are stable or have either statistically significant increasing or decreasing trends. A statistically significant increasing trend was identified for mercury in well AD-33 and a statistically significant decreasing trend was identified for mercury in well AD-22. In order to construct confidence intervals that represent current groundwater quality conditions and eliminate the influence of the trend, earlier concentrations were truncated from the records. A list of well/constituent pairs using truncated records follows this report.

Summary of Statistical Methods

Assessment monitoring for Appendix IV parameters involves the comparison of confidence intervals for parameters at each downgradient well against the corresponding Groundwater Protection Standard (GWPS). The GWPS is determined for each parameter as the highest limit of the Maximum Contaminant Levels (MCLs) or background limits determined from tolerance limits constructed from pooled upgradient well data.

Prior to computing tolerance limits on pooled upgradient well data or constructing confidence intervals on downgradient well data, the distribution of data is tested using the Shapiro-Wilk/Shapiro-Francia test for normality. After testing for normality and performing any adjustments as discussed below (US EPA, 2009), data are analyzed using either parametric or non-parametric tolerance limits and confidence intervals as appropriate, based on the following criteria.

- No statistical analyses are required on wells and analytes containing 100% non-detects (USEPA Unified Guidance, 2009, Chapter 6).
- When data contain <15% non-detects, the reporting limit utilized for non-detects is the practical quantification limit (PQL) as reported by the laboratory. For several constituents, the most recent reporting limits are significantly lower than those reported historically. This is a conservative approach for tolerance limits and confidence intervals at this site.
- When data contain between 15-50% non-detects, the Kaplan-Meier non-detect adjustment is applied to the background data for parametric limits. This technique adjusts the mean and standard deviation of the historical concentrations to account for concentrations below the reporting limit.
- Nonparametric tolerance limits and confidence intervals are used on data sets containing greater than 50% non-detects.

Background Update Summary – Conducted in October 2023

Outlier Analysis

Prior to evaluating Appendix IV parameters, background data are screened through visual screening and Tukey's outlier test for potential outliers and extreme trending patterns that would lead to artificially elevated statistical limits. Tukey's outlier test on pooled upgradient well data did not identify any outliers for Appendix IV parameters; therefore, no additional values were flagged during the update. No changes to previously flagged outliers were made among upgradient wells for Appendix IV parameters as these measurements were confirmed by visual screening.

Seasonality

When seasonal patterns are observed, data are deseasonalized so that the resulting limits will correctly account for the seasonality as a predictable pattern rather than random variation or a release. This procedure includes subtracting the seasonal mean from each value within a given season and adding the overall mean to each observation. Several Appendix IV constituents appear to have seasonal patterns for well AD-22. Therefore, all constituents evaluated with confidence intervals at this well were tested for seasonality using the Kruskal-Wallis test during the update (Figure D). Appendix IV constituents with significant seasonality were beryllium, cadmium, cobalt, combined radium 226 + 228, fluoride, lithium, and selenium.

Interwell Upper Tolerance Limits

Upper tolerance limits were used to calculate background limits from pooled upgradient well data through October 2023 for Appendix IV parameters (Figure E). These limits are updated on an annual basis and will be updated again during the Fall 2024 sample event. Parametric tolerance limits are calculated, with a target of 95% confidence and 95% coverage, when data follow a normal or transformed-normal distribution. When data contained greater than 50% non-detects or did not follow a normal or transformed-normal distribution, non-parametric tolerance limits were constructed using the highest background measurement. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples.

Groundwater Protection Standards

Background limits were compared to the MCLs in the GWPS table following this letter to determine the highest limit for use as the GWPS in the Confidence Interval comparisons (Figure F).

Evaluation of Appendix IV Parameters – February & April 2024

Time series plots were used to visually identify potential outliers in downgradient wells through the February and April 2024 sample events. When suspected outliers are identified, Tukey's outlier test is used to formally test whether measurements are statistically significant. As mentioned above, high outliers are 'cautiously' flagged in the downgradient wells when measurements are clearly much different from remaining data within a given well. This is intended to be a regulatory conservative approach in that it will reduce the variance and thus reduce the width of parametric confidence intervals; although it will also reduce the mean and thus lower the entire interval. The intent is to

better represent the actual downgradient mean. No additional suspected outliers were identified.

Confidence Intervals

Confidence intervals were then constructed on downgradient wells with data through April 2024 for each of the Appendix IV parameters using either parametric or nonparametric intervals depending on the data distribution and percentage of non-detects (Figure G). When data followed a normal or transformed-normal distribution, parametric confidence intervals were used for Appendix IV parameters. Nonparametric confidence intervals, which use the largest and smallest order statistics depending on the sample size as interval limits, were constructed when data did not follow a normal or transformed-normal distribution or when there were greater than 50% non-detects. The lower confidence limit, which is constructed with 99% confidence for parametric confidence intervals, is compared to the GWPS prepared as described above. The confidence level associated with nonparametric confidence intervals is dependent upon the number samples available.

Each confidence interval was compared to the corresponding GWPS from Figure F. Only when the entire confidence interval is above the GWPS is the well/constituent pair considered to exceed its respective standard. Exceedances were noted for the following well/constituent pairs:

- Beryllium: AD-22
- Cobalt: AD-22
- Mercury: AD-33

Deseasonalized Confidence Intervals

Confidence intervals were also constructed on deseasonalized data for constituents with detected seasonality in well AD-22 when at least one reported measurement was higher than the established GWPS for a given parameter. The constituents that met these criteria at well AD-22 are beryllium, cobalt, combined radium, and lithium. The results are included with the confidence intervals provided in Figure G. The following confidence interval exceedances were identified:

- Beryllium: AD-22
- Cobalt: AD-22

Trend Test Evaluation – Appendix IV

When confidence interval exceedances are identified in downgradient wells, data are further evaluated using the Sen's Slope/Mann Kendall trend test to determine whether concentrations are statistically increasing, decreasing, or stable at the 95% confidence level (Figure H). Utilizing the 95% confidence level for trend tests readily identifies significant trends and is more sensitive than the 99% confidence level without drastically increasing the false negative rate. Upgradient wells are included in the trend analyses for all parameters found to exceed their confidence interval in downgradient wells. When similar patterns exist upgradient of the site, it is an indication of variability in groundwater which may be unrelated to practices at the site. Statistically significant trends were identified for the following well/constituent pairs:

Increasing

- Cobalt: AD-13 (upgradient)
- Mercury: AD-33

Decreasing

- Beryllium: AD-12 and AD-13 (both upgradient)
- Cobalt: AD-12 (upgradient)

Thank you for the opportunity to assist you in the statistical analysis of groundwater quality for Pirkey Stackout. If you have any questions or comments, please feel free to contact us.

For Groundwater Stats Consulting,



Easton Rayner
Groundwater Analyst



Andrew T. Collins
Project Manager

Date Ranges

Date: 7/2/2024 2:17 PM

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

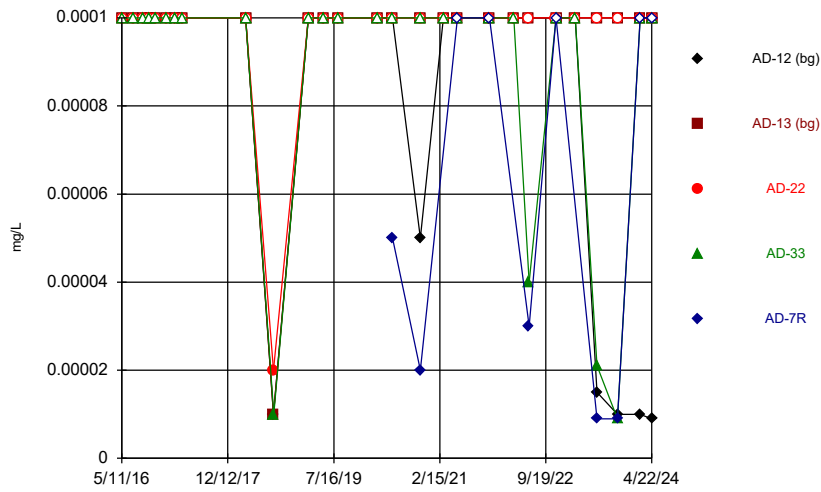
Mercury, total (mg/L)

AD-22 overall:3/10/2020-4/22/2024

AD-33 overall:3/10/2020-4/22/2024

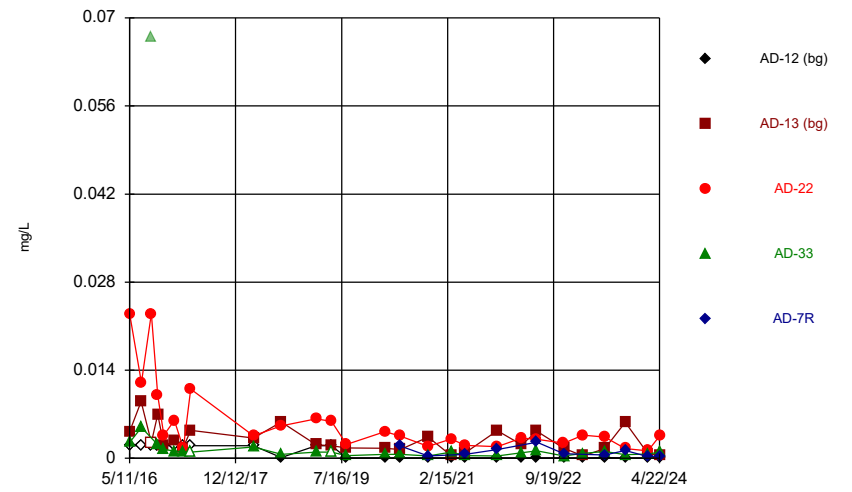
FIGURE A
Time Series

Time Series



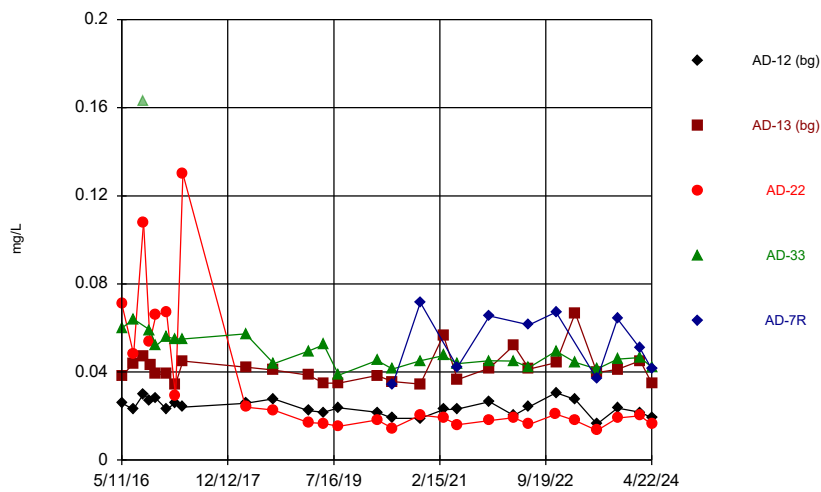
Constituent: Antimony, total Analysis Run 7/8/2024 2:41 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



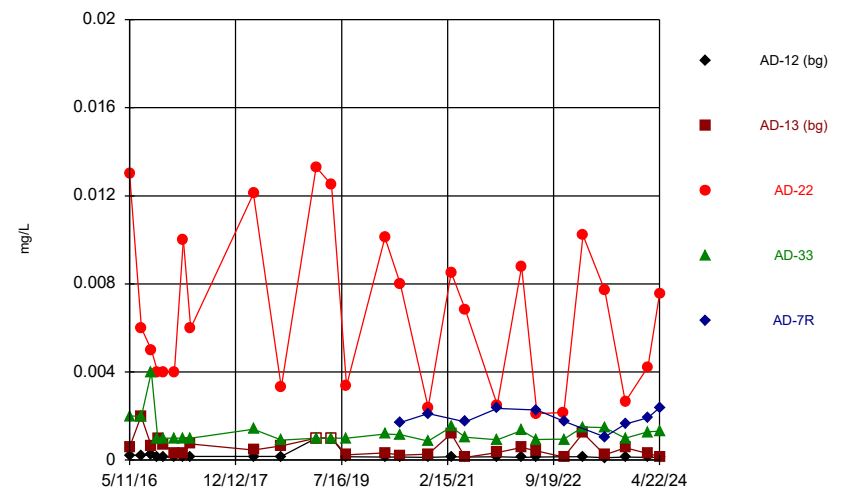
Constituent: Arsenic, total Analysis Run 7/8/2024 2:41 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



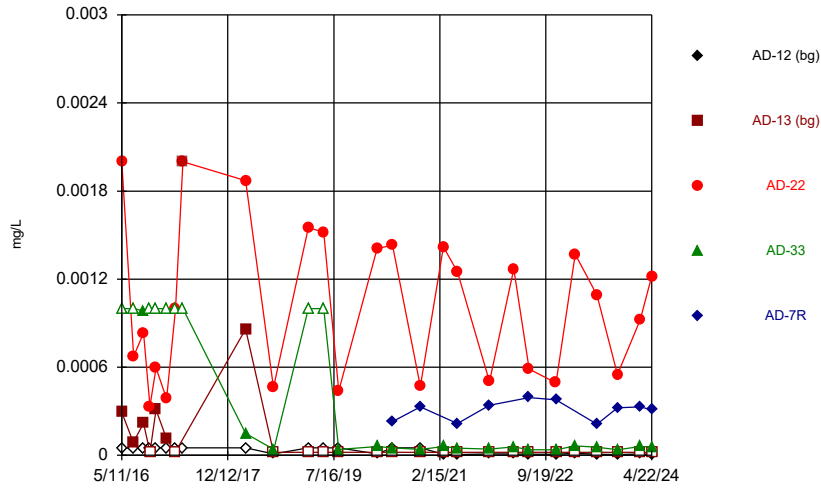
Constituent: Barium, total Analysis Run 7/8/2024 2:41 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



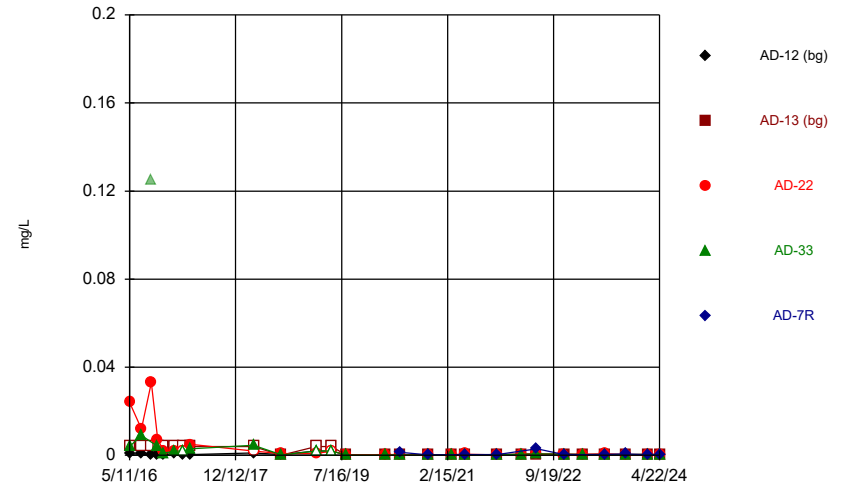
Constituent: Beryllium, total Analysis Run 7/8/2024 2:41 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



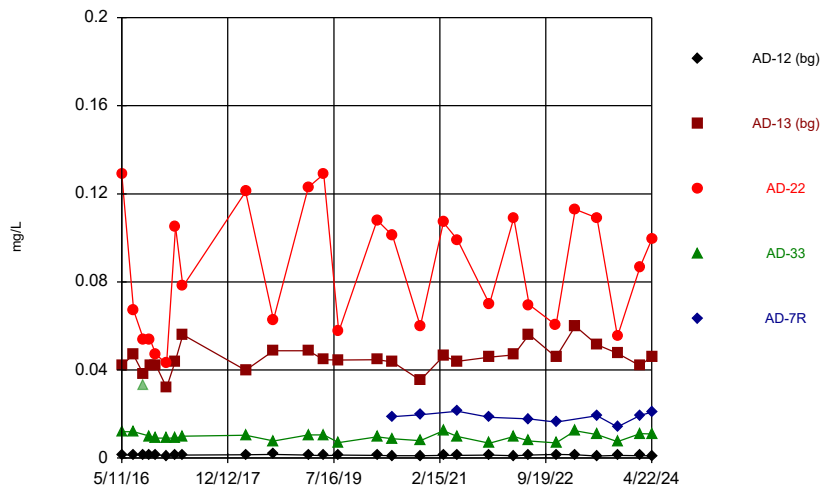
Constituent: Cadmium, total Analysis Run 7/8/2024 2:41 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



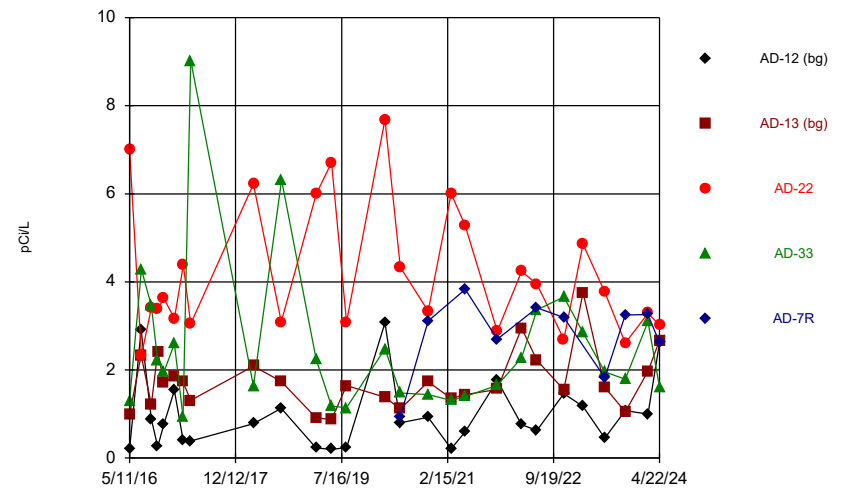
Constituent: Chromium, total Analysis Run 7/8/2024 2:41 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



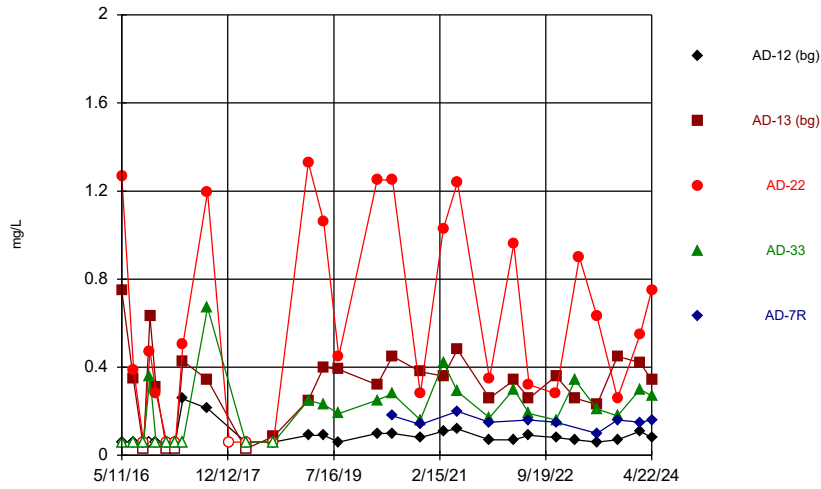
Constituent: Cobalt, total Analysis Run 7/8/2024 2:41 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



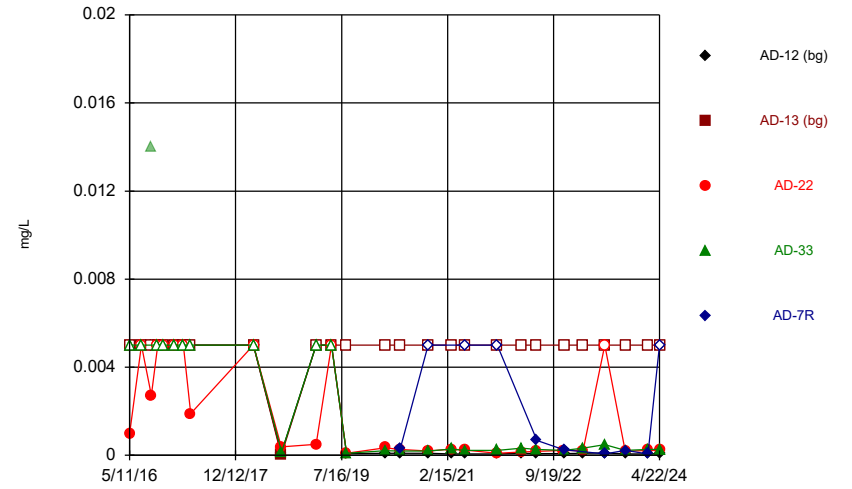
Constituent: Combined Radium 226 + 228 Analysis Run 7/8/2024 2:41 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



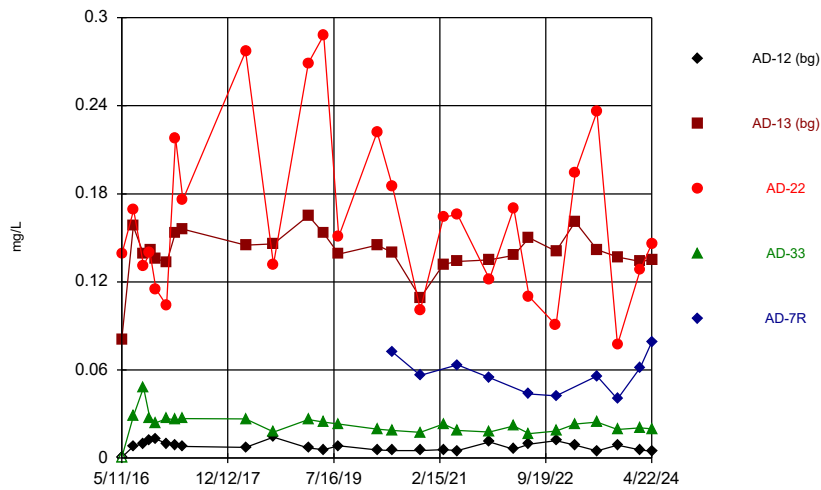
Constituent: Fluoride, total Analysis Run 7/8/2024 2:41 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



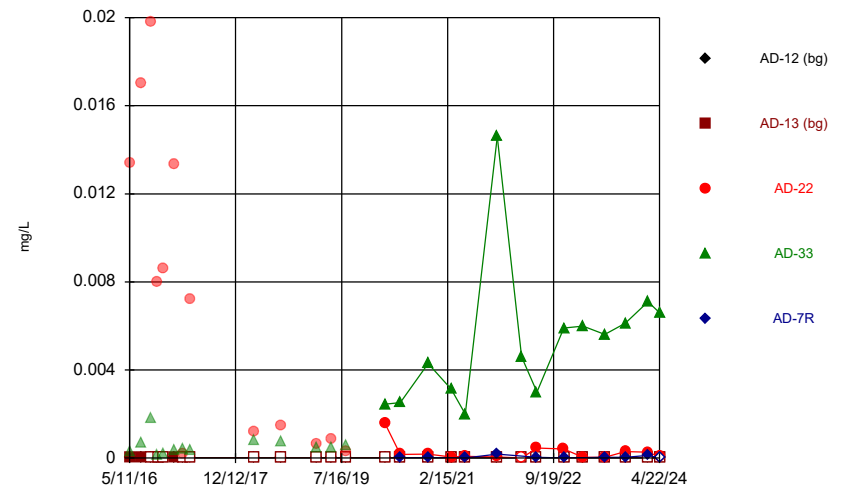
Constituent: Lead, total Analysis Run 7/8/2024 2:41 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



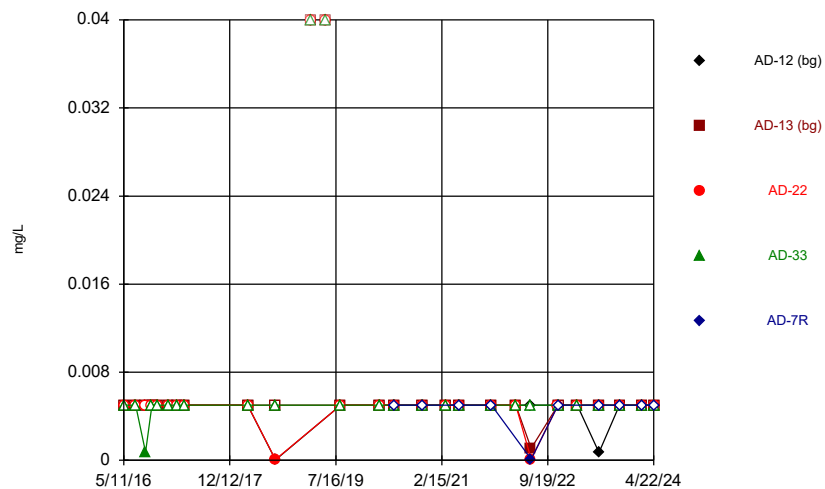
Constituent: Lithium, total Analysis Run 7/8/2024 2:41 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



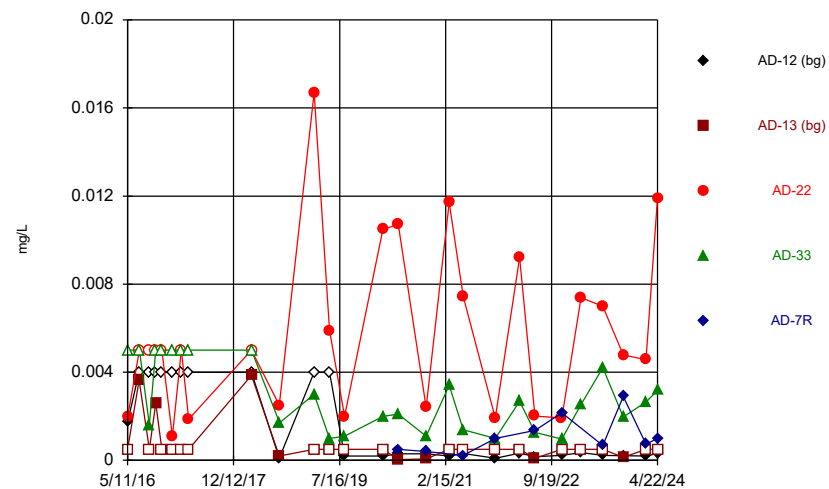
Constituent: Mercury, total Analysis Run 7/8/2024 2:41 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



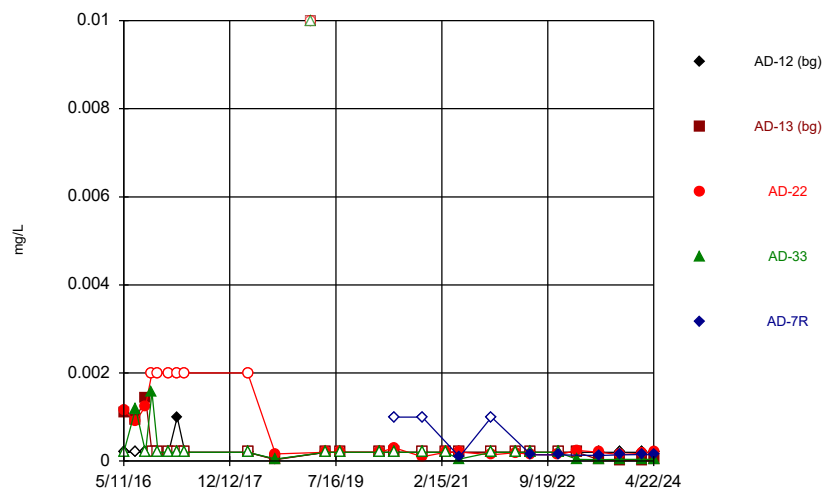
Constituent: Molybdenum, total Analysis Run 7/8/2024 2:41 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



Constituent: Selenium, total Analysis Run 7/8/2024 2:41 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

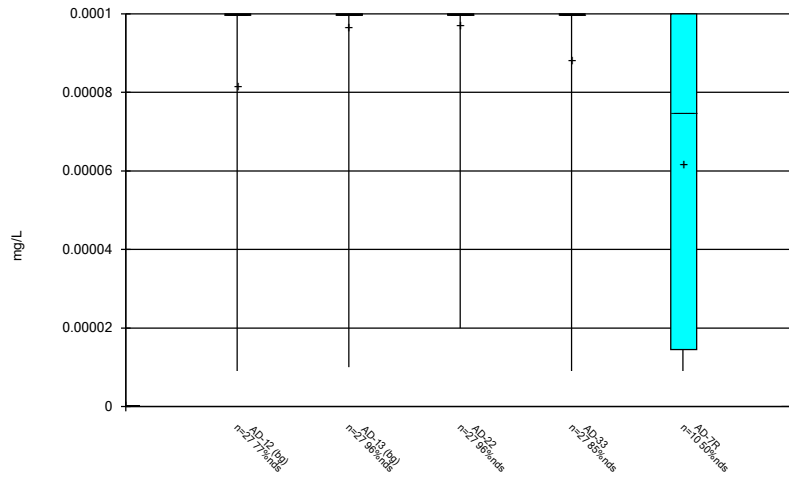
Time Series



Constituent: Thallium, total Analysis Run 7/8/2024 2:41 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

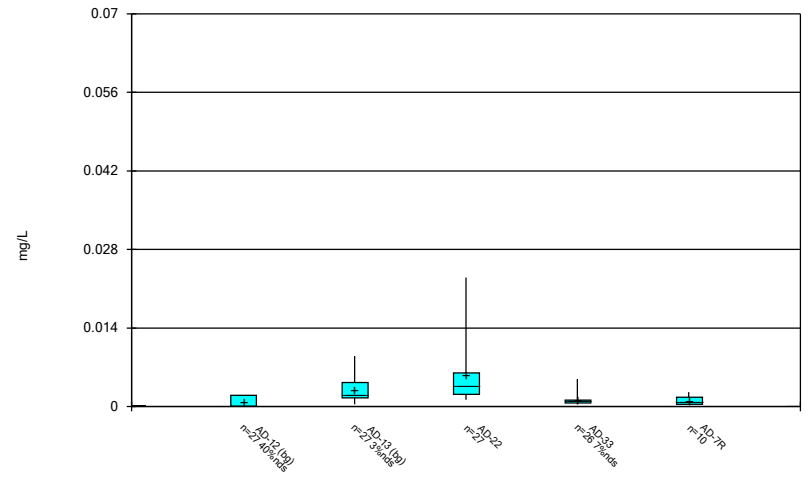
FIGURE B
Box Plots

Box & Whiskers Plot



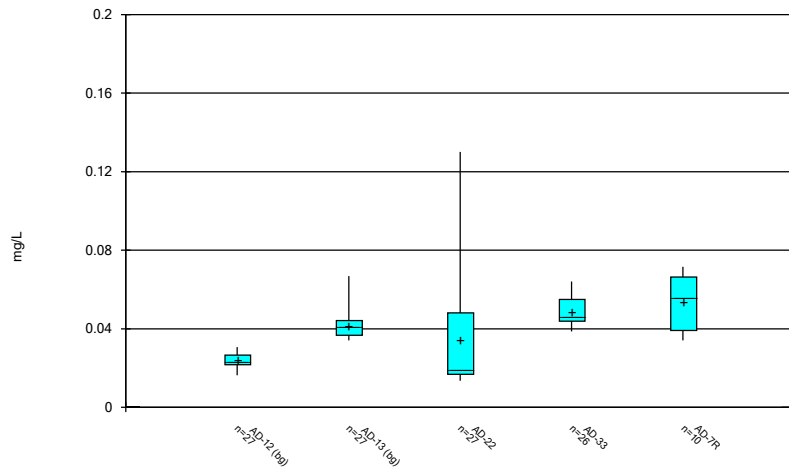
Constituent: Antimony, total Analysis Run 7/8/2024 2:42 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



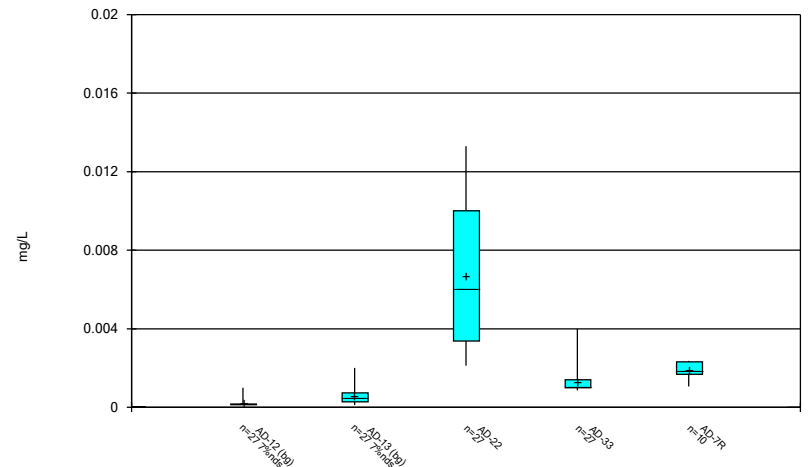
Constituent: Arsenic, total Analysis Run 7/8/2024 2:42 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



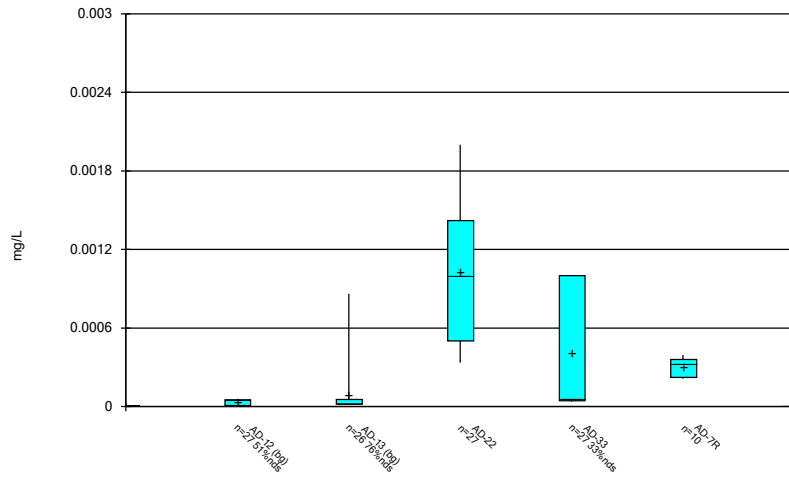
Constituent: Barium, total Analysis Run 7/8/2024 2:42 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



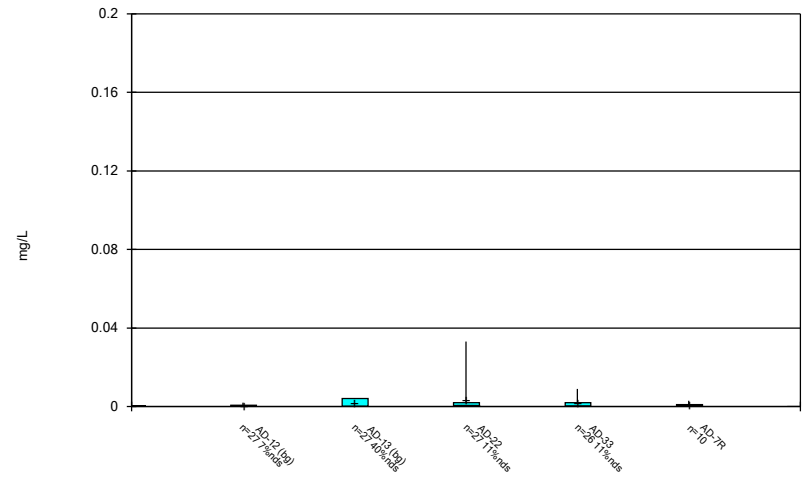
Constituent: Beryllium, total Analysis Run 7/8/2024 2:42 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



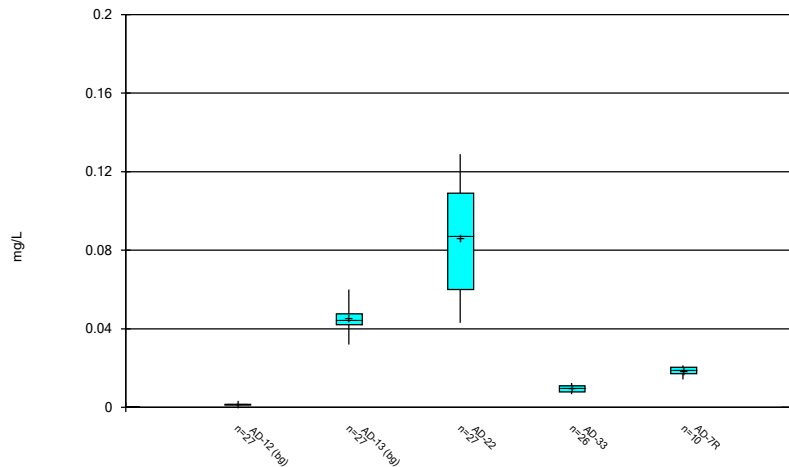
Constituent: Cadmium, total Analysis Run 7/8/2024 2:42 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



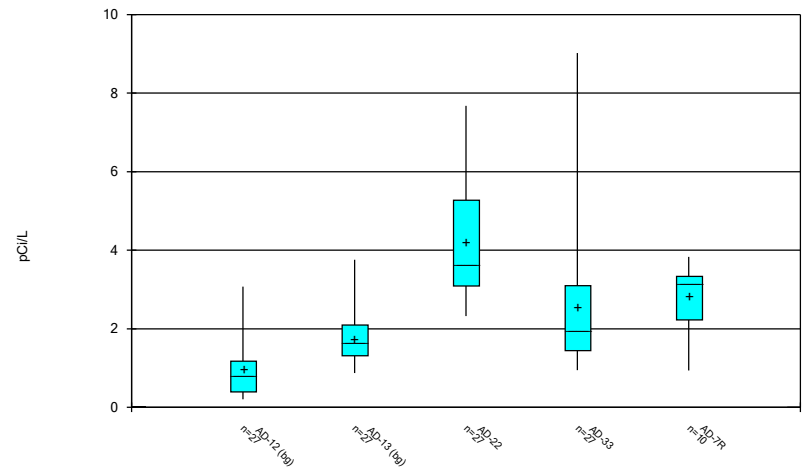
Constituent: Chromium, total Analysis Run 7/8/2024 2:42 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



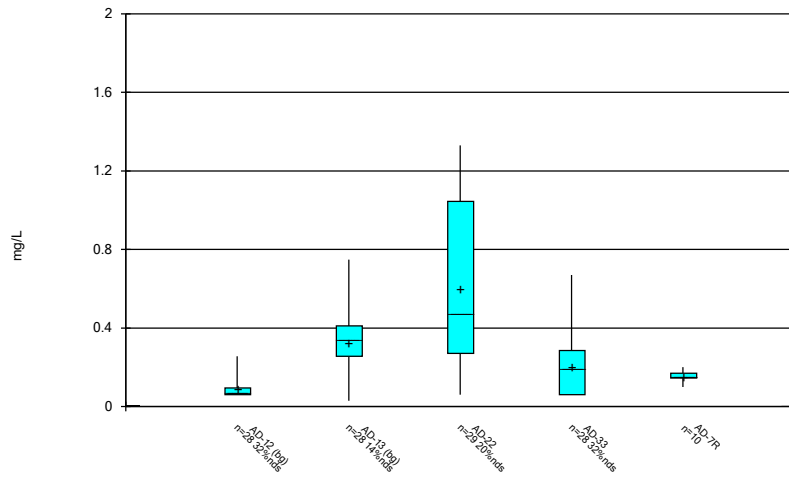
Constituent: Cobalt, total Analysis Run 7/8/2024 2:42 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



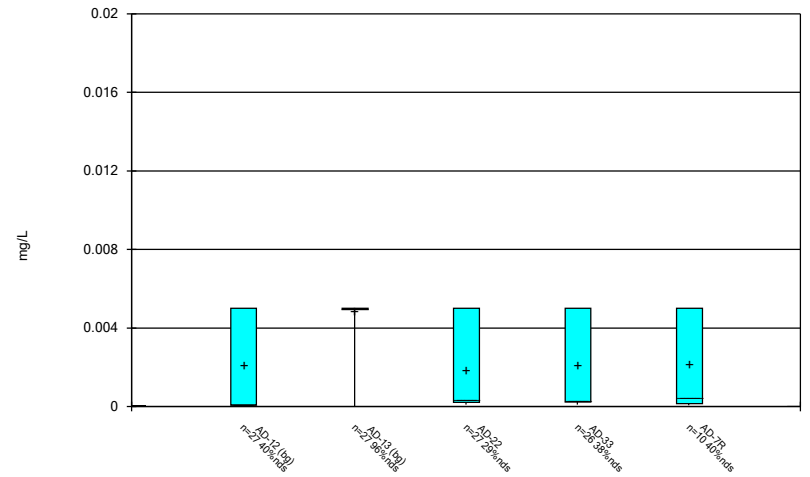
Constituent: Combined Radium 226 + 228 Analysis Run 7/8/2024 2:42 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



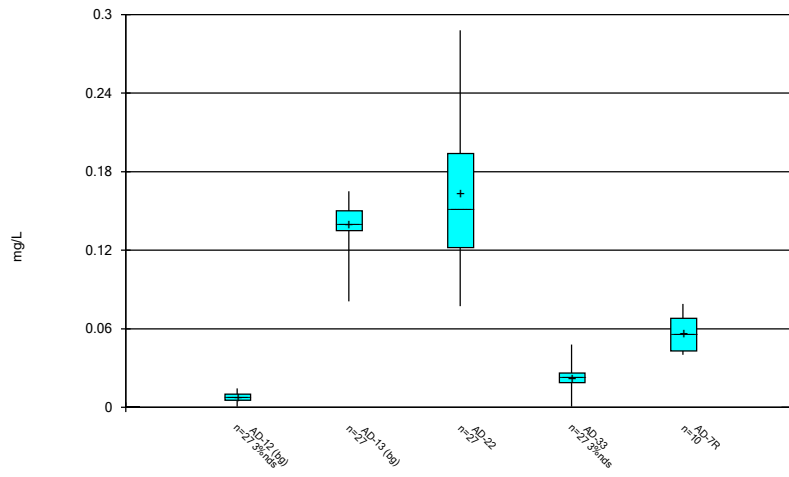
Constituent: Fluoride, total Analysis Run 7/8/2024 2:42 PM View: Appendix IV
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



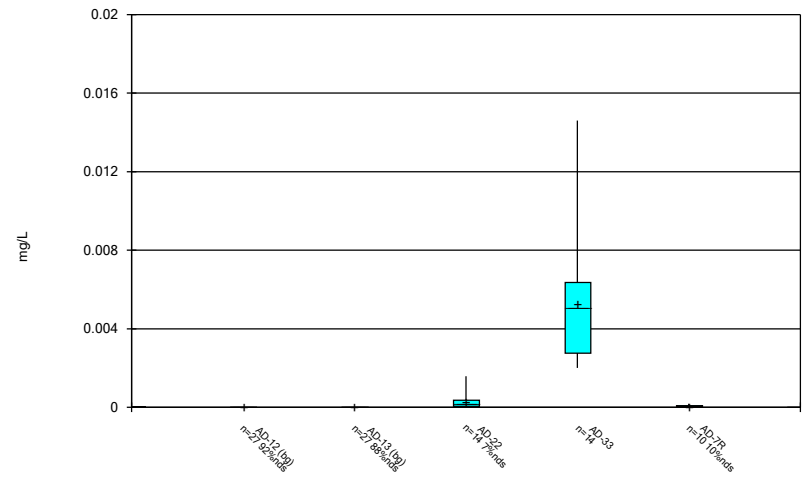
Constituent: Lead, total Analysis Run 7/8/2024 2:42 PM View: Appendix IV
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



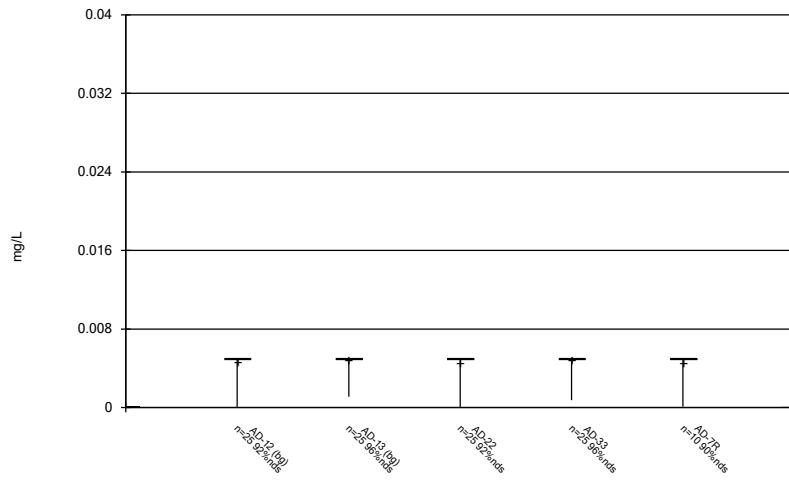
Constituent: Lithium, total Analysis Run 7/8/2024 2:42 PM View: Appendix IV
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



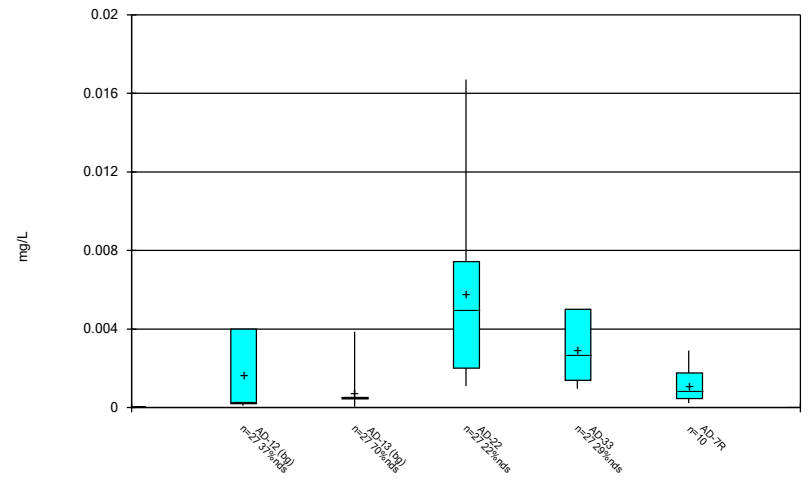
Constituent: Mercury, total Analysis Run 7/8/2024 2:42 PM View: Appendix IV
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



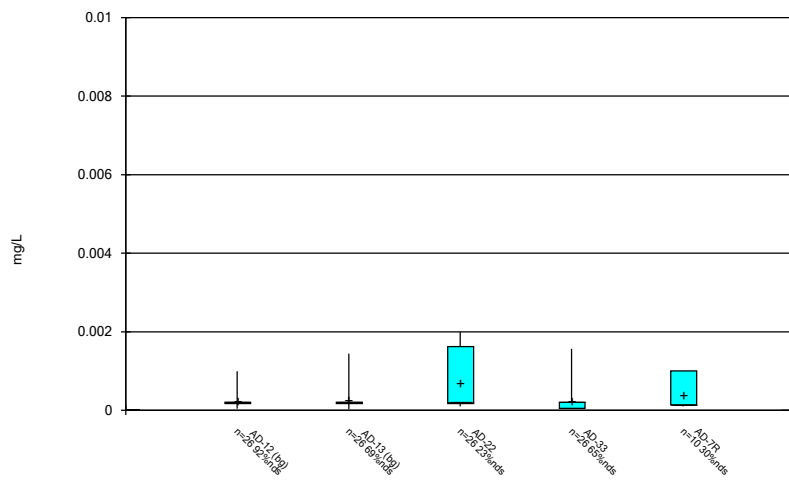
Constituent: Molybdenum, total Analysis Run 7/8/2024 2:42 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



Constituent: Selenium, total Analysis Run 7/8/2024 2:42 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 7/8/2024 2:42 PM View: Appendix IV
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

FIGURE C
Outlier Summary

Outlier Summary

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 7/8/2024, 2:42 PM

	AD-33 Arsenic, total (mg/L)	AD-33 Barium, total (mg/L)	AD-13 Cadmium, total (mg/L)	AD-33 Chromium, total (mg/L)	AD-33 Cobalt, total (mg/L)	AD-33 Lead, total (mg/L)	AD-12 Molybdenum, total (mg/L)	AD-13 Molybdenum, total (mg/L)	AD-22 Molybdenum, total (mg/L)	AD-33 Molybdenum, total (mg/L)
9/7/2016	0.067 (o)	0.163 (o)		0.125 (o)	0.033 (o)	0.014 (o)				
4/11/2017			0.002 (o)							
2/27/2019							<0.005 (o)	<0.005 (o)	<0.005 (o)	<0.005 (o)
5/21/2019							<0.005 (o)	<0.005 (o)		
5/22/2019								<0.005 (o)	<0.005 (o)	

	AD-12 Thallium, total (mg/L)	AD-13 Thallium, total (mg/L)	AD-22 Thallium, total (mg/L)	AD-33 Thallium, total (mg/L)
9/7/2016				
4/11/2017				
2/27/2019	<0.0002 (o)	<0.0002 (o)	<0.01 (o)	<0.0002 (o)
5/21/2019				
5/22/2019				

FIGURE D
Seasonality

Seasonality Summary Table - Significant Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 1/4/2024, 1:28 PM

<u>Constituent</u>	<u>Well</u>	<u>Sig.</u>	<u>K.-W.</u>	<u>Chi-Sq.</u>	<u>df</u>	<u>N</u>	<u>Alpha</u>
Beryllium, total (mg/L)	AD-22	Yes	11.66	3.841	1	25	0.05
Cadmium, total (mg/L)	AD-22	Yes	12.22	3.841	1	25	0.05
Cobalt, total (mg/L)	AD-22	Yes	12.62	3.841	1	25	0.05
Combined Radium 226 + 228 (pCi/L)	AD-22	Yes	13	3.841	1	25	0.05
Fluoride, total (mg/L)	AD-22	Yes	5.433	3.841	1	27	0.05
Lithium, total (mg/L)	AD-22	Yes	9.649	3.841	1	25	0.05
Selenium, total (mg/L)	AD-22	Yes	4.042	3.841	1	25	0.05

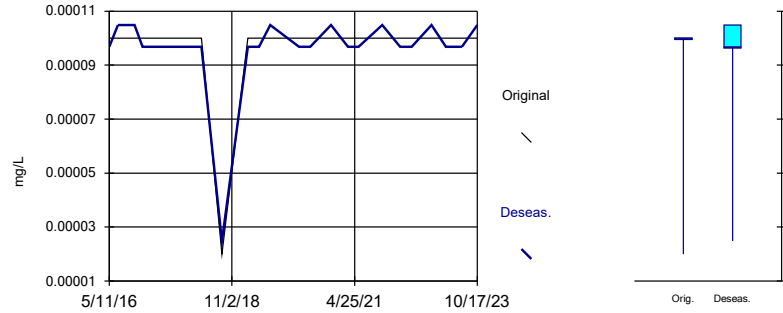
Seasonality Summary Table - All Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 1/4/2024, 1:28 PM

<u>Constituent</u>	<u>Well</u>	<u>Sig.</u>	<u>K.-W.</u>	<u>Chi-Sq.</u>	<u>df</u>	<u>N</u>	<u>Alpha</u>
Antimony, total (mg/L)	AD-22	No	1.5	3.841	1	25	0.05
Arsenic, total (mg/L)	AD-22	No	0.2224	3.841	1	25	0.05
Barium, total (mg/L)	AD-22	No	1.357	3.841	1	25	0.05
Beryllium, total (mg/L)	AD-22	Yes	11.66	3.841	1	25	0.05
Cadmium, total (mg/L)	AD-22	Yes	12.22	3.841	1	25	0.05
Chromium, total (mg/L)	AD-22	No	0.2228	3.841	1	25	0.05
Cobalt, total (mg/L)	AD-22	Yes	12.62	3.841	1	25	0.05
Combined Radium 226 + 228 (pCi/L)	AD-22	Yes	13	3.841	1	25	0.05
Fluoride, total (mg/L)	AD-22	Yes	5.433	3.841	1	27	0.05
Lead, total (mg/L)	AD-22	No	0.6235	3.841	1	25	0.05
Lithium, total (mg/L)	AD-22	Yes	9.649	3.841	1	25	0.05
Mercury, total (mg/L)	AD-22	No	1.038	3.841	1	12	0.05
Molybdenum, total (mg/L)	AD-22	No	0.06434	3.841	1	23	0.05
Selenium, total (mg/L)	AD-22	Yes	4.042	3.841	1	25	0.05
Thallium, total (mg/L)	AD-22	No	1.625	3.841	1	24	0.05

Seasonality: AD-22

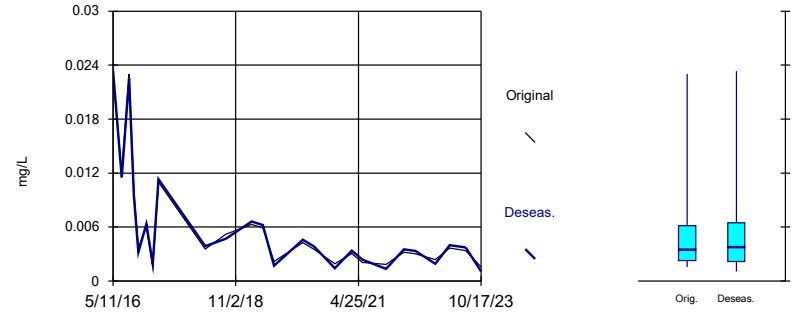
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
 Calculated Kruskal-Wallis statistic = 1.5
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 0.1731
 Adjusted Kruskal-Wallis statistic (H') = 1.5



Constituent: Antimony, total Analysis Run 1/4/2024 1:23 PM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

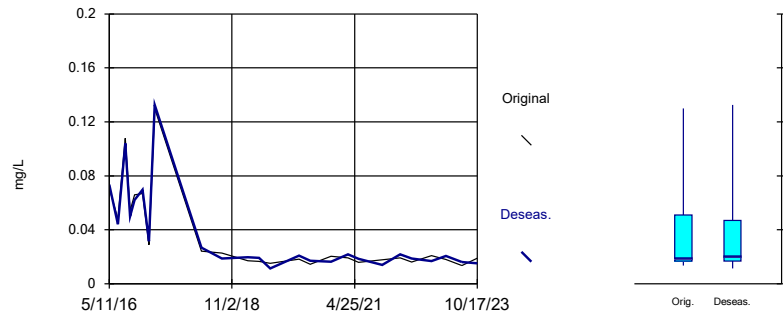
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
 Calculated Kruskal-Wallis statistic = 0.2224
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 0.2223
 Adjusted Kruskal-Wallis statistic (H') = 0.2224



Constituent: Arsenic, total Analysis Run 1/4/2024 1:23 PM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

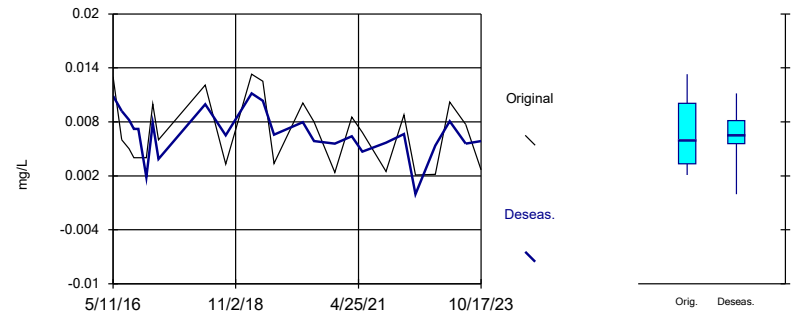
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
 Calculated Kruskal-Wallis statistic = 1.357
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Constituent: Barium, total Analysis Run 1/4/2024 1:23 PM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

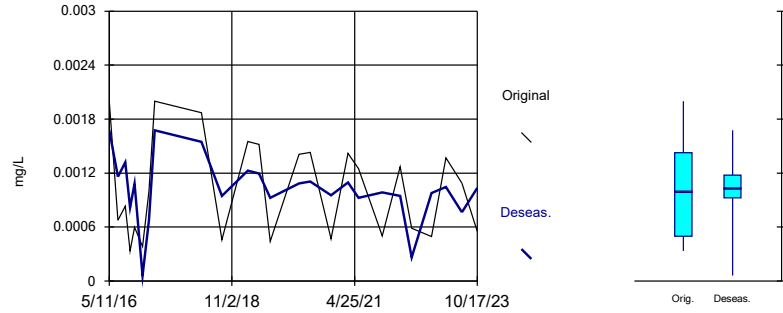
For the selected data, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
 Calculated Kruskal-Wallis statistic = 11.66
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 11.64
 Adjusted Kruskal-Wallis statistic (H') = 11.66



Constituent: Beryllium, total Analysis Run 1/4/2024 1:23 PM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

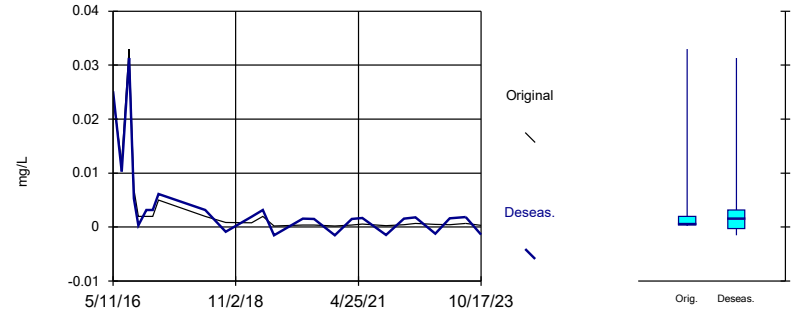
For the selected data, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
 Calculated Kruskal-Wallis statistic = 12.22
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 12.21
 Adjusted Kruskal-Wallis statistic (H') = 12.22



Constituent: Cadmium, total Analysis Run 1/4/2024 1:23 PM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

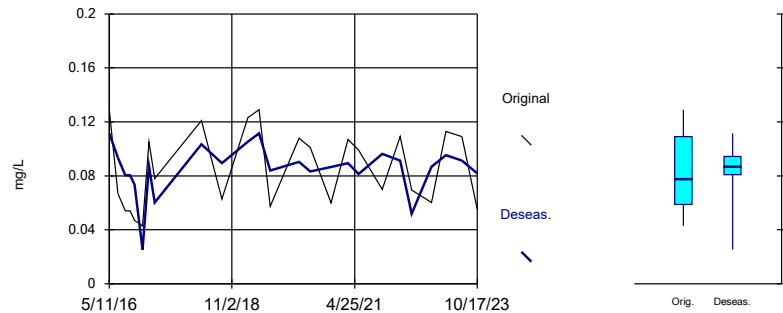
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
 Calculated Kruskal-Wallis statistic = 0.2228
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 0.2223
 Adjusted Kruskal-Wallis statistic (H') = 0.2228



Constituent: Chromium, total Analysis Run 1/4/2024 1:23 PM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

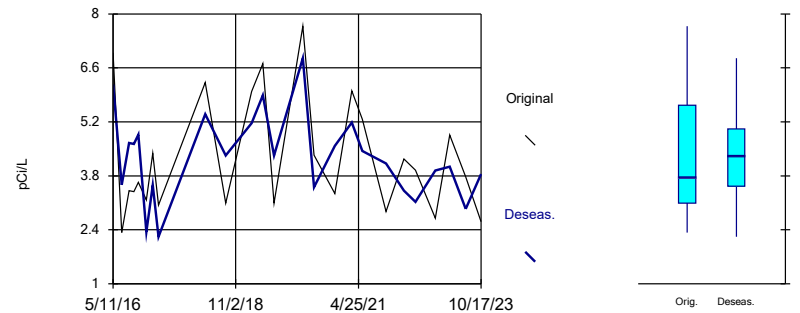
For the selected data, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
 Calculated Kruskal-Wallis statistic = 12.62
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 12.6
 Adjusted Kruskal-Wallis statistic (H') = 12.62



Constituent: Cobalt, total Analysis Run 1/4/2024 1:23 PM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

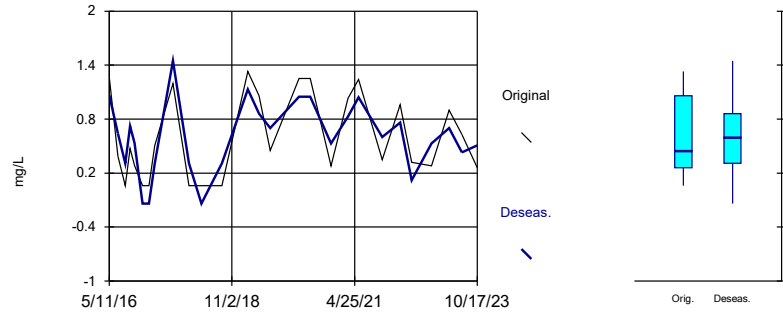
For the selected data, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
 Calculated Kruskal-Wallis statistic = 13
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Constituent: Combined Radium 226 + 228 Analysis Run 1/4/2024 1:23 PM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

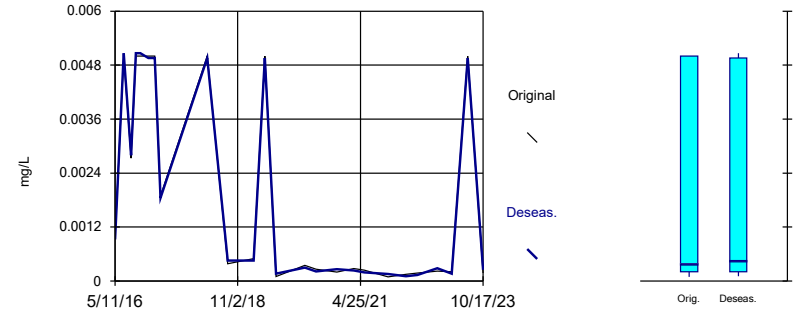
For the selected data, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
 Calculated Kruskal-Wallis statistic = 5.433
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H) was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 5.372
 Adjusted Kruskal-Wallis statistic (H) = 5.433



Constituent: Fluoride, total Analysis Run 1/4/2024 1:23 PM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

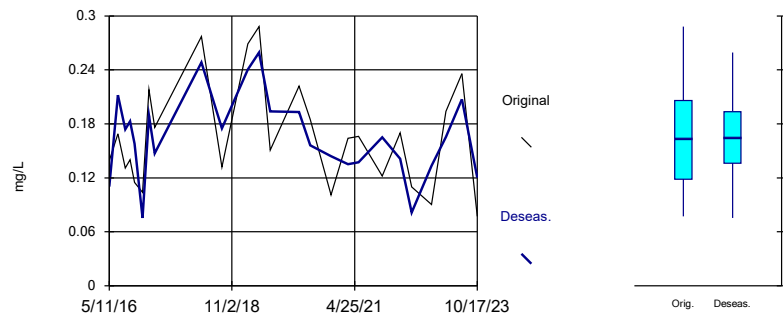
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
 Calculated Kruskal-Wallis statistic = 0.6235
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H) was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 0.6031
 Adjusted Kruskal-Wallis statistic (H) = 0.6235



Constituent: Lead, total Analysis Run 1/4/2024 1:23 PM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

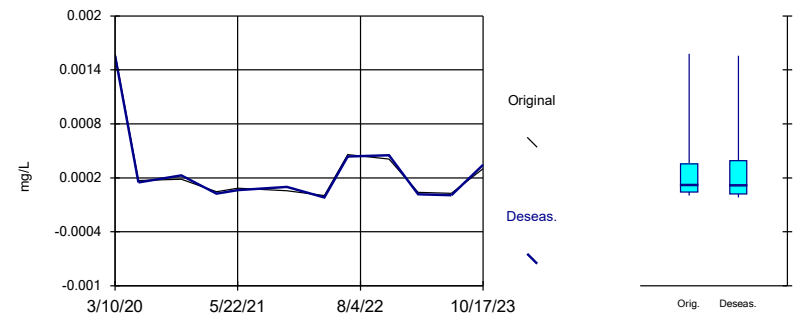
For the selected data, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
 Calculated Kruskal-Wallis statistic = 9.649
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Constituent: Lithium, total Analysis Run 1/4/2024 1:23 PM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

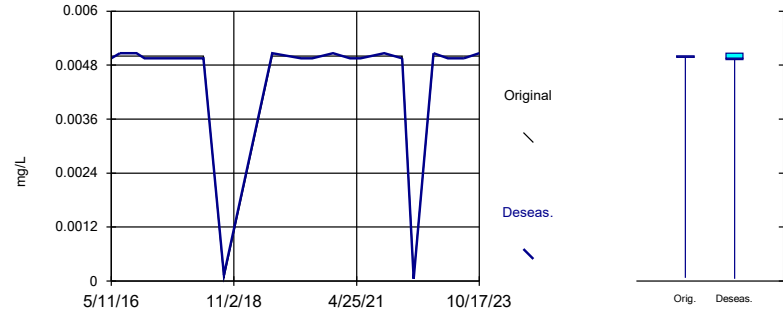
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
 Calculated Kruskal-Wallis statistic = 1.038
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Constituent: Mercury, total Analysis Run 1/4/2024 1:23 PM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

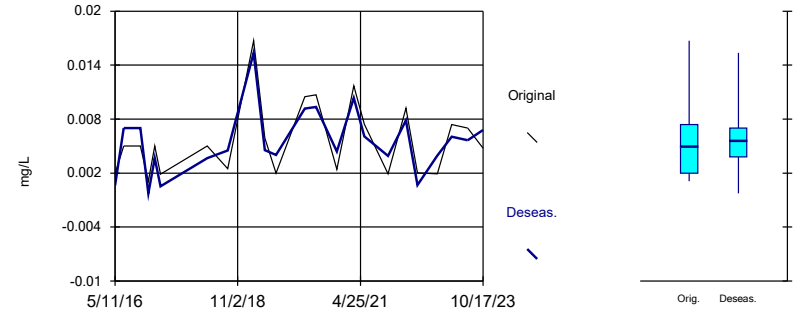
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
 Calculated Kruskal-Wallis statistic = 0.06434
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 0.01538
 Adjusted Kruskal-Wallis statistic (H') = 0.06434



Constituent: Molybdenum, total Analysis Run 1/4/2024 1:23 PM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

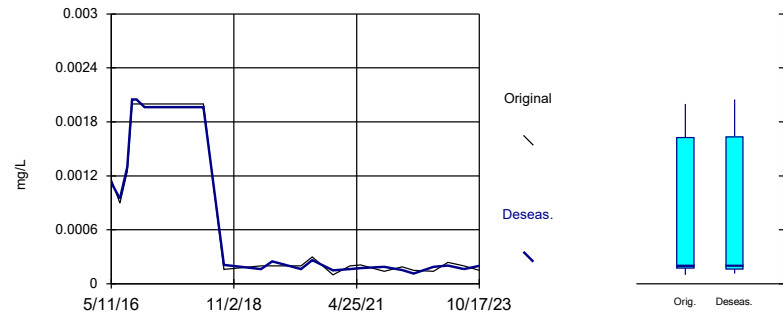
For the selected data, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
 Calculated Kruskal-Wallis statistic = 4.042
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 3.988
 Adjusted Kruskal-Wallis statistic (H') = 4.042



Constituent: Selenium, total Analysis Run 1/4/2024 1:23 PM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
 Calculated Kruskal-Wallis statistic = 1.625
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 1.585
 Adjusted Kruskal-Wallis statistic (H') = 1.625



Constituent: Thallium, total Analysis Run 1/4/2024 1:23 PM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

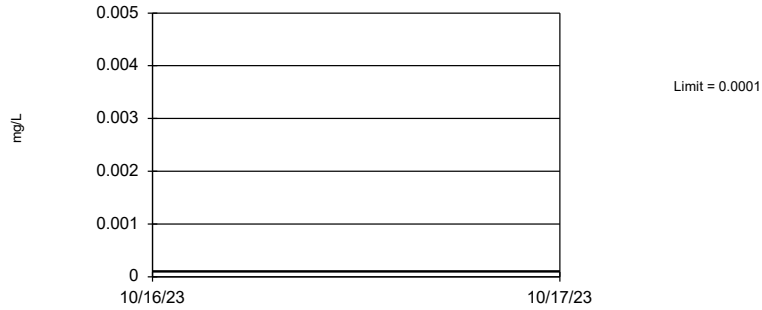
FIGURE E
UTLs

Upper Tolerance Limits Summary Table

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 1/3/2024, 6:42 PM

<u>Constituent</u>	<u>Upper Lim.</u>	<u>Bg N</u>	<u>Bg Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Antimony, total (mg/L)	0.0001	50	n/a	n/a	90	n/a	n/a	0.07694	NP Inter(NDs)
Arsenic, total (mg/L)	0.009	50	n/a	n/a	24	n/a	n/a	0.07694	NP Inter(normality)
Barium, total (mg/L)	0.05515	50	0.03305	0.0107	0	None	No	0.05	Inter
Beryllium, total (mg/L)	0.002	50	n/a	n/a	8	n/a	n/a	0.07694	NP Inter(normality)
Cadmium, total (mg/L)	0.00086	49	n/a	n/a	65.31	n/a	n/a	0.08099	NP Inter(NDs)
Chromium, total (mg/L)	0.004	50	n/a	n/a	26	n/a	n/a	0.07694	NP Inter(normality)
Cobalt, total (mg/L)	0.06	50	n/a	n/a	0	n/a	n/a	0.07694	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	2.983	50	1.308	0.8113	0	None	No	0.05	Inter
Fluoride, total (mg/L)	0.748	52	n/a	n/a	25	n/a	n/a	0.06944	NP Inter(normality)
Lead, total (mg/L)	0.005	50	n/a	n/a	70	n/a	n/a	0.07694	NP Inter(NDs)
Lithium, total (mg/L)	0.165	50	n/a	n/a	2	n/a	n/a	0.07694	NP Inter(normality)
Mercury, total (mg/L)	0.00001928	50	n/a	n/a	92	n/a	n/a	0.07694	NP Inter(NDs)
Molybdenum, total (mg/L)	0.005	46	n/a	n/a	93.48	n/a	n/a	0.09447	NP Inter(NDs)
Selenium, total (mg/L)	0.00386	50	n/a	n/a	54	n/a	n/a	0.07694	NP Inter(NDs)
Thallium, total (mg/L)	0.001443	48	n/a	n/a	83.33	n/a	n/a	0.08526	NP Inter(NDs)

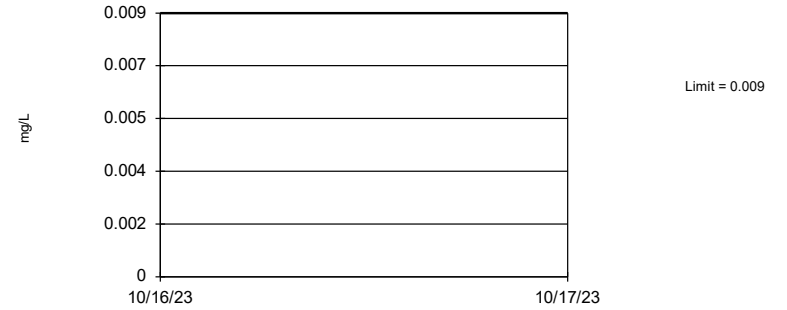
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 50 background values. 90% NDs. 91.21% coverage at alpha=0.01; 94.34% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.07694.

Constituent: Antimony, total Analysis Run 1/3/2024 6:42 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

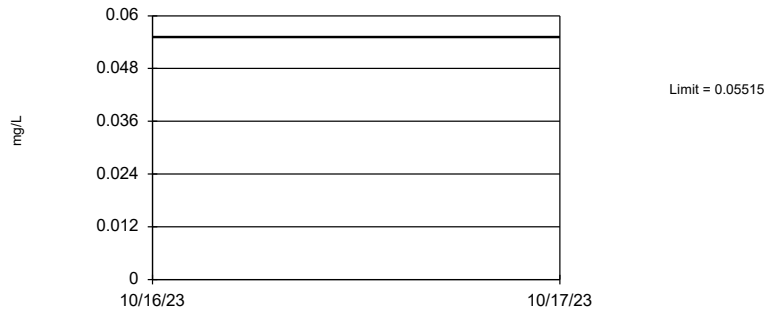
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 50 background values. 24% NDs. 91.21% coverage at alpha=0.01; 94.34% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.07694.

Constituent: Arsenic, total Analysis Run 1/3/2024 6:42 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary: Mean=0.03305, Std. Dev.=0.0107, n=50. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9354, critical = 0.935. Report alpha = 0.05.

Constituent: Barium, total Analysis Run 1/3/2024 6:42 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

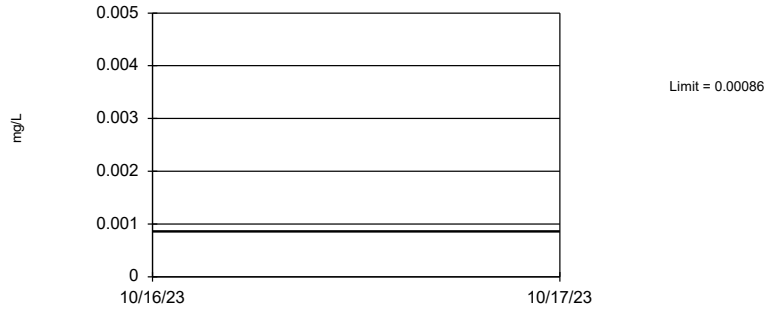
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 50 background values. 8% NDs. 91.21% coverage at alpha=0.01; 94.34% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.07694.

Constituent: Beryllium, total Analysis Run 1/3/2024 6:42 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

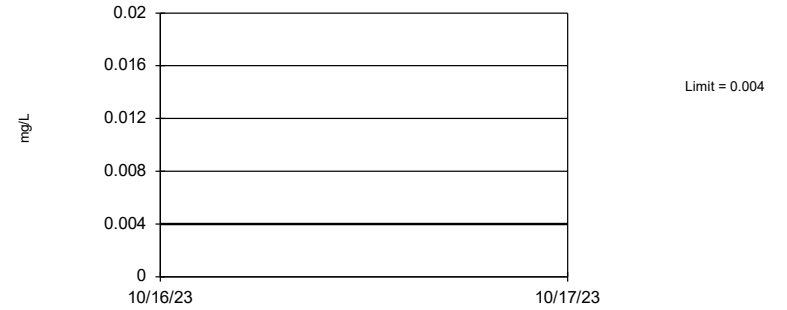
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 49 background values. 65.31% NDs. 91.21% coverage at alpha=0.01; 93.95% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.08099.

Constituent: Cadmium, total Analysis Run 1/3/2024 6:42 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 50 background values. 26% NDs. 91.21% coverage at alpha=0.01; 94.34% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.07694.

Constituent: Chromium, total Analysis Run 1/3/2024 6:42 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

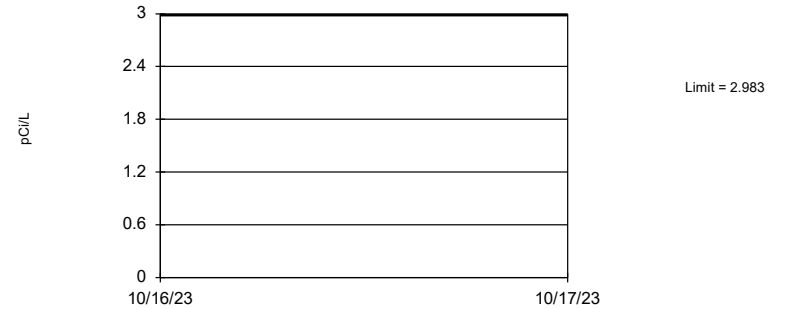
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 50 background values. 91.21% coverage at alpha=0.01; 94.34% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.07694.

Constituent: Cobalt, total Analysis Run 1/3/2024 6:42 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

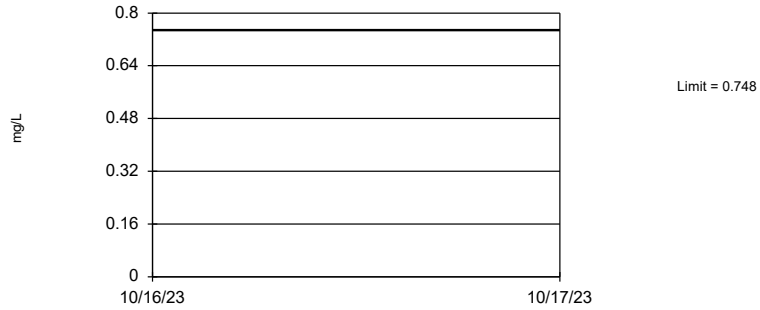
Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary: Mean=1.308, Std. Dev.=0.8113, n=50. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9413, critical = 0.935. Report alpha = 0.05.

Constituent: Combined Radium 226 + 228 Analysis Run 1/3/2024 6:42 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 52 background values. 25% NDs. 91.6% coverage at alpha=0.01; 94.34% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.06944.

Constituent: Fluoride, total Analysis Run 1/3/2024 6:42 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

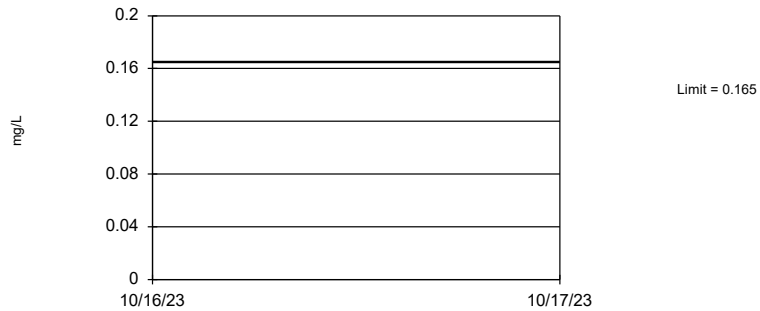
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 50 background values. 70% NDs. 91.21% coverage at alpha=0.01; 94.34% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.07694.

Constituent: Lead, total Analysis Run 1/3/2024 6:42 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

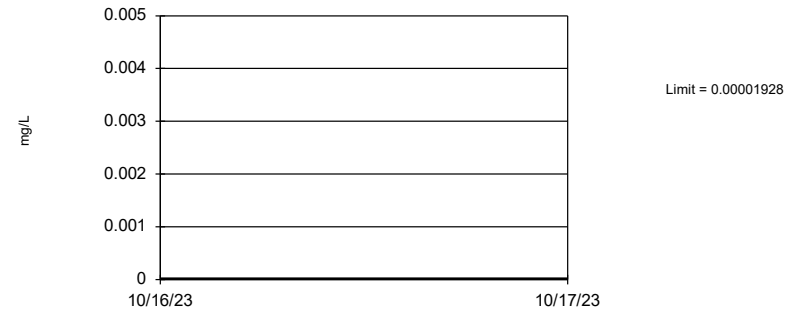
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 50 background values. 2% NDs. 91.21% coverage at alpha=0.01; 94.34% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.07694.

Constituent: Lithium, total Analysis Run 1/3/2024 6:42 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 50 background values. 92% NDs. 91.21% coverage at alpha=0.01; 94.34% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.07694.

Constituent: Mercury, total Analysis Run 1/3/2024 6:42 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

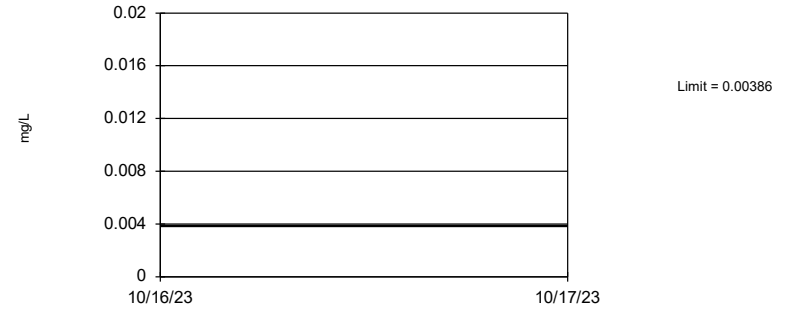
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 46 background values. 93.48% NDs. 90.43% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.09447.

Constituent: Molybdenum, total Analysis Run 1/3/2024 6:42 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

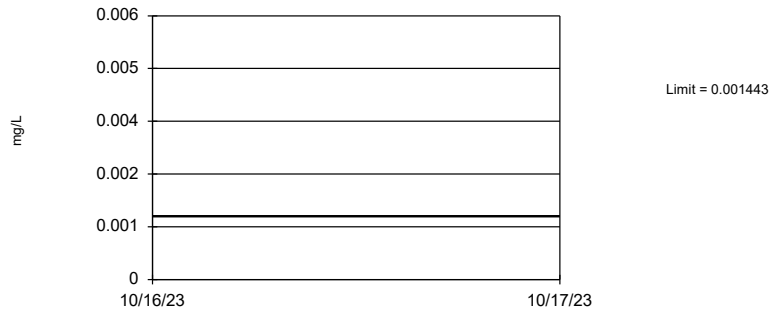
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 50 background values. 54% NDs. 91.21% coverage at alpha=0.01; 94.34% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.07694.

Constituent: Selenium, total Analysis Run 1/3/2024 6:42 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 48 background values. 83.33% NDs. 90.82% coverage at alpha=0.01; 93.95% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.08526.

Constituent: Thallium, total Analysis Run 1/3/2024 6:42 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

FIGURE F
GWPS

PIRKEY STACKOUT GWPS			
Constituent Name	MCL	Background Limit	GWPS
Antimony, Total (mg/L)	0.006	0.0001	0.006
Arsenic, Total (mg/L)	0.01	0.009	0.01
Barium, Total (mg/L)	2	0.055	2
Beryllium, Total (mg/L)	0.004	0.002	0.004
Cadmium, Total (mg/L)	0.005	0.00086	0.005
Chromium, Total (mg/L)	0.1	0.004	0.1
Cobalt, Total (mg/L)	n/a	0.06	0.06
Combined Radium, Total (pCi/L)	5	2.98	5
Fluoride, Total (mg/L)	4	0.75	4
Lead, Total (mg/L)	n/a	0.005	0.005
Lithium, Total (mg/L)	n/a	0.17	0.17
Mercury, Total (mg/L)	0.002	0.000019	0.002
Molybdenum, Total (mg/L)	n/a	0.005	0.005
Selenium, Total (mg/L)	0.05	0.0039	0.05
Thallium, Total (mg/L)	0.002	0.0014	0.002

*MCL = Maximum Contaminant Level

*GWPS = Groundwater Protection Standard

FIGURE G
Confidence Intervals

Confidence Intervals - Significant Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 7/8/2024, 10:03 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Beryllium, total (mg/L)	AD-22	0.008404	0.004951	0.004	Yes	27	0	None	No	0.01	Param.
Cobalt, total (mg/L)	AD-22	0.09905	0.07264	0.06	Yes	27	0	None	No	0.01	Param.
Mercury, total (mg/L)	AD-33	0.007068	0.003165	0.002	Yes	14	0	None	sqrt(x)	0.01	Param.

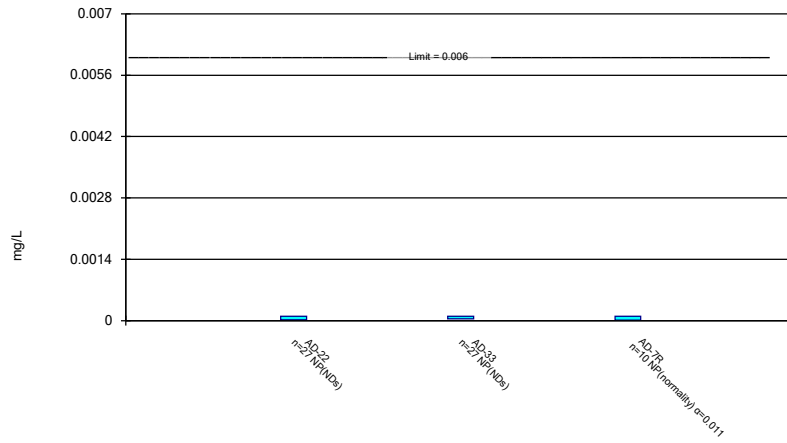
Confidence Intervals - All Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 7/8/2024, 10:03 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	AD-22	0.0001	0.00002	0.006	No	27	96.3	None	No	0.01	NP (NDs)
Antimony, total (mg/L)	AD-33	0.0001	0.00004	0.006	No	27	85.19	None	No	0.01	NP (NDs)
Antimony, total (mg/L)	AD-7R	0.0001	0.000009	0.006	No	10	50	None	No	0.011	NP (normality)
Arsenic, total (mg/L)	AD-22	0.005838	0.002801	0.01	No	27	0	None	ln(x)	0.01	Param.
Arsenic, total (mg/L)	AD-33	0.001224	0.0006673	0.01	No	26	7.692	None	ln(x)	0.01	Param.
Arsenic, total (mg/L)	AD-7R	0.001697	0.0003195	0.01	No	10	0	None	No	0.01	Param.
Barium, total (mg/L)	AD-22	0.048	0.0167	2	No	27	0	None	No	0.01	NP (normality)
Barium, total (mg/L)	AD-33	0.05203	0.04547	2	No	26	0	None	No	0.01	Param.
Barium, total (mg/L)	AD-7R	0.066	0.04094	2	No	10	0	None	No	0.01	Param.
Beryllium, total (mg/L)	AD-22	0.008404	0.004951	0.004	Yes	27	0	None	No	0.01	Param.
Beryllium, total (mg/L)	AD-33	0.0014	0.000945	0.004	No	27	0	None	No	0.01	NP (normality)
Beryllium, total (mg/L)	AD-7R	0.002256	0.001532	0.004	No	10	0	None	No	0.01	Param.
Cadmium, total (mg/L)	AD-22	0.001273	0.0007755	0.005	No	27	0	None	No	0.01	Param.
Cadmium, total (mg/L)	AD-33	0.001	0.000043	0.005	No	27	33.33	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	AD-7R	0.0003643	0.0002487	0.005	No	10	0	None	No	0.01	Param.
Chromium, total (mg/L)	AD-22	0.002	0.000395	0.1	No	27	11.11	None	No	0.01	NP (normality)
Chromium, total (mg/L)	AD-33	0.001235	0.0003404	0.1	No	26	11.54	None	ln(x)	0.01	Param.
Chromium, total (mg/L)	AD-7R	0.0009966	0.000214	0.1	No	10	0	None	ln(x)	0.01	Param.
Cobalt, total (mg/L)	AD-22	0.09905	0.07264	0.06	Yes	27	0	None	No	0.01	Param.
Cobalt, total (mg/L)	AD-33	0.01044	0.008764	0.06	No	26	0	None	No	0.01	Param.
Cobalt, total (mg/L)	AD-7R	0.02051	0.01673	0.06	No	10	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-22	4.783	3.438	5	No	27	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-33	2.966	1.71	5	No	27	0	None	x^(1/3)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-7R	3.575	2.054	5	No	10	0	None	No	0.01	Param.
Fluoride, total (mg/L)	AD-22	0.6843	0.2884	4	No	29	20.69	Kaplan-Meier	sqrt(x)	0.01	Param.
Fluoride, total (mg/L)	AD-33	0.2274	0.1087	4	No	28	32.14	Kaplan-Meier	sqrt(x)	0.01	Param.
Fluoride, total (mg/L)	AD-7R	0.1781	0.1319	4	No	10	0	None	No	0.01	Param.
Lead, total (mg/L)	AD-22	0.00273	0.00021	0.005	No	27	29.63	None	No	0.01	NP (normality)
Lead, total (mg/L)	AD-33	0.005	0.00022	0.005	No	26	38.46	None	No	0.01	NP (normality)
Lead, total (mg/L)	AD-7R	0.005	0.00007	0.005	No	10	40	None	No	0.011	NP (normality)
Lithium, total (mg/L)	AD-22	0.191	0.1365	0.17	No	27	0	None	No	0.01	Param.
Lithium, total (mg/L)	AD-33	0.0262	0.0188	0.17	No	27	3.704	None	No	0.01	NP (normality)
Lithium, total (mg/L)	AD-7R	0.0683	0.04558	0.17	No	10	0	None	No	0.01	Param.
Mercury, total (mg/L)	AD-22	0.0003666	0.00004577	0.002	No	14	7.143	None	x^(1/3)	0.01	Param.
Mercury, total (mg/L)	AD-33	0.007068	0.003165	0.002	Yes	14	0	None	sqrt(x)	0.01	Param.
Mercury, total (mg/L)	AD-7R	0.00008702	0.000005861	0.002	No	10	10	None	sqrt(x)	0.01	Param.
Molybdenum, total (mg/L)	AD-22	0.005	0.0001	0.005	No	25	92	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	AD-33	0.005	0.0007365	0.005	No	25	96	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	AD-7R	0.005	0.005	0.005	No	10	90	None	No	0.011	NP (NDs)
Selenium, total (mg/L)	AD-22	0.006349	0.002925	0.05	No	27	22.22	Kaplan-Meier	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	AD-33	0.00421	0.00139	0.05	No	27	29.63	None	No	0.01	NP (normality)
Selenium, total (mg/L)	AD-7R	0.001844	0.0003435	0.05	No	10	0	None	No	0.01	Param.
Thallium, total (mg/L)	AD-22	0.00125	0.00018	0.002	No	26	23.08	None	No	0.01	NP (normality)
Thallium, total (mg/L)	AD-33	0.0002	0.00005	0.002	No	26	65.38	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	AD-7R	0.001	0.00013	0.002	No	10	30	None	No	0.011	NP (normality)

Non-Parametric Confidence Interval

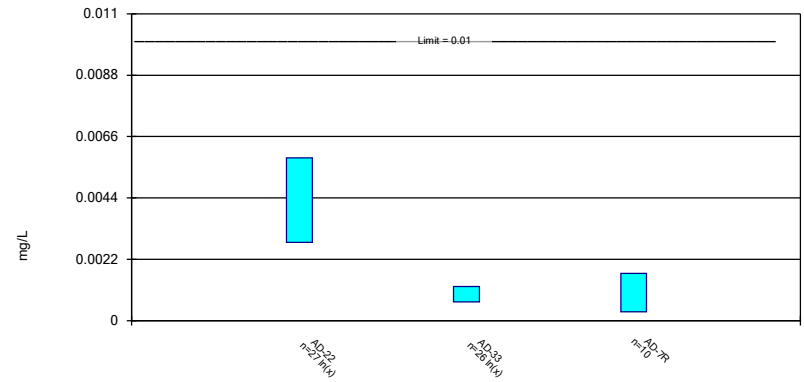
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted.



Constituent: Antimony, total Analysis Run 7/8/2024 10:02 AM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric Confidence Interval

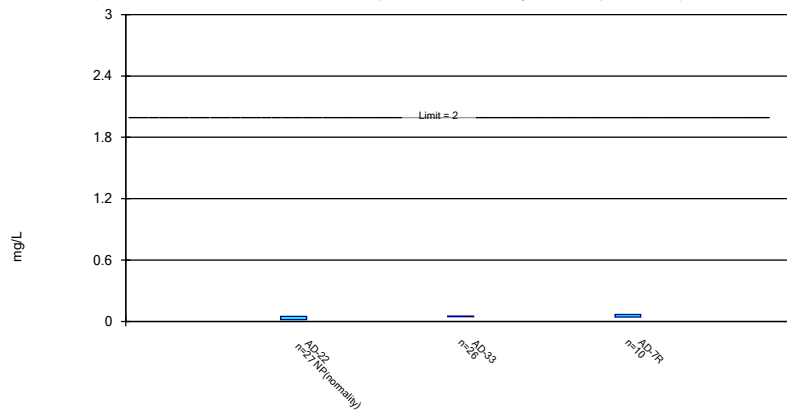
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, total Analysis Run 7/8/2024 10:02 AM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric and Non-Parametric (NP) Confidence Interval

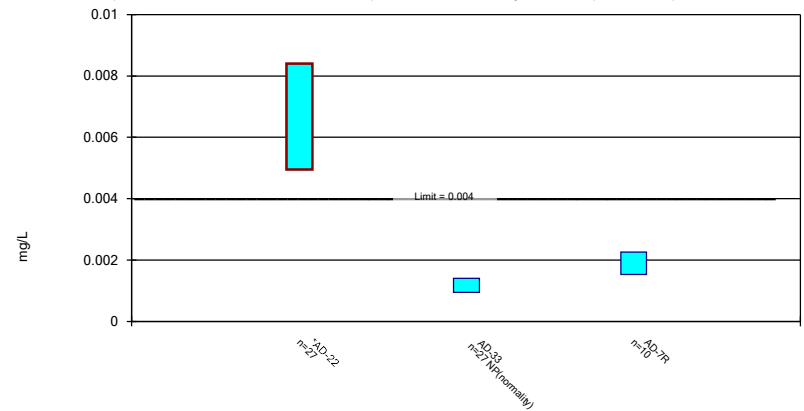
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 7/8/2024 10:02 AM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric and Non-Parametric (NP) Confidence Interval

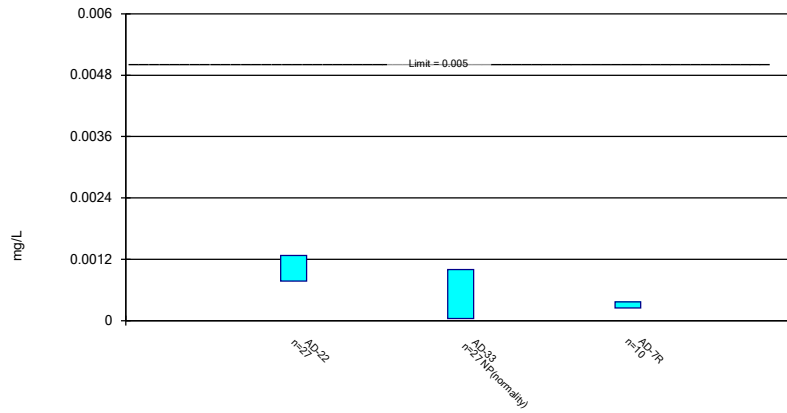
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total Analysis Run 7/8/2024 10:02 AM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric and Non-Parametric (NP) Confidence Interval

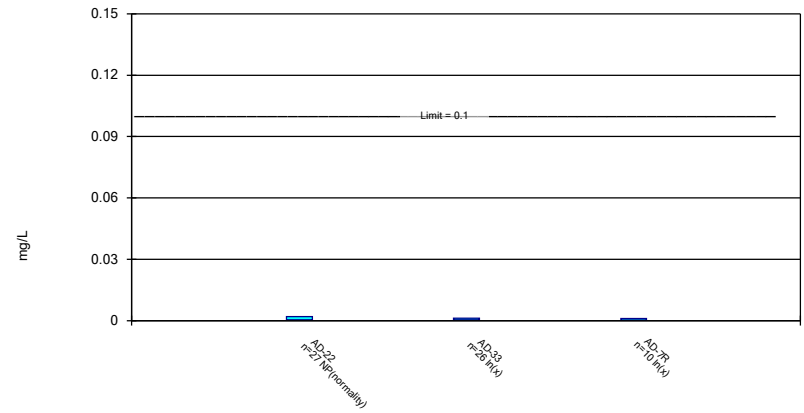
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 7/8/2024 10:02 AM View: Confidence Intervals
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric and Non-Parametric (NP) Confidence Interval

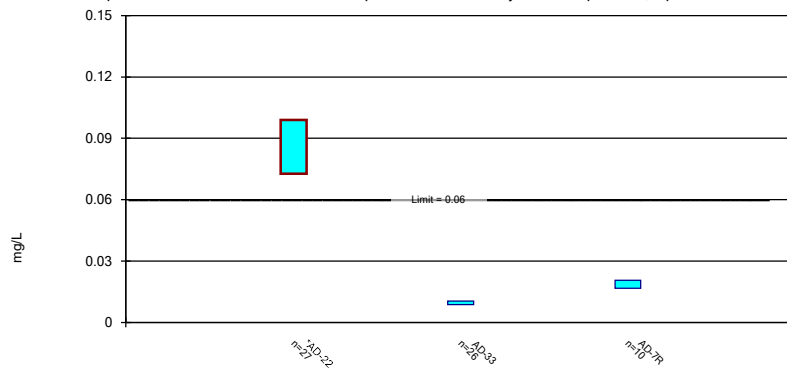
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 7/8/2024 10:02 AM View: Confidence Intervals
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric Confidence Interval

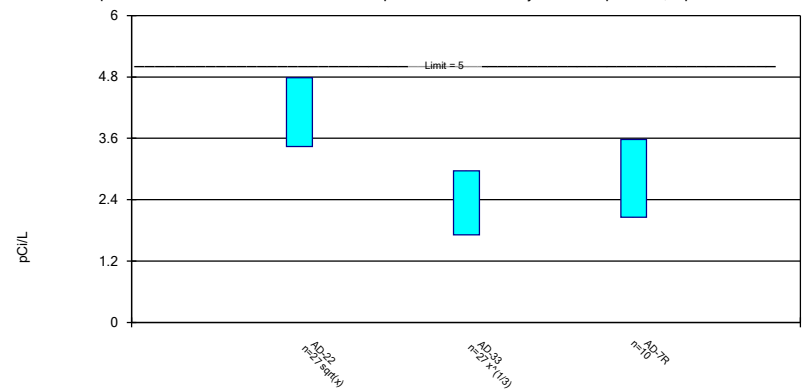
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 7/8/2024 10:02 AM View: Confidence Intervals
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric Confidence Interval

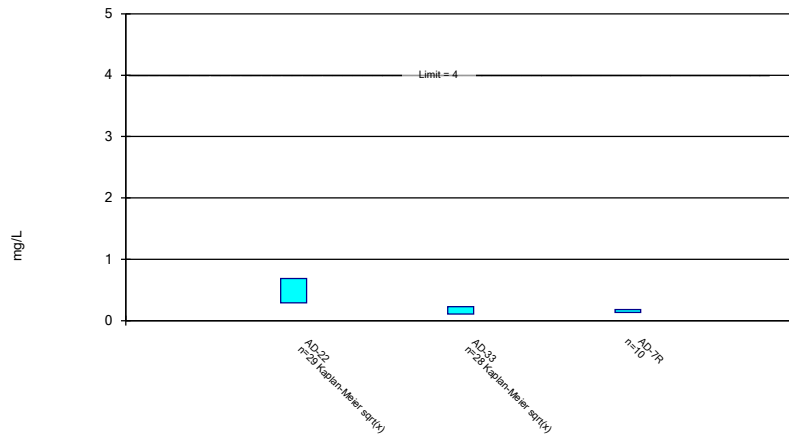
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 7/8/2024 10:02 AM View: Confidence Intervals
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric Confidence Interval

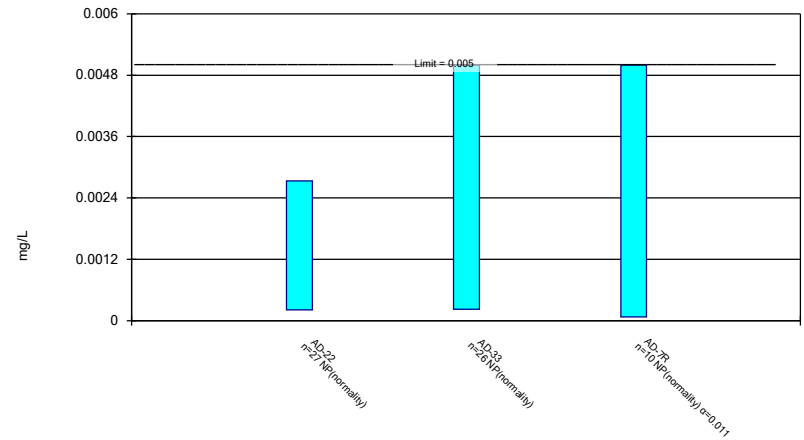
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 7/8/2024 10:02 AM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Non-Parametric Confidence Interval

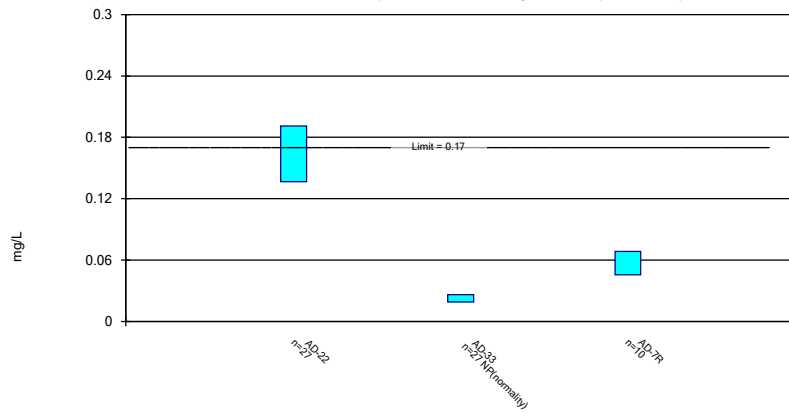
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted.



Constituent: Lead, total Analysis Run 7/8/2024 10:02 AM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric and Non-Parametric (NP) Confidence Interval

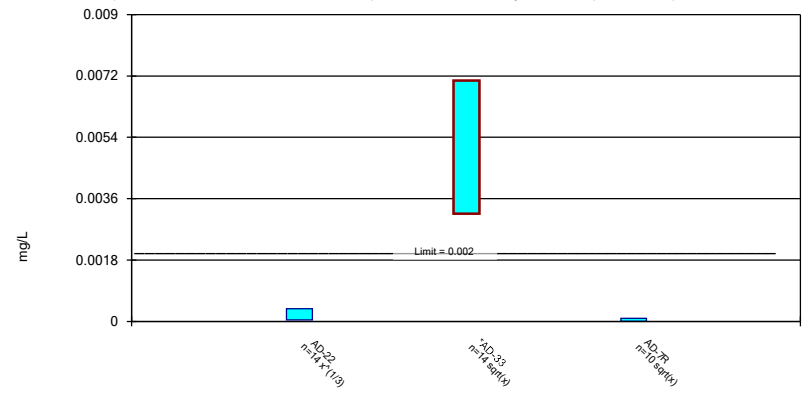
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 7/8/2024 10:02 AM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric Confidence Interval

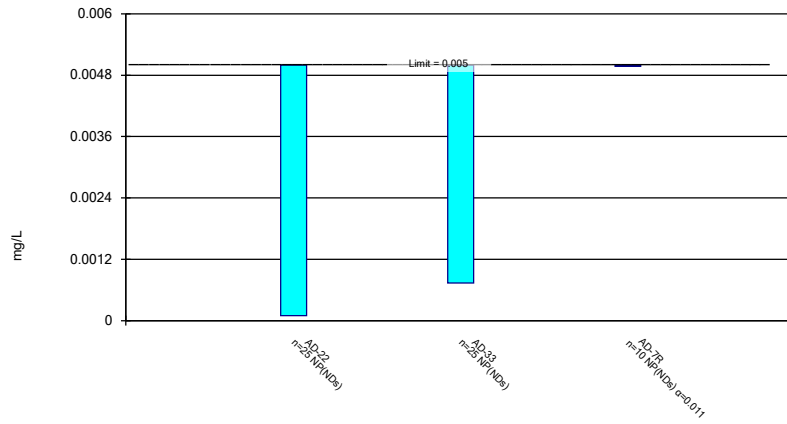
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Mercury, total Analysis Run 7/8/2024 10:02 AM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Non-Parametric Confidence Interval

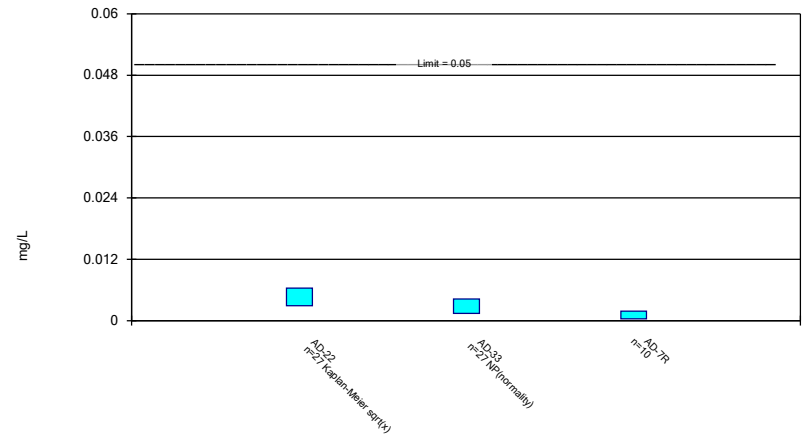
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted.



Constituent: Molybdenum, total Analysis Run 7/8/2024 10:02 AM View: Confidence Intervals
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric and Non-Parametric (NP) Confidence Interval

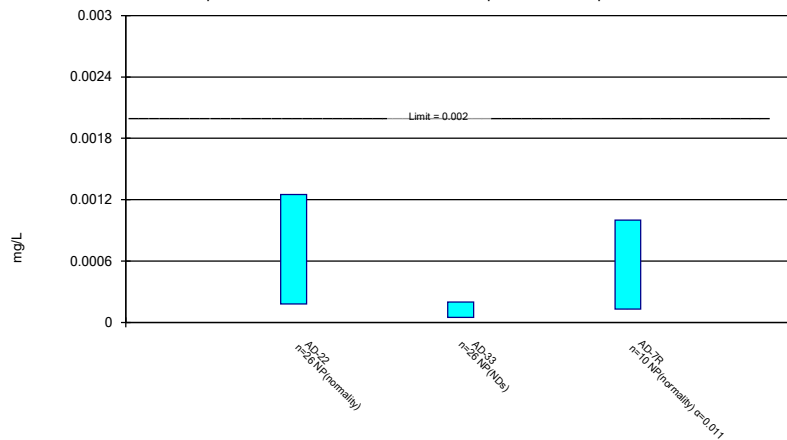
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 7/8/2024 10:02 AM View: Confidence Intervals
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Non-Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted.



Constituent: Thallium, total Analysis Run 7/8/2024 10:02 AM View: Confidence Intervals
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Deseasonalized Confidence Intervals - Well AD-22 - Significant Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 7/8/2024, 9:54 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Beryllium, total (mg/L)	AD-22	0.007945	0.005408	0.004	Yes	27	0	None	No	0.01	Param.
Cobalt, total (mg/L)	AD-22	0.09471	0.0799	0.06	Yes	27	0	None	x^2	0.01	Param.

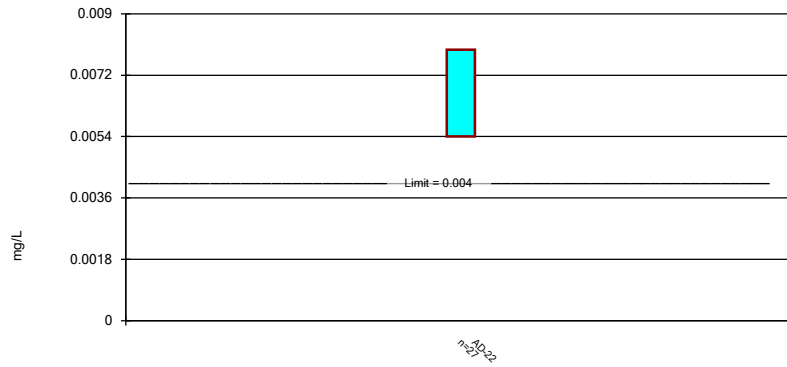
Deseasonalized Confidence Intervals - Well AD-22 - All Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 7/8/2024, 9:54 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	ND Adj.	Transform	Alpha	Method
Beryllium, total (mg/L)	AD-22	0.007945	0.005408	0.004	Yes	27	0	None	No	0.01	Param.
Cobalt, total (mg/L)	AD-22	0.09471	0.0799	0.06	Yes	27	0	None	x^2	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-22	4.769	3.631	5	No	27	0	None	No	0.01	Param.
Lithium, total (mg/L)	AD-22	0.1864	0.1412	0.17	No	27	0	None	No	0.01	Param.

Parametric Confidence Interval

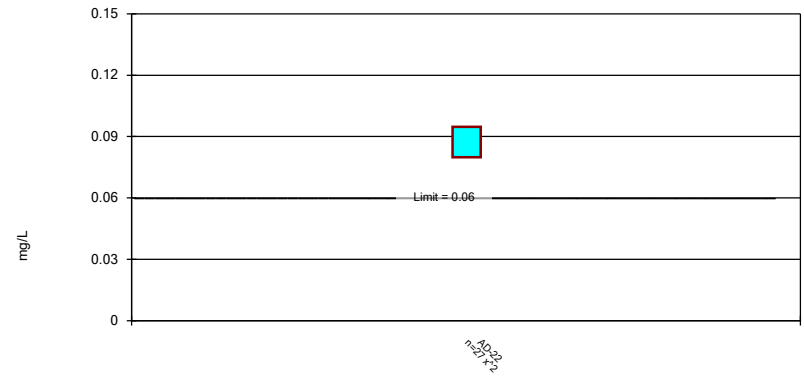
Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total, Alt. Values Analysis Run 7/8/2024 9:51 AM View: Deseasonalized Confidence
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric Confidence Interval

Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total, Alt. Values Analysis Run 7/8/2024 9:52 AM View: Deseasonalized Confidence
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric Confidence Interval

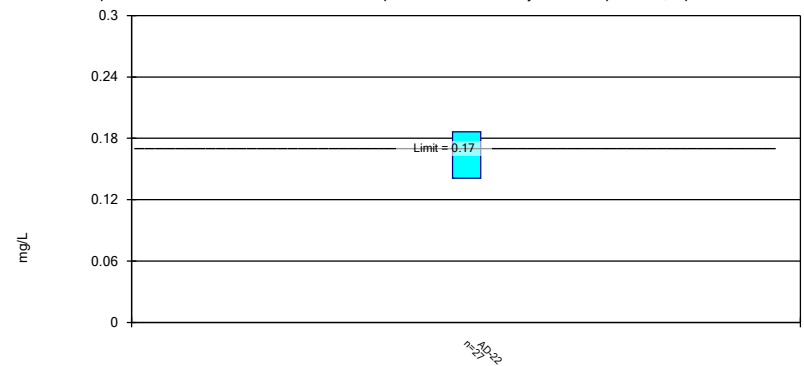
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228, Alt. Values Analysis Run 7/8/2024 9:52 AM View: Deseasonali
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total, Alt. Values Analysis Run 7/8/2024 9:53 AM View: Deseasonalized Confidence
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

FIGURE H
Appendix IV Trend Tests

Appendix IV Trend Tests - Significant Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 7/8/2024, 10:10 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Beryllium, total (mg/L)	AD-12 (bg)	-0.000005146	-147	-96	Yes	27	7.407	n/a	n/a	0.05	NP
Beryllium, total (mg/L)	AD-13 (bg)	-0.00004874	-100	-96	Yes	27	7.407	n/a	n/a	0.05	NP
Cobalt, total (mg/L)	AD-12 (bg)	-0.00003881	-112	-96	Yes	27	0	n/a	n/a	0.05	NP
Cobalt, total (mg/L)	AD-13 (bg)	0.0007044	100	96	Yes	27	0	n/a	n/a	0.05	NP
Mercury, total (mg/L)	AD-33	0.001018	53	37	Yes	14	0	n/a	n/a	0.05	NP

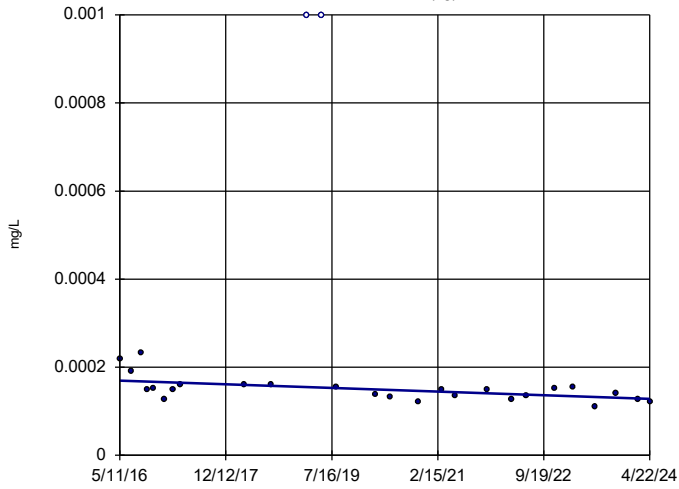
Appendix IV Trend Tests - All Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 7/8/2024, 10:10 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Beryllium, total (mg/L)	AD-12 (bg)	-0.000005146	-147	-96	Yes	27	7.407	n/a	n/a	0.05	NP
Beryllium, total (mg/L)	AD-13 (bg)	-0.00004874	-100	-96	Yes	27	7.407	n/a	n/a	0.05	NP
Beryllium, total (mg/L)	AD-22	-0.0003097	-53	-96	No	27	0	n/a	n/a	0.05	NP
Cobalt, total (mg/L)	AD-12 (bg)	-0.00003881	-112	-96	Yes	27	0	n/a	n/a	0.05	NP
Cobalt, total (mg/L)	AD-13 (bg)	0.0007044	100	96	Yes	27	0	n/a	n/a	0.05	NP
Cobalt, total (mg/L)	AD-22	0.001018	32	96	No	27	0	n/a	n/a	0.05	NP
Mercury, total (mg/L)	AD-12 (bg)	0	-35	-96	No	27	92.59	n/a	n/a	0.05	NP
Mercury, total (mg/L)	AD-13 (bg)	0	-67	-96	No	27	88.89	n/a	n/a	0.05	NP
Mercury, total (mg/L)	AD-33	0.001018	53	37	Yes	14	0	n/a	n/a	0.05	NP

Sen's Slope Estimator

AD-12 (bg)

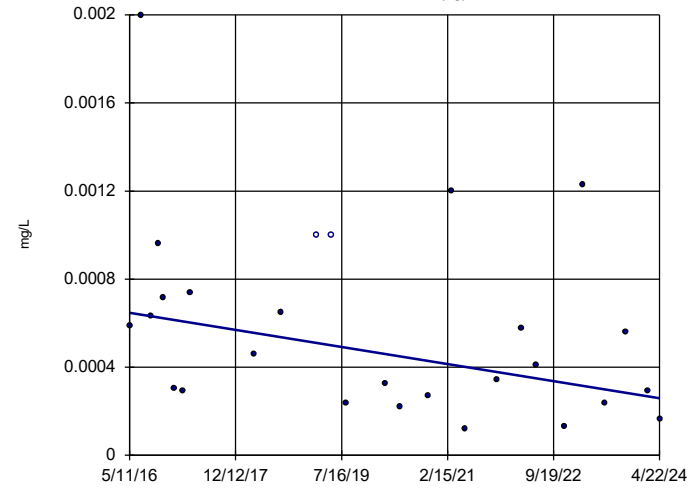


n = 27
Slope = -0.00005146
units per year.
Mann-Kendall
statistic = -147
critical = -96
Decreasing trend
significant at 95%
confidence level
($\alpha = 0.025$ per
tail).

Constituent: Beryllium, total Analysis Run 7/8/2024 10:08 AM View: Appendix IV Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-13 (bg)

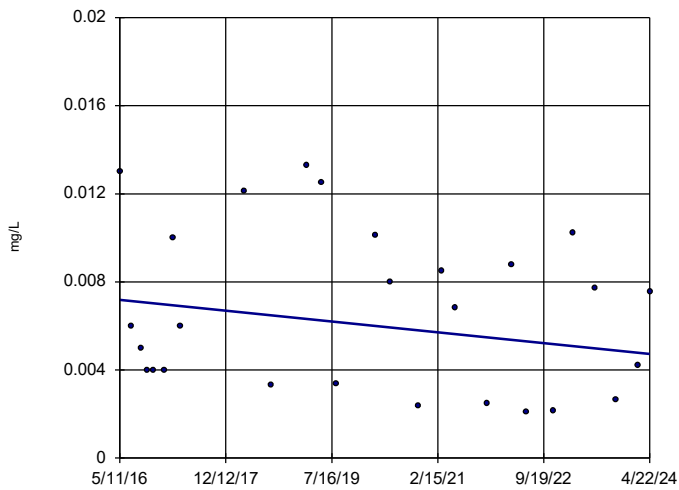


n = 27
Slope = -0.00004874
units per year.
Mann-Kendall
statistic = -100
critical = -96
Decreasing trend
significant at 95%
confidence level
($\alpha = 0.025$ per
tail).

Constituent: Beryllium, total Analysis Run 7/8/2024 10:08 AM View: Appendix IV Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-22

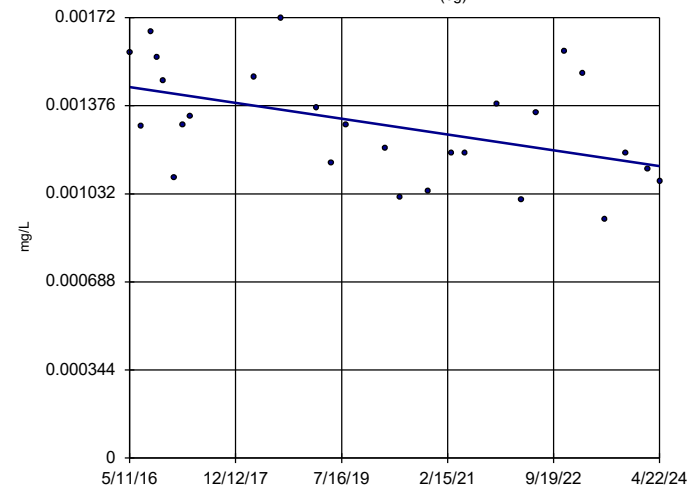


n = 27
Slope = -0.0003097
units per year.
Mann-Kendall
statistic = -53
critical = -96
Trend not sig-
nificant at 95%
confidence level
($\alpha = 0.025$ per
tail).

Constituent: Beryllium, total Analysis Run 7/8/2024 10:08 AM View: Appendix IV Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-12 (bg)

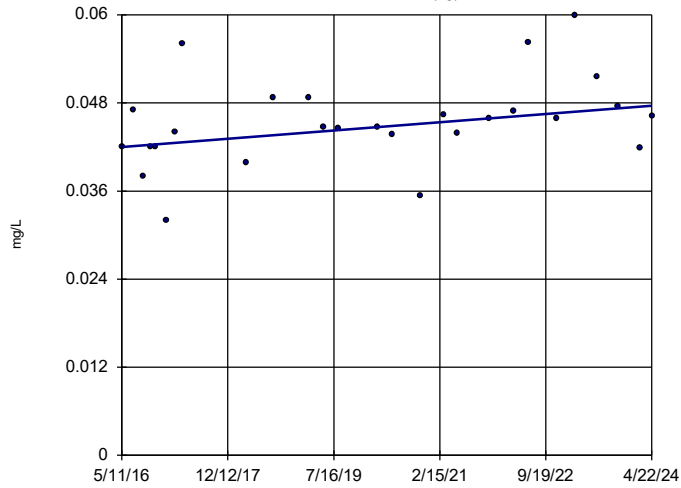


n = 27
Slope = -0.00003881
units per year.
Mann-Kendall
statistic = -112
critical = -96
Decreasing trend
significant at 95%
confidence level
($\alpha = 0.025$ per
tail).

Constituent: Cobalt, total Analysis Run 7/8/2024 10:08 AM View: Appendix IV Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-13 (bg)

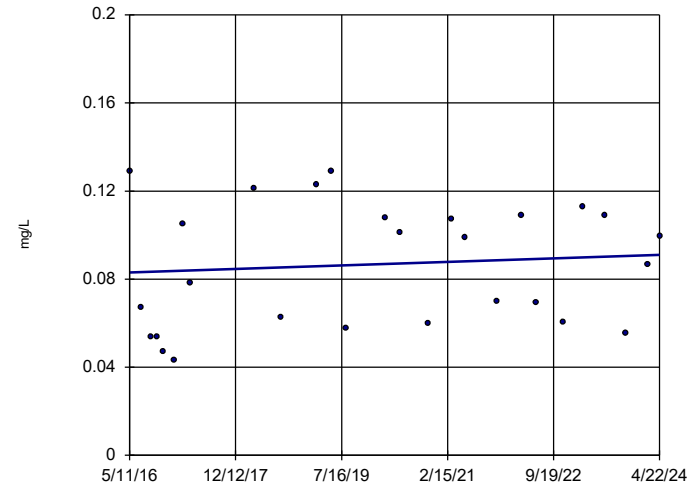


n = 27
 Slope = 0.0007044
 units per year.
 Mann-Kendall
 statistic = 100
 critical = 96
 Increasing trend
 significant at 95%
 confidence level
 ($\alpha = 0.025$ per
 tail).

Constituent: Cobalt, total Analysis Run 7/8/2024 10:08 AM View: Appendix IV Trend Tests
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-22

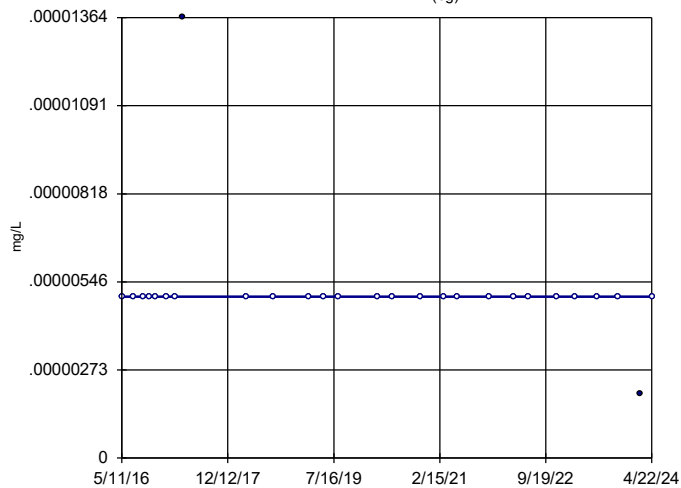


n = 27
 Slope = 0.001018
 units per year.
 Mann-Kendall
 statistic = 32
 critical = 96
 Trend not sig-
 nificant at 95%
 confidence level
 ($\alpha = 0.025$ per
 tail).

Constituent: Cobalt, total Analysis Run 7/8/2024 10:08 AM View: Appendix IV Trend Tests
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-12 (bg)

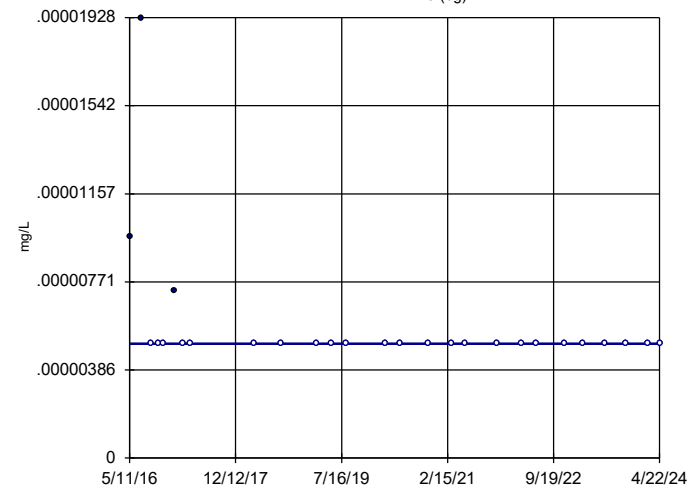


n = 27
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = -35
 critical = -96
 Trend not sig-
 nificant at 95%
 confidence level
 ($\alpha = 0.025$ per
 tail).

Constituent: Mercury, total Analysis Run 7/8/2024 10:08 AM View: Appendix IV Trend Tests
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-13 (bg)

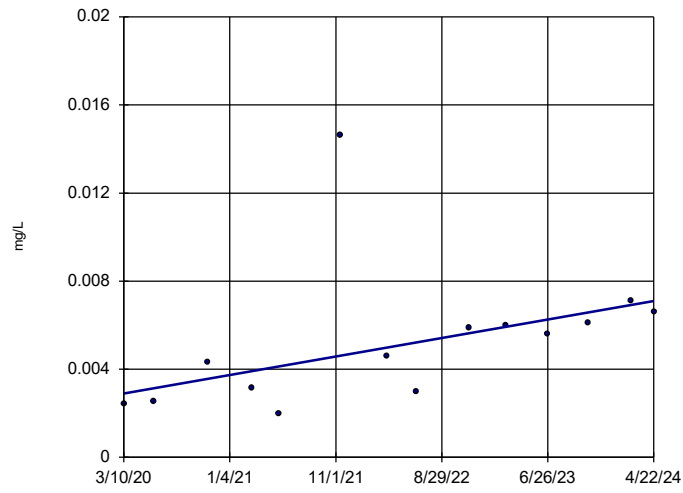


n = 27
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = -67
 critical = -96
 Trend not sig-
 nificant at 95%
 confidence level
 ($\alpha = 0.025$ per
 tail).

Constituent: Mercury, total Analysis Run 7/8/2024 10:08 AM View: Appendix IV Trend Tests
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-33



n = 14
Slope = 0.001018
units per year.
Mann-Kendall
statistic = 53
critical = 37
Increasing trend
significant at 95%
confidence level
($\alpha = 0.025$ per
tail).

Constituent: Mercury, total Analysis Run 7/8/2024 10:08 AM View: Appendix IV Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

STATISTICAL ANALYSIS SUMMARY 2024 2ND SEMIANNUAL EVENT FLUE GAS DESULFURIZATION (FGD) STACKOUT AREA

H.W. Pirkey Power Plant Hallsville, Texas

Prepared for

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Columbus, Ohio 43215-2372

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Project Number: CHA8500B

December 2024

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Table 2: Appendix IV Groundwater Protection Standards

Table 3: Appendix III Data Summary

LIST OF ATTACHMENTS

Attachment A: Certification by Qualified Professional Engineer

Attachment B: Data Quality Review Memorandum

Attachment C: Statistical Analysis Output

ACRONYMS AND ABBREVIATIONS

ASD	alternative source demonstration
CCR	coal combustion residuals
FGD	flue gas desulfurization
GWPS	groundwater protection standard
LCL	lower confidence limit
LPL	lower prediction limit
mg/L	milligrams per liter
PQL	practical quantitation limit
QA/QC	quality assurance and quality control
SSI	statistically significant increase
SSL	statistically significant level
TCEQ	Texas Commission on Environmental Quality
TDS	total dissolved solids
UPL	upper prediction limit

1. INTRODUCTION

In accordance with Texas Commission on Environmental Quality (TCEQ) regulations regarding the disposal of coal combustion residuals (CCRs) in landfills and surface impoundments (Texas Administrative Code Title 30, Chapter 352), groundwater monitoring has been conducted at the Flue Gas Desulfurization (FGD) Stackout Area, an existing CCR unit at the Pirkey Power Plant in Hallsville, Texas. Recent groundwater monitoring results were used to identify concentrations of Appendix IV constituents that are above site-specific groundwater protection standards (GWPSs).

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for boron, chloride, and sulfate at the FGD Stackout Area (Geosyntec 2018). An alternative source was not identified at the time, so assessment monitoring was initiated and GWPSs were set in accordance with § 352.951(b). One assessment monitoring event was conducted at the FGD Stackout Area in September 2024 in accordance with § 352.951(a). The results of the September 2024 assessment event are documented in this report.

Prior to conducting the statistical analyses, the groundwater data underwent several validation tests, including those for completeness, sample tracking accuracy, transcription errors, and consistent use of measurement units. No data quality issues were identified which would impact data usability.

The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. GWPSs were reestablished for the Appendix IV parameters. Confidence intervals were calculated for Appendix IV parameters at the compliance wells to assess whether statistically significant levels (SSLs) of Appendix IV parameters were present above the GWPS. SSLs were identified for beryllium, cobalt, lead, and mercury. Therefore, either the unit will move to an assessment of corrective measures, or an alternative source demonstration (ASD) will be conducted to evaluate if the unit can remain in assessment monitoring. Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A.

2. FGD STACKOUT AREA EVALUATION

2.1 Data Validation and QA/QC

One set of samples was collected for analysis from each background and compliance well to meet the requirements of § 352.951(a) in September 2024. Samples from the September 2024 sampling event were analyzed for all Appendix III and Appendix IV parameters. A summary of data collected during this assessment monitoring event are presented in Table 1.

Chemical analysis was completed by a National Environmental Laboratory Accreditation Program–certified analytical laboratory. The laboratory completed analysis of quality assurance and quality control (QA/QC) samples such as laboratory reagent blanks, continuing calibration verification samples, and laboratory fortified blanks.

A data quality review was completed to assess if the data met the objectives outlined in TCEQ Draft Technical Guidance No. 32 related to groundwater sampling and analysis (TCEQ 2020). The data were determined usable for supporting project objectives, as documented in the review memorandum provided in Attachment B. The analytical data were imported into a Microsoft Access database, where checks were completed to assess the accuracy of sample location identification and analyte identification. Where necessary, unit conversions were applied to standardize reported units across all sampling events. Exported data files were created for use with the Sanitas™ v.10.0.23a statistics software. The export file was checked against the analytical data for transcription errors and completeness.

2.2 Statistical Analysis

Statistical analyses for the FGD Stackout Area were conducted in accordance with the November 2021 *Statistical Analysis Plan* (Geosyntec 2021). Time series plots and results for all completed statistical tests are provided in Attachment C. The data obtained in September 2024 were screened for potential outliers. Two potential outliers were identified for cadmium at upgradient wells AD-12 and AD-13; however, the cadmium values were not flagged due to low concentrations below the maximum contaminant level. No outliers were removed for this event.

2.2.1 Establishment of GWPSs

A GWPS was established for each Appendix IV parameter in accordance with the Statistical Analysis Plan (Geosyntec 2021). The established GWPS was set to whichever was greater of the background concentration and the maximum contaminant level for each Appendix IV parameter. To determine background concentrations, an upper tolerance limit was calculated using data that were pooled from the background wells collected during the background monitoring and assessment monitoring events. Tolerance limits were calculated parametrically with 95% coverage and 95% confidence for barium and combined radium. Nonparametric tolerance limits were calculated for arsenic, beryllium, chromium, cobalt, fluoride, and lithium due to apparent nonnormal distributions, and for antimony, cadmium, lead, mercury, molybdenum, selenium, and thallium due to a high nondetect frequency. Upper tolerance limits and the final GWPSs are summarized in Table 2.

2.2.2 Evaluation of Potential Appendix IV SSLs

A confidence interval was constructed for each Appendix IV parameter at each compliance well. Confidence limits were generally calculated parametrically ($\alpha = 0.01$). However, nonparametric confidence limits were calculated in some cases (e.g., when the data did not appear to be normally distributed or when the nondetect frequency was too high).

Seasonal patterns were observed for several parameters at AD-22 based on the time series graphs (Attachment C). Kruskal-Wallis tests were performed to test whether differences between the results from different seasons were statistically significant for all Appendix IV constituents. Statistically significant differences were found for beryllium, cadmium, cobalt, combined radium, fluoride, lithium, and selenium at AD-22. Where the Kruskal-Wallis test found significant seasonal effects and at least one reported result was above the GWPS, the data for these well/parameter pairs were deseasonalized so that the resulting confidence limits correctly account for seasonality as a predictable pattern rather than a random variation or a release.

An SSL was concluded if the lower confidence limit (LCL) exceeded the GWPS (i.e., if the entire confidence interval was above the GWPS). Calculated confidence limits are shown in Attachment C.

The following SSLs were identified at the Pirkey FGD Stackout Area:

- The deseasonalized LCL for beryllium was above the GWPS of 0.00400 milligrams per liter (mg/L) at AD-22 (0.00531 mg/L).
- The deseasonalized LCL for cobalt was above the GWPS of 0.0600 mg/L at AD-22 (0.0771 mg/L).
- The LCL for lead exceeded the GWPS of 0.000200 mg/L at AD-33 (0.000208 mg/L).
- The LCL for mercury exceeded the GWPS of 0.00200 mg/L at AD-33 (0.00335 mg/L).

As a result, the Pirkey FGD Stackout Area will either move to an assessment of corrective measures or an ASD will be conducted to evaluate if the unit can remain in assessment monitoring.

2.2.3 Establishment of Appendix III Prediction Limits

Upper prediction limits (UPLs) were previously established for all Appendix III parameters following the background monitoring period (Geosyntec 2018). Intrawell tests were used to evaluate potential SSIs for calcium, pH and total dissolved solids (TDS), and interwell tests were used to evaluate potential SSIs for boron, chloride, fluoride, and sulfate. Interwell and intrawell prediction limits are updated periodically during the assessment monitoring period as sufficient data become available.

Mann-Whitney (Wilcoxon rank-sum) tests were performed to determine whether the newer data are affected by a release from the FGD Stackout Area. Because the interwell Appendix III limits and the Appendix IV GWPSs are based on data from background wells which we would not expect to have been impacted by a release, these tests were used for intrawell Appendix III tests only.

Mann-Whitney tests were used to compare the medians of historical data (May 2016 – June 2022) to the new compliance samples (November 2022 – April 2024) for calcium, pH, and TDS. Results were evaluated to determine if the medians of the two groups were statistically different at the 99% confidence level. Where no statistically significant difference was found, the new compliance data were added to the background dataset. Where a statistically significant difference was found between the medians of the two groups, the data were reviewed to evaluate the cause of the difference and to determine if adding newer data to the background dataset, truncating historical data and using only the newer data, or continuing to use the existing background dataset was most appropriate. If the differences appeared to have been caused by a release, then the previous background dataset would have continued to be used. Because insufficient data was available during the previous update to establish prediction limits for AD-7R, trend tests were used to evaluate concentrations observed at AD-7R through April 2024.

The complete Mann-Whitney and trend test results and a summary of the significant findings can be found in Attachment C. The datasets for all wells were updated to include both the historical and more recent results.

Prediction limits for the interwell tests were calculated using data collected through the September 2024 assessment monitoring event. New background well data were tested for outliers before being added to the background data set. Background well data were also evaluated for statistically significant trends using the Sen’s Slope/Mann-Kendall trend test, and the results are included in Attachment C. Seasonality was observed in the datasets for calcium, pH, and TDS at AD-22 (Attachment C); as a result, the data for these well/parameter pairs were deseasonalized so that the resulting prediction limits correctly account for seasonality as a predictable pattern.

After the revised background set was established, a parametric or nonparametric analysis was selected based on the distribution of the data and the frequency of nondetect data. Estimated results under the reporting limit (i.e., practical quantitation limit [PQL]) but above the method detection limit—that is, “J-flagged” data—were considered detections and the estimated results were used in the statistical analyses. Nonparametric analyses were selected for data sets with at least 50% nondetect data or data sets that could not be normalized. Parametric analyses were selected for data sets (either transformed or untransformed) that passed the Shapiro-Wilk/Shapiro-Francia test for normality. The Kaplan-Meier nondetect adjustment was applied to data sets with between 15% and 50% nondetect data. For data sets with fewer than 15% nondetect data, nondetect data were replaced with one half of the PQL. The selected analysis (i.e., parametric or nonparametric) and transformation (where applicable) for each background data set are shown in Attachment C.

Interwell UPLs were updated for boron, chloride, fluoride, and sulfate using historical data through September 2024. Intrawell UPLs for calcium, pH, and TDS and intrawell lower prediction limits (LPLs) for pH were updated using data through April 2024 to represent background values. The updated prediction limits are summarized in Table 3. The prediction limits were calculated for a one-of-two retesting procedure: If at least one sample in a series of two is not above the UPL (or, in the case of pH, is neither less than the LPL nor greater than the UPL), then it can be concluded that an SSI has not occurred. In practice, where the initial result does not exceed the UPL (or, in the case of pH, is neither less than the LPL nor greater than the UPL), a second sample will not be collected. The retesting procedures allow achieving an acceptably high statistical power to detect changes at downgradient wells for constituents evaluated using intrawell prediction limits.

2.2.4 Evaluation of Potential Appendix III SSIs

While SSLs were identified, a review of the Appendix III results were also completed to assess whether concentrations of Appendix III parameters at the compliance wells were above background concentrations. Data collected during the September 2024 assessment monitoring event from each compliance well were compared to updated interwell and intrawell prediction limits to assess whether the results are above background values (Table 3).

The following concentrations were above the UPLs:

- Boron concentrations were above the interwell UPL of 0.0857 mg/L at AD-7R (0.241 mg/L) and AD-33 (0.122 mg/L).
- Chloride concentrations were above the interwell UPL of 54.5 mg/L at AD-22 (108 mg/L).
- Sulfate concentrations were above the interwell UPL of 138 mg/L at AD-22 (276 mg/L).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the September 2024 sample was above the UPL or below the LPL in the case of pH.

2.3 Conclusions

A semiannual assessment monitoring event was conducted in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, and no QA/QC issues that impacted data usability were identified. A review of outliers identified two potential outliers in the September 2024 data; however, no outliers were flagged and removed. GWPSs were reestablished for the Appendix IV parameters. A confidence interval was constructed at each compliance well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval was above the GWPS. SSLs were identified for beryllium, cobalt, lead, and mercury. Appendix III parameters were compared to calculated prediction limits, with exceedances identified for boron, chloride, and sulfate.

Based on this evaluation, the Pirkey FGD Stackout Area CCR unit will either move to an assessment of corrective measures or an ASD will be conducted to evaluate if the unit can remain in assessment monitoring.

3. REFERENCES

Geosyntec. 2018. Statistical Analysis Summary – Flue Gas Desulfurization Stackout Area, H.W. Pirkey Power Plant, Hallsville, Texas. Geosyntec Consultants, Inc. January.

Geosyntec. 2021. Statistical Analysis Plan – H.W. Pirkey Power Plant. Geosyntec Consultants, Inc. November.

TCEQ. 2020. Topic: Coal Combustion Residuals (CCR) Groundwater Monitoring and Corrective Action Draft Technical Guidance No. 32. May.

TABLES

Table 1. Groundwater Data Summary
Statistical Analysis Summary
Pirkey Plant – Flue Gas Desulfurization Stackout Area

Parameter	Unit	AD-7R	AD-12	AD-13	AD-22	AD-33
		Compliance	Background	Background	Compliance	Compliance
		9/16/2024	9/16/2024	9/16/2024	9/16/2024	9/16/2024
Antimony	µg/L	0.1 U1	0.011 J1	0.1 U1	0.1 U1	0.1 U1
Arsenic	µg/L	0.66	0.09 J1	1.53	1.11	0.54
Barium	µg/L	57.9	16.6	34.0	17.0	43.2
Beryllium	µg/L	2.0 J1	2.5 U1	2.5 U1	2.56	1.30
Boron	mg/L	0.241	0.018 J1	0.052	0.028 J1	0.122
Cadmium	µg/L	0.336	0.007 J1	0.02 U1	0.531	0.049
Calcium	mg/L	2.68	0.23	8.21	12.3 M1	1.54
Chloride	mg/L	24.5	4.45	29.0	108	10.1
Chromium	µg/L	0.30	0.43	0.28 J1	0.40	0.39
Cobalt	µg/L	16.0	1.06	35.6	74.3 M1	9.82
Combined Radium	pCi/L	4.77	2.84	2.13	2.76	2.34
Fluoride	mg/L	0.12	0.07	0.35	0.22	0.20
Lead	µg/L	0.08 J1	0.08 J1	0.2 U1	0.08 J1	0.28
Lithium	mg/L	0.053	0.006 J1	0.155	0.125 M1	0.0224
Mercury	µg/L	0.023	0.002 J1	0.005 U1	0.093	6.500
Molybdenum	µg/L	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1
Selenium	µg/L	0.64	0.19 J1	0.5 U1	2.37	1.73
Sulfate	mg/L	43.3	3.1	54.1	276	54.4
Thallium	µg/L	0.11 J1	0.02 J1	0.2 U1	0.16 J1	0.06 J1
Total Dissolved Solids	mg/L	190	60	210	620	170
pH	SU	4.7	3.0	5.8	4.3	4.0

Notes:

J1: Estimated value. Parameter was detected in concentrations below the reporting limit.

M1: the associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U1: Non-detect value. For statistical analysis, parameters which were not detected were replaced with the reporting limit.

µg/L: micrograms per liter

**Table 2. Appendix IV Groundwater Protection Standards
Statistical Analysis Summary
Pirkey Plant – Flue Gas Desulfurization Stackout Area**

Constituent Name	MCL	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600	0.000100	0.00600
Arsenic, Total (mg/L)	0.0100	0.00900	0.0100
Barium, Total (mg/L)	2.00	0.0544	2.00
Beryllium, Total (mg/L)	0.00400	0.00200	0.00400
Cadmium, Total (mg/L)	0.00500	0.000860	0.00500
Chromium, Total (mg/L)	0.100	0.00400	0.100
Cobalt, Total (mg/L)	n/a	0.0600	0.0600
Combined Radium, Total (pCi/L)	5.00	3.11	5.00
Fluoride, Total (mg/L)	4.00	0.748	4.00
Lead, Total (mg/L)	n/a	0.00020	0.00020
Lithium, Total (mg/L)	n/a	0.165	0.165
Mercury, Total (mg/L)	0.00200	0.0000193	0.00200
Molybdenum, Total (mg/L)	n/a	0.00110	0.00110
Selenium, Total (mg/L)	0.0500	0.00386	0.0500
Thallium, Total (mg/L)	0.00200	0.00144	0.00200

Notes:

1. Calculated UTL (Upper Tolerance Limit) represents site-specific background values.
2. Gray cells indicate the GWPS is based on the calculated UTL. Either the UTL is higher than the MCL or an MCL does not exist.

FGD: flue gas desulfurization

GWPS: groundwater protection standard

MCL: maximum contaminant level

mg/L: milligrams per liter

n/a: not applicable

pCi/L: picocuries per liter

**Table 3. Appendix III Data Summary
Statistical Analysis Summary
Pirkey Plant – Flue Gas Desulfurization Stackout Area**

Analyte	Unit	Description	AD-7R	AD-22	AD-33
			9/16/2024	9/16/2024	9/16/2024
Boron	mg/L	Interwell Background Value (UPL)	0.0857		
		Analytical Result	0.241	0.028	0.122
Calcium	mg/L	Intrawell Background Value (UPL)	4.53	15.2	2.38
		Analytical Result	2.68	12.3	1.54
Chloride	mg/L	Interwell Background Value (UPL)	54.5		
		Analytical Result	24.5	108	10.1
Fluoride	mg/L	Interwell Background Value (UPL)	0.748		
		Analytical Result	0.12	0.22	0.20
pH	SU	Intrawell Background Value (UPL)	5.8	4.9	4.6
		Intrawell Background Value (LPL)	3.9	3.6	3.2
		Analytical Result	4.7	4.3	4.0
Sulfate	mg/L	Interwell Background Value (UPL)	138		
		Analytical Result	43.3	276	54.4
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	266	721	215
		Analytical Result	190	620	170

Notes:

1. Bold values exceed the background value.

2. Background values are shaded gray.

LPL: lower prediction limit

mg/L: milligrams per liter

SU: standard units

UPL: upper prediction limit

ATTACHMENT A

Certification by Qualified Professional Engineer

Certification by Qualified Professional Engineer

I certify that selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Pirkey FGD Stackout Area CCR management area and that the requirements of § 352.931(a) have been met.

David Anthony Miller

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



112498

License Number

Texas

Licensing State

12.24.2024

Date

ATTACHMENT B
Data Quality Review Memorandum

Memorandum

Date: December 2, 2024
To: David Miller (AEP)
Copies to: Pryce Warren (AEP)
From: Allison Kreinberg (Geosyntec)
Subject: Data Quality Review – Pirkey Power Plant
September 2024 Sampling Event

This memorandum summarizes the findings of a data quality review for groundwater samples collected at the Pirkey Power Plant in Hallsville, Texas in September 2024. The groundwater samples were collected to comply with the Texas Commission on Environmental Quality’s (TCEQ’s) regulations regarding the disposal of coal combustion residuals (CCRs) in landfills and surface impoundments (Title 30 Chapter 352, “CCR Rule”). 40 CFR 257 Appendix III and IV constituents were analyzed.

The following sample data groups (SDGs) were associated with the groundwater samples collected during the September 2024 sampling event and are reviewed in this memorandum:

- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 242807
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 242840

The data included in these SDGs were reviewed to assess if they met the objectives outlined in TCEQ Draft Technical Guideline No. 32¹ prior to submittal of this data to TCEQ. Only data quality issues which affected data used for compliance with the CCR Rule are discussed herein (i.e., issues associated with filtered samples or additional parameters beyond those included in 40 CFR 257 Appendix III and IV are not discussed).

The following data quality issues were identified:

¹ TCEQ. Topic: Coal Combustion Residuals (CCR) Groundwater Monitoring and Corrective Action: Technical Guidance No. 32. May 2020.

- As reported in SDG 242840, chromium and lithium were detected in the field blank sample “Field Blank” collected on 9/17/24. The detected estimated (J-flagged) chromium concentration in the field blank (0.23 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias in the chromium results for all groundwater samples.
- As reported in SDG 242840, chromium was detected in the equipment blank sample “Equipment Blank” collected on 9/17/24. The detected estimated (J-flagged) chromium concentration in the equipment blank (0.22 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias in the chromium results for all groundwater samples.
- As reported in SDG 242840, the relative percent difference (RPD) for chromium concentrations from parent sample “AD-22” and duplicate sample “Duplicate 1” was 22%. The RPD for lead concentrations from AD-22 and Duplicate was 32%. The AD-22 results for chromium, and lead should be considered estimated.
- As reported in SDG 242840, Radium-228 was detected in the method blank (MB) above the UCL of 0.95 pCi/L and the associated samples were flagged B1: analyte detected in the MB at or above the method criteria. The associated results should be considered estimated.
- As reported in SDG 242840, laboratory control spike (LCS) recovery for Radium-228 (136%) was above the acceptable limit of 125%. The associated sample (AD-31) was flagged L1: the associated LCS or laboratory control spike duplicate (LCS D) recovery was outside acceptance limits. Insufficient sample was provided for radium duplicates, and AD-31 was flagged O2: insufficient sample was received to perform the matrix spike (MS) and duplicate analyses with this sample batch. The AD-31 Radium-228 result should be considered estimated.
- As reported in SDG 242840, matrix spike duplicate (MSD) recoveries for calcium (129%) and cobalt (205%) were above the acceptable limit of 125%, and MSD recovery for lithium (66.1%) was below the acceptable limit of 75%. The associated sample (AD-22) was flagged M1: the associated MS or MSD recovery was outside acceptance limits. The AD-22 calcium, cobalt, and lithium results should be considered estimated.

Based on these findings, the majority of the data reported in these SDGs are considered accurate and complete. Although the QC failures mentioned above will result in some limitations of data use since the affected results are considered estimated or have elevated reporting limits, the data are considered usable for supporting project objectives.

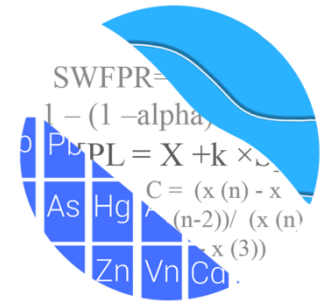
ATTACHMENT C

Statistical Analysis Output

GROUNDWATER STATS CONSULTING

December 11, 2024

Geosyntec Consultants
Attn: Ms. Allison Kreinberg
500 W. Wilson Bridge Road, Suite 250
Worthington, OH 43085



Re: Pirkey Stackout
Background Update & Assessment Monitoring Event – September 2024

Dear Ms. Kreinberg,

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the background update and statistical analysis of groundwater data for the September 2024 sample event for American Electric Power Inc.'s Pirkey Stackout. The analysis complies with the Texas Commission of Environmental Quality rule 30 TAC 352 as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

Sampling began at the site for the CCR program in 2016. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** AD-12 and AD-13
- **Downgradient wells:** AD-22, AD-33, and AD-7R

Downgradient well AD-7 was previously in the well network, but has been removed, and replacement well AD-7R has been sampled since June 2020. Appendix III constituents are evaluated using prediction limits, which require a minimum of 8 samples. Appendix IV constituents are evaluated using confidence intervals, which require a minimum of 4 samples. Sufficient samples have been collected for well AD-7R to be evaluated for both Appendix III and IV during this update.

Data were sent electronically to Groundwater Stats Consulting, and the statistical analysis was conducted according to the Statistical Analysis Plan and screening evaluation prepared by GSC and approved by Dr. Kirk Cameron, PhD Statistician with MacStat Consulting, primary author of the USEPA Unified Guidance, and Senior Advisor to GSC.

Data were sent electronically, and the statistical analysis was reviewed by Dr. Jim Loftis, Civil & Environmental Engineering professor emeritus at Colorado State University and Senior Advisor to Groundwater Stats Consulting.

The CCR program consists of the following constituents:

- **Appendix III** (Detection Monitoring) – boron, calcium, chloride, fluoride, pH, sulfate, and TDS
- **Appendix IV** (Assessment Monitoring) – antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226 + 228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium

Time series plots for these parameters are provided for all wells and constituents; and are used to evaluate concentrations over the entire record (Figure A). Additionally, box plots are included for all constituents at upgradient and downgradient wells (Figure B). All flagged values may also be seen in a lighter font and disconnected symbol on the time series graphs (Figure C).

Due to varying detection limits in background data sets, a substitution of the most recent reporting limit is used for all non-detects. Note that for reports conducted on a well-by-well or intrawell basis (time series, box plots, trend tests, and confidence intervals), substitution of the most recent reporting limit is performed separately for each well/parameter pair. In some cases, the reporting limit provided by the laboratory contains varying limits for a given parameter; therefore, the substitution may differ from well to well. Reporting limit changes may occur depending on laboratory capabilities and, in the case of fluoride and lead, elevated historic reporting limits were replaced by the most recent laboratory reporting limit of 0.06 mg/L and 0.0002 mg/L, respectively, which were substituted across all non-detects for all wells.

A change in reported concentrations of more recent data was previously noted for mercury relative to historical concentrations in wells AD-22 and AD-33. In order to construct confidence intervals that represent current groundwater quality conditions and eliminate the influence of the trend, earlier observations were truncated from the records. A list of well/constituent pairs using truncated records follows this report.

In the previous background screening, data at all wells were evaluated for the following: 1) outliers; 2) trends; 3) most appropriate statistical method for Appendix III parameters based on site characteristics of groundwater data upgradient of the facility; and 4) eligibility of downgradient wells when intrawell statistical methods are recommended. Power curves were provided with the background screening report submitted in

December 2017 and demonstrated that the selected statistical methods for Appendix III parameters comply with the USEPA Unified Guidance recommendations.

Summary of Appendix III Statistical Methods

The most appropriate statistical methods for each parameter as recommended in the 2017 screening analysis were as follows:

- Intrawell prediction limits, combined with a 1-of-2 resample plan, for calcium, pH, and TDS
- Interwell prediction limits, combined with a 1-of-2 resample plan, for boron, chloride, fluoride, and sulfate

Parametric prediction limits are utilized when the screened historical data follow a normal or transformed-normal distribution. When data cannot be normalized or the majority of data are non-detects, a nonparametric test is utilized. The distribution of data is tested using the Shapiro-Wilk/Shapiro-Francia test for normality. After testing for normality and performing any adjustments as discussed below (US EPA, 2009), data are analyzed using either parametric or non-parametric prediction limits as appropriate. Non-detects are handled as follows:

- No statistical analyses are required on wells and analytes containing 100% non-detects (USEPA Unified Guidance, 2009, Chapter 6).
- When data contain <15% non-detects, simple substitution of one-half the reporting limit is utilized in the statistical analysis. The reporting limit utilized for non-detects is the most practical quantification limit (PQL) as reported by the laboratory.
- When data contain between 15-50% non-detects, the Kaplan-Meier non-detect adjustment is applied to the background data for parametric limits. This technique adjusts the mean and standard deviation of the historical concentrations to account for concentrations below the reporting limit.
- Nonparametric prediction limits are used on data containing greater than 50% non-detects.

Natural systems continuously evolve due to physical changes made to the environment. Examples include capping a landfill, paving areas near a well, or lining a drainage channel to prevent erosion. Periodic updating of background statistical limits will be necessary to accommodate these types of changes. In the interwell case, statistical limits may be updated with all upgradient well data after careful screening for new outliers. In the intrawell case, data for all wells and constituents are re-evaluated when a minimum of 4

new data points are available to determine whether earlier concentrations are representative of present-day groundwater quality. In some cases, the earlier portion of data are deselected prior to construction of limits in order to provide sensitive limits that will rapidly detect changes in groundwater quality. Even though the data are excluded from the calculation, the values will continue to be reported and shown in tables and graphs.

Summary of Original Background Screening Conducted in December 2017

Outlier Evaluation

Time series plots were used to identify suspected outliers, or extreme values that would result in limits that would not readily identify changes in groundwater, in proposed background data. Suspected outliers at all wells for Appendix III and Appendix IV parameters were formally tested using Tukey's box plot method and, when identified by Tukey's test or visual comparison with other data, flagged in the computer database with "o" and deselected prior to construction of statistical limits.

Tukey's outlier test noted a few outliers, and the results were submitted with the screening report. For the downgradient well data that are used to construct confidence intervals, values that are marginally high relative to the rest of the data are retained unless there is particular justification for excluding them. However, during the 9/7/16 sample event, several reported measurements for a number of constituents were remarkably high, likely suggesting a systematic error. Therefore, those values were flagged as outliers.

Trend Test Evaluation

The Sen's Slope/Mann Kendall trend test was used to evaluate all data at each well to identify statistically significant increasing or decreasing trends. When statistically significant or visually apparent trends are found, the background data record may be truncated as needed in order to remove the trend and improve representation of background groundwater quality for calculation of statistical limits.

The results of the trend analyses showed no statistically significant trends; therefore, no adjustments were made to the data sets at the time of the screening.

Appendix III – Determination of Statistical Methods

The most appropriate statistical method, i.e., interwell or intrawell prediction limits as listed above for each Appendix III parameter, was recommended based on two criteria:

1) spatial variability of each parameter among upgradient wells and 2) comparison of average concentrations in each downgradient well to the expected upper limit of concentrations across all upgradient wells. The results of the application of Analysis of Variance, upgradient tolerance limits, and downgradient confidence intervals were included in the 2017 screening study report.

Summary of Background Update

Fall 2022 & Fall 2023

Proposed background data were originally screened during December 2017. Prior to updating background data sets during the Fall 2022 analysis for calcium, pH, and TDS (which are evaluated using intrawell methods) at all wells and during the Fall 2023 analysis for boron, chloride, fluoride, and sulfate (which are evaluated using interwell methods) at upgradient wells, data were re-evaluated using Tukey's outlier test and visual screening. No additional values were flagged as all reported measurements were similar to remaining measurements within the record. Additionally, no changes to previously flagged outliers were made.

Several Appendix III constituents appeared to have seasonal patterns for downgradient well AD-22 and were tested for seasonality. All Appendix III constituents evaluated with intrawell prediction limits at this well were tested for seasonality using the Kruskal-Wallis test. Significant seasonality was identified for all Appendix III parameters that are evaluated with intrawell prediction limits (calcium, pH, and TDS); therefore, deseasonalized prediction limits were constructed for these constituents at well AD-22.

For calcium, pH, and TDS which are tested using intrawell prediction limits, the Mann-Whitney (Wilcoxon Rank Sum) test was used to compare the medians of historical data through June 2020 to the new compliance samples at each well through June 2022 to evaluate whether the groups are statistically different at the 99% confidence level. When no statistically significant difference is found, background data may be updated with compliance data. No statistically significant differences were identified; therefore, all records were updated with compliance data.

The Sen's Slope/Mann Kendall trend test was used to evaluate data at upgradient wells for boron, chloride, fluoride, and sulfate to identify statistically significant increasing or decreasing trends at the 99% confidence level. Although a statistically significant decreasing trend was identified for sulfate in upgradient well AD-12, the magnitude of the trend is marginal relative to the respective concentrations; therefore, no adjustments were made at this time. The statistically significant increasing trends identified for chloride

and sulfate in upgradient well AD-13 also required no adjustments since the influence of the trends would not affect the respective nonparametric interwell prediction limits, and the current limits were representative of current groundwater quality conditions.

Fall 2024

Outlier Analysis

During this analysis, Tukey's outlier test and visual screening were used to evaluate data through April 2024 at all wells for calcium, pH, and TDS, which are tested using intrawell prediction limits, and through September 2024 using pooled upgradient well data for boron, chloride, fluoride, and sulfate, which are tested using interwell prediction limits (Figure C). Tukey's outlier test on data at all wells for calcium, pH, and TDS did not identify any values; however, visual screening identified a low level non-detect measurement for TDS in upgradient well AD-12. In order to reduce variation, this measurement was flagged as an outlier. Tukey's outlier test on pooled upgradient well data did not identify any values for boron, chloride, fluoride, or sulfate as outliers; therefore, no new values were flagged. Tukey's outlier test results for all Appendix III parameters are shown in Figure C.

No changes to values flagged in previous background updates occurred for any Appendix III parameters as these values were confirmed by visual screening. As mentioned above, any flagged data are displayed in a lighter font and as a disconnected symbol on the time series reports, as well as in a lighter font on the accompanying data pages.

Seasonality

When seasonal patterns are observed, data are evaluated using the Kruskal-Wallis test to determine whether seasonality is statistically significant. When the test identifies seasonality, data are deseasonalized so that the resulting statistical limits will correctly account for the seasonality as a predictable pattern rather than random variation or a release. This procedure includes subtracting the seasonal mean from each value within a given season and adding the overall mean to each observation. As mentioned earlier in the previous update, several Appendix III constituents appeared to have seasonal patterns at downgradient well AD-22. Therefore, all Appendix III constituents evaluated with intrawell prediction limits at this well were re-screened for seasonality using the Kruskal-Wallis test (Figure D). Calcium, pH, and TDS were identified with significant seasonality; therefore, these records continue to be deseasonalized prior to constructing intrawell prediction limits at well AD-22.

Intrawell – Mann-Whitney Test

For calcium, pH, and TDS which are tested using intrawell prediction limits, the Mann-Whitney (Wilcoxon Rank Sum) test was used to compare the medians of historical data through June 2022 to the new compliance samples at each well, except at well AD-7R, through April 2024 to evaluate whether the groups are statistically different at the 99% confidence level (Figure E). If no statistically significant difference is found, background data may be updated with compliance data. Note that because downgradient well AD-7R did not have sufficient observations for construction of prediction limits during the previous update, trend tests were used in lieu of the Mann-Whitney test for screening AD-7R and are discussed below. No statistically significant differences were identified; therefore, all records were updated with compliance data through April 2024. A summary of the Mann-Whitney results follows this report.

Intrawell – Trend Test Evaluation

As mentioned above, because downgradient well AD-7R did not have sufficient observations for construction of prediction limits during the previous update (n=8), trend tests were used in lieu of the Mann-Whitney test for screening at this well to determine whether concentrations are increasing or decreasing at the 99% confidence level (Figure F). No statistically significant trends were identified; therefore, all data through April 2024 were used in constructing intrawell prediction limits for well AD-7R.

Intrawell Prediction Limits

Intrawell prediction limits, combined with a 1-of-2 resample plan, are constructed using historical data through April 2024 for calcium, pH, and TDS at all wells (Figure G). As mentioned above, deseasonalized prediction limits were constructed for calcium, pH, and TDS at downgradient well AD-22. The prediction limits plots for the deseasonalized cases are included separately after the rest of the plots. No comparisons of the September 2024 compliance data to these limits were made in this analysis.

Interwell – Trend Test Evaluation

The Sen's Slope/Mann Kendall trend test was used to evaluate data at upgradient wells for boron, chloride, fluoride, and sulfate to identify statistically significant increasing or decreasing trends at the 99% confidence level (Figure H). Statistically significant trends were identified for the following well/constituent pairs:

Increasing:

- Chloride: AD-13 (upgradient)
- Sulfate: AD-13 (upgradient)

Decreasing:

- Boron: AD-12 (upgradient)
- Sulfate: AD-12 (upgradient)

For the well/constituent pairs with significant trends, the trends are either not large compared to the overall variation in the data over the time period being tested or truncating earlier concentrations would not impact the resulting statistical limits. Therefore, the trending data are representative of background conditions, and no adjustments were required at this time. All data from upgradient wells were used to construct interwell prediction limits for boron, chloride, fluoride, and sulfate.

Interwell – Prediction Limits

Interwell prediction limits, combined with a 1-of-2 resample plan, were constructed using all pooled upgradient well data through September 2024 for boron, chloride, fluoride, and sulfate (Figure I). Time series plots were included with the interwell prediction limit graphs to display concentrations at upgradient wells that were used to construct the statistical limits. A summary table of the updated limits may be found following this letter in the Prediction Limit Summary Table. No comparisons of the September 2024 compliance data to these limits were made in this analysis.

Evaluation of Appendix IV Parameters – Fall 2024

As mentioned above, prior to evaluating Appendix IV parameters, background data are screened through visual screening and Tukey's outlier test for potential outliers and extreme trending patterns that would lead to artificially elevated statistical limits. For the current analysis, Tukey's outlier test on pooled upgradient well data only identified values for cadmium. However, none of those currently identified values were flagged as all identified observations were low-level concentrations and were below the MCL. Visual screening confirmed previously flagged non-detects observations from 2019 with elevated reporting limits for molybdenum and thallium in both upgradient and downgradient wells. These elevated reporting limits are more than an order of magnitude higher than the current reporting limits.

Additionally, downgradient well data through September 2024 were screened through visual screening using time series graphs. Since the downgradient well data are used to construct confidence intervals, values that are marginally high relative to the rest of the

data are retained unless there is particular justification for excluding them. Several observations among the 2016 events for multiple Appendix IV constituents for downgradient wells AD-13 and AD-33 remain flagged as outliers since the measurements were inconsistent with remaining concentrations. The flagged non-detect observations with elevated reporting limits from 2019 for molybdenum and thallium were discussed above. No changes were made to previously flagged data.

No additional outliers among downgradient wells were flagged during this analysis, and previously flagged values were confirmed by visual screening. All flagged values may be seen on the Outlier Summary following this letter (Figure C).

Seasonality

Several Appendix IV constituents appeared to have seasonal patterns at downgradient well AD-22. Therefore, all constituents evaluated with confidence intervals at this well were tested for seasonality using the Kruskal-Wallis test (Figure D). Appendix IV constituents with significant seasonality were beryllium, cadmium, cobalt, combined radium 226 + 228, fluoride, lithium, and selenium. Deseasonalized confidence intervals are computed for these well/constituent pairs in addition to the regular confidence intervals. More narrow confidence intervals are expected with deseasonalized data as a result of seasonal effects being removed, and are more sensitive to detecting exceedances.

Interwell Upper Tolerance Limits

Upper tolerance limits were used to calculate background limits from pooled upgradient well data through September 2024 for Appendix IV parameters (Figure J). These limits are updated on an annual basis and will be updated again during the Fall 2025 sample event. Parametric tolerance limits are calculated, with a target of 95% confidence and 95% coverage, when data follow a normal or transformed-normal distribution. When data contained greater than 50% non-detects or did not follow a normal or transformed-normal distribution, non-parametric tolerance limits were constructed using the highest background measurement. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples.

Groundwater Protection Standards

These background limits were compared to the Maximum Contaminant Levels (MCLs) as shown in the Groundwater Protection Standard (GWPS) table following this letter to determine the highest limit for use as the GWPS in the Confidence Interval comparisons (Figure K).

Confidence Intervals

Confidence intervals were then constructed on downgradient wells with data through September 2024 for each of the Appendix IV parameters and compared to the GWPS, i.e., the highest limit of the MCL, or background limit as discussed above. These intervals were constructed as either parametric or nonparametric confidence intervals depending on the data distribution and percentage of non-detects. When data followed a normal or transformed-normal distribution, parametric confidence intervals were used for Appendix IV parameters. Nonparametric confidence intervals were constructed when data did not follow a normal or transformed-normal distribution or when there were greater than 50% non-detects. The lower confidence limit, which is constructed with 99% confidence for parametric confidence intervals, is compared to the GWPS prepared as described above. The confidence level associated with nonparametric confidence intervals is dependent upon the number samples available.

Only when the entire confidence interval is above a GWPS is the well/constituent pair considered to exceed its respective standard. Note that due to a statistically significant increasing trend for lead at downgradient well AD-33 (Figure L) and more recent data reported at or above the GWPS, only more recent observations were used to construct a confidence interval on stable, non-trending data (USEPA Unified Guidance, 2009, Chapter 7). A summary of the confidence intervals follows this letter (Figure M). Exceedances were identified for the following well/constituent pairs:

- Beryllium: AD-22
- Cobalt: AD-22
- Lead: AD-33
- Mercury: AD-33

Deseasonalized Confidence Intervals

Additional confidence intervals were constructed on deseasonalized data for constituents with detected seasonality in well AD-22 when at least one reported measurement was higher than the established GWPS for a given parameter. The constituents that met these criteria at well AD-22 are beryllium, cobalt, combined radium 226 + 228, and lithium. The results are included with the confidence intervals provided in Figure M. The deseasonalized confidence intervals are presented separately, with a separate summary table, at the end of the confidence interval results section. Deseasonalized confidence intervals for beryllium and cobalt at well AD-22 also exceeded the respective GWPS.

Trend Test Evaluation

When confidence interval exceedances are identified in downgradient wells, data are further evaluated using the Sen's Slope/Mann Kendall trend test to determine whether concentrations are statistically increasing, decreasing, or stable at the 95% confidence level (Figure N). Utilizing the 95% confidence level for trend tests readily identifies significant trends and is more sensitive than the 99% confidence level without drastically increasing the false negative rate. Upgradient wells are included in the trend analyses for all parameters found to exceed their confidence intervals in downgradient wells. When similar patterns exist upgradient of the site, it is an indication of variability in groundwater which may be unrelated to practices at the site. Statistically significant trends were identified for the following well/constituent pairs:

Increasing:

- Mercury: AD-33
- Lead: AD-33

Decreasing:

- Beryllium: AD-12 (upgradient)
- Cobalt: AD-12 (upgradient)
- Lead: AD-12 (upgradient)

Note that the decreasing trend in lead at upgradient well AD-12 results from non-detects early in the record compared to observations below the most recent reporting limit (0.0002 mg/L) in the later part of the record.

Thank you for the opportunity to assist you in the statistical analysis of groundwater quality for Pirkey Stackout. If you have any questions or comments, please feel free to contact us.

For Groundwater Stats Consulting,



Andrew T. Collins
Project Manager



Kristina L. Rayner
Senior Statistician

Date Ranges

Date: 12/9/2024 3:08 PM

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Lead, total (mg/L)

AD-33 overall:3/10/2020-9/16/2024

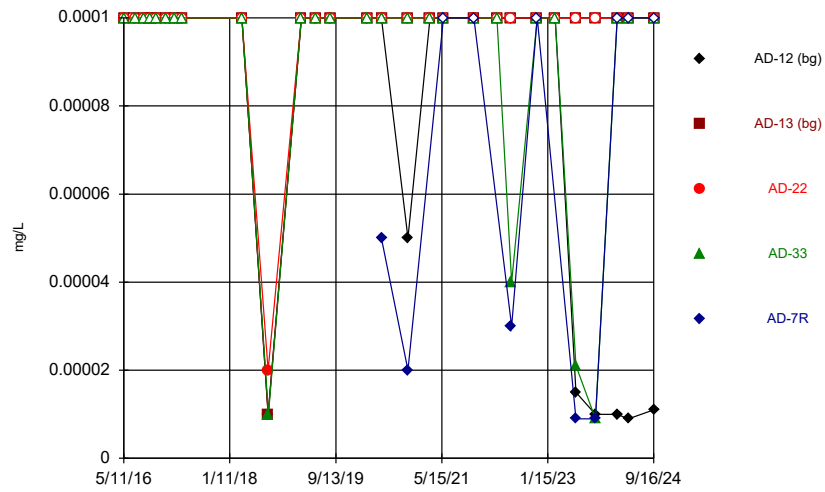
Mercury, total (mg/L)

AD-22 overall:3/10/2020-9/16/2024

AD-33 overall:3/10/2020-9/16/2024

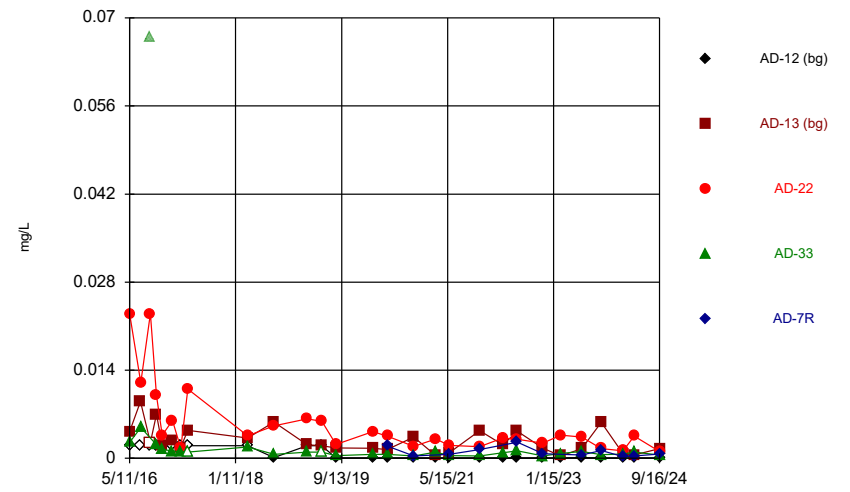
FIGURE A
Time Series

Time Series



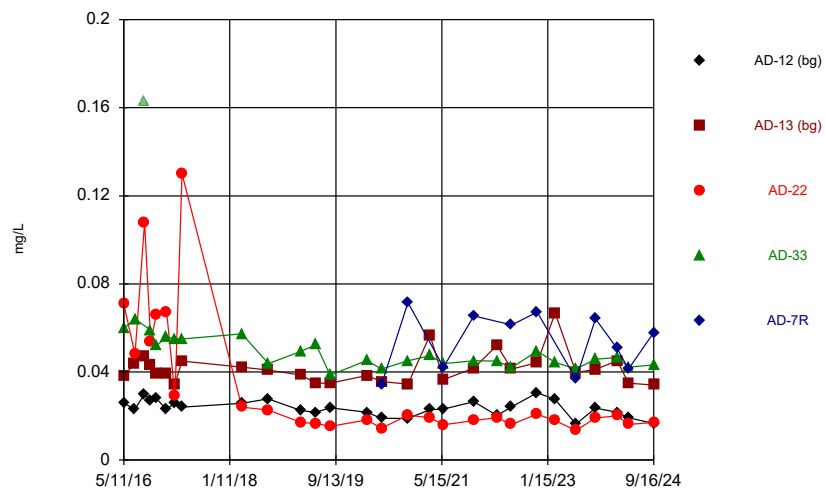
Constituent: Antimony, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



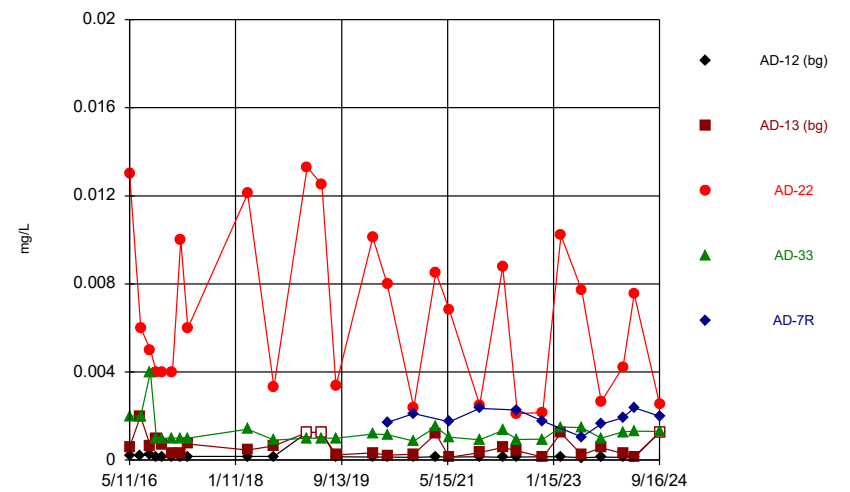
Constituent: Arsenic, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



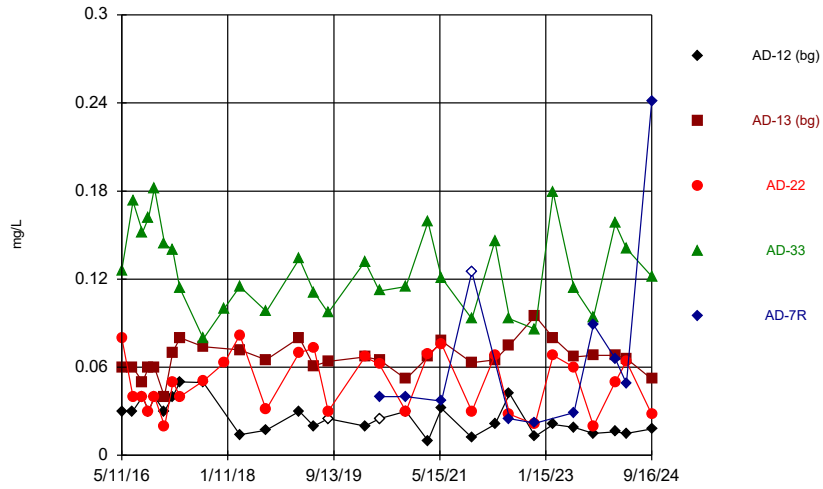
Constituent: Barium, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



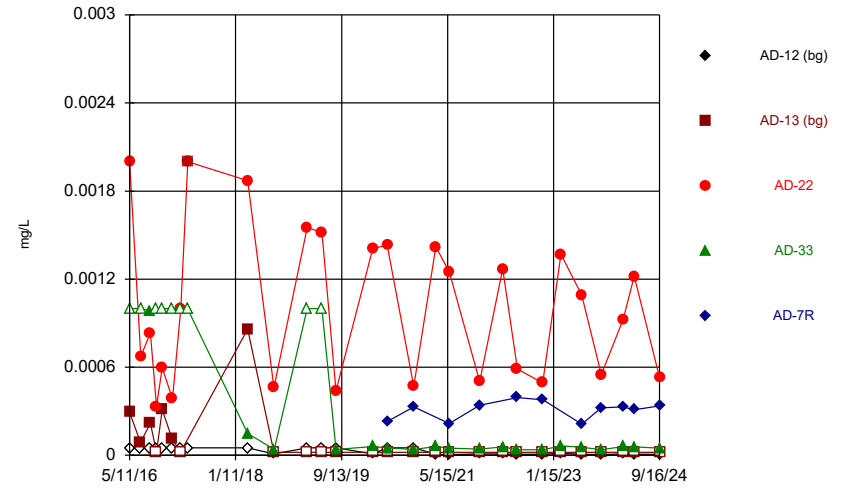
Constituent: Beryllium, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



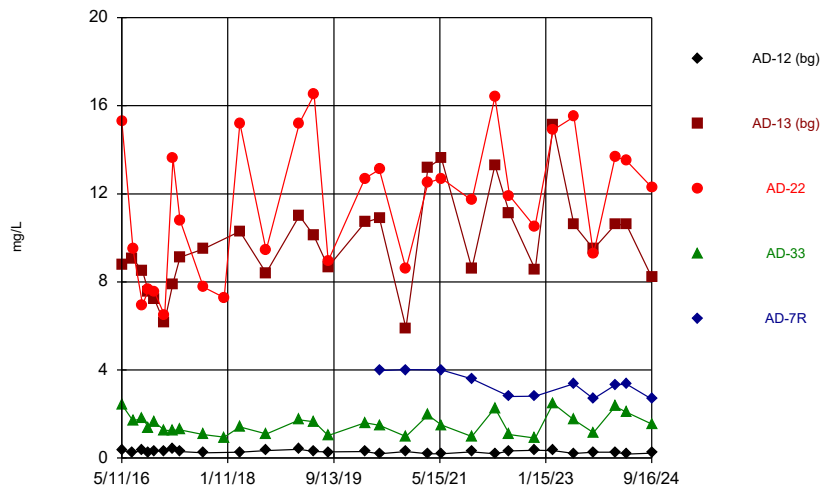
Constituent: Boron, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



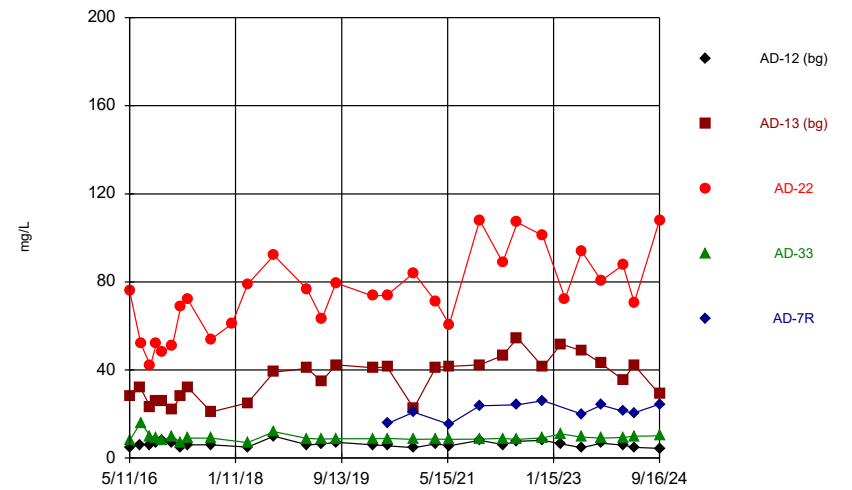
Constituent: Cadmium, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



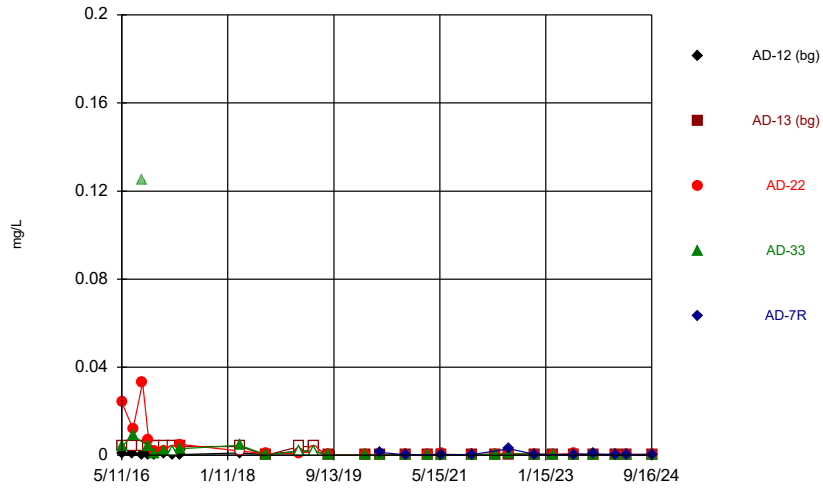
Constituent: Calcium, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



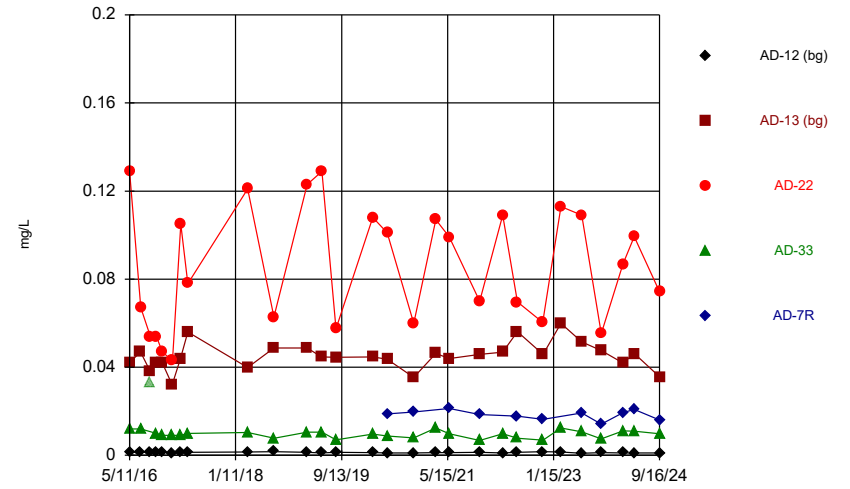
Constituent: Chloride, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



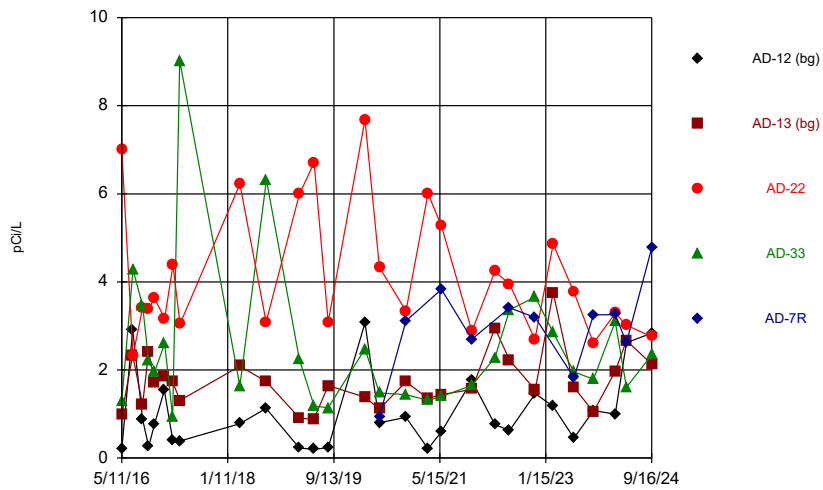
Constituent: Chromium, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



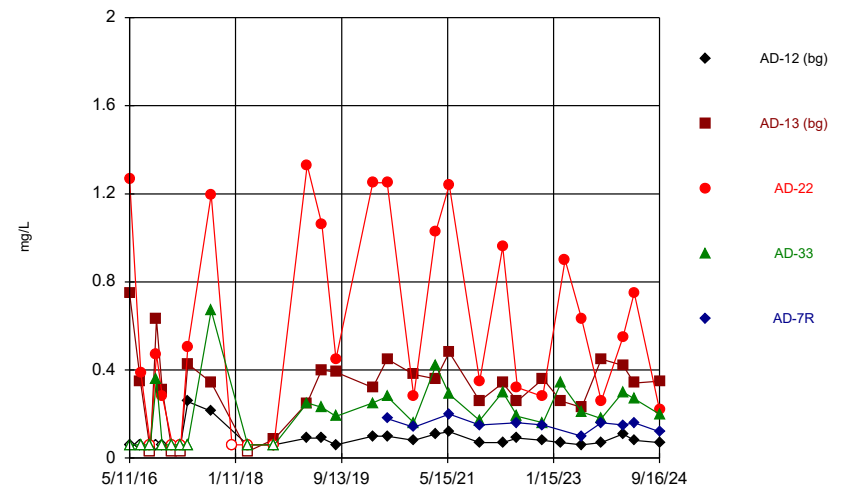
Constituent: Cobalt, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



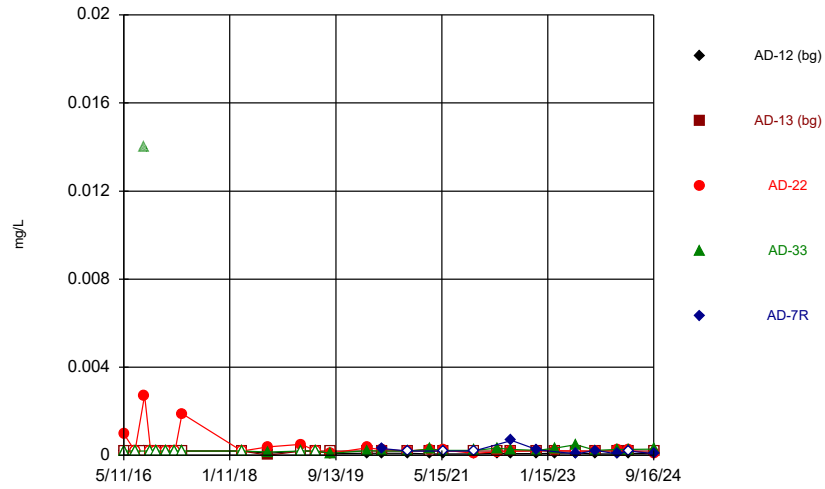
Constituent: Combined Radium 226 + 228 Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



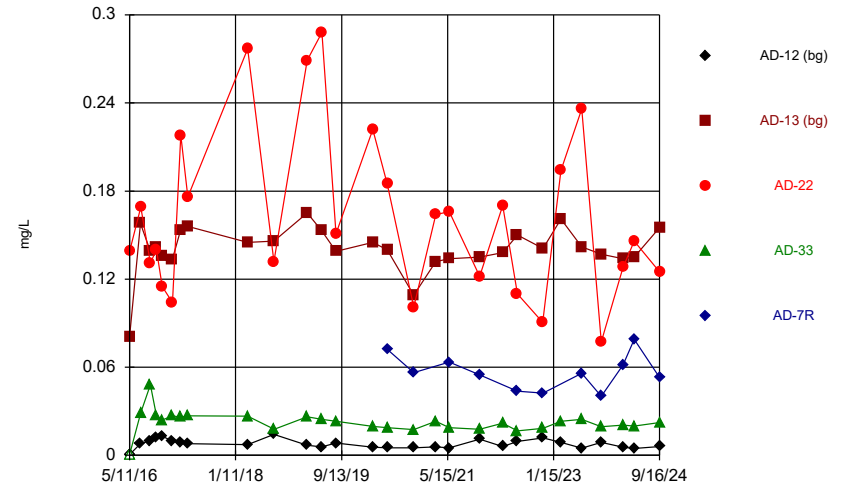
Constituent: Fluoride, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



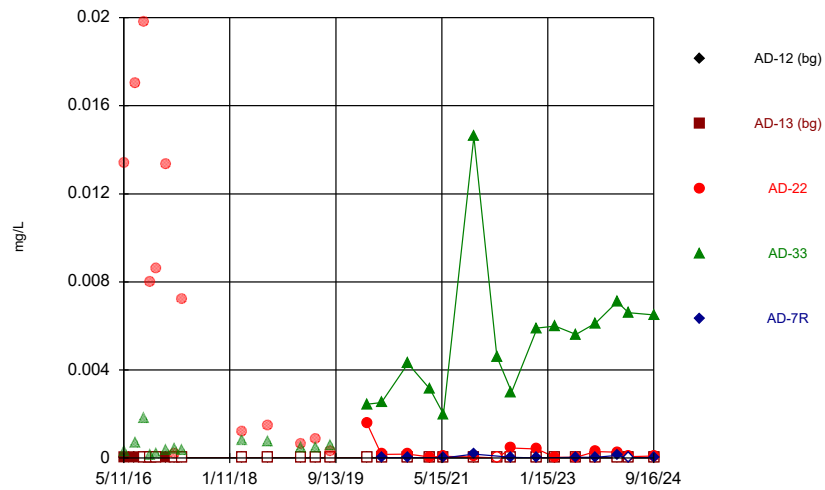
Constituent: Lead, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



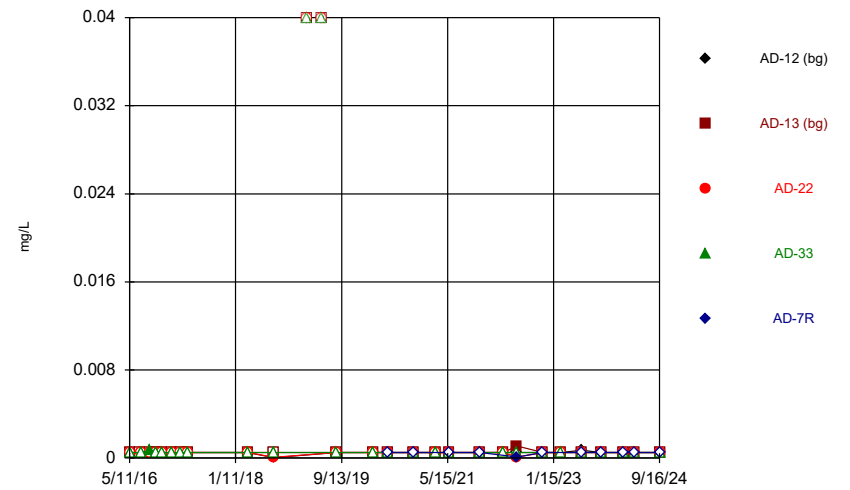
Constituent: Lithium, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



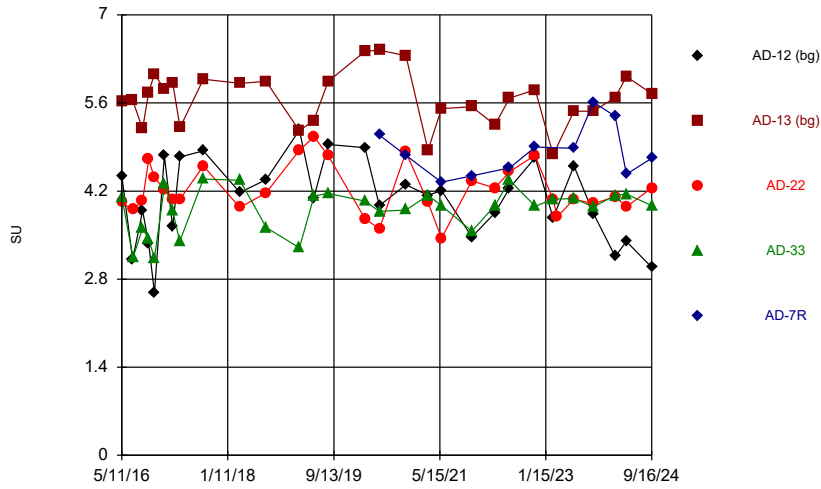
Constituent: Mercury, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



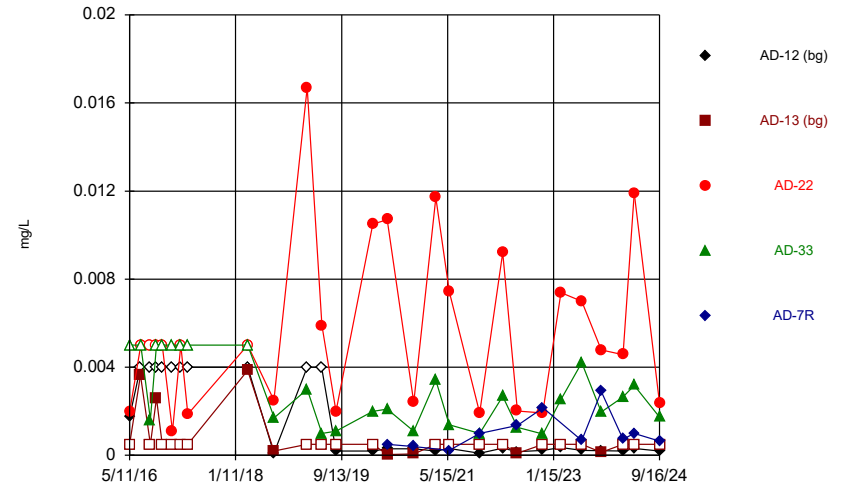
Constituent: Molybdenum, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



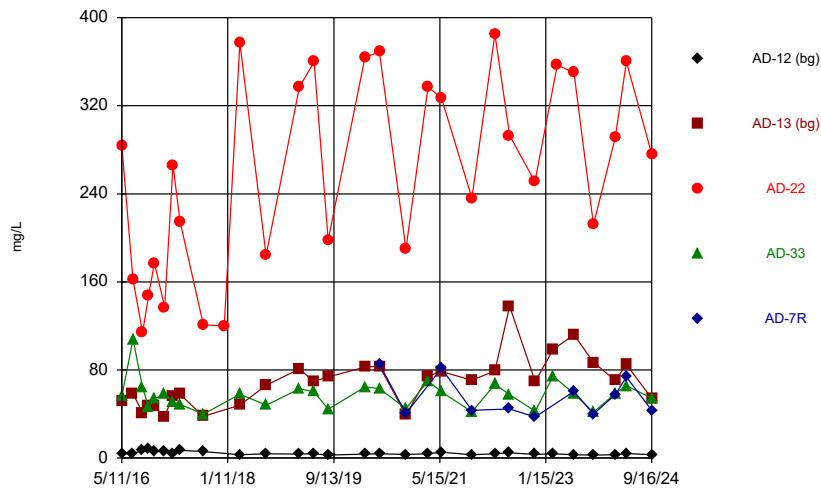
Constituent: pH, field Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



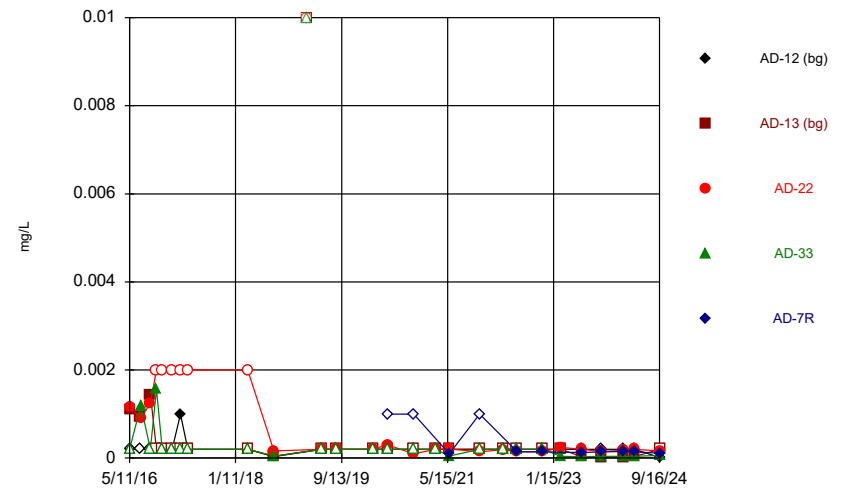
Constituent: Selenium, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



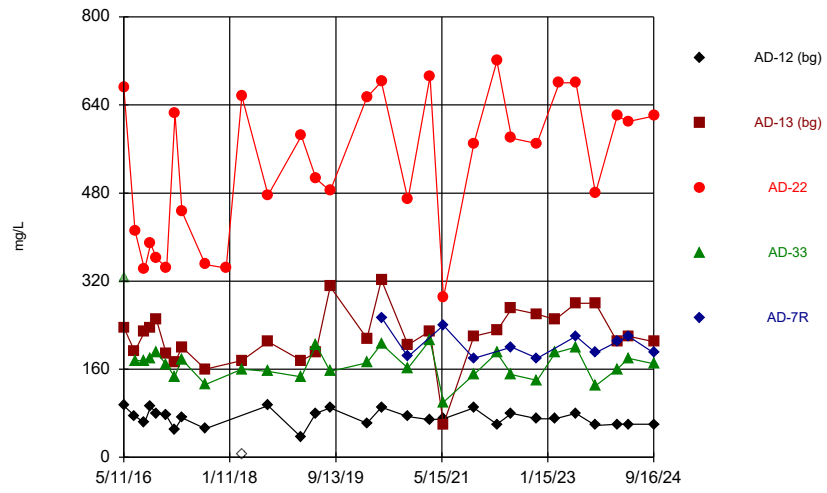
Constituent: Sulfate, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Time Series



Constituent: Thallium, total Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

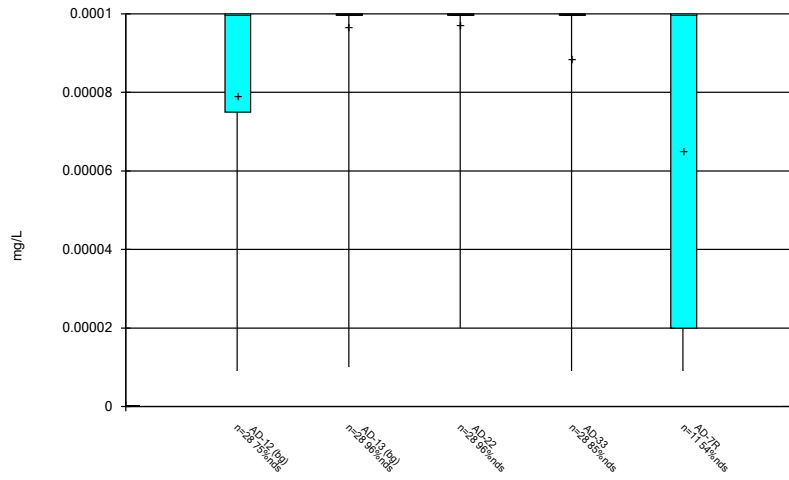
Time Series



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 3:00 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

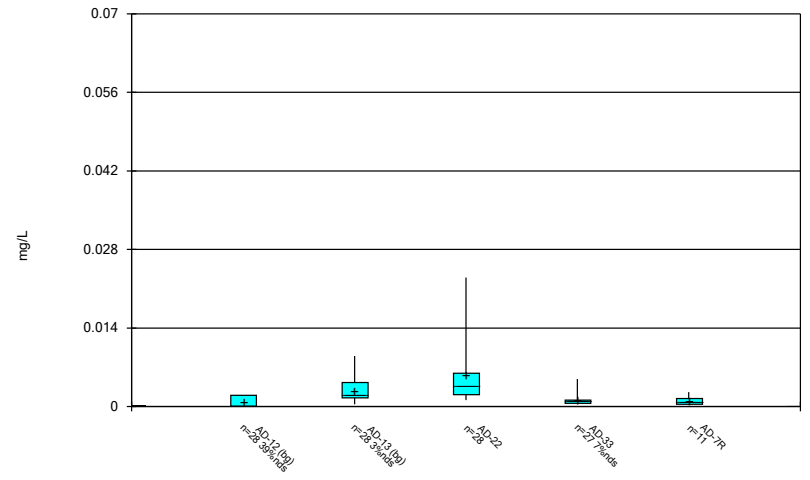
FIGURE B
Box Plots

Box & Whiskers Plot



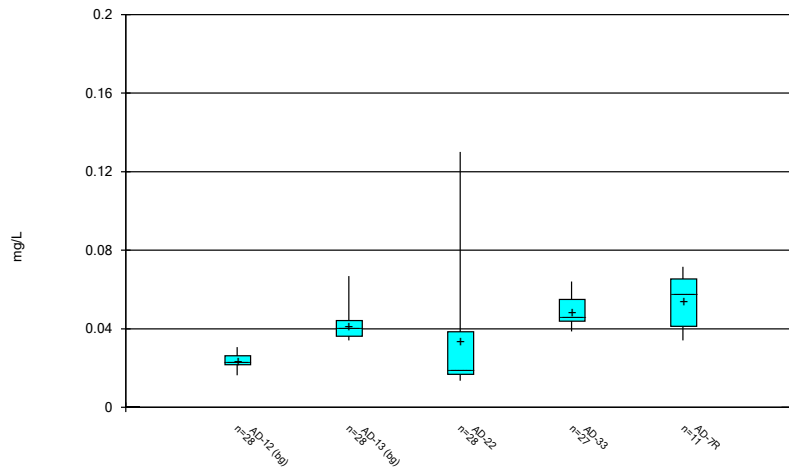
Constituent: Antimony, total Analysis Run 12/9/2024 3:03 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



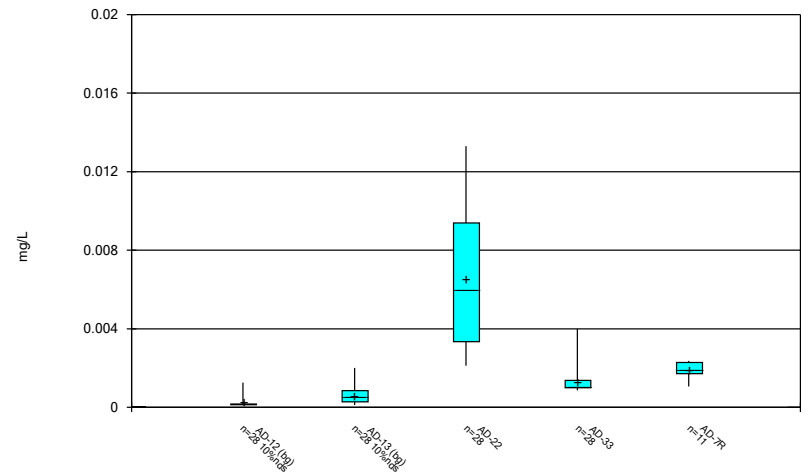
Constituent: Arsenic, total Analysis Run 12/9/2024 3:03 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



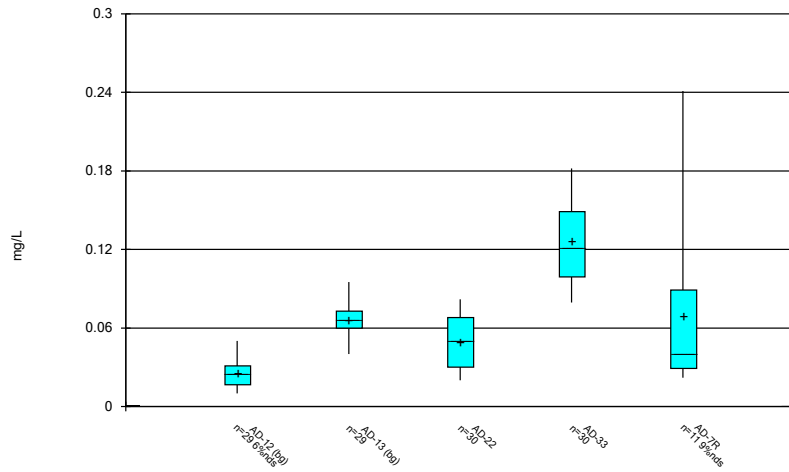
Constituent: Barium, total Analysis Run 12/9/2024 3:03 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



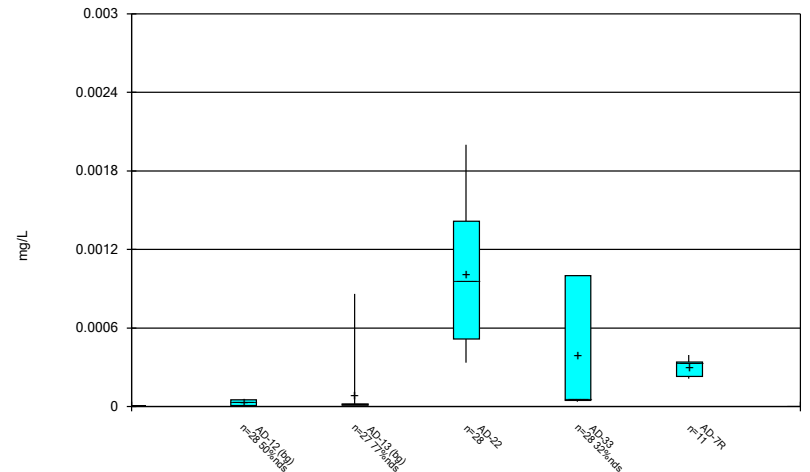
Constituent: Beryllium, total Analysis Run 12/9/2024 3:03 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



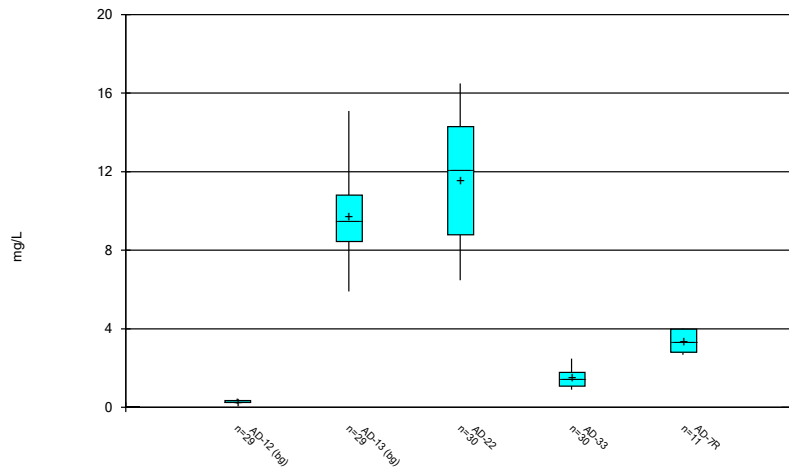
Constituent: Boron, total Analysis Run 12/9/2024 3:03 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



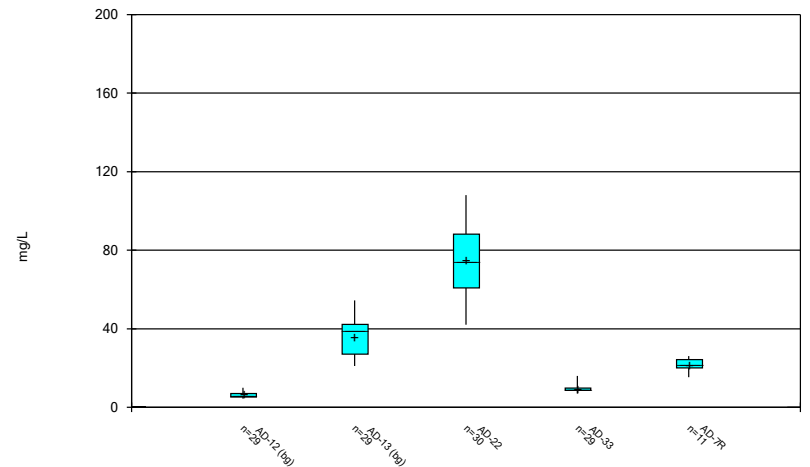
Constituent: Cadmium, total Analysis Run 12/9/2024 3:03 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



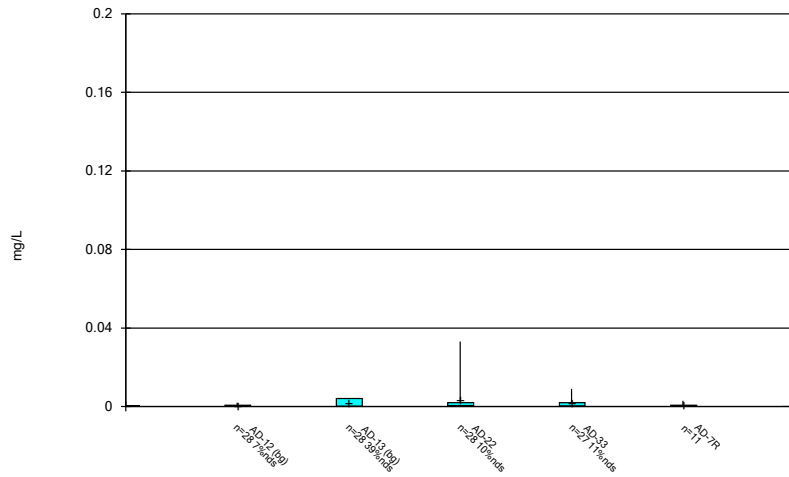
Constituent: Calcium, total Analysis Run 12/9/2024 3:03 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



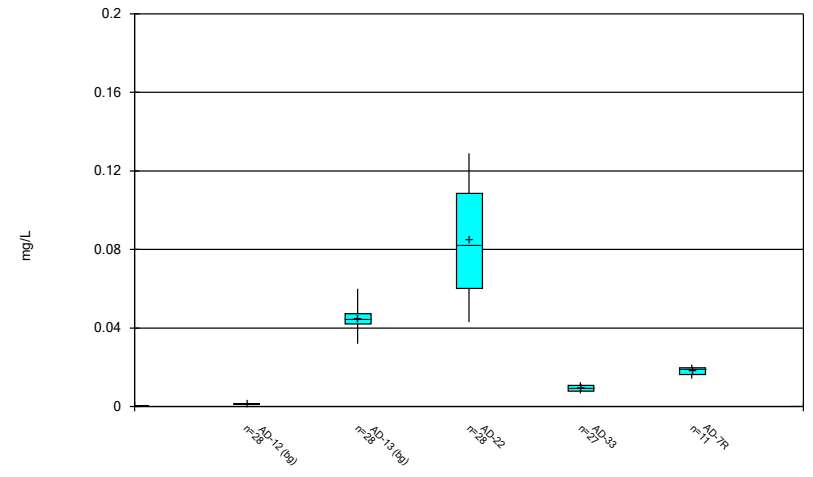
Constituent: Chloride, total Analysis Run 12/9/2024 3:03 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



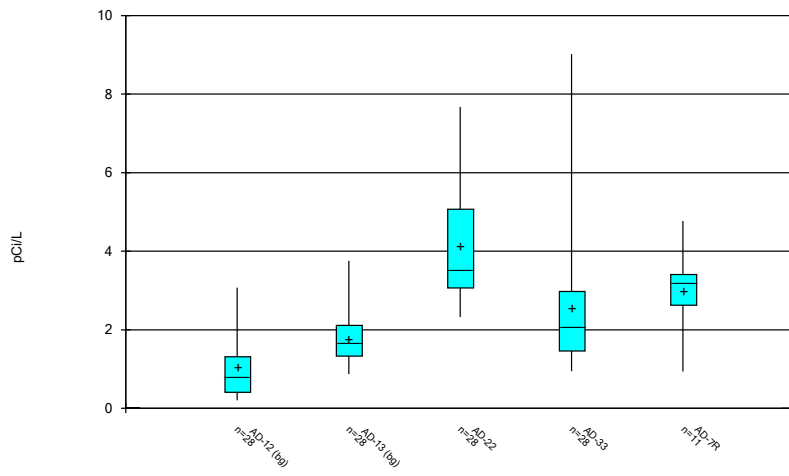
Constituent: Chromium, total Analysis Run 12/9/2024 3:03 PM
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



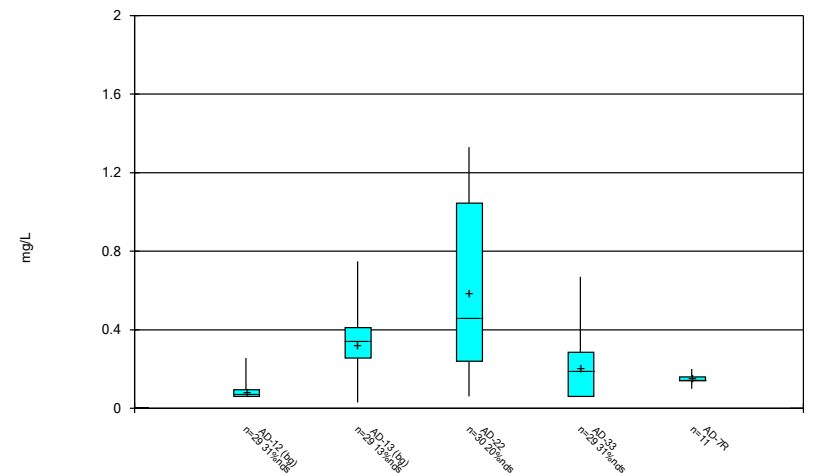
Constituent: Cobalt, total Analysis Run 12/9/2024 3:03 PM
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



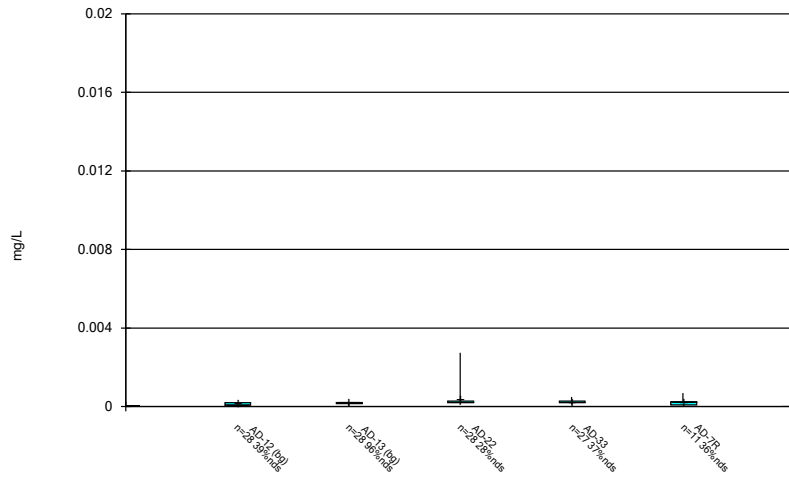
Constituent: Combined Radium 226 + 228 Analysis Run 12/9/2024 3:03 PM
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



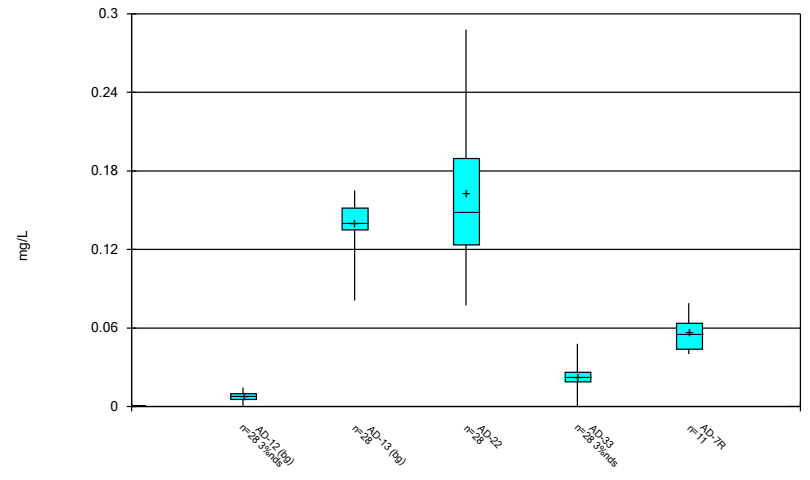
Constituent: Fluoride, total Analysis Run 12/9/2024 3:03 PM
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



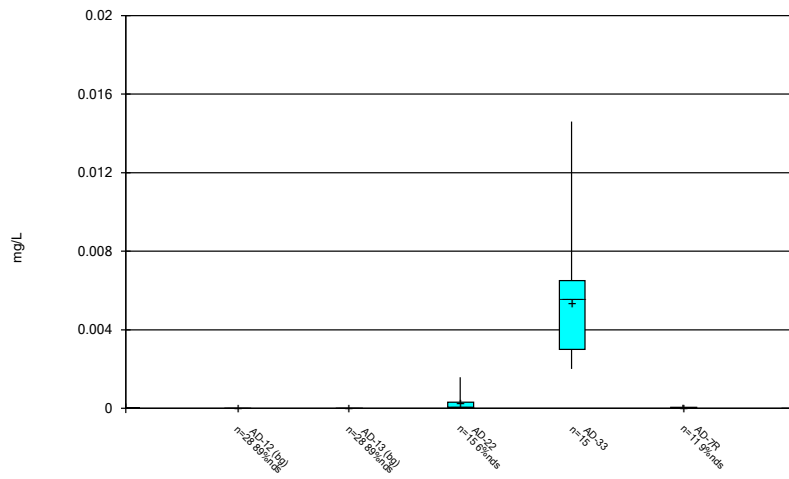
Constituent: Lead, total Analysis Run 12/9/2024 3:03 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



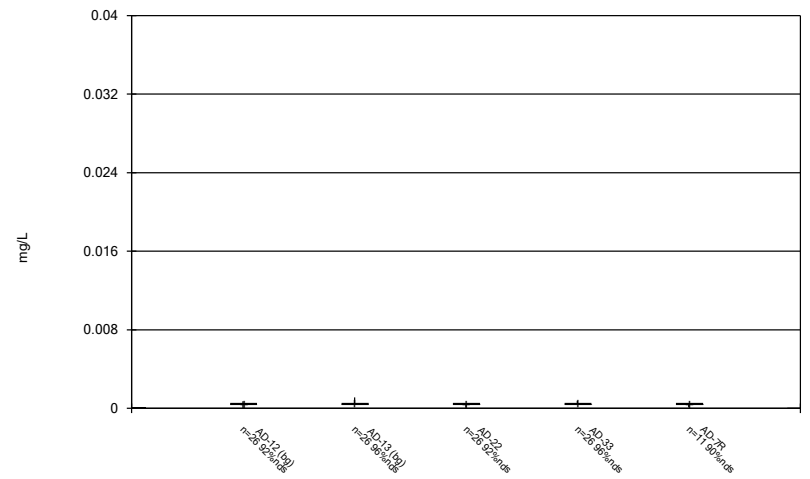
Constituent: Lithium, total Analysis Run 12/9/2024 3:03 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



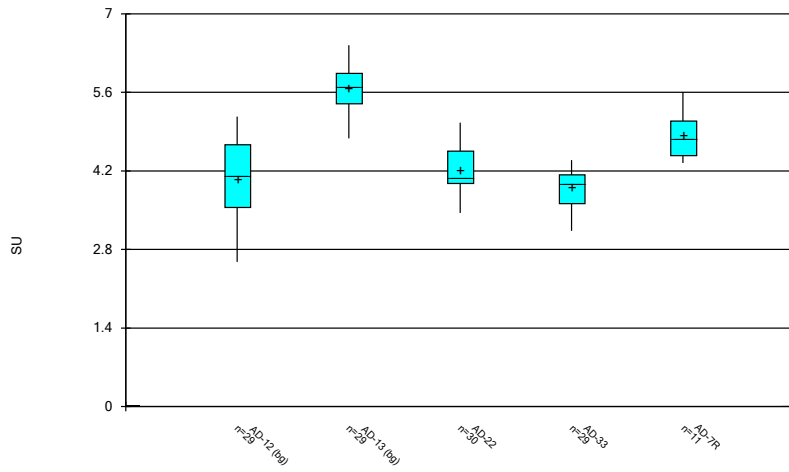
Constituent: Mercury, total Analysis Run 12/9/2024 3:03 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



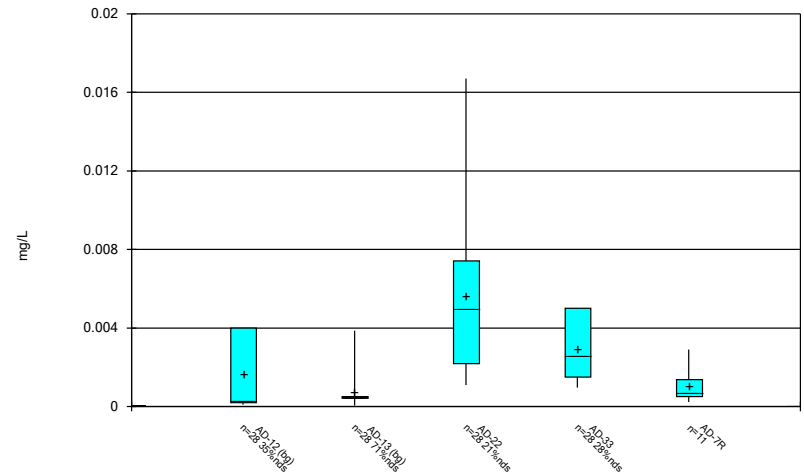
Constituent: Molybdenum, total Analysis Run 12/9/2024 3:03 PM
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



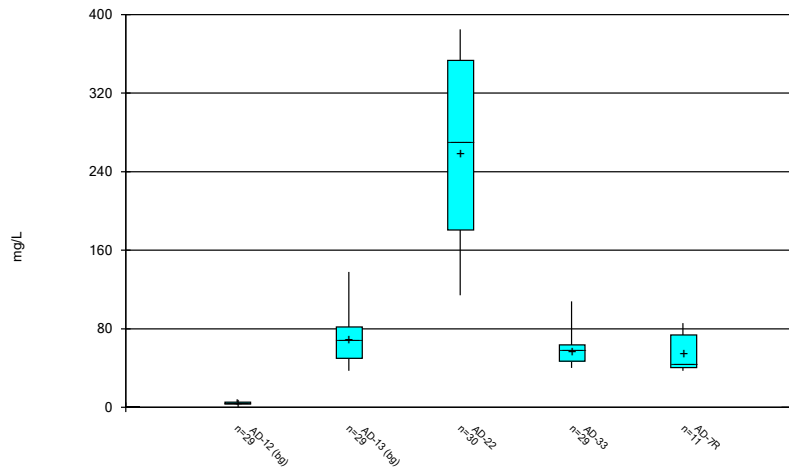
Constituent: pH, field Analysis Run 12/9/2024 3:03 PM
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



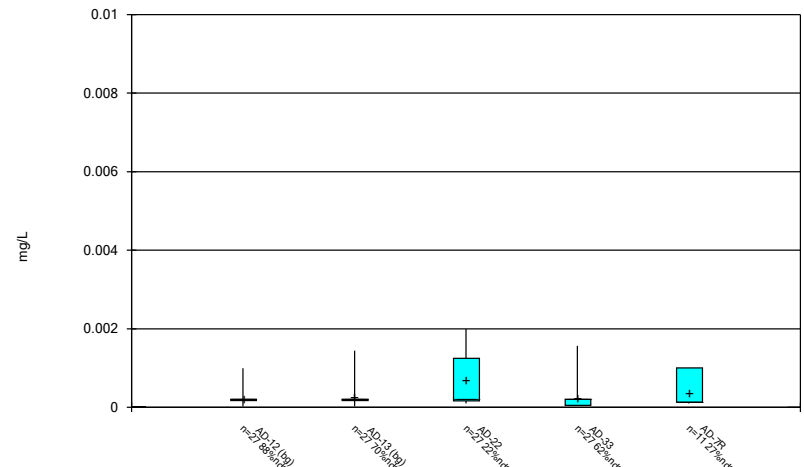
Constituent: Selenium, total Analysis Run 12/9/2024 3:03 PM
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



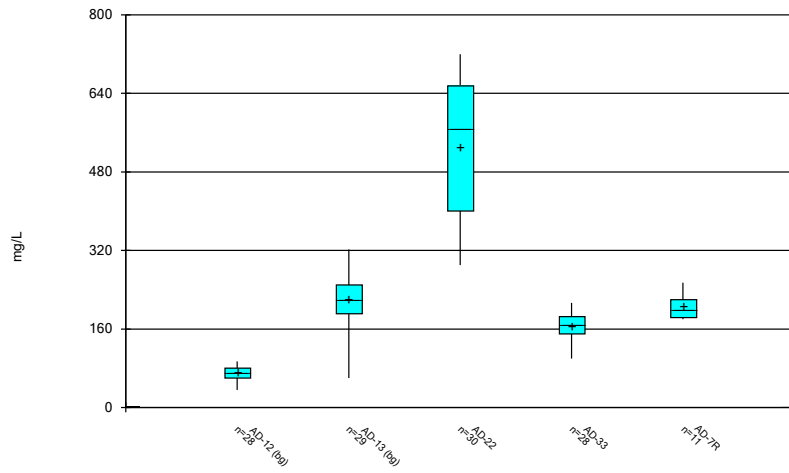
Constituent: Sulfate, total Analysis Run 12/9/2024 3:03 PM
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 12/9/2024 3:03 PM
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 3:03 PM

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

FIGURE C

Outlier Summary and Tukey's Outlier Test

Outlier Summary

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/5/2024, 11:50 AM

	AD-33 Arsenic, total (mg/L)	AD-33 Barium, total (mg/L)	AD-13 Cadmium, total (mg/L)	AD-33 Chromium, total (mg/L)	AD-33 Cobalt, total (mg/L)	AD-33 Lead, total (mg/L)	AD-12 Molybdenum, total (mg/L)	AD-13 Molybdenum, total (mg/L)	AD-22 Molybdenum, total (mg/L)	AD-33 Molybdenum, total (mg/L)
5/11/2016										
9/7/2016	0.067 (o)	0.163 (o)		0.125 (o)	0.033 (o)	0.014 (o)				
4/11/2017			0.002 (o)							
3/21/2018										
2/27/2019							<0.04 (o)	<0.04 (o)	<0.04 (o)	<0.04 (o)
5/21/2019							<0.04 (o)	<0.04 (o)		
5/22/2019									<0.04 (o)	<0.04 (o)

	AD-12 Thallium, total (mg/L)	AD-13 Thallium, total (mg/L)	AD-22 Thallium, total (mg/L)	AD-33 Thallium, total (mg/L)	AD-12 Total Dissolved Solids [TDS] (mg/L)	AD-33 Total Dissolved Solids [TDS] (mg/L)
5/11/2016						
9/7/2016						326 (o)
4/11/2017						
3/21/2018					<5 (o)	
2/27/2019	<0.01 (o)	<0.01 (o)	<0.01 (o)	<0.01 (o)		
5/21/2019						
5/22/2019						

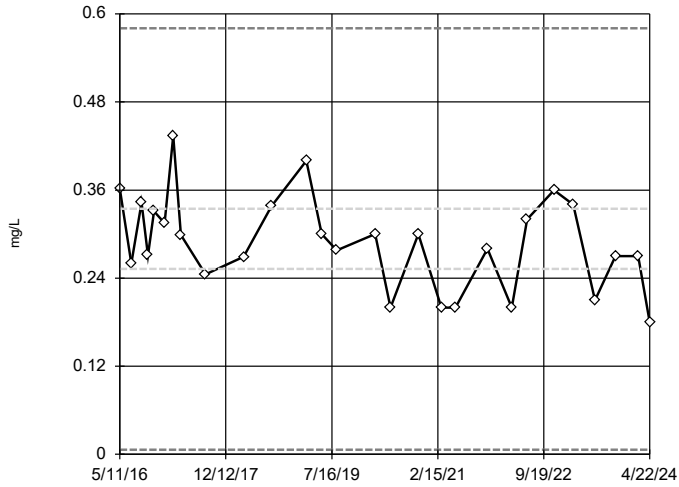
Tukey's Outlier Test - All Results (No Significant)

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/5/2024, 11:11 AM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Calcium, total (mg/L)	AD-12 (bg)	No	n/a	NP	NaN	28	0.2884	0.06375	normal	ShapiroWilk
Calcium, total (mg/L)	AD-13 (bg)	No	n/a	NP	NaN	28	9.802	2.178	$x^{(1/3)}$	ShapiroWilk
Calcium, total (mg/L)	AD-22	No	n/a	NP	NaN	29	11.56	3.138	normal	ShapiroWilk
Calcium, total (mg/L)	AD-33	No	n/a	NP	NaN	29	1.525	0.4737	ln(x)	ShapiroWilk
Calcium, total (mg/L)	AD-7R	No	n/a	NP	NaN	10	3.396	0.5058	normal	ShapiroWilk
pH, field (SU)	AD-12 (bg)	No	n/a	NP	NaN	28	4.096	0.6355	x^2	ShapiroWilk
pH, field (SU)	AD-13 (bg)	No	n/a	NP	NaN	28	5.67	0.4259	x^2	ShapiroWilk
pH, field (SU)	AD-22	No	n/a	NP	NaN	29	4.219	0.3993	ln(x)	ShapiroWilk
pH, field (SU)	AD-33	No	n/a	NP	NaN	28	3.898	0.3624	x^6	ShapiroWilk
pH, field (SU)	AD-7R	No	n/a	NP	NaN	10	4.846	0.42	ln(x)	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-12 (bg)	No	n/a	NP	NaN	28	69.63	19.58	x^2	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-13 (bg)	No	n/a	NP	NaN	28	220.5	51.39	x^2	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-22	No	n/a	NP	NaN	29	527.1	132.3	x^2	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-33	No	n/a	NP	NaN	28	172.8	39.59	ln(x)	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-7R	No	n/a	NP	NaN	10	207.7	25.85	ln(x)	ShapiroWilk

Tukey's Outlier Screening

AD-12 (bg)

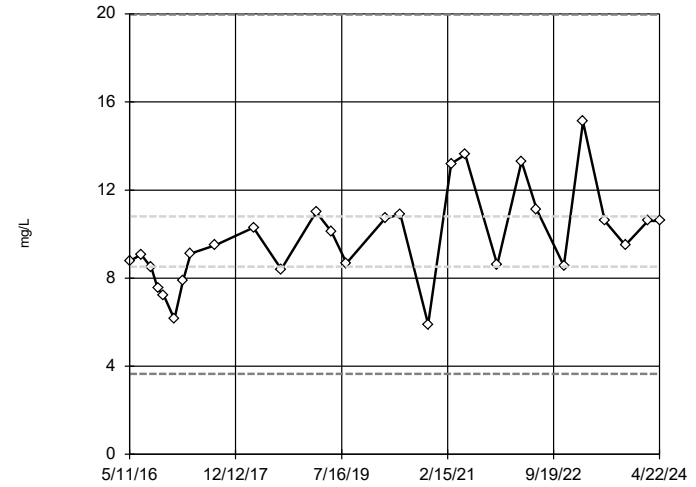


n = 28
 No outliers found.
 Tukey's method selected by user.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 High cutoff = 0.5805, low cutoff = 0.0065, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/5/2024 11:10 AM View: Outliers
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening

AD-13 (bg)

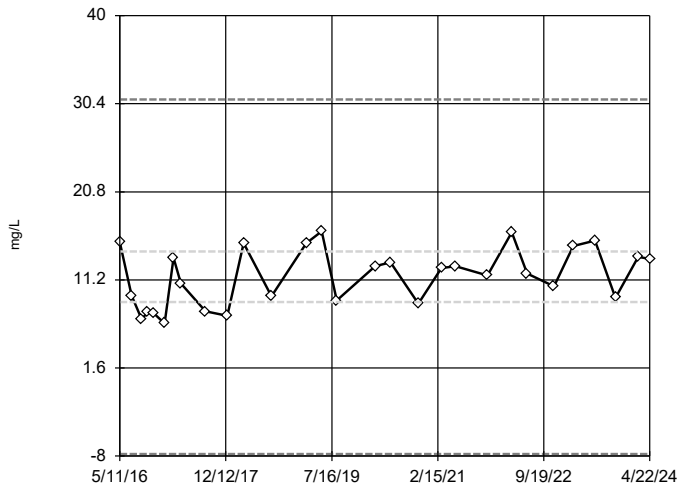


n = 28
 No outliers found.
 Tukey's method selected by user.
 Data were cube root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 19.97, low cutoff = 3.653, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/5/2024 11:10 AM View: Outliers
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening

AD-22

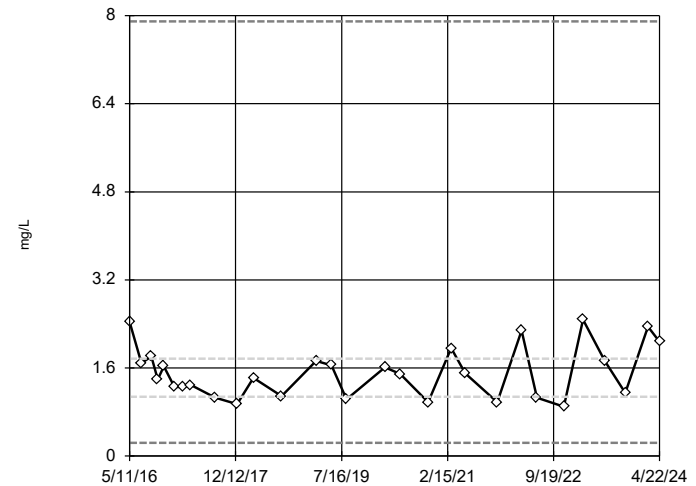


n = 29
 No outliers found.
 Tukey's method selected by user.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 High cutoff = 30.86, low cutoff = -7.78, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/5/2024 11:10 AM View: Outliers
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening

AD-33

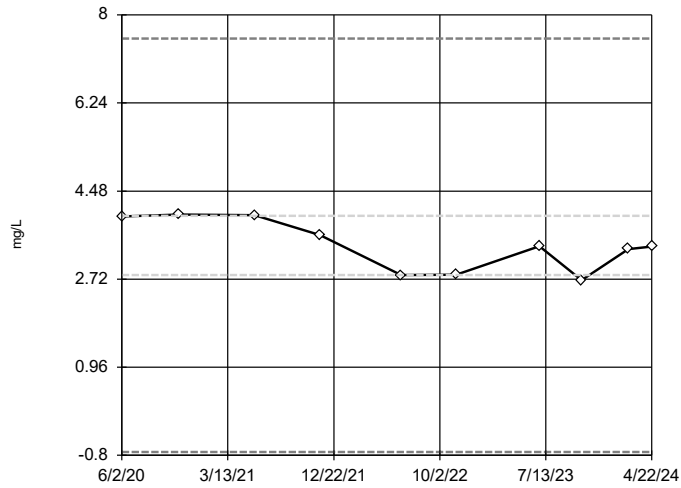


n = 29
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 7.895, low cutoff = 0.2409, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/5/2024 11:10 AM View: Outliers
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening

AD-7R

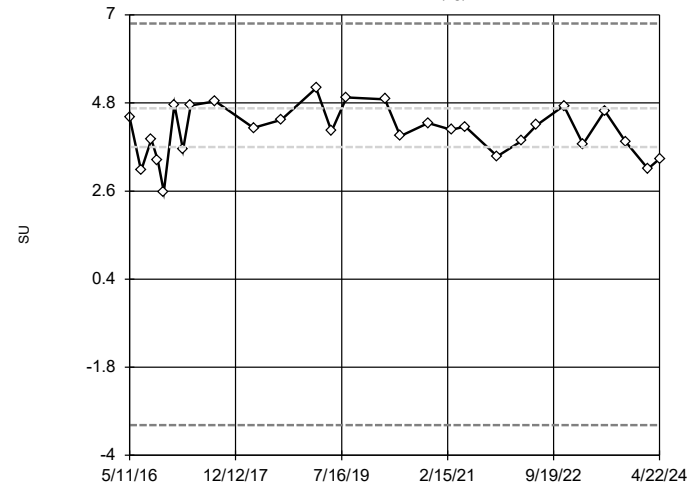


n = 10
 No outliers found.
 Tukey's method selected by user.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 High cutoff = 7.525, low cutoff = -0.735, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/5/2024 11:10 AM View: Outliers
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening

AD-12 (bg)

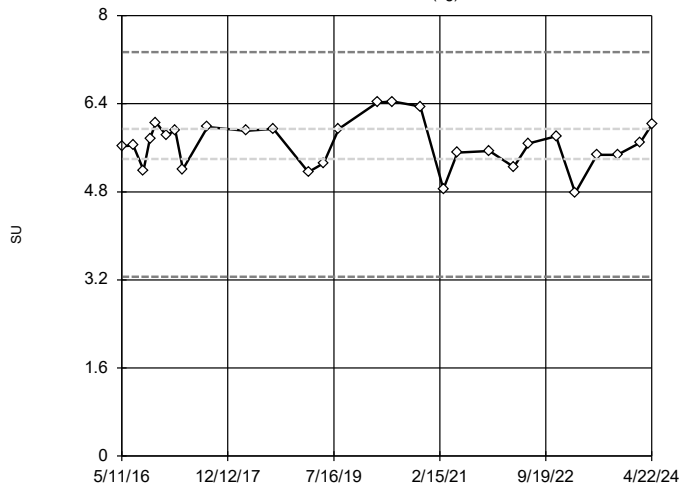


n = 28
 No outliers found.
 Tukey's method selected by user.
 Data were square transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 6.781, low cutoff = -3.243, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/5/2024 11:10 AM View: Outliers
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening

AD-13 (bg)

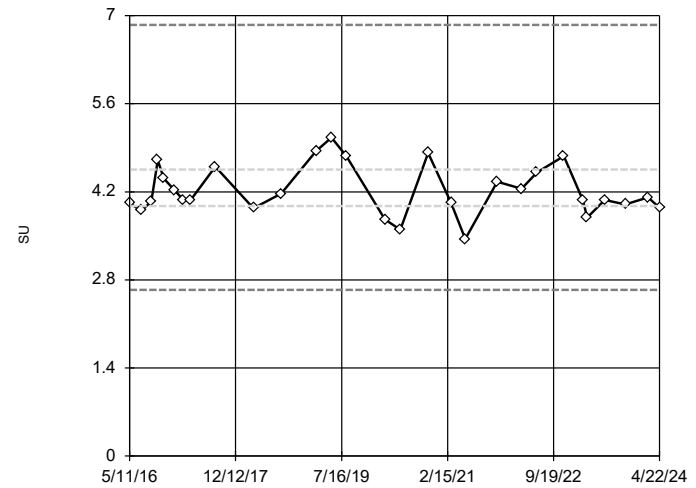


n = 28
 No outliers found.
 Tukey's method selected by user.
 Data were square transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 7.335, low cutoff = 3.255, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/5/2024 11:10 AM View: Outliers
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening

AD-22

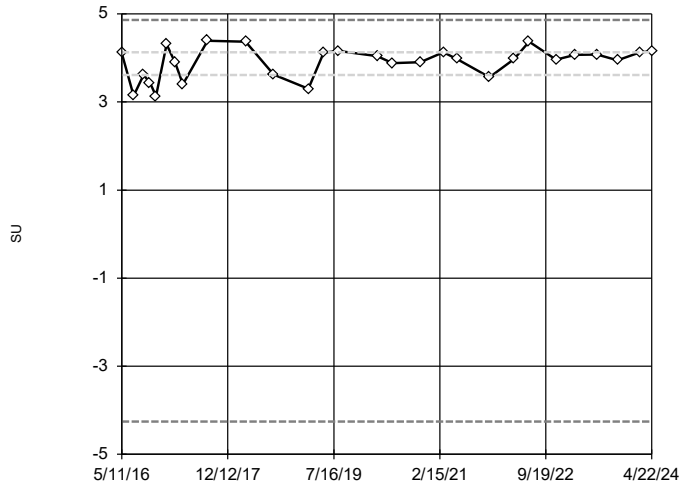


n = 29
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 6.853, low cutoff = 2.642, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/5/2024 11:10 AM View: Outliers
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening

AD-33

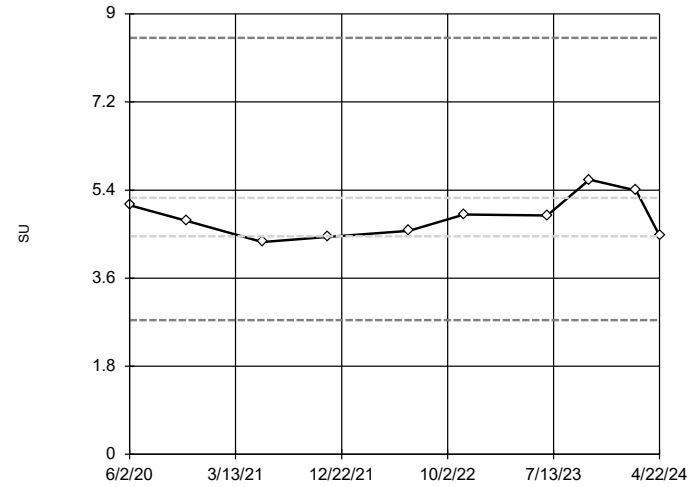


n = 28
 No outliers found.
 Tukey's method selected by user.
 Data were x*6 transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 4.859, low cutoff = -4.258, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/5/2024 11:10 AM View: Outliers
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening

AD-7R

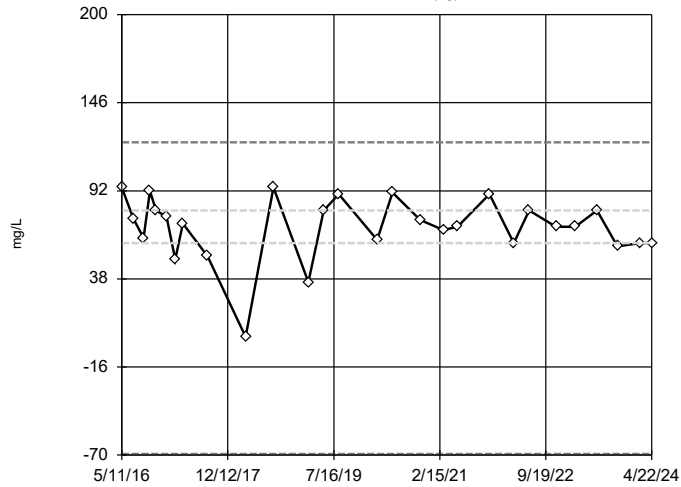


n = 10
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 8.513, low cutoff = 2.741, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/5/2024 11:10 AM View: Outliers
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening

AD-12 (bg)

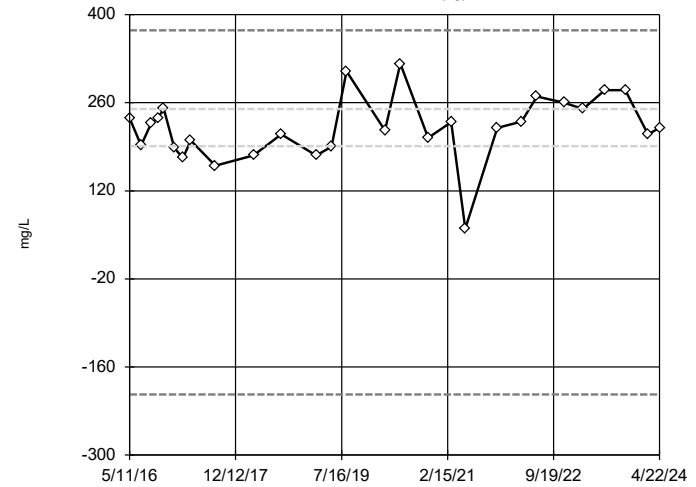


n = 28
 No outliers found.
 Tukey's method selected by user.
 Data were square transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 121.7, low cutoff = -69.28, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/5/2024 11:10 AM View: Outliers
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening

AD-13 (bg)

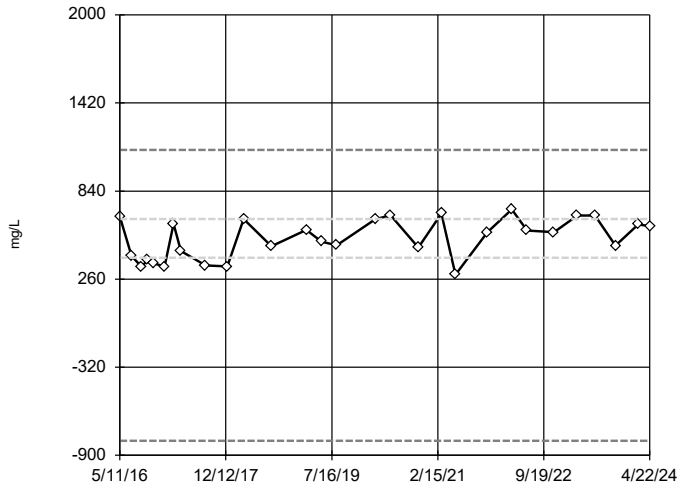


n = 28
 No outliers found.
 Tukey's method selected by user.
 Data were square transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 374.9, low cutoff = -203.9, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/5/2024 11:10 AM View: Outliers
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening

AD-22



n = 29

No outliers found. Tukey's method selected by user.

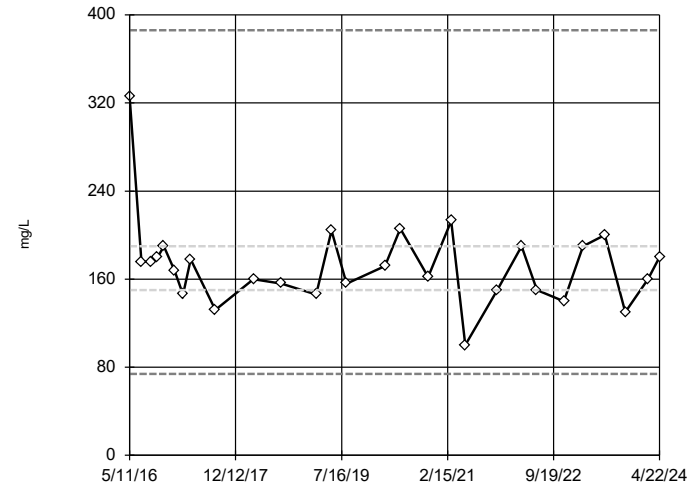
Data were square transformed to achieve best W statistic (graph shown in original units).

High cutoff = 1112, low cutoff = -804.1, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/5/2024 11:10 AM View: Outliers
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening

AD-33



n = 28

No outliers found. Tukey's method selected by user.

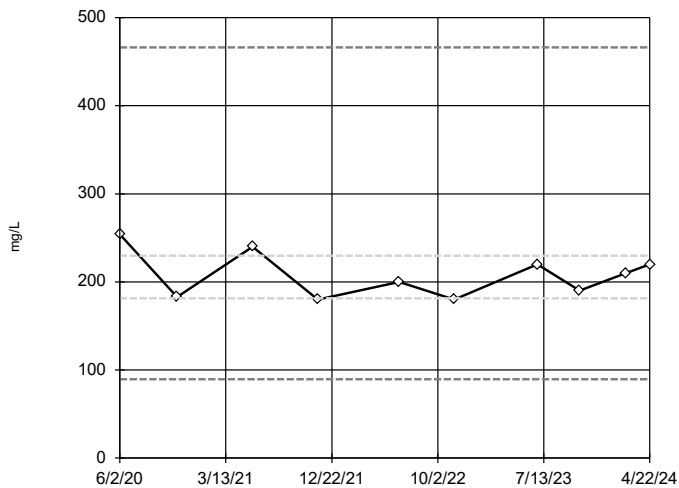
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 386.1, low cutoff = 73.81, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/5/2024 11:10 AM View: Outliers
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening

AD-7R



n = 10

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 466.3, low cutoff = 89.43, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/5/2024 11:10 AM View: Outliers
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Test - Upgradient Wells - Significant Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/5/2024, 11:13 AM

<u>Constituent</u>	<u>Well</u>	<u>Outlier</u>	<u>Value(s)</u>	<u>Method</u>	<u>Alpha</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Distribution</u>	<u>Normality Test</u>
Cadmium, total (mg/L)	AD-12,AD-13	Yes	0.000007,0.000007,0.000007,0.000007,0.000007,0.00	NP	NaN	56	0.00008391	0.0002896	In(x)	ShapiroFrancia

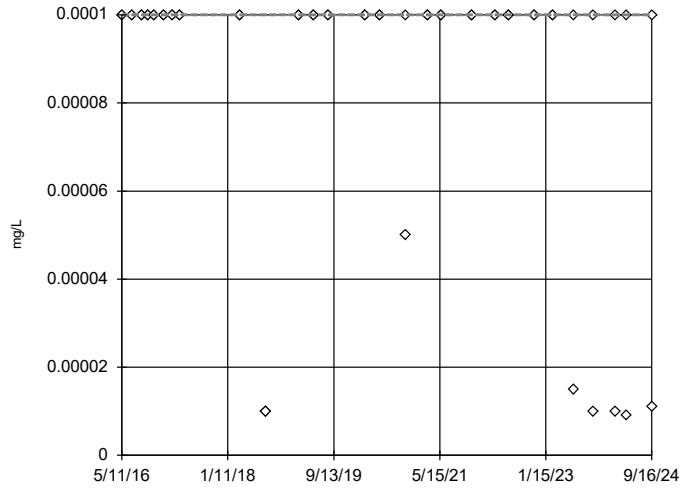
Tukey's Outlier Test - Upgradient Wells - All Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/5/2024, 11:13 AM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony, total (mg/L)	AD-12,AD-13	n/a	n/a	NP	NaN	56	0.00008795	0.00003021	unknown	ShapiroFrancia
Arsenic, total (mg/L)	AD-12,AD-13	No	n/a	NP	NaN	56	0.001822	0.001909	sqrt(x)	ShapiroFrancia
Barium, total (mg/L)	AD-12,AD-13	No	n/a	NP	NaN	56	0.03258	0.01073	ln(x)	ShapiroFrancia
Beryllium, total (mg/L)	AD-12,AD-13	No	n/a	NP	NaN	56	0.0004446	0.0004429	ln(x)	ShapiroFrancia
Boron, total (mg/L)	AD-12,AD-13	No	n/a	NP	NaN	58	0.04618	0.02309	normal	ShapiroFrancia
Cadmium, total (mg/L)	AD-12,AD-13	Yes	0.000007,0.000007,0.000007,0.000007,0.000007,0.00	NP	NaN	56	0.00008391	0.0002896	ln(x)	ShapiroFrancia
Chloride, total (mg/L)	AD-12,AD-13	No	n/a	NP	NaN	58	21.11	16.39	x^(1/3)	ShapiroFrancia
Chromium, total (mg/L)	AD-12,AD-13	No	n/a	NP	NaN	56	0.001193	0.001567	ln(x)	ShapiroFrancia
Cobalt, total (mg/L)	AD-12,AD-13	No	n/a	NP	NaN	56	0.02317	0.02249	x^3	ShapiroFrancia
Combined Radium 226 + 228 (pCi/L)	AD-12,AD-13	No	n/a	NP	NaN	56	1.404	0.8406	sqrt(x)	ShapiroFrancia
Fluoride, total (mg/L)	AD-12,AD-13	No	n/a	NP	NaN	58	0.2062	0.168	ln(x)	ShapiroFrancia
Lead, total (mg/L)	AD-12,AD-13	No	n/a	NP	NaN	56	0.0001609	0.00005853	normal	ShapiroFrancia
Lithium, total (mg/L)	AD-12,AD-13	No	n/a	NP	NaN	56	0.07411	0.06798	x^5	ShapiroFrancia
Mercury, total (mg/L)	AD-12,AD-13	n/a	n/a	NP	NaN	56	0.000005427	0.000002388	unknown	ShapiroFrancia
Molybdenum, total (mg/L)	AD-12,AD-13	n/a	n/a	NP	NaN	56	0.0005061	0.0001053	unknown	ShapiroFrancia
Selenium, total (mg/L)	AD-12,AD-13	No	n/a	NP	NaN	56	0.0005587	0.000726	ln(x)	ShapiroFrancia
Sulfate, total (mg/L)	AD-12,AD-13	No	n/a	NP	NaN	58	36.55	36.34	sqrt(x)	ShapiroFrancia
Thallium, total (mg/L)	AD-12,AD-13	n/a	n/a	NP	NaN	56	0.0002441	0.0002573	unknown	ShapiroFrancia

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13

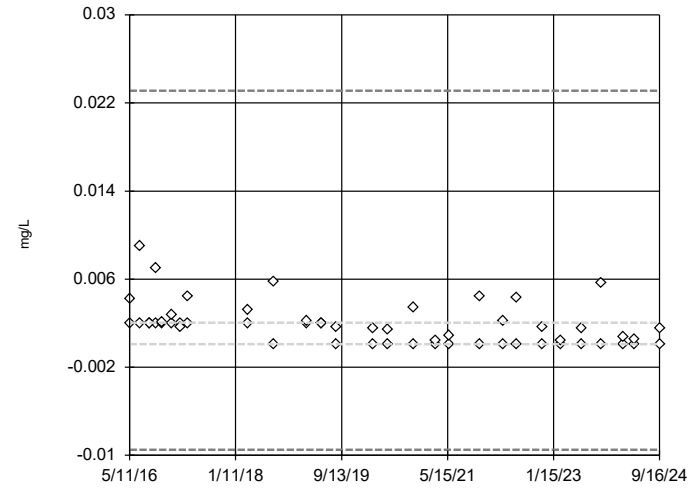


n = 56
 No outliers found.
 Tukey's method selected by user.
 Data were square transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Antimony, total Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13

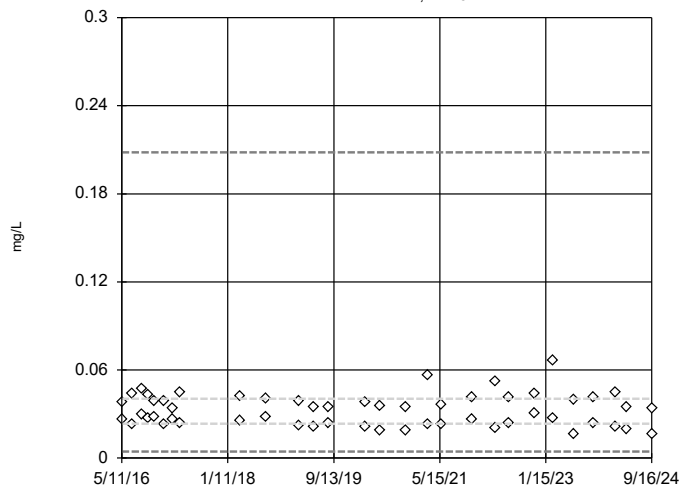


n = 56
 No outliers found.
 Tukey's method selected by user.
 Data were square root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.02311, low cutoff = -0.009489, based on IQR multiplier of 3.

Constituent: Arsenic, total Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13

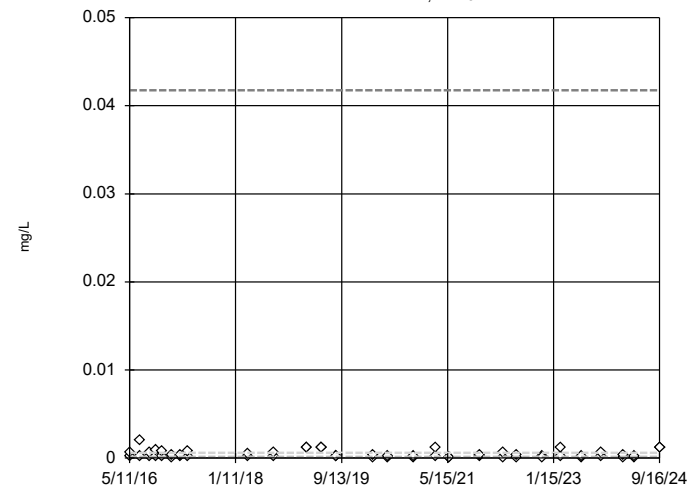


n = 56
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.2082, low cutoff = 0.004525, based on IQR multiplier of 3.

Constituent: Barium, total Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13

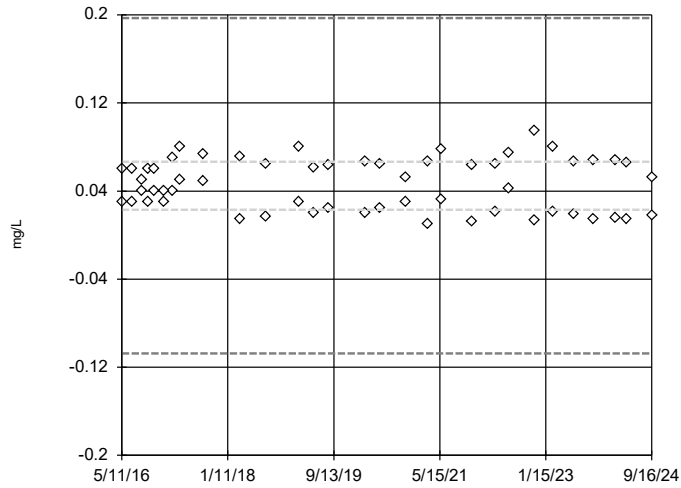


n = 56
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.04176, low cutoff = 0.00002165, based on IQR multiplier of 3.

Constituent: Beryllium, total Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13

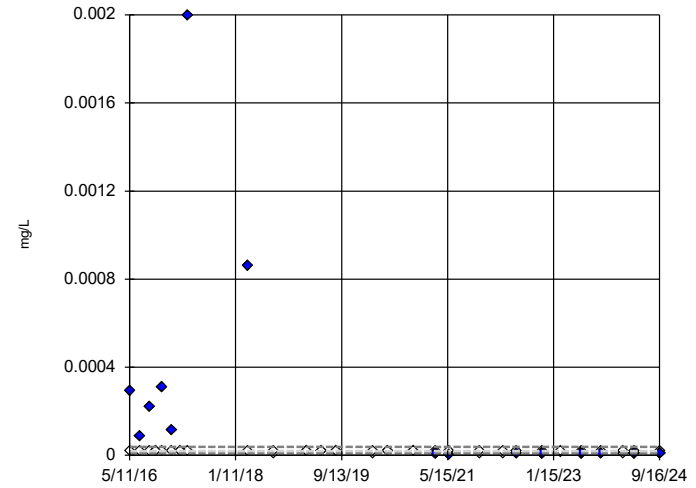


n = 58
 No outliers found.
 Tukey's method selected by user.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 High cutoff = 0.197, low cutoff = -0.1075, based on IQR multiplier of 3.

Constituent: Boron, total Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13

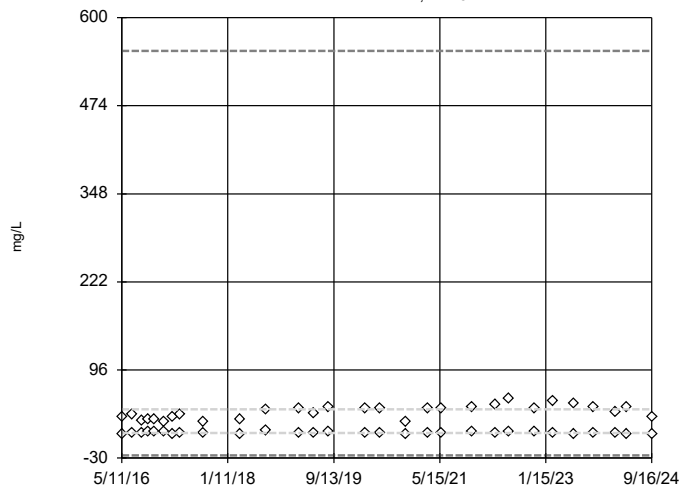


n = 56
 Outliers are drawn as solid.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.00003816, low cutoff = 0.00000845, based on IQR multiplier of 3.

Constituent: Cadmium, total Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13

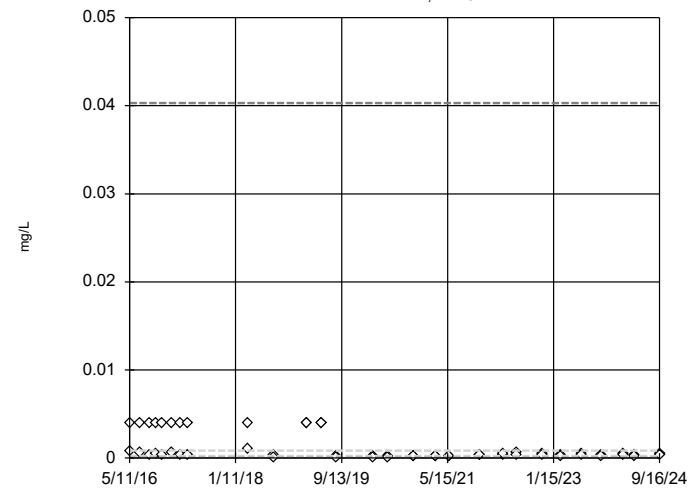


n = 58
 No outliers found.
 Tukey's method selected by user.
 Data were cube root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 552.2, low cutoff = -26.1, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13

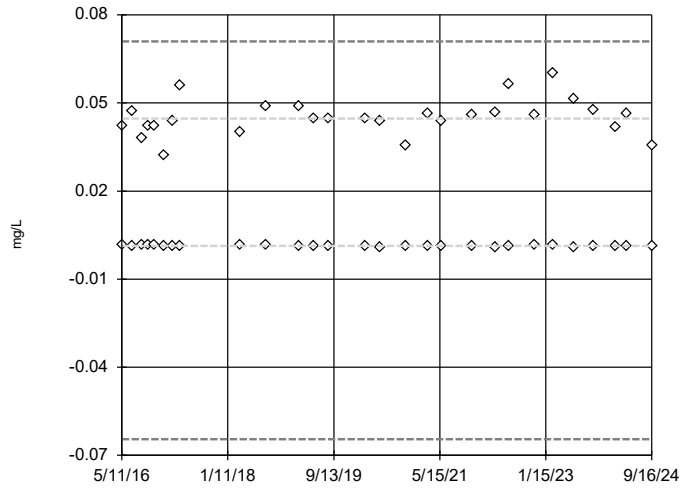


n = 56
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.04031, low cutoff = 0.000005144, based on IQR multiplier of 3.

Constituent: Chromium, total Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13

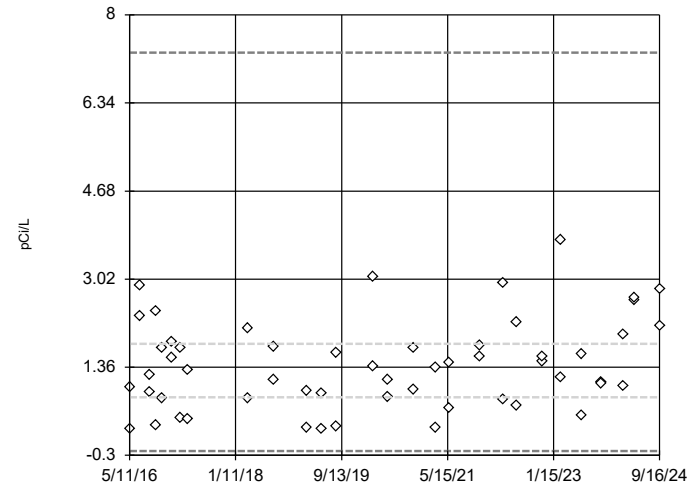


n = 56
 No outliers found.
 Tukey's method selected by user.
 Data were cube transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.07096, low cutoff = -0.06447, based on IQR multiplier of 3.

Constituent: Cobalt, total Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13

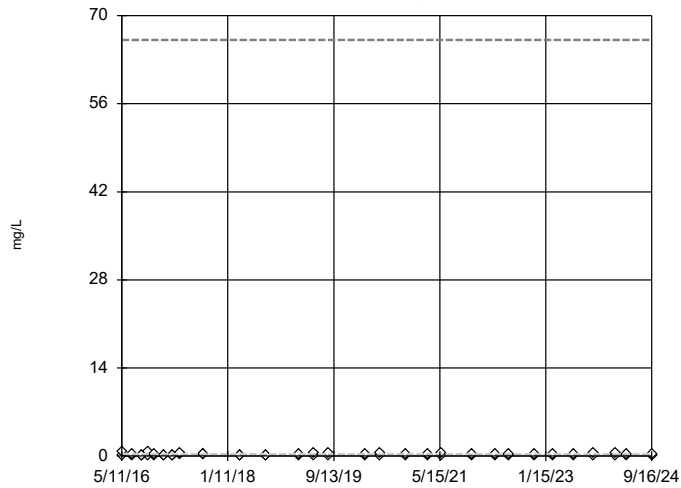


n = 56
 No outliers found.
 Tukey's method selected by user.
 Data were square root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 7.291, low cutoff = -0.2193, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13

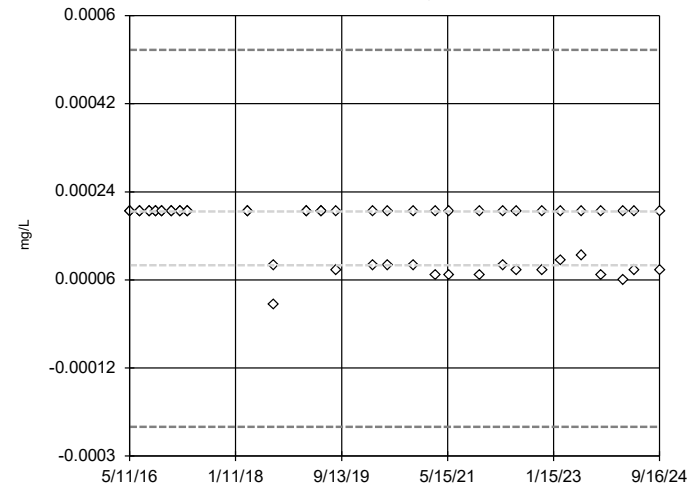


n = 58
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 66.12, low cutoff = 0.0003137, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13

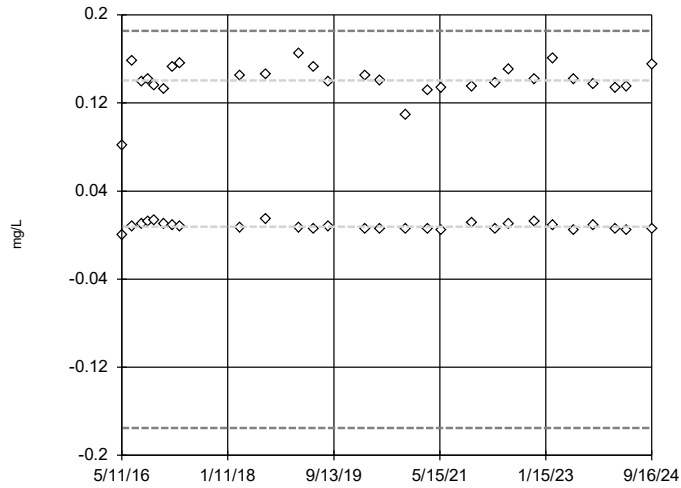


n = 56
 No outliers found.
 Tukey's method selected by user.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 High cutoff = 0.00053, low cutoff = -0.00024, based on IQR multiplier of 3.

Constituent: Lead, total Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13

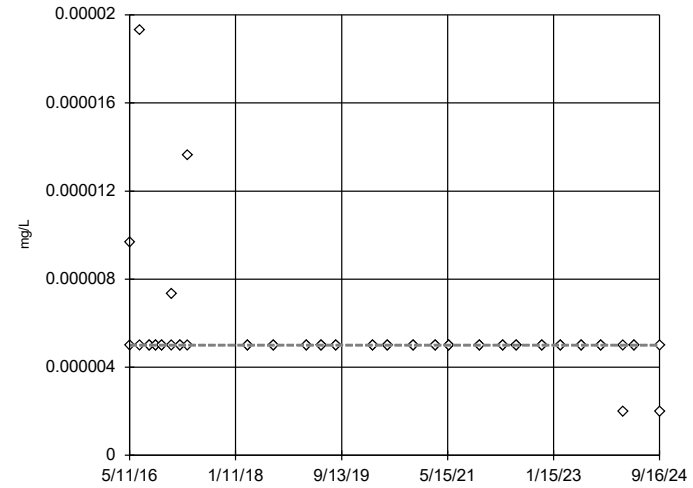


n = 56
 No outliers found.
 Tukey's method selected by user.
 Data were x^5 transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.1854,
 low cutoff = -0.175, based on IQR multiplier of 3.

Constituent: Lithium, total Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13

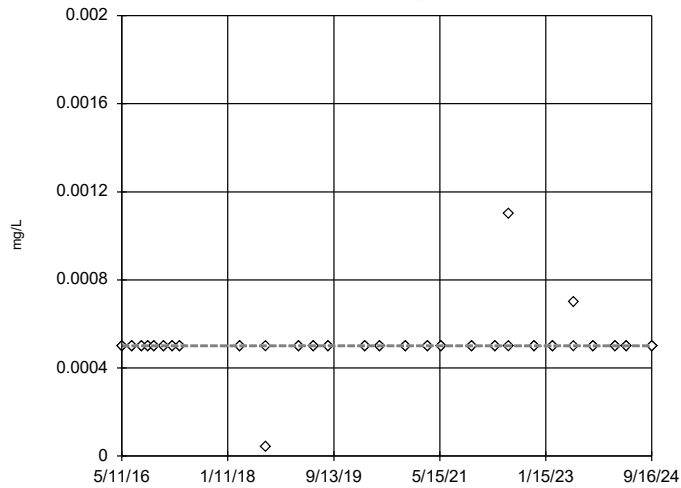


n = 56
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury, total Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13

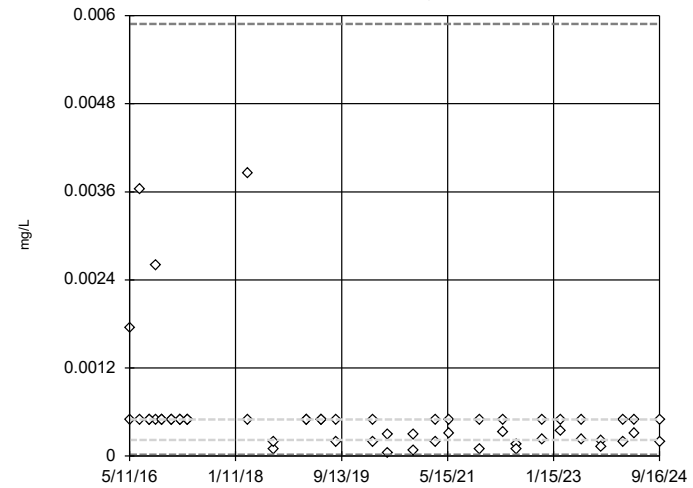


n = 56
 No outliers found.
 Tukey's method selected by user.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Molybdenum, total Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13

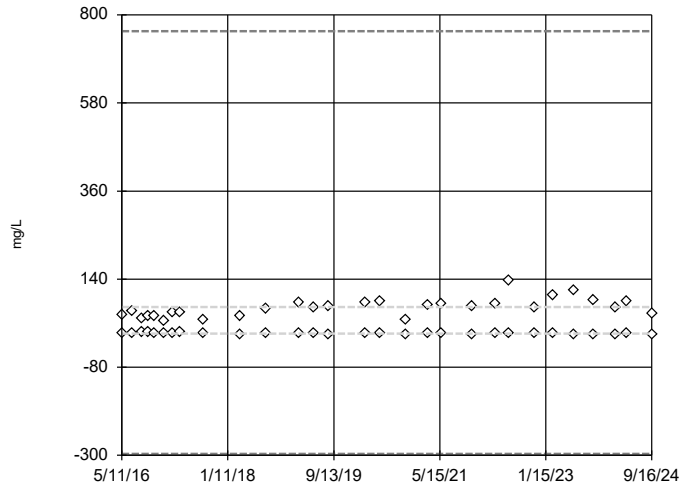


n = 56
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.005888,
 low cutoff = 0.00001866, based on IQR multiplier of 3.

Constituent: Selenium, total Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13



n = 58

No outliers found.
Tukey's method selected by user.

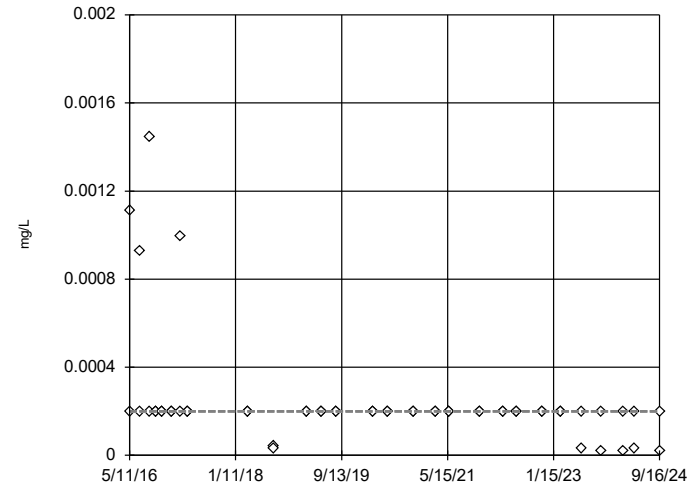
Data were square root transformed to achieve best W statistic (graph shown in original units).

High cutoff = 759.2, low cutoff = -296.2, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tukey's Outlier Screening, Pooled Background

AD-12,AD-13



n = 56

No outliers found.
Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Thallium, total Analysis Run 12/5/2024 11:11 AM View: Outliers Upgradient
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

FIGURE D
Seasonality

Seasonality Summary Table - Significant Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/5/2024, 11:33 AM

<u>Constituent</u>	<u>Well</u>	<u>Sig.</u>	<u>K.-W.</u>	<u>Chi-Sq.</u>	<u>df</u>	<u>N</u>	<u>Alpha</u>
Beryllium, total (mg/L)	AD-22	Yes	13.14	3.841	1	28	0.05
Cadmium, total (mg/L)	AD-22	Yes	14.34	3.841	1	28	0.05
Calcium, total (mg/L)	AD-22	Yes	15.65	3.841	1	30	0.05
Cobalt, total (mg/L)	AD-22	Yes	14.35	3.841	1	28	0.05
Combined Radium 226 + 228 (pCi/L)	AD-22	Yes	11.95	3.841	1	28	0.05
Fluoride, total (mg/L)	AD-22	Yes	7.01	3.841	1	30	0.05
Lithium, total (mg/L)	AD-22	Yes	9.493	3.841	1	28	0.05
pH, field (SU)	AD-22	Yes	4.049	3.841	1	30	0.05
Selenium, total (mg/L)	AD-22	Yes	4.625	3.841	1	28	0.05
Total Dissolved Solids [TDS] (mg/L)	AD-22	Yes	9.215	3.841	1	30	0.05

Seasonality Summary Table - All Results

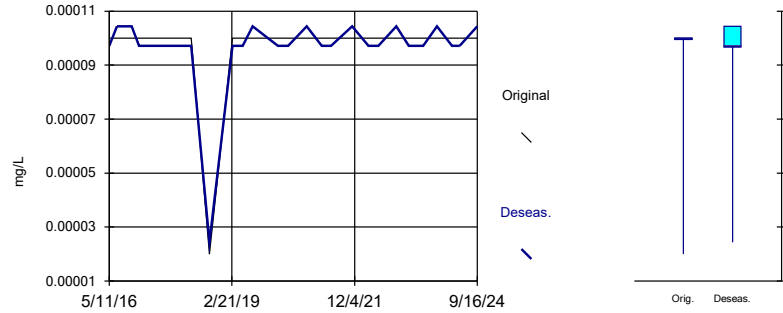
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/5/2024, 11:33 AM

<u>Constituent</u>	<u>Well</u>	<u>Sig.</u>	<u>K.-W.</u>	<u>Chi-Sq.</u>	<u>df</u>	<u>N</u>	<u>Alpha</u>
Antimony, total (mg/L)	AD-22	No	1.545	3.841	1	28	0.05
Arsenic, total (mg/L)	AD-22	No	0.3187	3.841	1	28	0.05
Barium, total (mg/L)	AD-22	No	1.384	3.841	1	28	0.05
Beryllium, total (mg/L)	AD-22	Yes	13.14	3.841	1	28	0.05
Cadmium, total (mg/L)	AD-22	Yes	14.34	3.841	1	28	0.05
Calcium, total (mg/L)	AD-22	Yes	15.65	3.841	1	30	0.05
Chromium, total (mg/L)	AD-22	No	0.2683	3.841	1	28	0.05
Cobalt, total (mg/L)	AD-22	Yes	14.35	3.841	1	28	0.05
Combined Radium 226 + 228 (pCi/L)	AD-22	Yes	11.95	3.841	1	28	0.05
Fluoride, total (mg/L)	AD-22	Yes	7.01	3.841	1	30	0.05
Lead, total (mg/L)	AD-22	No	0.9523	3.841	1	28	0.05
Lithium, total (mg/L)	AD-22	Yes	9.493	3.841	1	28	0.05
Mercury, total (mg/L)	AD-22	No	0.96	3.841	1	15	0.05
Molybdenum, total (mg/L)	AD-22	No	0.07879	3.841	1	26	0.05
pH, field (SU)	AD-22	Yes	4.049	3.841	1	30	0.05
Selenium, total (mg/L)	AD-22	Yes	4.625	3.841	1	28	0.05
Thallium, total (mg/L)	AD-22	No	2.094	3.841	1	27	0.05
Total Dissolved Solids [TDS] (mg/L)	AD-22	Yes	9.215	3.841	1	30	0.05

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.

Calculated Kruskal-Wallis statistic = 1.545
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 0.1599
 Adjusted Kruskal-Wallis statistic (H') = 1.545

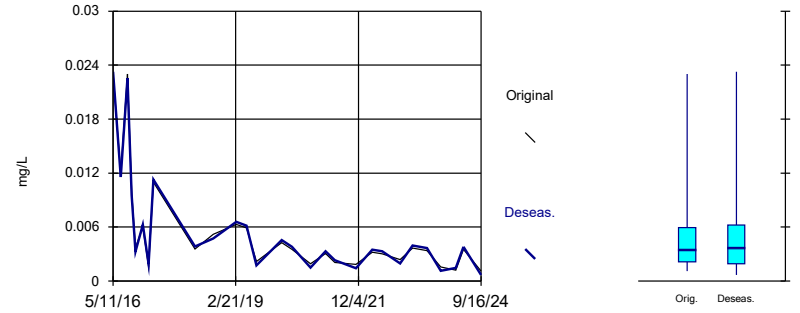


Constituent: Antimony, total Analysis Run 12/5/2024 11:31 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.

Calculated Kruskal-Wallis statistic = 0.3187
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 0.3186
 Adjusted Kruskal-Wallis statistic (H') = 0.3187

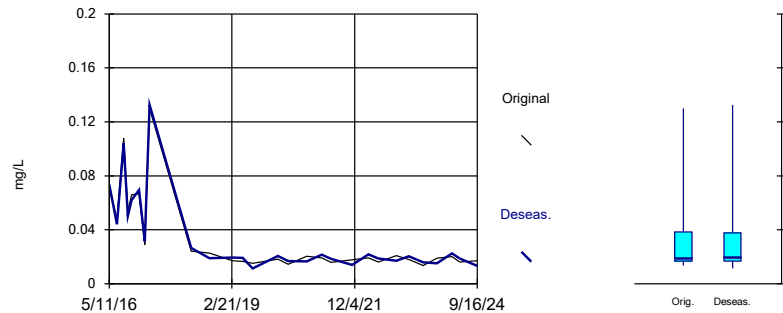


Constituent: Arsenic, total Analysis Run 12/5/2024 11:31 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.

Calculated Kruskal-Wallis statistic = 1.384
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 1.383
 Adjusted Kruskal-Wallis statistic (H') = 1.384

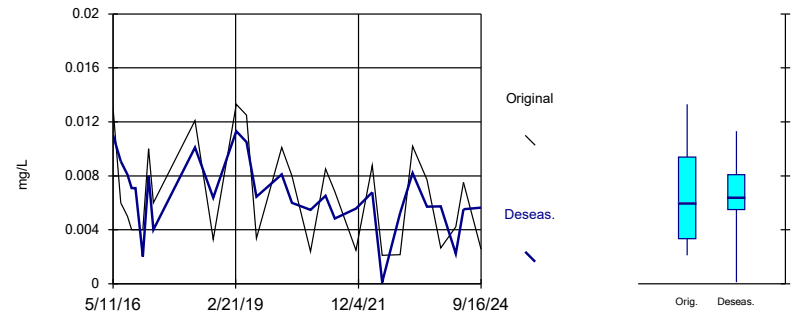


Constituent: Barium, total Analysis Run 12/5/2024 11:31 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.

Calculated Kruskal-Wallis statistic = 13.14
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 13.12
 Adjusted Kruskal-Wallis statistic (H') = 13.14

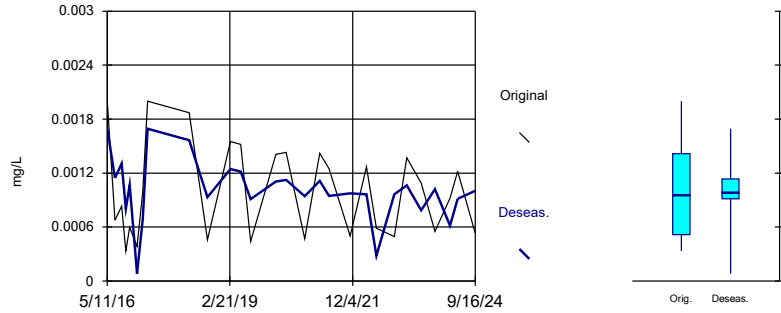


Constituent: Beryllium, total Analysis Run 12/5/2024 11:31 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.

Calculated Kruskal-Wallis statistic = 14.34
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 14.34
 Adjusted Kruskal-Wallis statistic (H') = 14.34

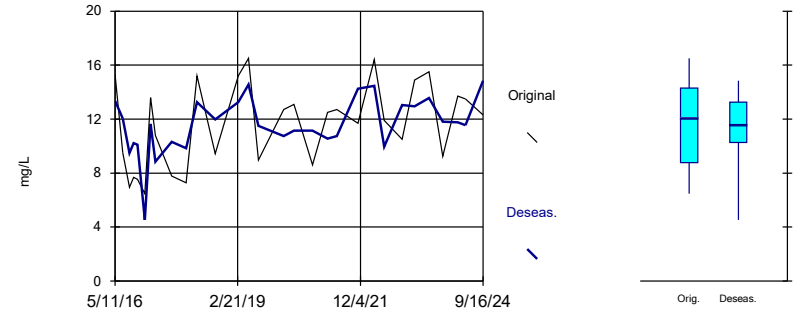


Constituent: Cadmium, total Analysis Run 12/5/2024 11:31 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.

Calculated Kruskal-Wallis statistic = 15.65
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 15.64
 Adjusted Kruskal-Wallis statistic (H') = 15.65

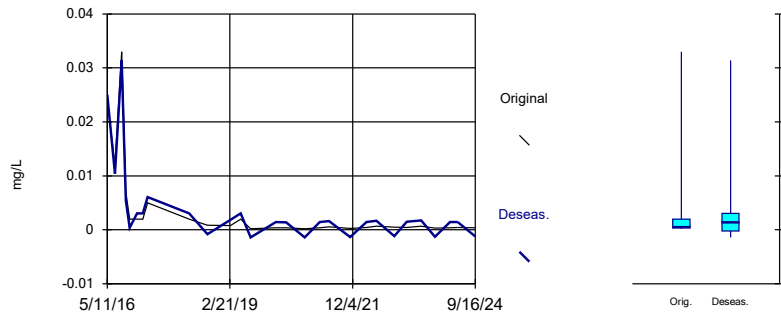


Constituent: Calcium, total Analysis Run 12/5/2024 11:31 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.

Calculated Kruskal-Wallis statistic = 0.2683
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 0.2677
 Adjusted Kruskal-Wallis statistic (H') = 0.2683

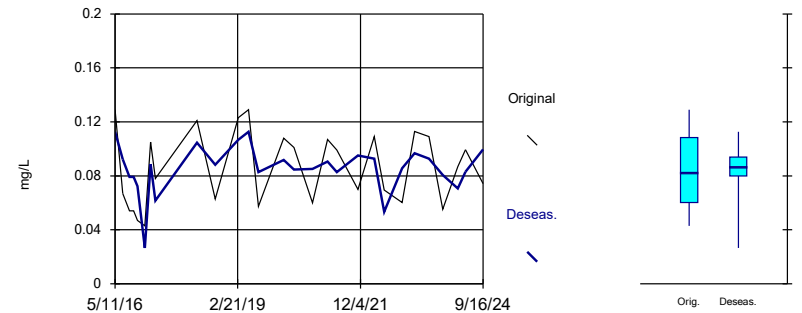


Constituent: Chromium, total Analysis Run 12/5/2024 11:31 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.

Calculated Kruskal-Wallis statistic = 14.35
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 14.34
 Adjusted Kruskal-Wallis statistic (H') = 14.35

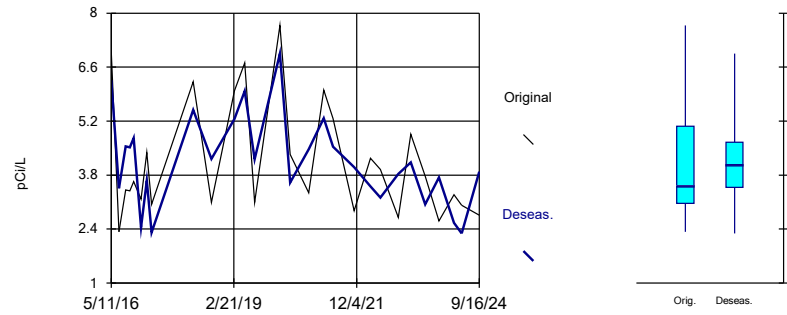


Constituent: Cobalt, total Analysis Run 12/5/2024 11:31 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.

Calculated Kruskal-Wallis statistic = 11.95
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



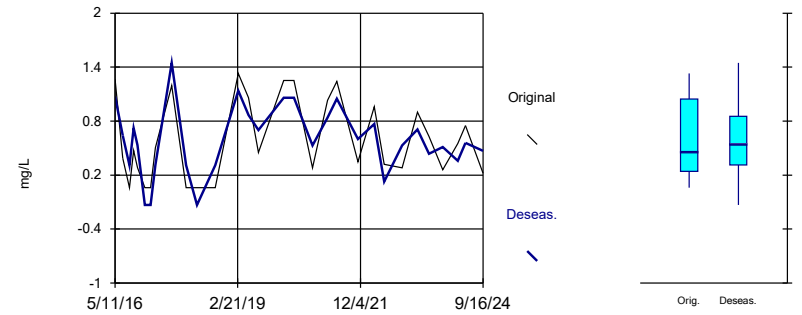
Constituent: Combined Radium 226 + 228 Analysis Run 12/5/2024 11:31 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.

Calculated Kruskal-Wallis statistic = 7.01
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.

Kruskal-Wallis statistic (H) = 6.952
 Adjusted Kruskal-Wallis statistic (H') = 7.01



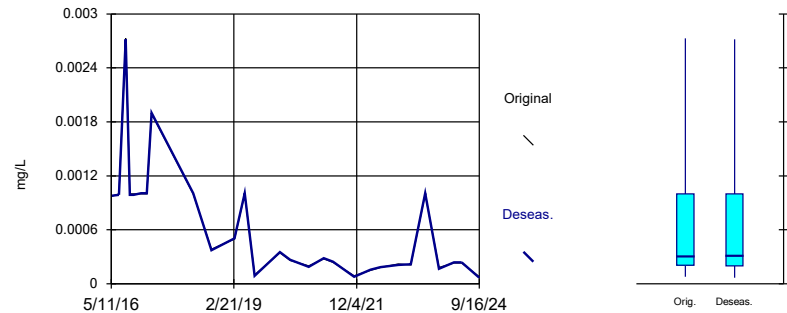
Constituent: Fluoride, total Analysis Run 12/5/2024 11:31 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.

Calculated Kruskal-Wallis statistic = 0.9523
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.

Kruskal-Wallis statistic (H) = 0.9299
 Adjusted Kruskal-Wallis statistic (H') = 0.9523

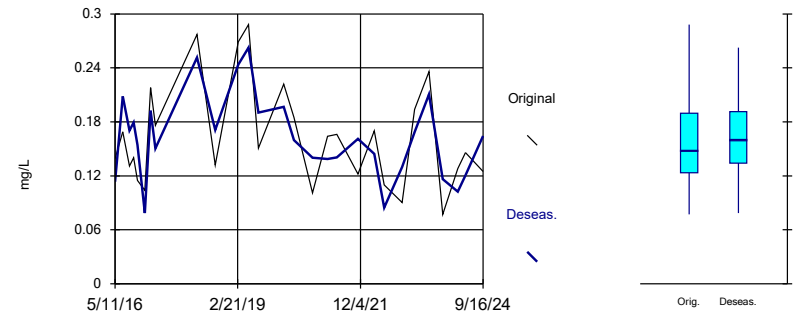


Constituent: Lead, total Analysis Run 12/5/2024 11:31 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.

Calculated Kruskal-Wallis statistic = 9.493
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

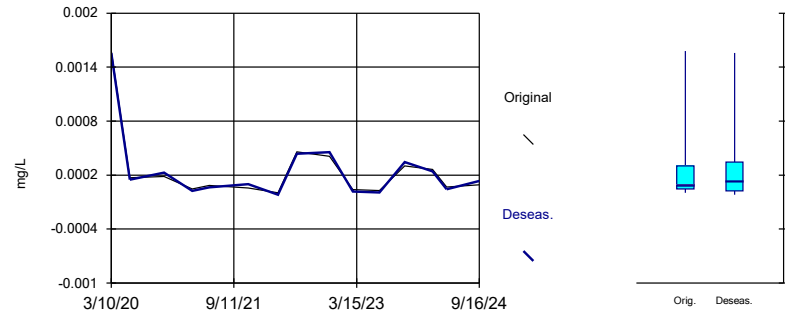


Constituent: Lithium, total Analysis Run 12/5/2024 11:31 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.

Calculated Kruskal-Wallis statistic = 0.96
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

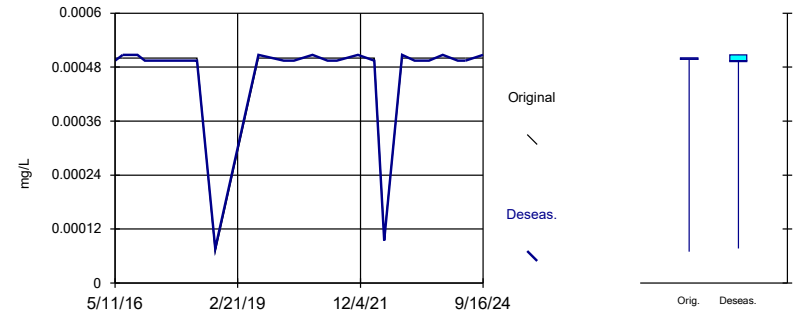


Constituent: Mercury, total Analysis Run 12/5/2024 11:31 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.

Calculated Kruskal-Wallis statistic = 0.07879
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 0.01684
 Adjusted Kruskal-Wallis statistic (H') = 0.07879

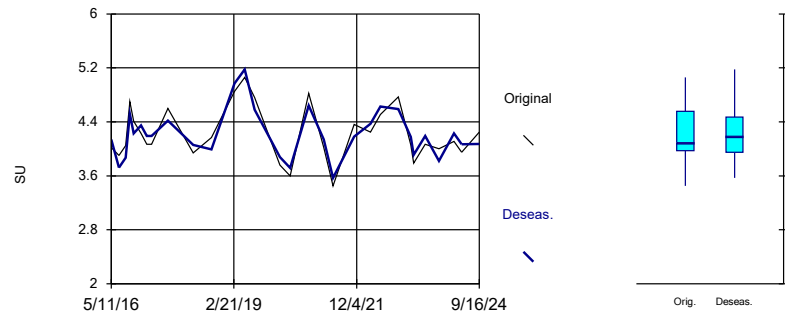


Constituent: Molybdenum, total Analysis Run 12/5/2024 11:31 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.

Calculated Kruskal-Wallis statistic = 4.049
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 4.043
 Adjusted Kruskal-Wallis statistic (H') = 4.049

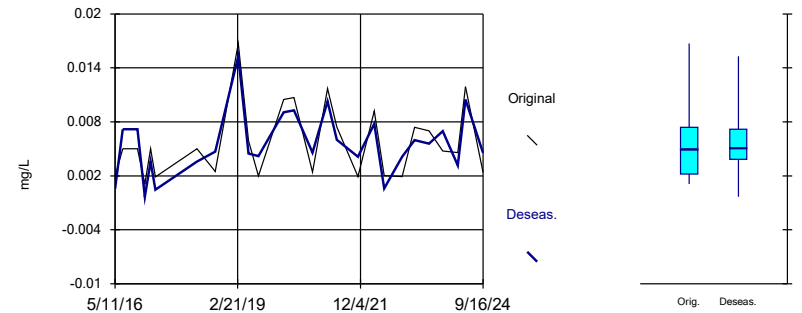


Constituent: pH, field Analysis Run 12/5/2024 11:31 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.

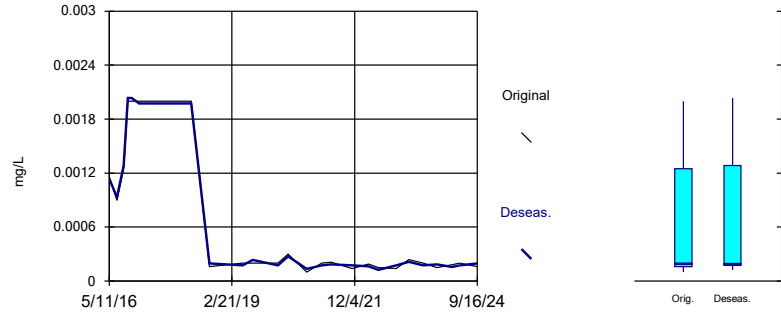
Calculated Kruskal-Wallis statistic = 4.625
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 4.581
 Adjusted Kruskal-Wallis statistic (H') = 4.625



Constituent: Selenium, total Analysis Run 12/5/2024 11:32 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

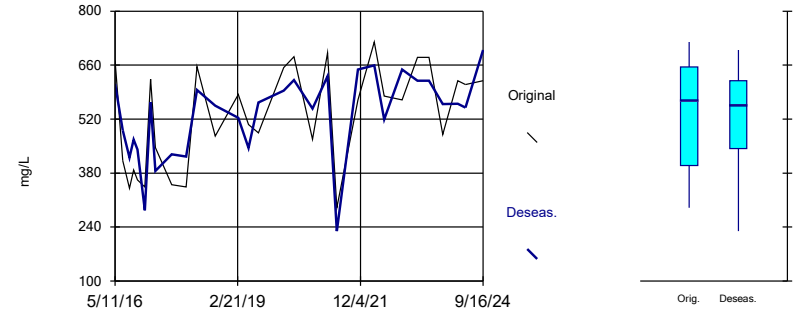
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
 Calculated Kruskal-Wallis statistic = 2.094
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 2.048
 Adjusted Kruskal-Wallis statistic (H') = 2.094



Constituent: Thallium, total Analysis Run 12/5/2024 11:32 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Seasonality: AD-22

For the selected data, the Kruskal-Wallis test indicates SEASONALITY at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
 Calculated Kruskal-Wallis statistic = 9.215
 Tabulated Chi-Squared value = 3.841 with 1 degrees of freedom at the 5% significance level.
 There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
 Kruskal-Wallis statistic (H) = 9.207
 Adjusted Kruskal-Wallis statistic (H') = 9.215



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/5/2024 11:32 AM View: Seasonality
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

FIGURE E
Mann-Whitney

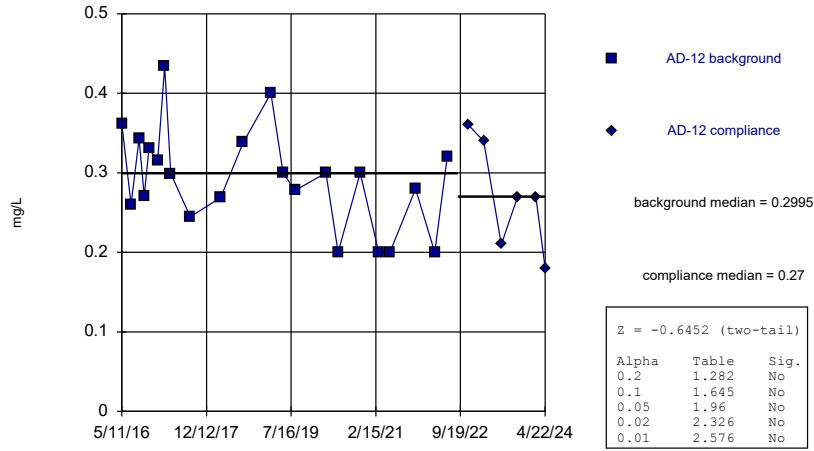
Welch's t-test/Mann-Whitney - All Results (No Significant)

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/5/2024, 11:55 AM

<u>Constituent</u>	<u>Well</u>	<u>Calc.</u>	<u>0.01</u>	<u>Alpha</u>	<u>Sig.</u>	<u>Method</u>
Calcium, total (mg/L)	AD-12 (bg)	-0.6452	No	0.01	No	Mann-W
Calcium, total (mg/L)	AD-13 (bg)	1.092	No	0.01	No	Mann-W
Calcium, total (mg/L)	AD-22	1.212	No	0.01	No	Mann-W
Calcium, total (mg/L)	AD-33	1.185	No	0.01	No	Mann-W
pH, field (SU)	AD-12 (bg)	-1.092	No	0.01	No	Mann-W
pH, field (SU)	AD-13 (bg)	-0.7561	No	0.01	No	Mann-W
pH, field (SU)	AD-22	-0.9434	No	0.01	No	Mann-W
pH, field (SU)	AD-33	0.9522	No	0.01	No	Mann-W
Total Dissolved Solids [TDS] (mg/L)	AD-12 (bg)	-1.463	No	0.01	No	Mann-W
Total Dissolved Solids [TDS] (mg/L)	AD-13 (bg)	1.905	No	0.01	No	Mann-W
Total Dissolved Solids [TDS] (mg/L)	AD-22	1.454	No	0.01	No	Mann-W
Total Dissolved Solids [TDS] (mg/L)	AD-33	-0.08762	No	0.01	No	Mann-W

Mann-Whitney (Wilcoxon Rank Sum)

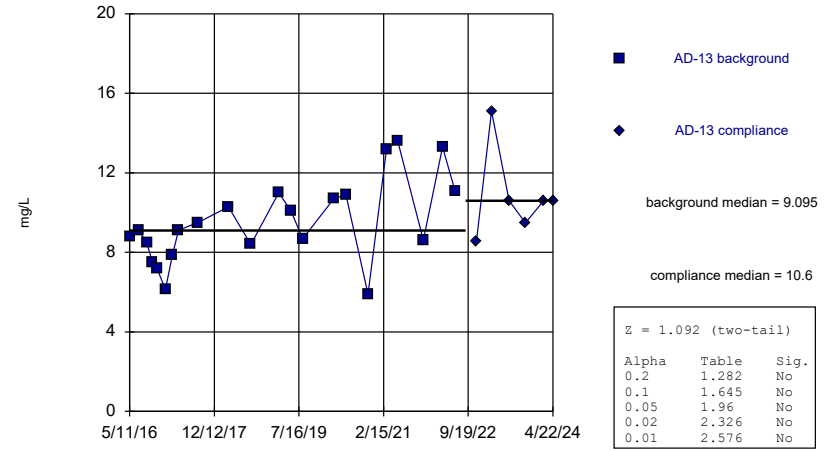
AD-12 (bg)



Constituent: Calcium, total Analysis Run 12/5/2024 11:53 AM View: Mann-Whitney
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Mann-Whitney (Wilcoxon Rank Sum)

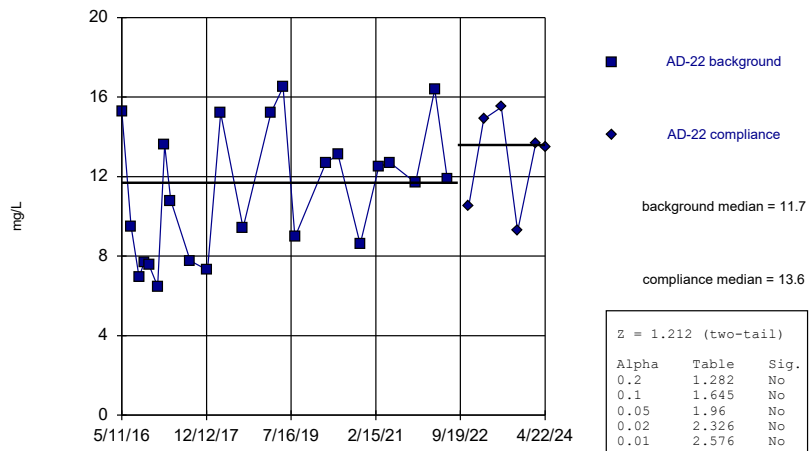
AD-13 (bg)



Constituent: Calcium, total Analysis Run 12/5/2024 11:53 AM View: Mann-Whitney
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Mann-Whitney (Wilcoxon Rank Sum)

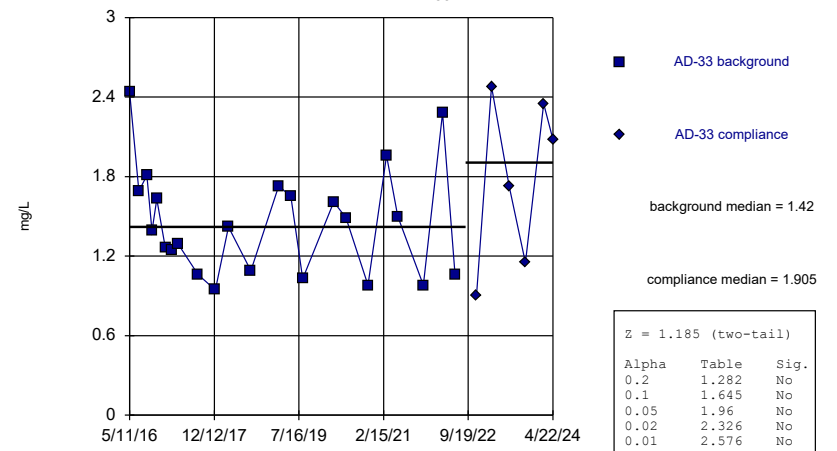
AD-22



Constituent: Calcium, total Analysis Run 12/5/2024 11:53 AM View: Mann-Whitney
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Mann-Whitney (Wilcoxon Rank Sum)

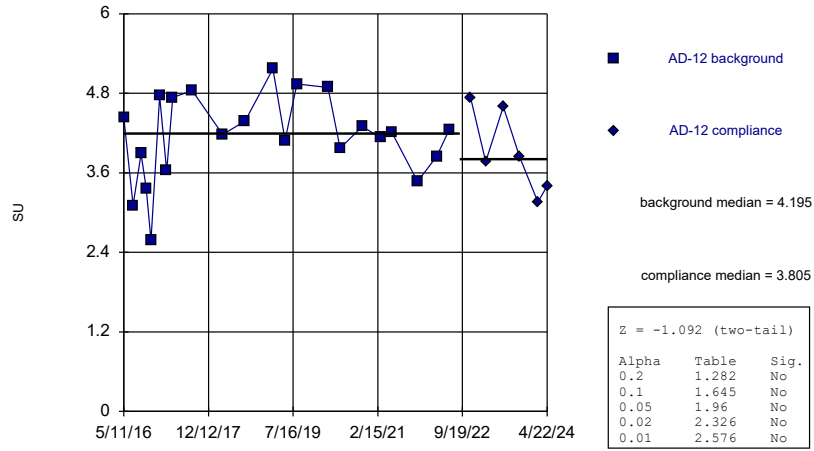
AD-33



Constituent: Calcium, total Analysis Run 12/5/2024 11:53 AM View: Mann-Whitney
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Mann-Whitney (Wilcoxon Rank Sum)

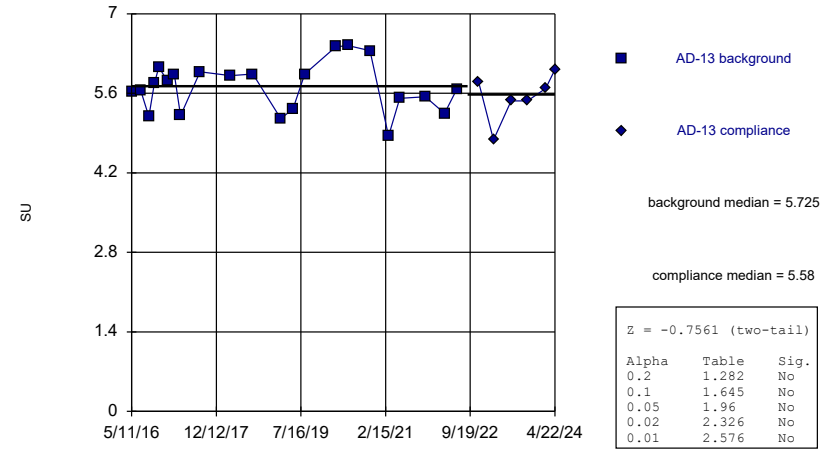
AD-12 (bg)



Constituent: pH, field Analysis Run 12/5/2024 11:53 AM View: Mann-Whitney
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Mann-Whitney (Wilcoxon Rank Sum)

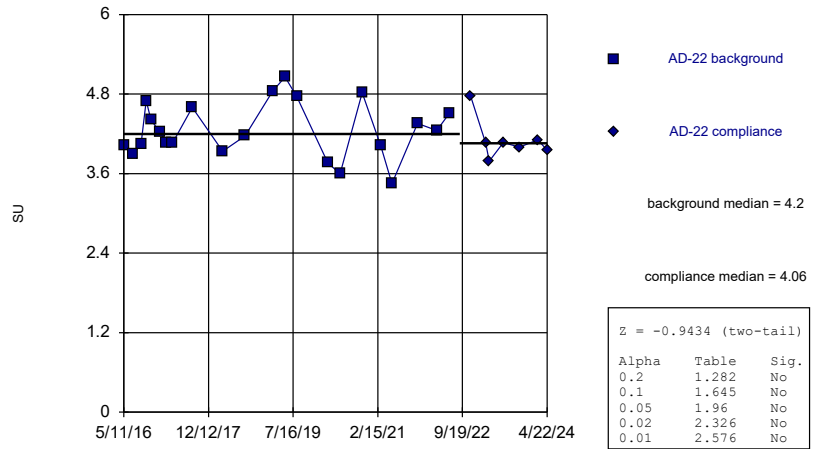
AD-13 (bg)



Constituent: pH, field Analysis Run 12/5/2024 11:53 AM View: Mann-Whitney
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Mann-Whitney (Wilcoxon Rank Sum)

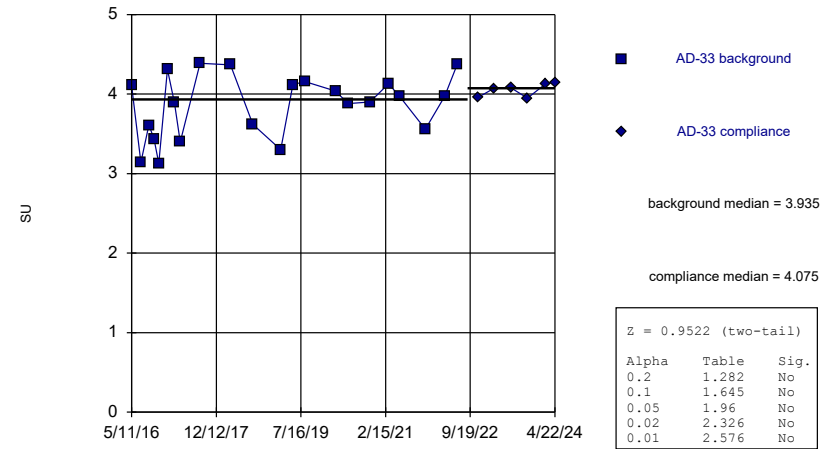
AD-22



Constituent: pH, field Analysis Run 12/5/2024 11:53 AM View: Mann-Whitney
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

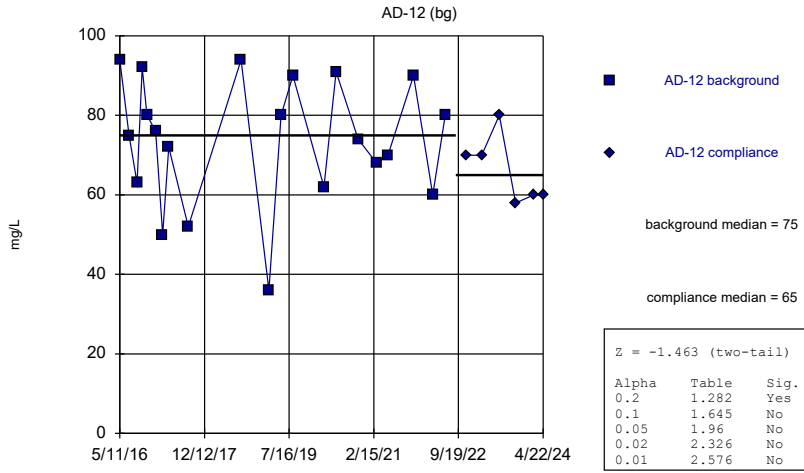
Mann-Whitney (Wilcoxon Rank Sum)

AD-33



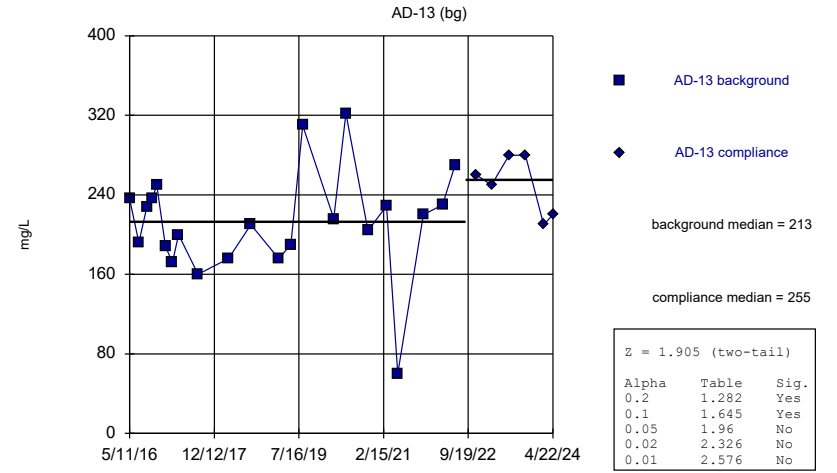
Constituent: pH, field Analysis Run 12/5/2024 11:53 AM View: Mann-Whitney
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Mann-Whitney (Wilcoxon Rank Sum)



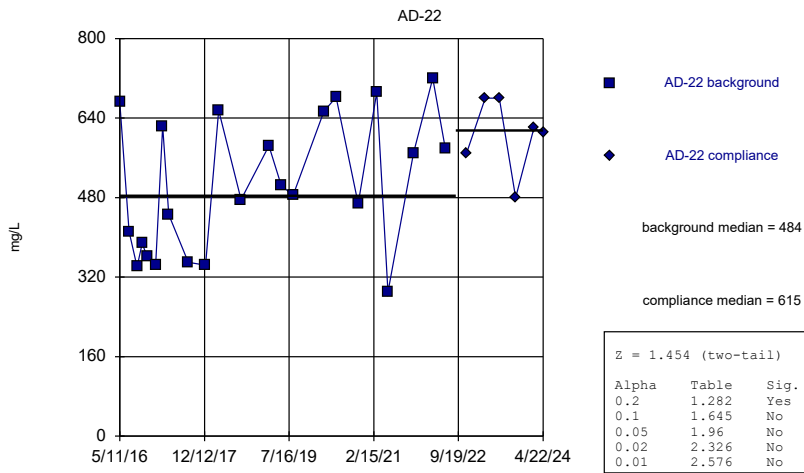
Constituent: Total Dissolved Solids [TDS] Analysis Run 12/5/2024 11:53 AM View: Mann-Whitney
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Mann-Whitney (Wilcoxon Rank Sum)



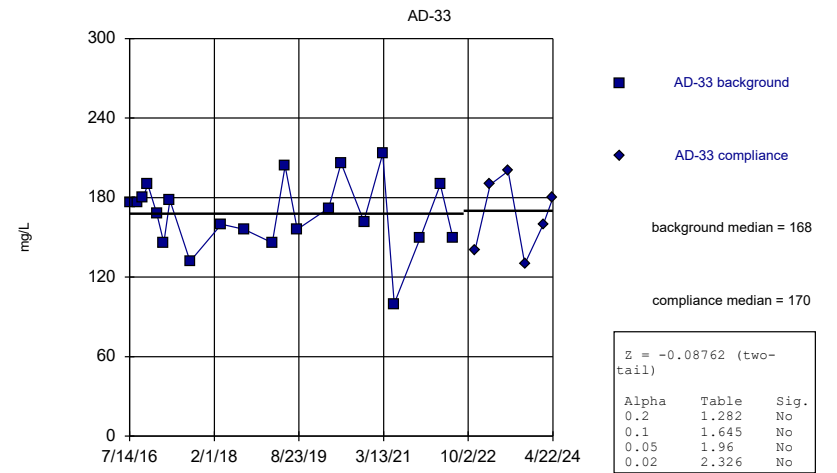
Constituent: Total Dissolved Solids [TDS] Analysis Run 12/5/2024 11:53 AM View: Mann-Whitney
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Mann-Whitney (Wilcoxon Rank Sum)



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/5/2024 11:53 AM View: Mann-Whitney
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Mann-Whitney (Wilcoxon Rank Sum)



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/5/2024 11:53 AM View: Mann-Whitney
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

FIGURE F
Trend Tests – AD-7R

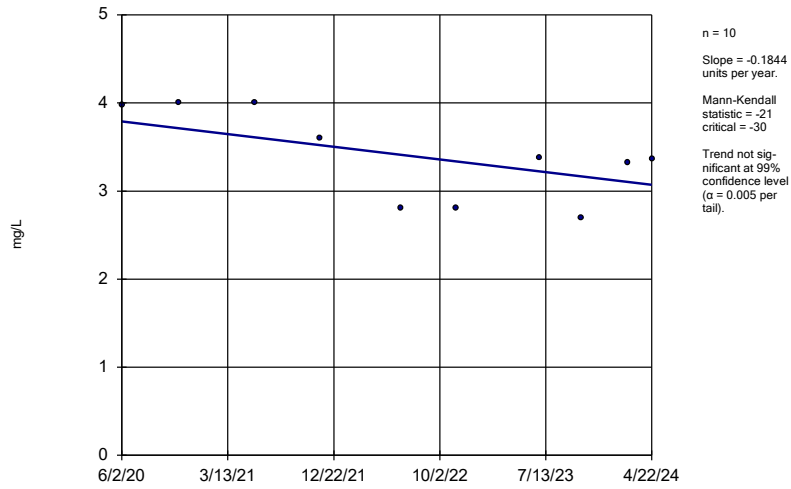
Appendix III - Well AD-7R - All Results (No Significant)

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/5/2024, 11:41 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Alpha</u>	<u>Method</u>
Calcium, total (mg/L)	AD-7R	-0.1844	-21	-30	No	10	0	n/a	0.01	NP
pH, field (SU)	AD-7R	0.08069	9	30	No	10	0	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	AD-7R	0	-1	-30	No	10	0	n/a	0.01	NP

Sen's Slope Estimator

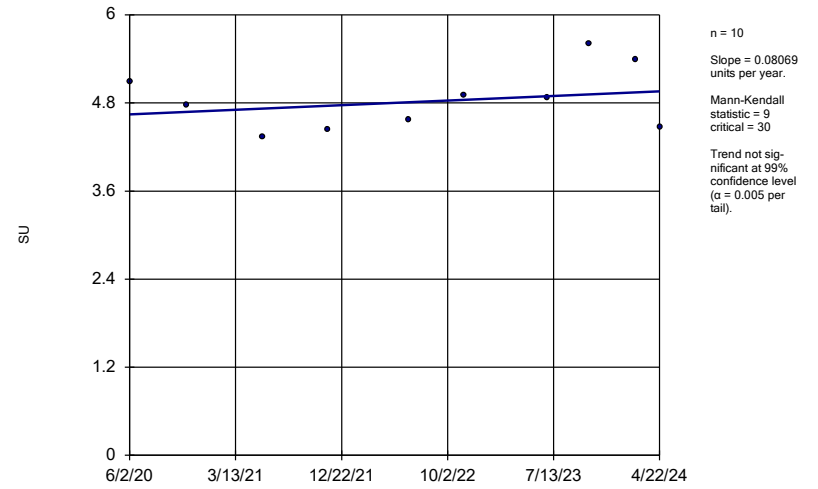
AD-7R



Constituent: Calcium, total Analysis Run 12/5/2024 11:40 AM View: Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

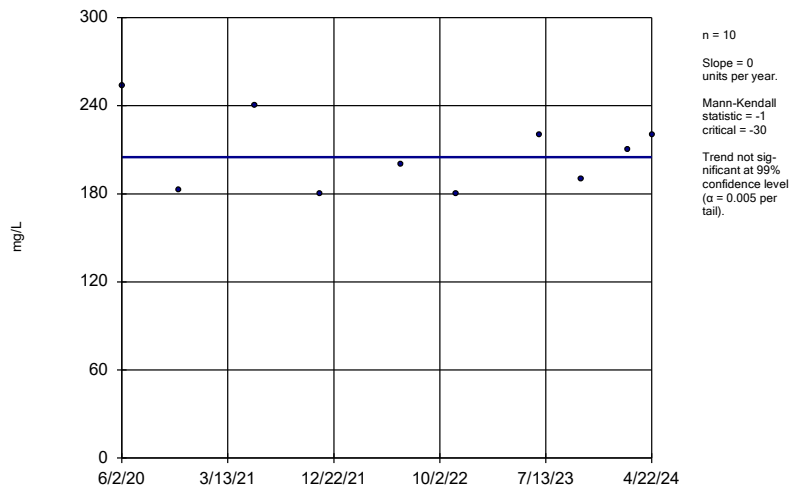
AD-7R



Constituent: pH, field Analysis Run 12/5/2024 11:40 AM View: Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-7R



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/5/2024 11:40 AM View: Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

FIGURE G
Intrawell PLs

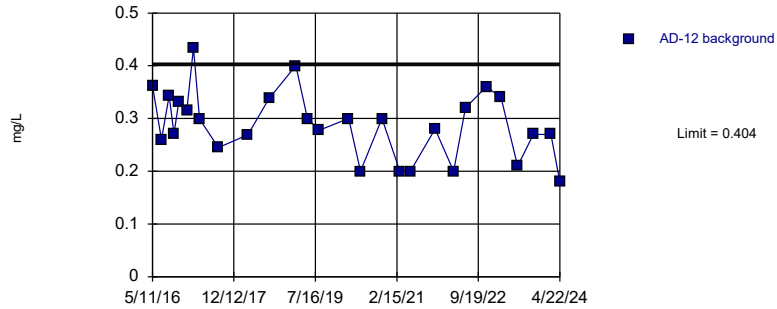
Intrawell Prediction Limits - All Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/5/2024, 12:00 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg	NBg	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Calcium, total (mg/L)	AD-12	0.404	n/a	n/a	1 future	n/a	28	0.2884	0.06375	0	None	No	0.002505	Param Intra 1 of 2	
Calcium, total (mg/L)	AD-13	13.75	n/a	n/a	1 future	n/a	28	9.802	2.178	0	None	No	0.002505	Param Intra 1 of 2	
Calcium, total (mg/L)	AD-22	15.24	n/a	n/a	1 future	n/a	29	11.56	2.037	0	None	No	0.002505	Param Intra 1 of 2 Deseas	
Calcium, total (mg/L)	AD-33	2.381	n/a	n/a	1 future	n/a	29	1.525	0.4737	0	None	No	0.002505	Param Intra 1 of 2	
Calcium, total (mg/L)	AD-7R	4.528	n/a	n/a	1 future	n/a	10	3.396	0.5058	0	None	No	0.002505	Param Intra 1 of 2	
pH, field (SU)	AD-12	5.249	2.944	n/a	1 future	n/a	28	4.096	0.6355	0	None	No	0.001253	Param Intra 1 of 2	
pH, field (SU)	AD-13	6.443	4.898	n/a	1 future	n/a	28	5.67	0.4259	0	None	No	0.001253	Param Intra 1 of 2	
pH, field (SU)	AD-22	4.885	3.553	n/a	1 future	n/a	29	4.219	0.3684	0	None	No	0.001253	Param Intra 1 of 2 Deseas	
pH, field (SU)	AD-33	4.555	3.241	n/a	1 future	n/a	28	3.898	0.3624	0	None	No	0.001253	Param Intra 1 of 2	
pH, field (SU)	AD-7R	5.786	3.906	n/a	1 future	n/a	10	4.846	0.42	0	None	No	0.001253	Param Intra 1 of 2	
Total Dissolved Solids [TDS] (mg/L)	AD-12	99.01	n/a	n/a	1 future	n/a	27	72.11	14.78	0	None	No	0.002505	Param Intra 1 of 2	
Total Dissolved Solids [TDS] (mg/L)	AD-13	313.7	n/a	n/a	1 future	n/a	28	220.5	51.39	0	None	No	0.002505	Param Intra 1 of 2	
Total Dissolved Solids [TDS] (mg/L)	AD-22	721.4	n/a	n/a	1 future	n/a	29	527.1	107.6	0	None	No	0.002505	Param Intra 1 of 2 Deseas	
Total Dissolved Solids [TDS] (mg/L)	AD-33	214.9	n/a	n/a	1 future	n/a	27	167.1	26.29	0	None	No	0.002505	Param Intra 1 of 2	
Total Dissolved Solids [TDS] (mg/L)	AD-7R	265.5	n/a	n/a	1 future	n/a	10	207.7	25.85	0	None	No	0.002505	Param Intra 1 of 2	

Prediction Limit

Intrawell Parametric, AD-12 (bg)

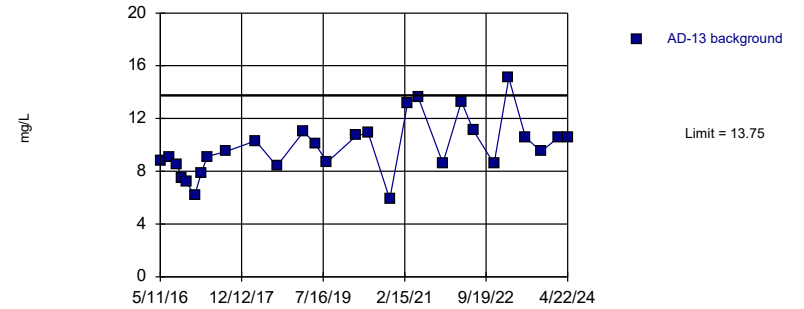


Background Data Summary: Mean=0.2884, Std. Dev.=0.06375, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.965, critical = 0.896. Kappa = 1.814 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/5/2024 11:56 AM View: Intrawell
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Prediction Limit

Intrawell Parametric, AD-13 (bg)

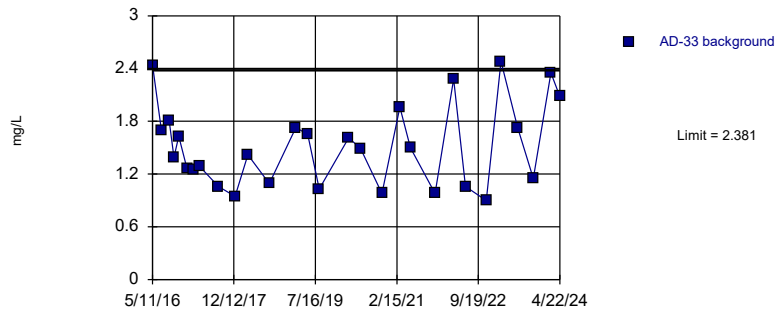


Background Data Summary: Mean=9.802, Std. Dev.=2.178, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9595, critical = 0.896. Kappa = 1.814 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/5/2024 11:56 AM View: Intrawell
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Prediction Limit

Intrawell Parametric, AD-33

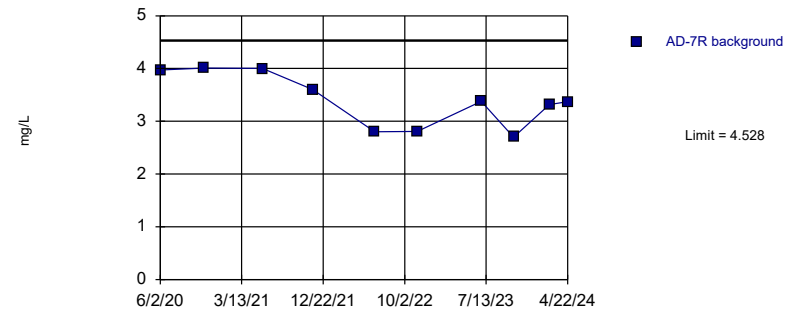


Background Data Summary: Mean=1.525, Std. Dev.=0.4737, n=29. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9242, critical = 0.898. Kappa = 1.807 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/5/2024 11:56 AM View: Intrawell
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Prediction Limit

Intrawell Parametric, AD-7R

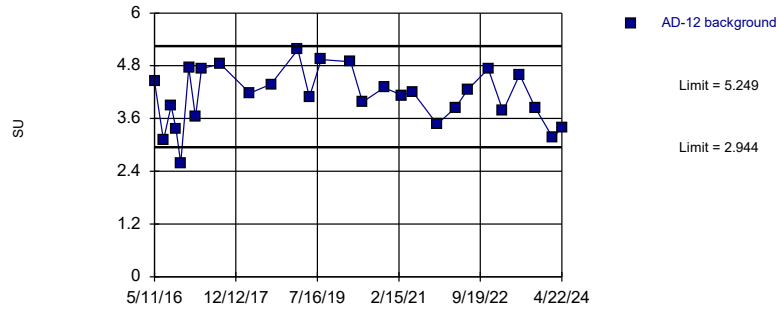


Background Data Summary: Mean=3.396, Std. Dev.=0.5058, n=10. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8878, critical = 0.842. Kappa = 2.238 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/5/2024 11:56 AM View: Intrawell
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Prediction Limit

Intrawell Parametric, AD-12 (bg)

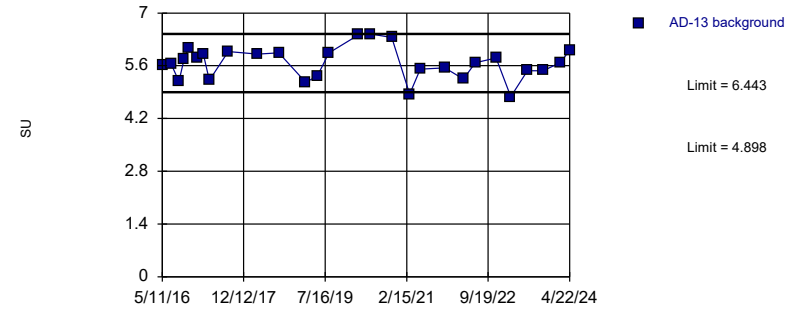


Background Data Summary: Mean=4.096, Std. Dev.=0.6355, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9753, critical = 0.896. Kappa = 1.814 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/5/2024 11:56 AM View: Intrawell
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Prediction Limit

Intrawell Parametric, AD-13 (bg)

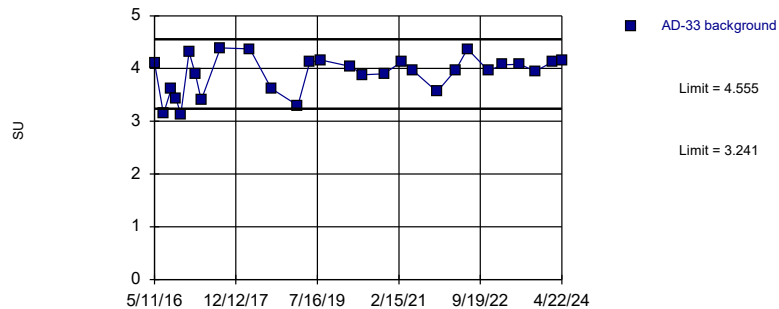


Background Data Summary: Mean=5.67, Std. Dev.=0.4259, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9733, critical = 0.896. Kappa = 1.814 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/5/2024 11:56 AM View: Intrawell
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Prediction Limit

Intrawell Parametric, AD-33

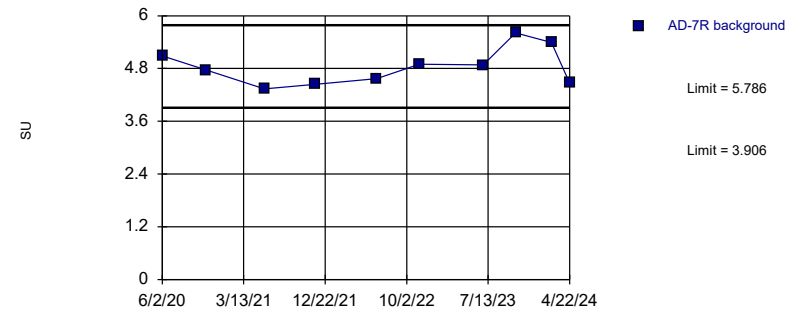


Background Data Summary: Mean=3.898, Std. Dev.=0.3624, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9083, critical = 0.896. Kappa = 1.814 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/5/2024 11:56 AM View: Intrawell
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

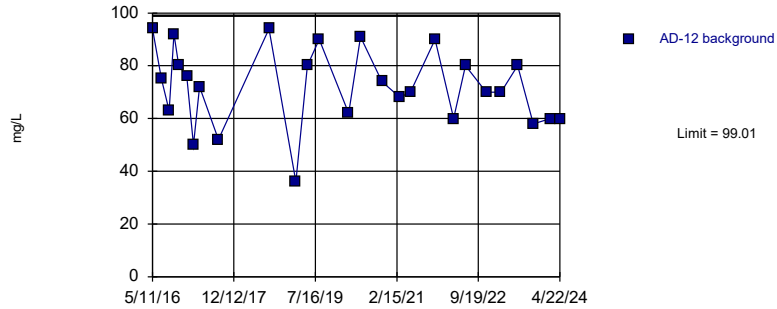
Prediction Limit

Intrawell Parametric, AD-7R



Prediction Limit

Intrawell Parametric, AD-12 (bg)

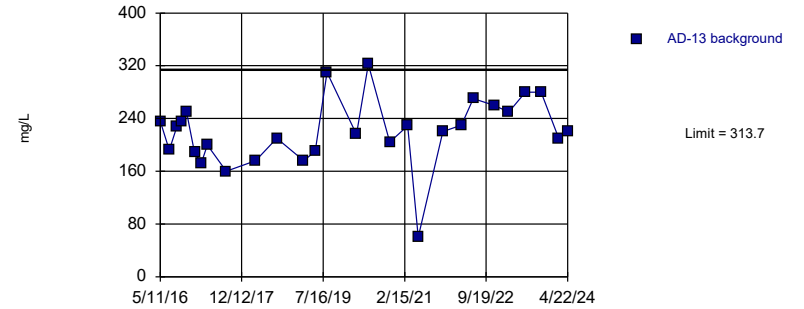


Background Data Summary: Mean=72.11, Std. Dev.=14.78, n=27. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9598, critical = 0.894. Kappa = 1.82 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/5/2024 11:56 AM View: Intrawell
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Prediction Limit

Intrawell Parametric, AD-13 (bg)

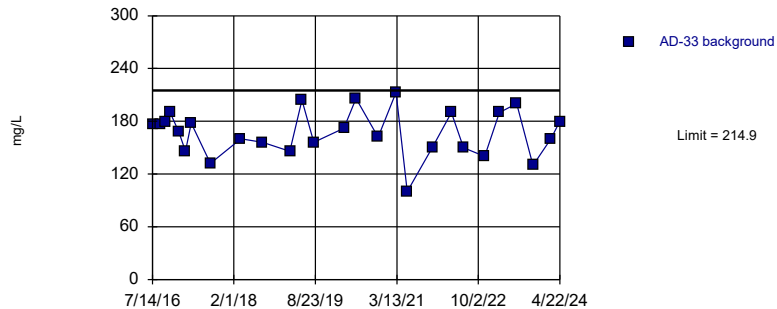


Background Data Summary: Mean=220.5, Std. Dev.=51.39, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9478, critical = 0.896. Kappa = 1.814 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/5/2024 11:56 AM View: Intrawell
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Prediction Limit

Intrawell Parametric, AD-33

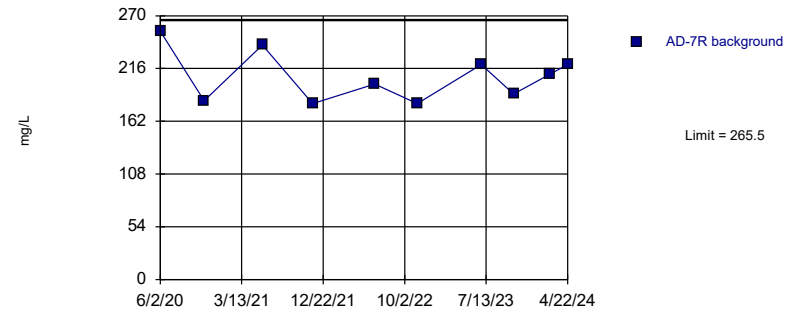


Background Data Summary: Mean=167.1, Std. Dev.=26.29, n=27. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9793, critical = 0.894. Kappa = 1.82 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/5/2024 11:56 AM View: Intrawell
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Prediction Limit

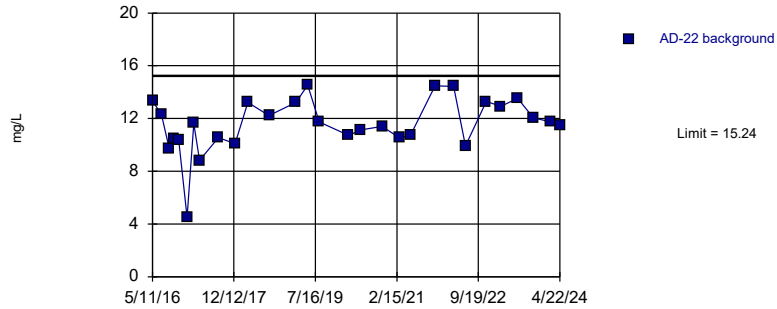
Intrawell Parametric, AD-7R



Background Data Summary: Mean=207.7, Std. Dev.=25.85, n=10. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9159, critical = 0.842. Kappa = 2.238 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/5/2024 11:56 AM View: Intrawell
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

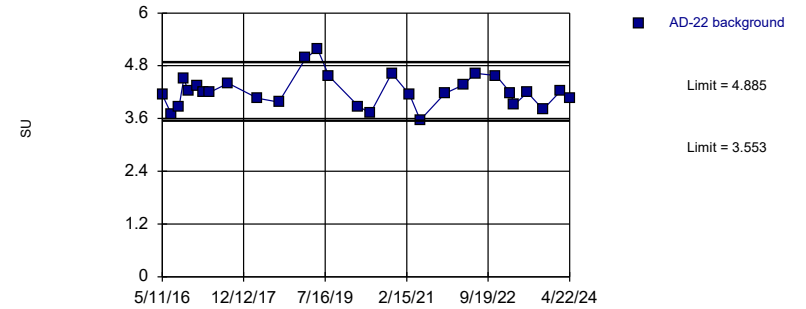
Prediction Limit
Intrawell Parametric, AD-22



Background Data Summary: Mean=11.56, Std. Dev.=2.037, n=29. Data were deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9027, critical = 0.898. Kappa = 1.807 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/5/2024 11:59 AM View: Intrawell
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

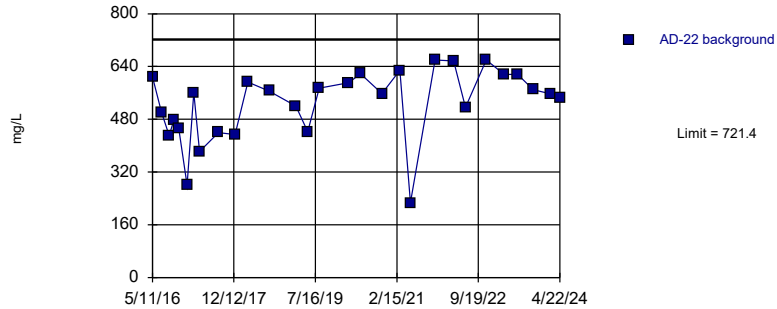
Prediction Limit
Intrawell Parametric, AD-22



Background Data Summary: Mean=4.219, Std. Dev.=0.3684, n=29. Data were deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.964, critical = 0.898. Kappa = 1.807 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/5/2024 11:59 AM View: Intrawell
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Prediction Limit
Intrawell Parametric, AD-22



Background Data Summary: Mean=527.1, Std. Dev.=107.6, n=29. Data were deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9032, critical = 0.898. Kappa = 1.807 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/5/2024 11:59 AM View: Intrawell
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

FIGURE H
Trend Tests – Appendix III

Appendix III - Upgradient Trend Test Summary - Significant Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/5/2024, 11:22 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Alpha</u>	<u>Method</u>
Boron, total (mg/L)	AD-12 (bg)	-0.001963	-150	-139	Yes	29	6.897	n/a	0.01	NP
Chloride, total (mg/L)	AD-13 (bg)	2.413	202	139	Yes	29	0	n/a	0.01	NP
Sulfate, total (mg/L)	AD-12 (bg)	-0.1971	-164	-139	Yes	29	0	n/a	0.01	NP
Sulfate, total (mg/L)	AD-13 (bg)	4.851	195	139	Yes	29	0	n/a	0.01	NP

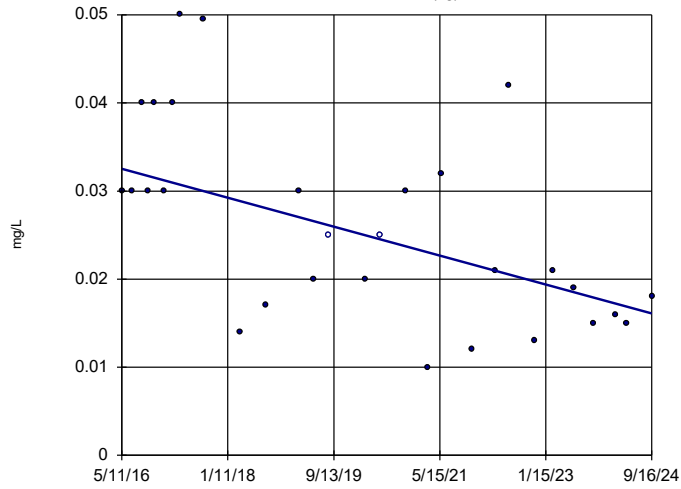
Appendix III - Upgradient Trend Test Summary - All Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/5/2024, 11:22 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Alpha</u>	<u>Method</u>
Boron, total (mg/L)	AD-12 (bg)	-0.001963	-150	-139	Yes	29	6.897	n/a	0.01	NP
Boron, total (mg/L)	AD-13 (bg)	0.0009364	95	139	No	29	0	n/a	0.01	NP
Chloride, total (mg/L)	AD-12 (bg)	-0.01827	-18	-139	No	29	0	n/a	0.01	NP
Chloride, total (mg/L)	AD-13 (bg)	2.413	202	139	Yes	29	0	n/a	0.01	NP
Fluoride, total (mg/L)	AD-12 (bg)	0.00136	89	139	No	29	31.03	n/a	0.01	NP
Fluoride, total (mg/L)	AD-13 (bg)	0.002863	24	139	No	29	13.79	n/a	0.01	NP
Sulfate, total (mg/L)	AD-12 (bg)	-0.1971	-164	-139	Yes	29	0	n/a	0.01	NP
Sulfate, total (mg/L)	AD-13 (bg)	4.851	195	139	Yes	29	0	n/a	0.01	NP

Sen's Slope Estimator

AD-12 (bg)

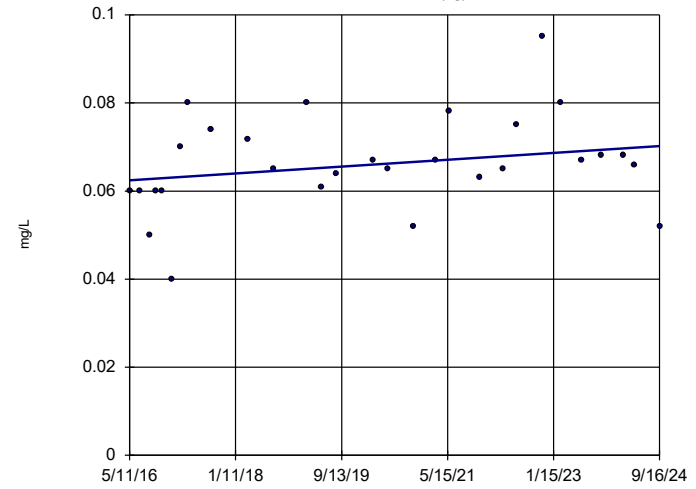


n = 29
Slope = -0.001963
units per year.
Mann-Kendall
statistic = -150
critical = -139
Decreasing trend
significant at 99%
confidence level
($\alpha = 0.005$ per
tail).

Constituent: Boron, total Analysis Run 12/5/2024 11:21 AM View: Upgradient Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-13 (bg)

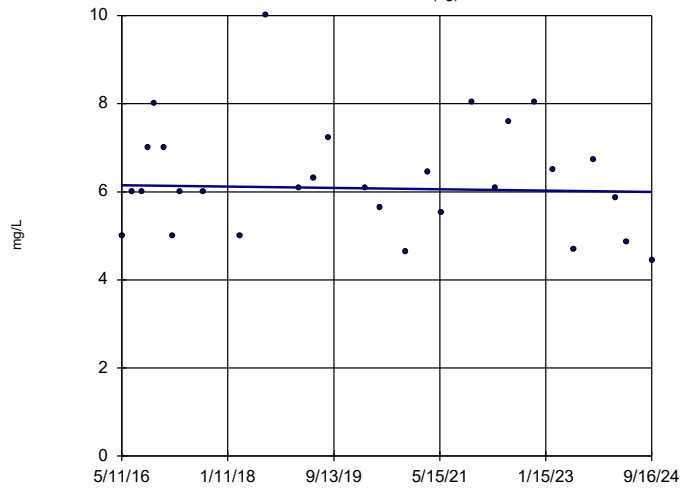


n = 29
Slope = 0.0009364
units per year.
Mann-Kendall
statistic = 95
critical = 139
Trend not sig-
nificant at 99%
confidence level
($\alpha = 0.005$ per
tail).

Constituent: Boron, total Analysis Run 12/5/2024 11:22 AM View: Upgradient Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-12 (bg)

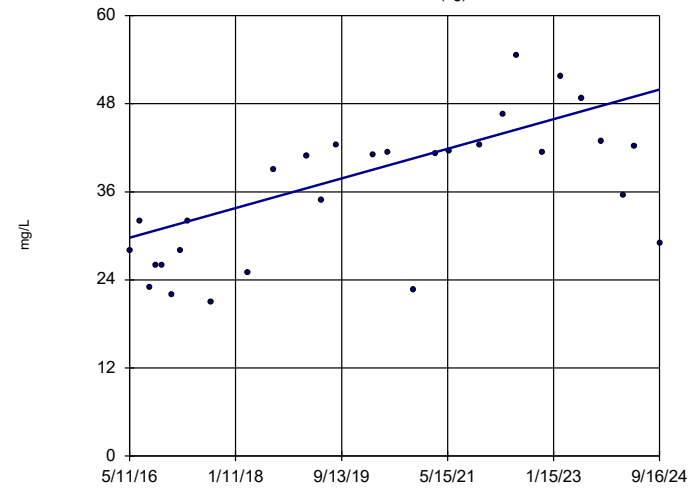


n = 29
Slope = -0.01827
units per year.
Mann-Kendall
statistic = -18
critical = -139
Trend not sig-
nificant at 99%
confidence level
($\alpha = 0.005$ per
tail).

Constituent: Chloride, total Analysis Run 12/5/2024 11:22 AM View: Upgradient Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-13 (bg)

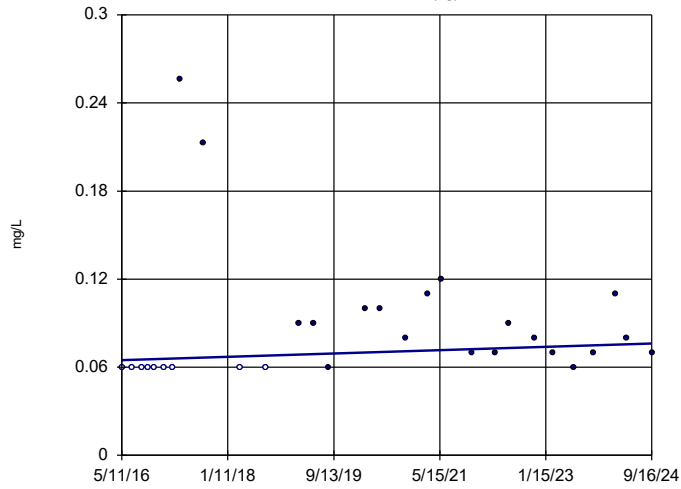


n = 29
Slope = 2.413
units per year.
Mann-Kendall
statistic = 202
critical = 139
Increasing trend
significant at 99%
confidence level
($\alpha = 0.005$ per
tail).

Constituent: Chloride, total Analysis Run 12/5/2024 11:22 AM View: Upgradient Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-12 (bg)

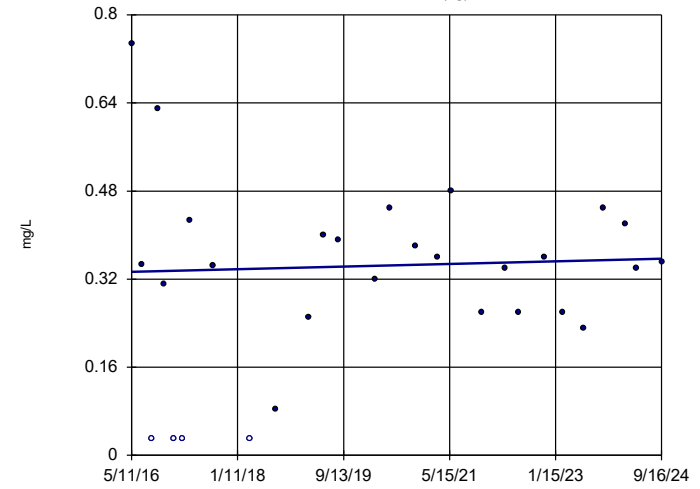


n = 29
Slope = 0.00136
units per year.
Mann-Kendall
statistic = 89
critical = 139
Trend not sig-
nificant at 99%
confidence level
($\alpha = 0.005$ per
tail).

Constituent: Fluoride, total Analysis Run 12/5/2024 11:22 AM View: Upgradient Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-13 (bg)

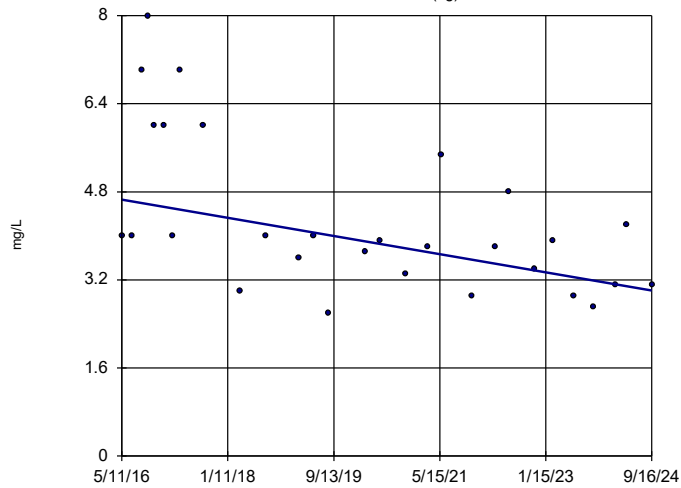


n = 29
Slope = 0.002863
units per year.
Mann-Kendall
statistic = 24
critical = 139
Trend not sig-
nificant at 99%
confidence level
($\alpha = 0.005$ per
tail).

Constituent: Fluoride, total Analysis Run 12/5/2024 11:22 AM View: Upgradient Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-12 (bg)

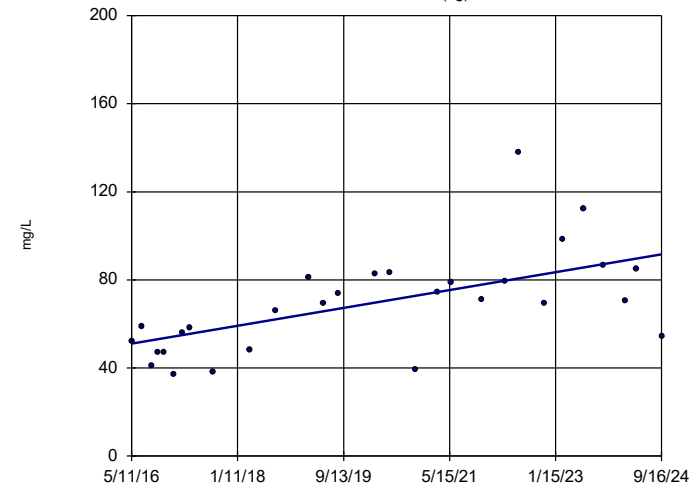


n = 29
Slope = -0.1971
units per year.
Mann-Kendall
statistic = -164
critical = -139
Decreasing trend
significant at 99%
confidence level
($\alpha = 0.005$ per
tail).

Constituent: Sulfate, total Analysis Run 12/5/2024 11:22 AM View: Upgradient Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-13 (bg)



n = 29
Slope = 4.851
units per year.
Mann-Kendall
statistic = 195
critical = 139
Increasing trend
significant at 99%
confidence level
($\alpha = 0.005$ per
tail).

Constituent: Sulfate, total Analysis Run 12/5/2024 11:22 AM View: Upgradient Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

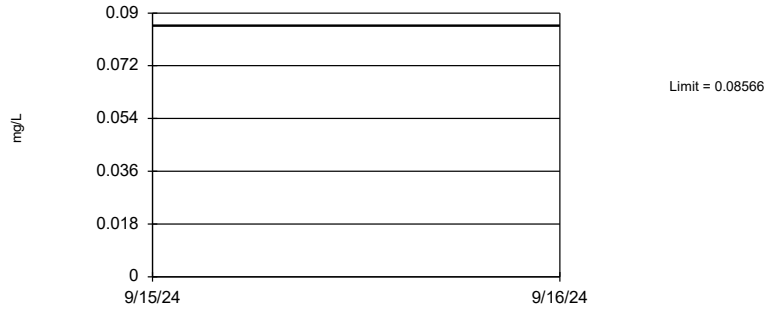
FIGURE I
Interwell PLs

Interwell Prediction Limits - All Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/5/2024, 11:24 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg	NBg	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron, total (mg/L)	n/a	0.08566	n/a	n/a	3 future	n/a	58	0.04618	0.02309	3.448	None	No	0.002505	Param Inter 1 of 2	
Chloride, total (mg/L)	n/a	54.5	n/a	n/a	3 future	n/a	58	n/a	n/a	0	n/a	n/a	0.0005697	NP Inter (normality) 1 of 2	
Fluoride, total (mg/L)	n/a	0.748	n/a	n/a	3 future	n/a	58	n/a	n/a	22.41	n/a	n/a	0.0005697	NP Inter (normality) 1 of 2	
Sulfate, total (mg/L)	n/a	138	n/a	n/a	3 future	n/a	58	n/a	n/a	0	n/a	n/a	0.0005697	NP Inter (normality) 1 of 2	

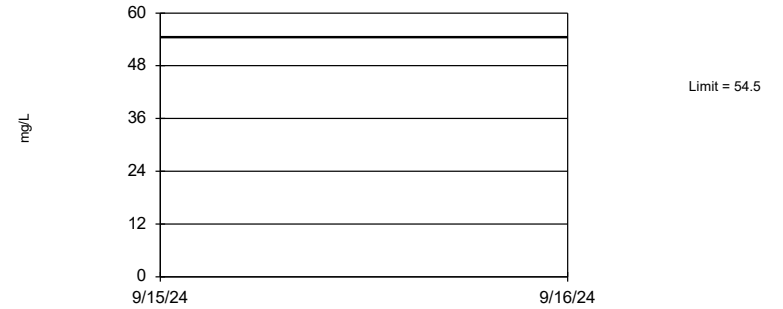
Prediction Limit Interwell Parametric



Background Data Summary: Mean=0.04618, Std. Dev.=0.02309, n=58, 3.448% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9461, critical = 0.944. Kappa = 1.71 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Assumes 3 future values.

Constituent: Boron, total Analysis Run 12/5/2024 11:23 AM View: Interwell
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

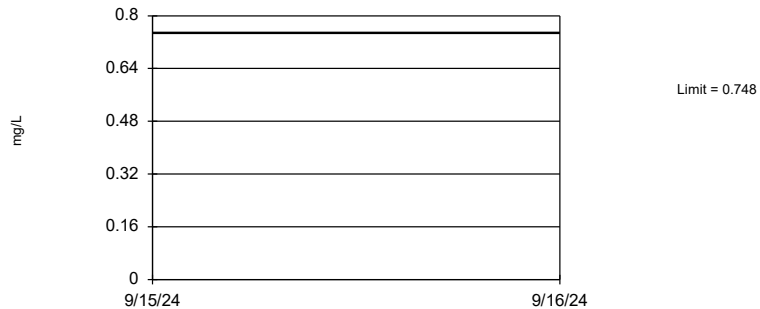
Prediction Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 58 background values. Annual per-constituent alpha = 0.003413. Individual comparison alpha = 0.0005697 (1 of 2). Assumes 3 future values.

Constituent: Chloride, total Analysis Run 12/5/2024 11:23 AM View: Interwell
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

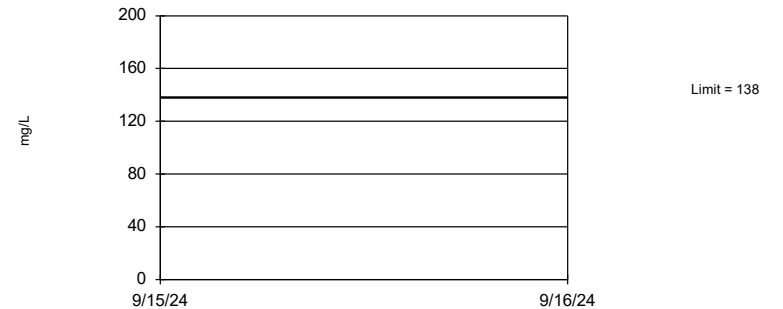
Prediction Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 58 background values. 22.41% NDs. Annual per-constituent alpha = 0.003413. Individual comparison alpha = 0.0005697 (1 of 2). Assumes 3 future values.

Constituent: Fluoride, total Analysis Run 12/5/2024 11:23 AM View: Interwell
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Prediction Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 58 background values. Annual per-constituent alpha = 0.003413. Individual comparison alpha = 0.0005697 (1 of 2). Assumes 3 future values.

Constituent: Sulfate, total Analysis Run 12/5/2024 11:23 AM View: Interwell
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

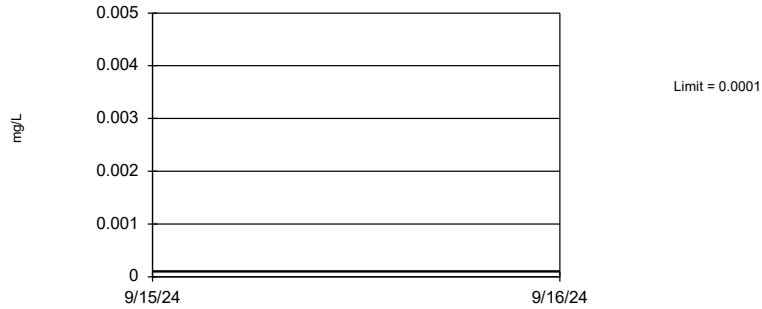
FIGURE J
UTLs

Upper Tolerance Limits

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/5/2024, 12:59 PM

<u>Constituent</u>	<u>Upper Lim.</u>	<u>Bg N</u>	<u>Bg Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Antimony, total (mg/L)	0.0001	56	n/a	n/a	85.71	n/a	n/a	0.05656	NP Inter(NDs)
Arsenic, total (mg/L)	0.009	56	n/a	n/a	21.43	n/a	n/a	0.05656	NP Inter(normality)
Barium, total (mg/L)	0.05439	56	0.03258	0.01073	0	None	No	0.05	Inter
Beryllium, total (mg/L)	0.002	56	n/a	n/a	10.71	n/a	n/a	0.05656	NP Inter(normality)
Cadmium, total (mg/L)	0.00086	55	n/a	n/a	63.64	n/a	n/a	0.05954	NP Inter(NDs)
Chromium, total (mg/L)	0.004	56	n/a	n/a	23.21	n/a	n/a	0.05656	NP Inter(normality)
Cobalt, total (mg/L)	0.06	56	n/a	n/a	0	n/a	n/a	0.05656	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	3.112	56	1.404	0.8406	0	None	No	0.05	Inter
Fluoride, total (mg/L)	0.748	58	n/a	n/a	22.41	n/a	n/a	0.05105	NP Inter(normality)
Lead, total (mg/L)	0.0002	56	n/a	n/a	67.86	n/a	n/a	0.05656	NP Inter(NDs)
Lithium, total (mg/L)	0.165	56	n/a	n/a	1.786	n/a	n/a	0.05656	NP Inter(normality)
Mercury, total (mg/L)	0.00001928	56	n/a	n/a	89.29	n/a	n/a	0.05656	NP Inter(NDs)
Molybdenum, total (mg/L)	0.0011	52	n/a	n/a	94.23	n/a	n/a	0.06944	NP Inter(NDs)
Selenium, total (mg/L)	0.00386	56	n/a	n/a	53.57	n/a	n/a	0.05656	NP Inter(NDs)
Thallium, total (mg/L)	0.001443	54	n/a	n/a	79.63	n/a	n/a	0.06267	NP Inter(NDs)

Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 56 background values. 85.71% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05656.

Constituent: Antimony, total Analysis Run 12/5/2024 12:59 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

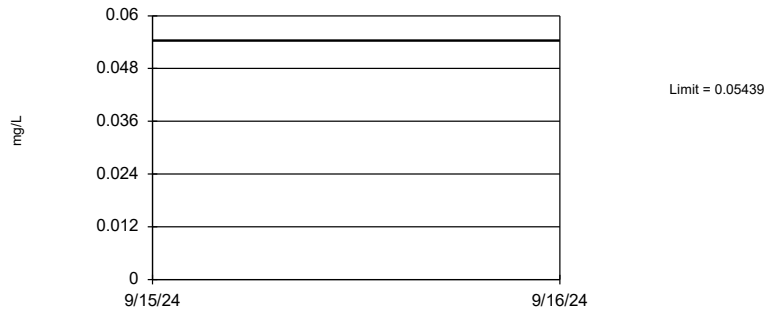
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 56 background values. 21.43% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05656.

Constituent: Arsenic, total Analysis Run 12/5/2024 12:59 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

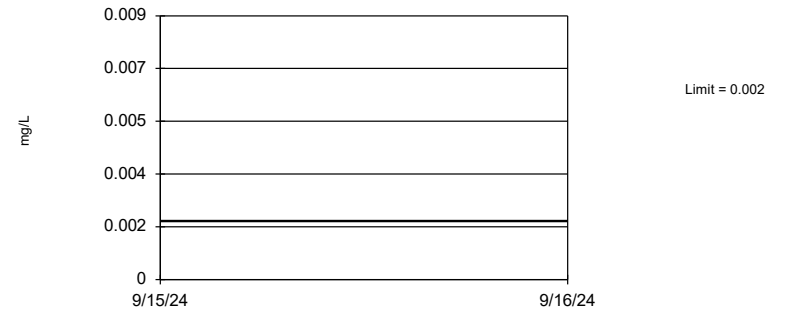
Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary: Mean=0.03258, Std. Dev.=0.01073, n=56. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9429, critical = 0.942. Report alpha = 0.05.

Constituent: Barium, total Analysis Run 12/5/2024 12:59 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

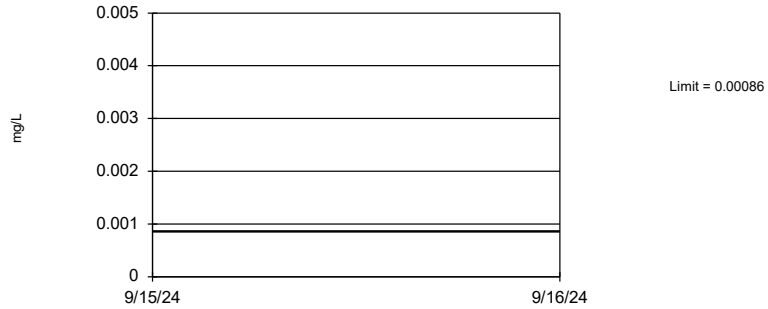
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 56 background values. 10.71% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05656.

Constituent: Beryllium, total Analysis Run 12/5/2024 12:59 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

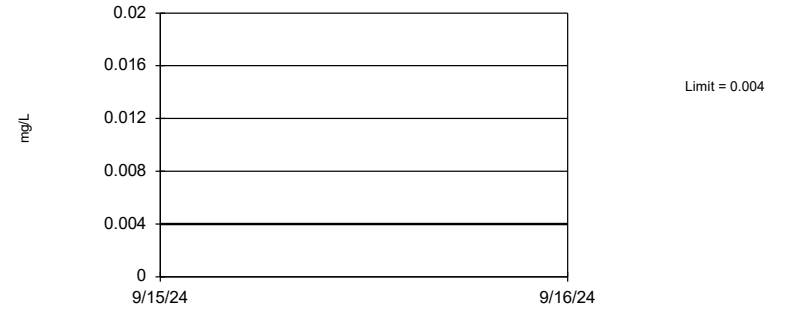
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 55 background values. 63.64% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05954.

Constituent: Cadmium, total Analysis Run 12/5/2024 12:59 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 56 background values. 23.21% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05656.

Constituent: Chromium, total Analysis Run 12/5/2024 12:59 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

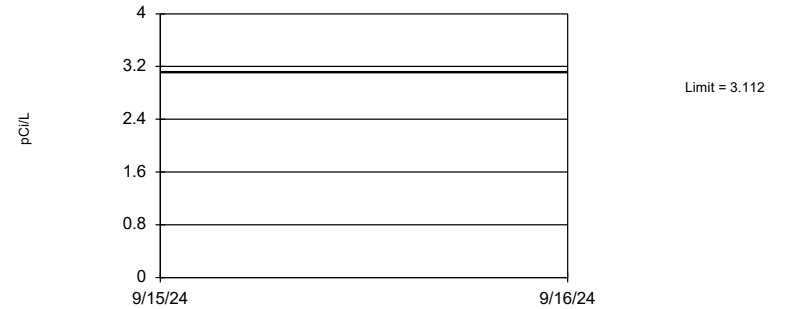
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 56 background values. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05656.

Constituent: Cobalt, total Analysis Run 12/5/2024 12:59 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

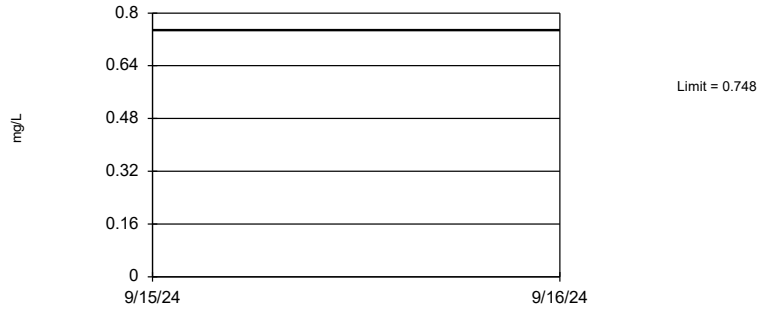
Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary: Mean=1.404, Std. Dev.=0.8406, n=56. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9629, critical = 0.942. Report alpha = 0.05.

Constituent: Combined Radium 226 + 228 Analysis Run 12/5/2024 12:59 PM View: Upper Tolerance Limit
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

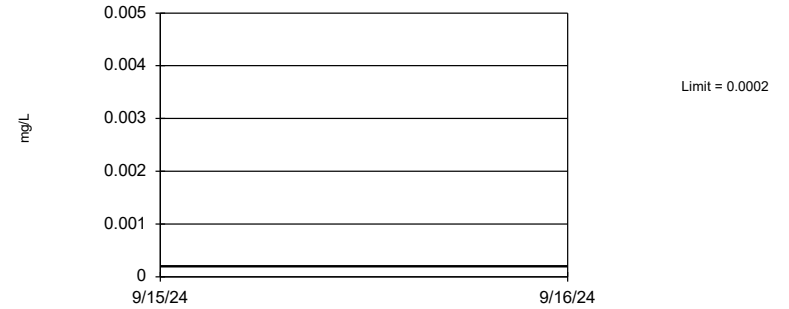
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 58 background values. 22.41% NDs. 92.38% coverage at alpha=0.01; 95.12% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05105.

Constituent: Fluoride, total Analysis Run 12/5/2024 12:59 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 56 background values. 67.86% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05656.

Constituent: Lead, total Analysis Run 12/5/2024 12:59 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 56 background values. 1.786% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05656.

Constituent: Lithium, total Analysis Run 12/5/2024 12:59 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

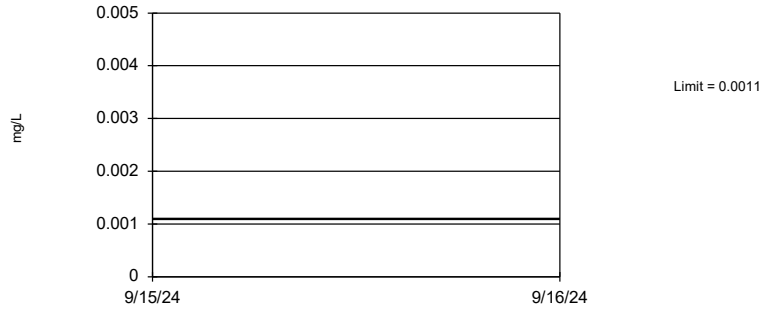
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 56 background values. 89.29% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05656.

Constituent: Mercury, total Analysis Run 12/5/2024 12:59 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

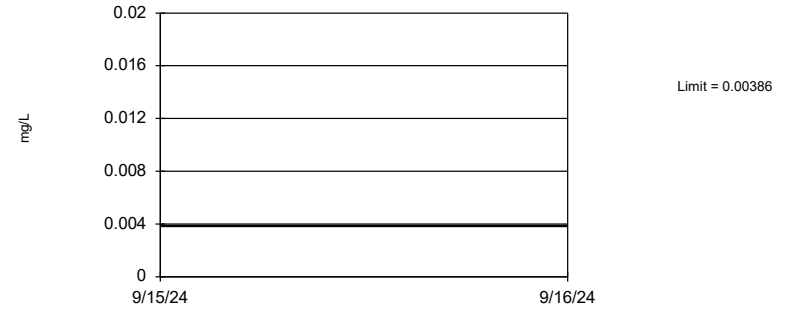
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 52 background values. 94.23% NDs. 91.6% coverage at alpha=0.01; 94.34% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.06944.

Constituent: Molybdenum, total Analysis Run 12/5/2024 12:59 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

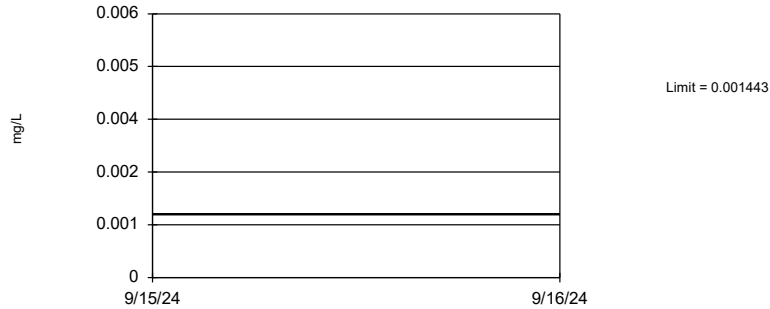
Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 56 background values. 53.57% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.05656.

Constituent: Selenium, total Analysis Run 12/5/2024 12:59 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 54 background values. 79.63% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.06267.

Constituent: Thallium, total Analysis Run 12/5/2024 12:59 PM View: Upper Tolerance Limits
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

FIGURE K
GWPS

PIRKEY STACKOUT GWPS			
Constituent Name	MCL	Background Limit	GWPS
Antimony, Total (mg/L)	0.006	0.0001	0.006
Arsenic, Total (mg/L)	0.01	0.009	0.01
Barium, Total (mg/L)	2	0.055	2
Beryllium, Total (mg/L)	0.004	0.002	0.004
Cadmium, Total (mg/L)	0.005	0.00086	0.005
Chromium, Total (mg/L)	0.1	0.004	0.1
Cobalt, Total (mg/L)	n/a	0.06	0.06
Combined Radium, Total (pCi/L)	5	3.11	5
Fluoride, Total (mg/L)	4	0.75	4
Lead, Total (mg/L)	n/a	0.0002	0.0002
Lithium, Total (mg/L)	n/a	0.17	0.17
Mercury, Total (mg/L)	0.002	0.000019	0.002
Molybdenum, Total (mg/L)	n/a	0.0011	0.0011
Selenium, Total (mg/L)	0.05	0.0039	0.05
Thallium, Total (mg/L)	0.002	0.0014	0.002

*MCL = Maximum Contaminant Level

*GWPS = Groundwater Protection Standard

FIGURE L
Trend Test – AD-33

Lead AD-33 Trend Test - Significant/All Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/9/2024, 3:07 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Alpha</u>	<u>Method</u>
Lead, total (mg/L)	AD-33	0.000009204	184	96	Yes	27	37.04	n/a	0.05	NP

Sen's Slope Estimator

AD-33

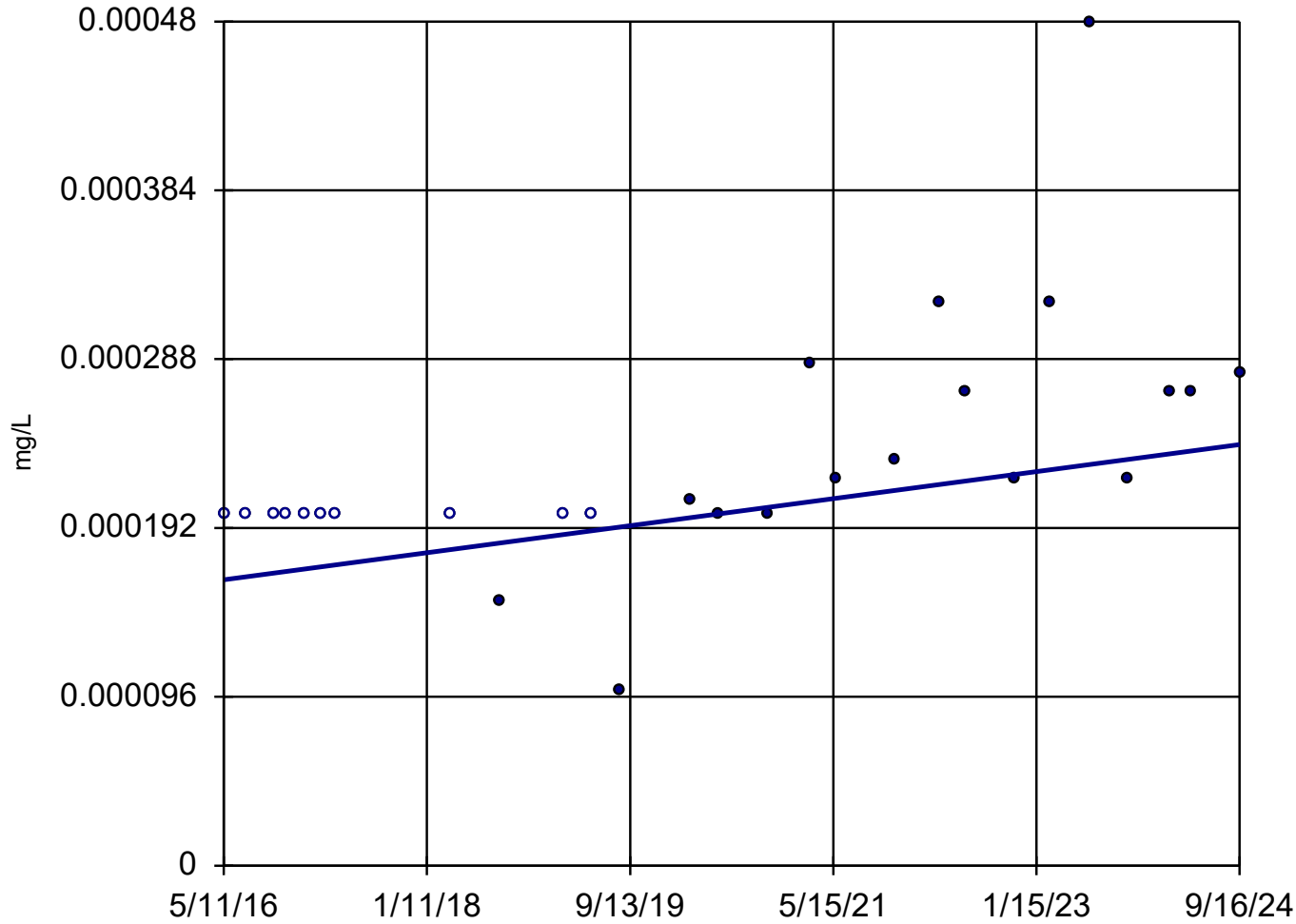


FIGURE M
Confidence Intervals

Appendix IV - Confidence Intervals - Significant Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/9/2024, 3:10 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig. N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Beryllium, total (mg/L)	AD-22	0.008229	0.004832	0.004	Yes 28	0.00653	0.003636	0	None	No	0.01	Param.
Cobalt, total (mg/L)	AD-22	0.09817	0.07269	0.06	Yes 28	0.08543	0.02726	0	None	No	0.01	Param.
Lead, total (mg/L)	AD-33	0.00032	0.000208	0.0002	Yes 15	0.0002663	0.00007171	0	None	No	0.01	NP (normality)
Mercury, total (mg/L)	AD-33	0.007024	0.003353	0.002	Yes 15	0.005362	0.003078	0	None	sqrt(x)	0.01	Param.

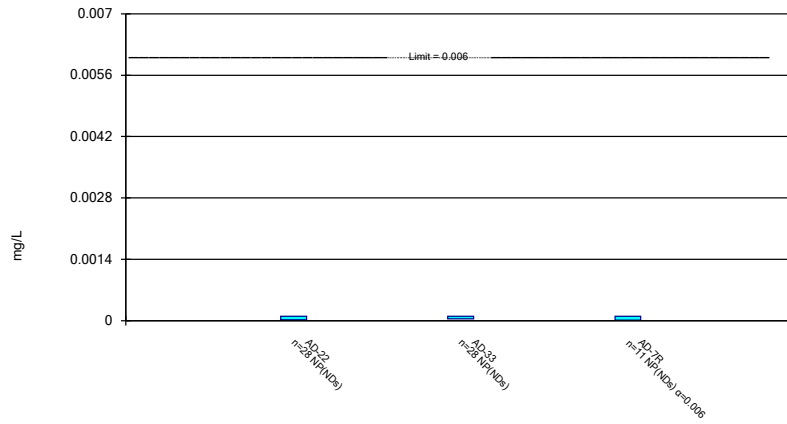
Appendix IV - Confidence Intervals - All Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/9/2024, 3:10 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig. N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	AD-22	0.0001	0.00002	0.006	No 28	0.00009714	0.00001512	96.43	None	No	0.01	NP (NDs)
Antimony, total (mg/L)	AD-33	0.0001	0.00004	0.006	No 28	0.00008857	0.00002891	85.71	None	No	0.01	NP (NDs)
Antimony, total (mg/L)	AD-7R	0.0001	0.000009	0.006	No 11	0.00006527	0.00004135	54.55	None	No	0.006	NP (NDs)
Arsenic, total (mg/L)	AD-22	0.005596	0.002664	0.01	No 28	0.005471	0.005692	0	None	ln(x)	0.01	Param.
Arsenic, total (mg/L)	AD-33	0.001191	0.0006602	0.01	No 27	0.001098	0.0009293	7.407	None	ln(x)	0.01	Param.
Arsenic, total (mg/L)	AD-7R	0.00149	0.0004111	0.01	No 11	0.0009764	0.0007396	0	None	sqrt(x)	0.01	Param.
Barium, total (mg/L)	AD-22	0.029	0.017	2	No 28	0.0334	0.0298	0	None	No	0.01	NP (normality)
Barium, total (mg/L)	AD-33	0.05173	0.04536	2	No 27	0.04854	0.006676	0	None	No	0.01	Param.
Barium, total (mg/L)	AD-7R	0.06503	0.04272	2	No 11	0.05387	0.01338	0	None	No	0.01	Param.
Beryllium, total (mg/L)	AD-22	0.008229	0.004832	0.004	Yes 28	0.00653	0.003636	0	None	No	0.01	Param.
Beryllium, total (mg/L)	AD-33	0.00135	0.001	0.004	No 28	0.001288	0.0006106	0	None	No	0.01	NP (normality)
Beryllium, total (mg/L)	AD-7R	0.002226	0.001581	0.004	No 11	0.001904	0.0003866	0	None	No	0.01	Param.
Cadmium, total (mg/L)	AD-22	0.001249	0.0007636	0.005	No 28	0.001006	0.0005197	0	None	No	0.01	Param.
Cadmium, total (mg/L)	AD-33	0.0009847	0.000048	0.005	No 28	0.0003919	0.0004609	32.14	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	AD-7R	0.0003609	0.0002575	0.005	No 11	0.0003092	0.00006208	0	None	No	0.01	Param.
Chromium, total (mg/L)	AD-22	0.002	0.000398	0.1	No 28	0.003546	0.00759	10.71	None	No	0.01	NP (normality)
Chromium, total (mg/L)	AD-33	0.001183	0.0003422	0.1	No 27	0.001437	0.002026	11.11	None	ln(x)	0.01	Param.
Chromium, total (mg/L)	AD-7R	0.00137	0.00023	0.1	No 11	0.0006664	0.0008179	0	None	No	0.006	NP (normality)
Cobalt, total (mg/L)	AD-22	0.09817	0.07269	0.06	Yes 28	0.08543	0.02726	0	None	No	0.01	Param.
Cobalt, total (mg/L)	AD-33	0.01041	0.008806	0.06	No 27	0.009609	0.001684	0	None	No	0.01	Param.
Cobalt, total (mg/L)	AD-7R	0.02018	0.01658	0.06	No 11	0.01838	0.002156	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-22	4.712	3.403	5	No 28	4.149	1.492	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-33	2.94	1.732	5	No 28	2.536	1.717	0	None	x^(1/3)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-7R	3.826	2.158	5	No 11	2.992	1.001	0	None	No	0.01	Param.
Fluoride, total (mg/L)	AD-22	0.6663	0.2862	4	No 30	0.5861	0.4461	20	Kaplan-Meier	sqrt(x)	0.01	Param.
Fluoride, total (mg/L)	AD-33	0.2266	0.1118	4	No 29	0.2054	0.1388	31.03	Kaplan-Meier	sqrt(x)	0.01	Param.
Fluoride, total (mg/L)	AD-7R	0.1741	0.1295	4	No 11	0.1518	0.02676	0	None	No	0.01	Param.
Lead, total (mg/L)	AD-22	0.000261	0.00018	0.0002	No 28	0.0003956	0.0005771	28.57	None	No	0.01	NP (normality)
Lead, total (mg/L)	AD-33	0.00032	0.000208	0.0002	Yes 15	0.0002663	0.00007171	0	None	No	0.01	NP (normality)
Lead, total (mg/L)	AD-7R	0.000282	0.00005781	0.0002	No 11	0.0002253	0.0001692	36.36	Kaplan-Meier	sqrt(x)	0.01	Param.
Lithium, total (mg/L)	AD-22	0.1888	0.1359	0.17	No 28	0.1623	0.05654	0	None	No	0.01	Param.
Lithium, total (mg/L)	AD-33	0.026	0.0188	0.17	No 28	0.02249	0.007379	3.571	None	No	0.01	NP (normality)
Lithium, total (mg/L)	AD-7R	0.06669	0.04647	0.17	No 11	0.05658	0.01213	0	None	No	0.01	Param.
Mercury, total (mg/L)	AD-22	0.0003383	0.00004882	0.002	No 15	0.0002524	0.0003937	6.667	None	x^(1/3)	0.01	Param.
Mercury, total (mg/L)	AD-33	0.007024	0.003353	0.002	Yes 15	0.005362	0.003078	0	None	sqrt(x)	0.01	Param.
Mercury, total (mg/L)	AD-7R	0.0000783	0.000007314	0.002	No 11	0.00004573	0.00005673	9.091	None	sqrt(x)	0.01	Param.
Molybdenum, total (mg/L)	AD-22	0.0005	0.0001	0.0011	No 26	0.0004681	0.0001129	92.31	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	AD-33	0.0007365	0.0005	0.0011	No 26	0.0005091	0.00004638	96.15	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	AD-7R	0.0005	0.0005	0.0011	No 11	0.0004636	0.0001206	90.91	None	No	0.006	NP (NDs)
Selenium, total (mg/L)	AD-22	0.006183	0.002899	0.05	No 28	0.005637	0.003878	21.43	Kaplan-Meier	sqrt(x)	0.01	Param.
Selenium, total (mg/L)	AD-33	0.00421	0.001613	0.05	No 28	0.002878	0.001572	28.57	None	No	0.01	NP (normality)
Selenium, total (mg/L)	AD-7R	0.001609	0.0004394	0.05	No 11	0.001053	0.0008096	0	None	sqrt(x)	0.01	Param.
Thallium, total (mg/L)	AD-22	0.00125	0.000162	0.002	No 27	0.00069	0.0007723	22.22	None	No	0.01	NP (normality)
Thallium, total (mg/L)	AD-33	0.0002	0.00006	0.002	No 27	0.0002411	0.0003399	62.96	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	AD-7R	0.001	0.00011	0.002	No 11	0.0003682	0.000406	27.27	None	No	0.006	NP (normality)

Non-Parametric Confidence Interval

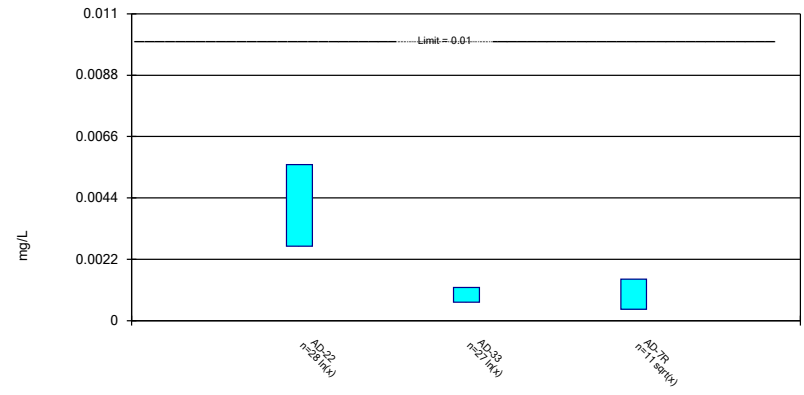
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted.



Constituent: Antimony, total Analysis Run 12/9/2024 3:09 PM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric Confidence Interval

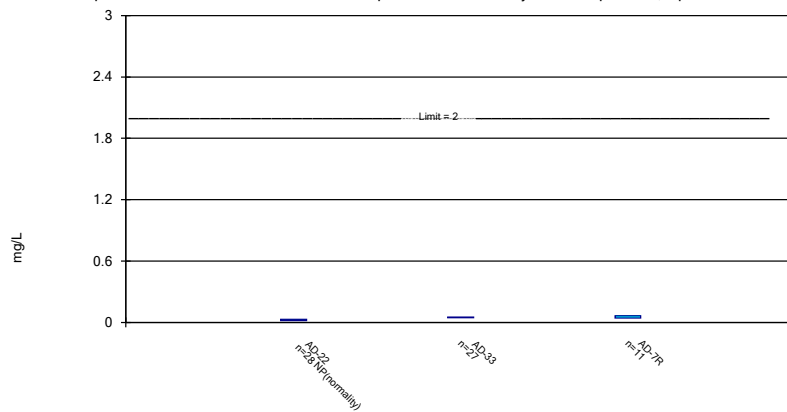
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, total Analysis Run 12/9/2024 3:09 PM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric and Non-Parametric (NP) Confidence Interval

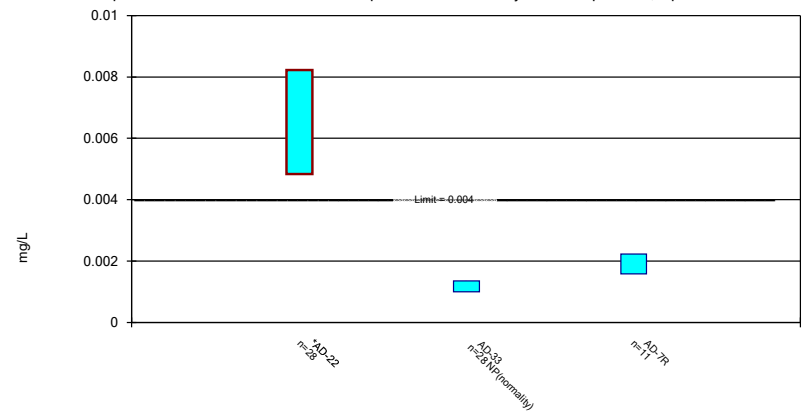
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 12/9/2024 3:09 PM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric and Non-Parametric (NP) Confidence Interval

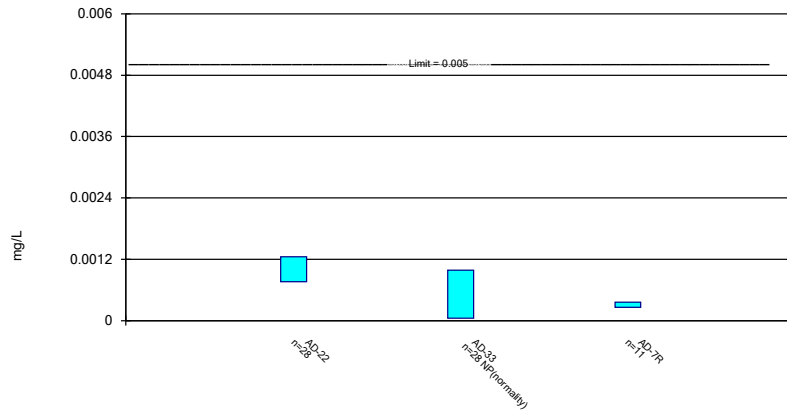
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total Analysis Run 12/9/2024 3:09 PM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric and Non-Parametric (NP) Confidence Interval

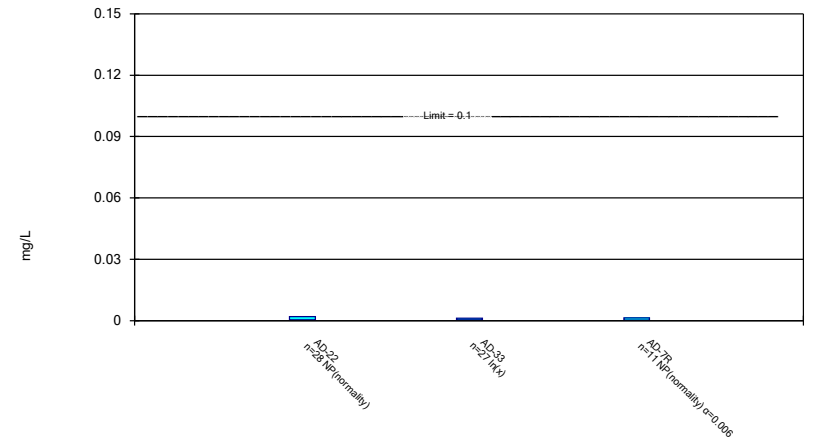
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 12/9/2024 3:09 PM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric and Non-Parametric (NP) Confidence Interval

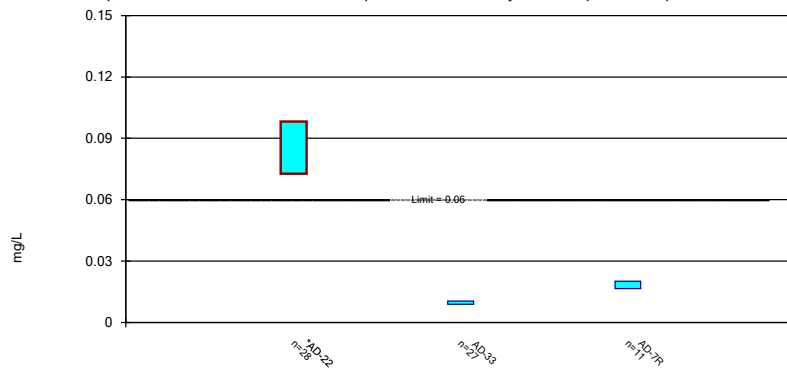
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 12/9/2024 3:09 PM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric Confidence Interval

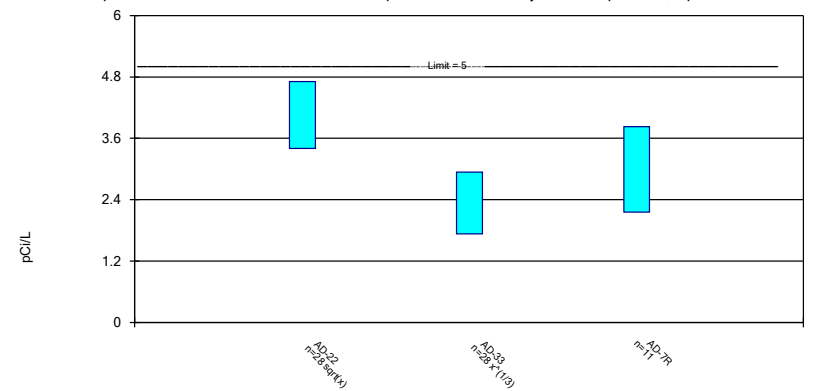
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 12/9/2024 3:09 PM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric Confidence Interval

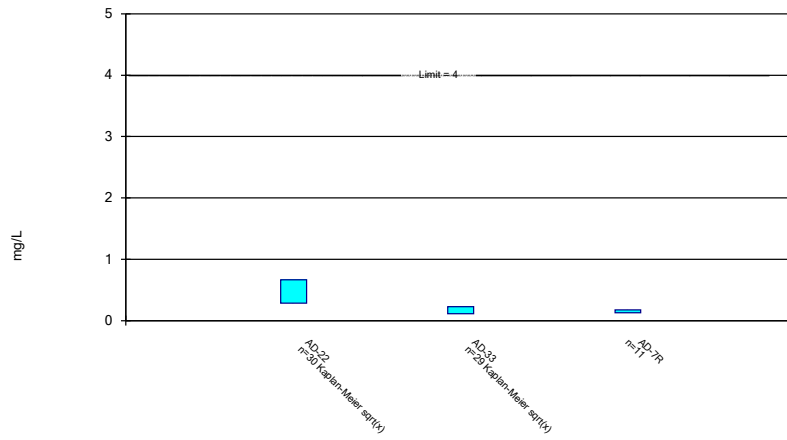
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 12/9/2024 3:09 PM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric Confidence Interval

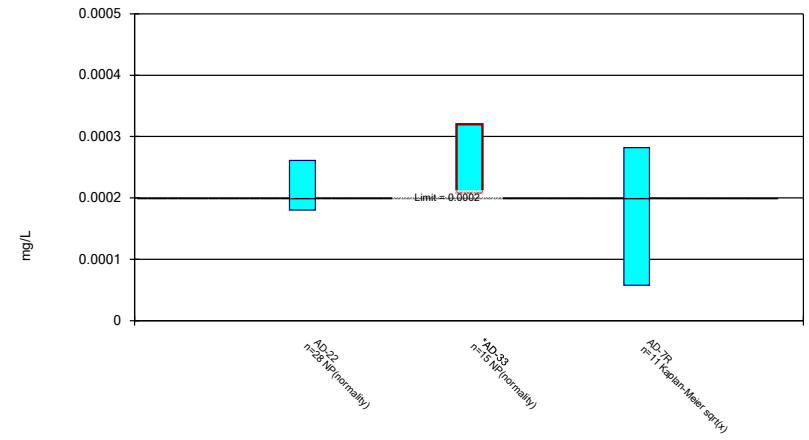
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 12/9/2024 3:09 PM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric and Non-Parametric (NP) Confidence Interval

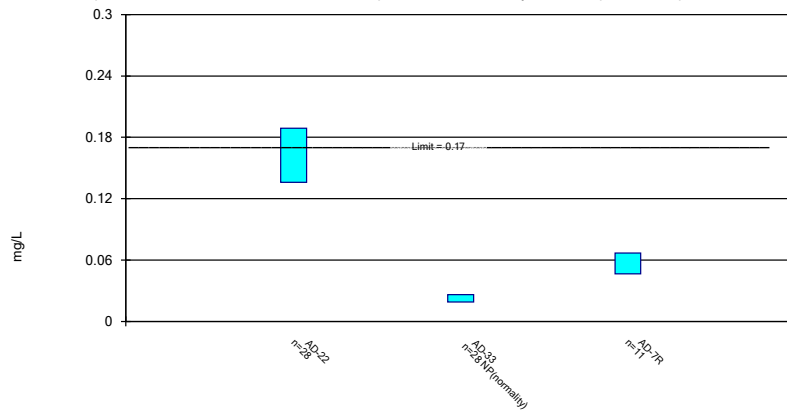
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead, total Analysis Run 12/9/2024 3:09 PM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric and Non-Parametric (NP) Confidence Interval

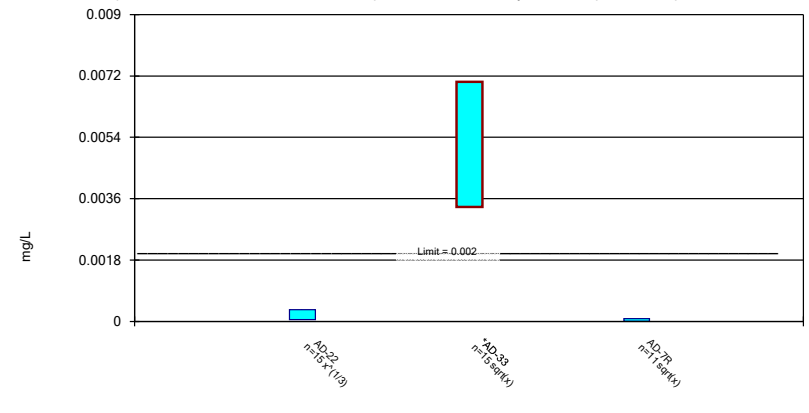
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 12/9/2024 3:09 PM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric Confidence Interval

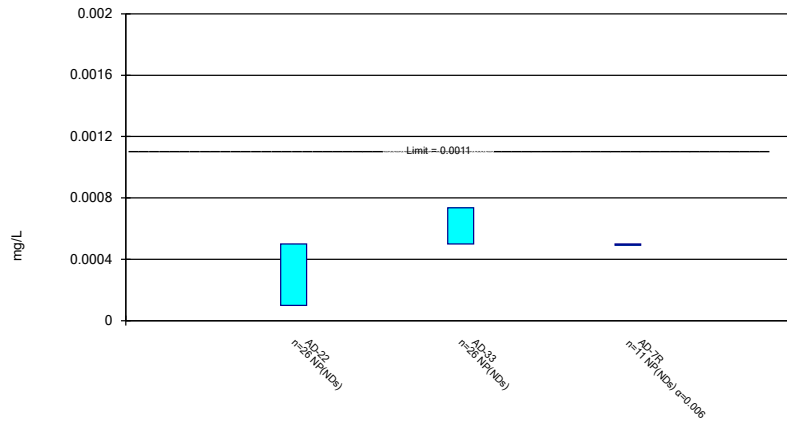
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Mercury, total Analysis Run 12/9/2024 3:09 PM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Non-Parametric Confidence Interval

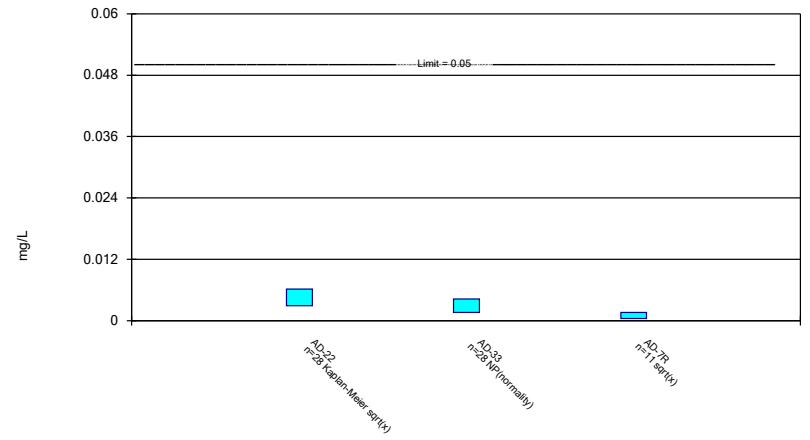
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted.



Constituent: Molybdenum, total Analysis Run 12/9/2024 3:09 PM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric and Non-Parametric (NP) Confidence Interval

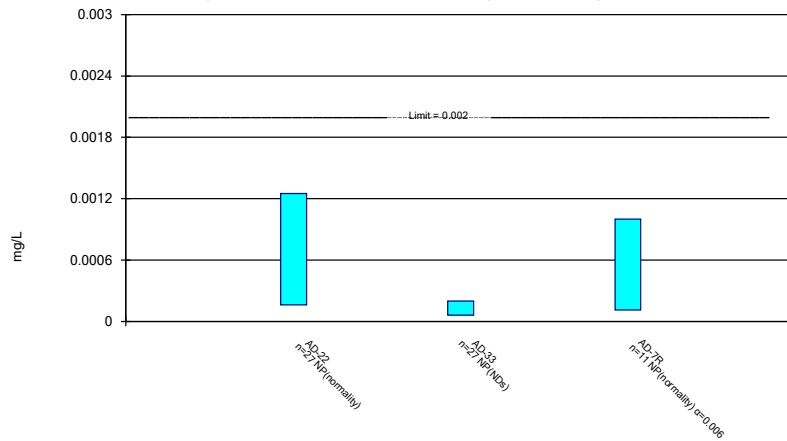
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 12/9/2024 3:09 PM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Non-Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted.



Constituent: Thallium, total Analysis Run 12/9/2024 3:09 PM View: Confidence Intervals
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Appendix IV - Deseasonalized Confidence Intervals - Significant Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/5/2024, 1:21 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig. N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Beryllium, total (mg/L)	AD-22	0.007754	0.005308	0.004	Yes 28	0.006531	0.002617	0	None	No	0.01	Param.
Cobalt, total (mg/L)	AD-22	0.09374	0.07713	0.06	Yes 28	0.08543	0.01778	0	None	No	0.01	Param.

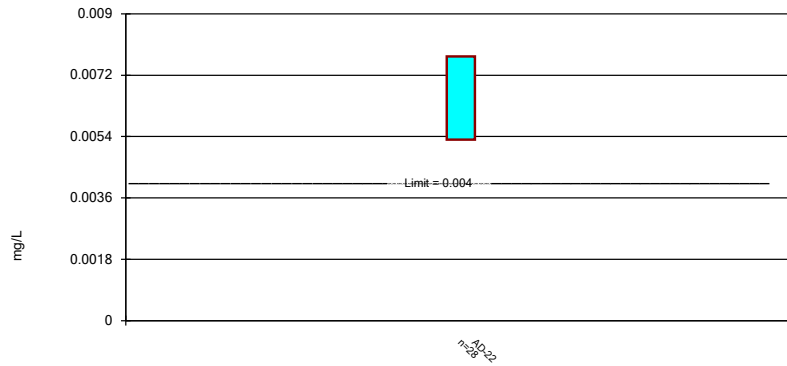
Appendix IV - Deseasonalized Confidence Intervals - All Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/5/2024, 1:21 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig. N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Beryllium, total (mg/L)	AD-22	0.007754	0.005308	0.004	Yes 28	0.006531	0.002617	0	None	No	0.01	Param.
Cobalt, total (mg/L)	AD-22	0.09374	0.07713	0.06	Yes 28	0.08543	0.01778	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-22	4.696	3.601	5	No 28	4.149	1.171	0	None	No	0.01	Param.
Lithium, total (mg/L)	AD-22	0.1841	0.1406	0.17	No 28	0.1624	0.04649	0	None	No	0.01	Param.

Parametric Confidence Interval

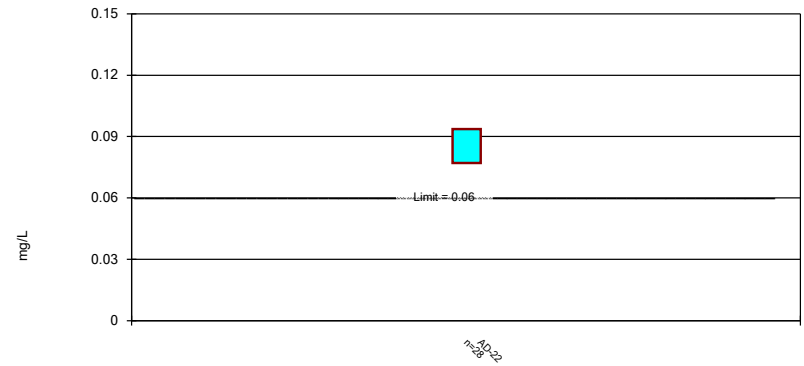
Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total, Alt. Values Analysis Run 12/5/2024 1:19 PM View: Deseasonalized Confidence
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric Confidence Interval

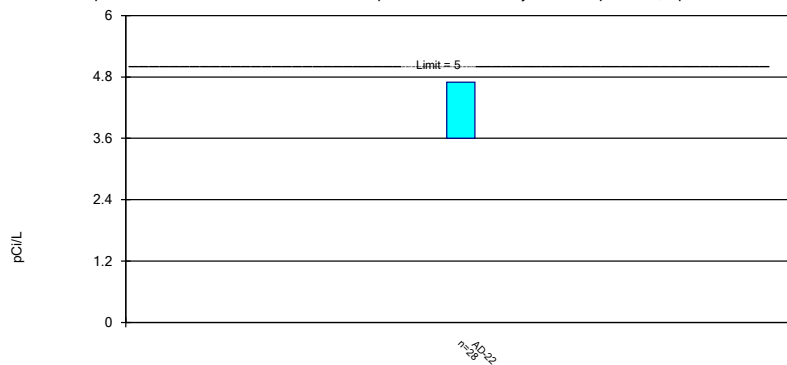
Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total, Alt. Values Analysis Run 12/5/2024 1:19 PM View: Deseasonalized Confidence
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric Confidence Interval

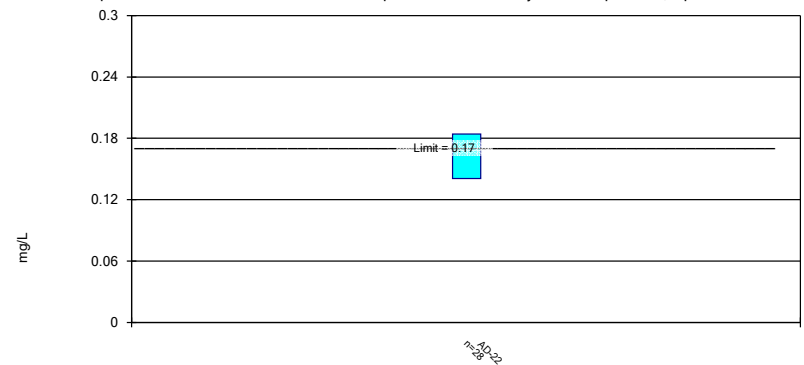
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228, Alt. Values Analysis Run 12/5/2024 1:19 PM View: Deseason
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total, Alt. Values Analysis Run 12/5/2024 1:20 PM View: Deseasonalized Confidence
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

FIGURE N
Trend Tests – Appendix IV

Appendix IV Trend Tests - Significant Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/11/2024, 11:17 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Alpha	Method
Beryllium, total (mg/L)	AD-12 (bg)	-0.000003987	-122	-101	Yes	28	10.71	n/a	0.05	NP
Cobalt, total (mg/L)	AD-12 (bg)	-0.00004082	-131	-101	Yes	28	0	n/a	0.05	NP
Lead, total (mg/L)	AD-12 (bg)	-0.00001521	-197	-101	Yes	28	39.29	n/a	0.05	NP
Lead, total (mg/L)	AD-33	0.000009204	184	96	Yes	27	37.04	n/a	0.05	NP
Mercury, total (mg/L)	AD-33	0.0008043	276	101	Yes	28	0	n/a	0.05	NP

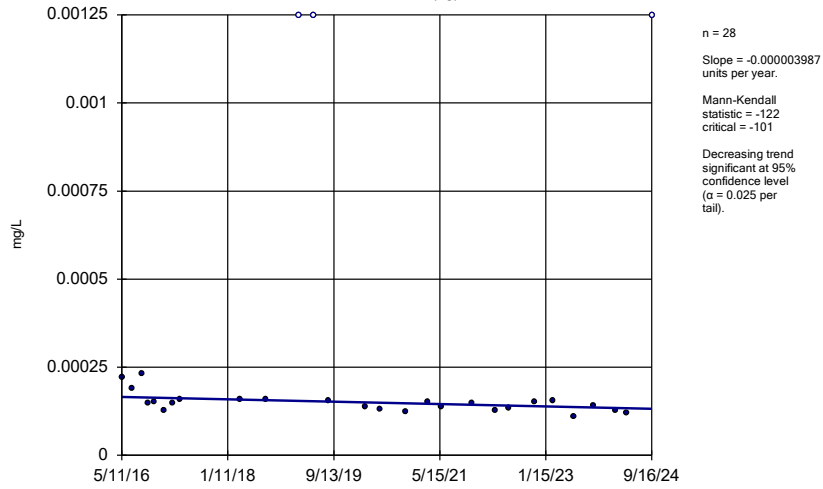
Appendix IV Trend Tests - All Results

Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout Printed 12/11/2024, 11:17 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Alpha	Method
Beryllium, total (mg/L)	AD-12 (bg)	-0.00003987	-122	-101	Yes	28	10.71	n/a	0.05	NP
Beryllium, total (mg/L)	AD-13 (bg)	-0.00003172	-85	-101	No	28	10.71	n/a	0.05	NP
Beryllium, total (mg/L)	AD-22	-0.0003159	-72	-101	No	28	0	n/a	0.05	NP
Cobalt, total (mg/L)	AD-12 (bg)	-0.00004082	-131	-101	Yes	28	0	n/a	0.05	NP
Cobalt, total (mg/L)	AD-13 (bg)	0.0005666	77	101	No	28	0	n/a	0.05	NP
Cobalt, total (mg/L)	AD-22	0.0008807	29	101	No	28	0	n/a	0.05	NP
Lead, total (mg/L)	AD-12 (bg)	-0.00001521	-197	-101	Yes	28	39.29	n/a	0.05	NP
Lead, total (mg/L)	AD-13 (bg)	0	9	101	No	28	96.43	n/a	0.05	NP
Lead, total (mg/L)	AD-33	0.000009204	184	96	Yes	27	37.04	n/a	0.05	NP
Mercury, total (mg/L)	AD-12 (bg)	0	-61	-101	No	28	89.29	n/a	0.05	NP
Mercury, total (mg/L)	AD-13 (bg)	0	-70	-101	No	28	89.29	n/a	0.05	NP
Mercury, total (mg/L)	AD-33	0.0008043	276	101	Yes	28	0	n/a	0.05	NP

Sen's Slope Estimator

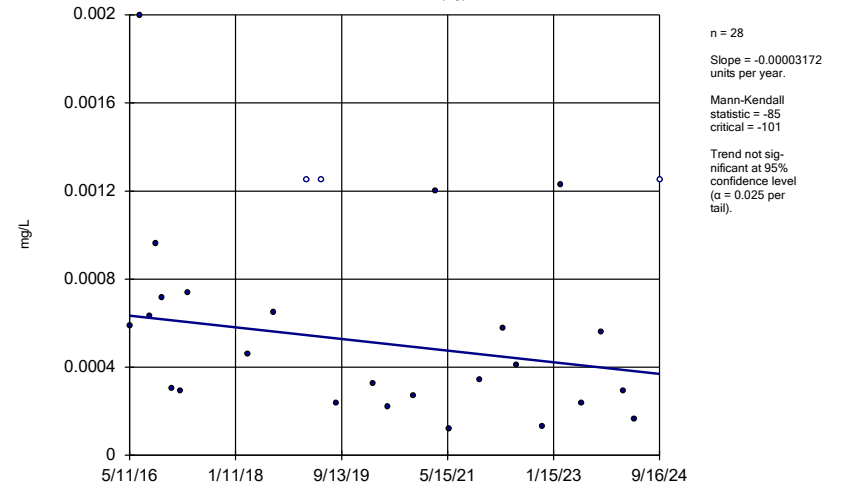
AD-12 (bg)



Constituent: Beryllium, total Analysis Run 12/11/2024 11:14 AM View: Appendix IV Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

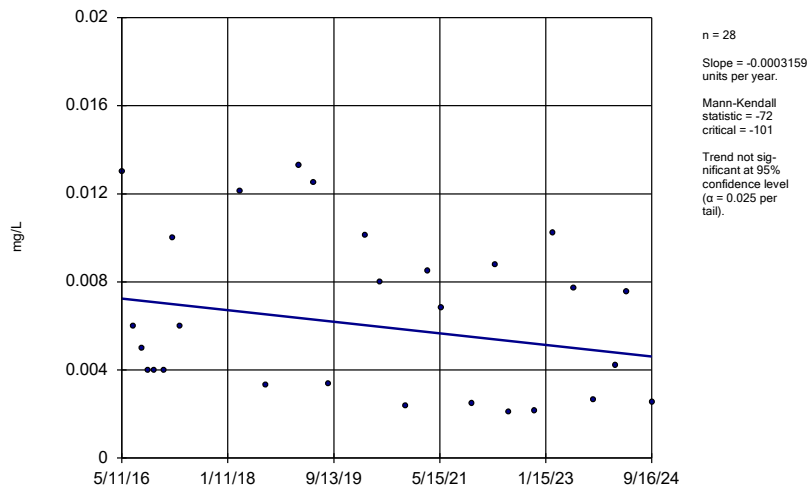
AD-13 (bg)



Constituent: Beryllium, total Analysis Run 12/11/2024 11:14 AM View: Appendix IV Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

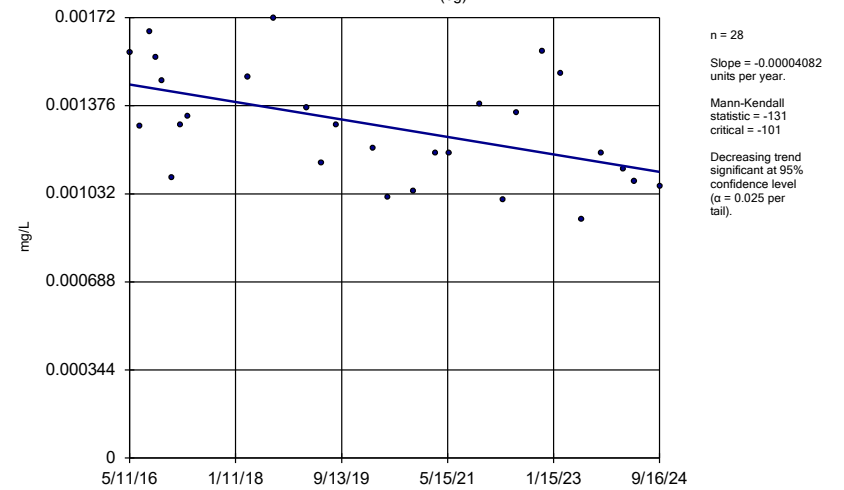
AD-22



Constituent: Beryllium, total Analysis Run 12/11/2024 11:14 AM View: Appendix IV Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

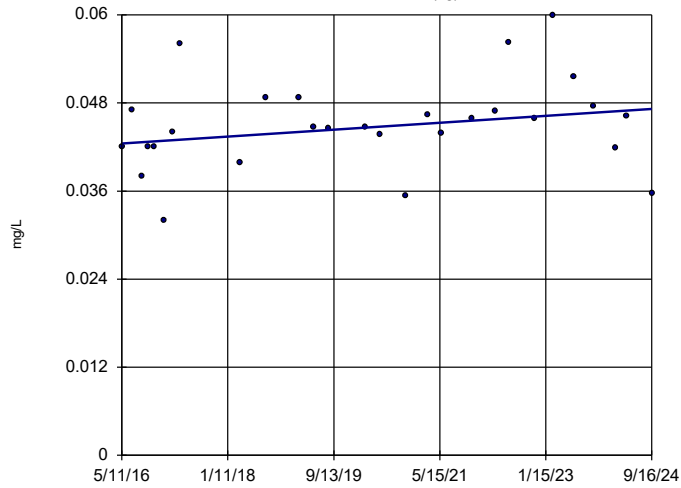
AD-12 (bg)



Constituent: Cobalt, total Analysis Run 12/11/2024 11:14 AM View: Appendix IV Trend Tests
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Sen's Slope Estimator

AD-13 (bg)

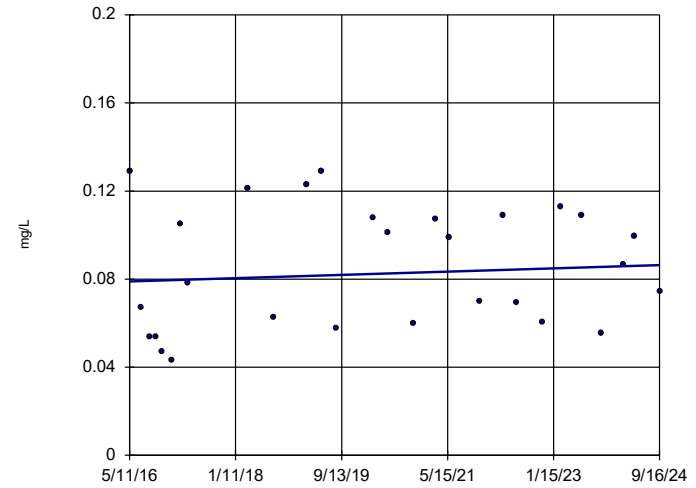


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 Slope = 0.0005666
 units per year.
 Mann-Kendall
 statistic = 77
 critical = 101
 Trend not sig-
 nificant at 95%
 confidence level
 ($\alpha = 0.025$ per
 tail).

Constituent: Cobalt, total Analysis Run 12/11/2024 11:14 AM View: Appendix IV Trend Tests
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-22

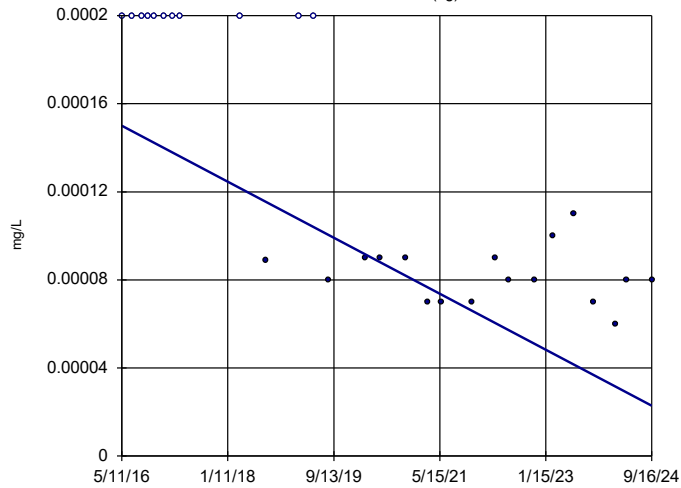


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 Mann-Kendall
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 Trend not sig-
 nificant at 95%
 confidence level
 ($\alpha = 0.025$ per
 tail).

Constituent: Cobalt, total Analysis Run 12/11/2024 11:14 AM View: Appendix IV Trend Tests
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-12 (bg)

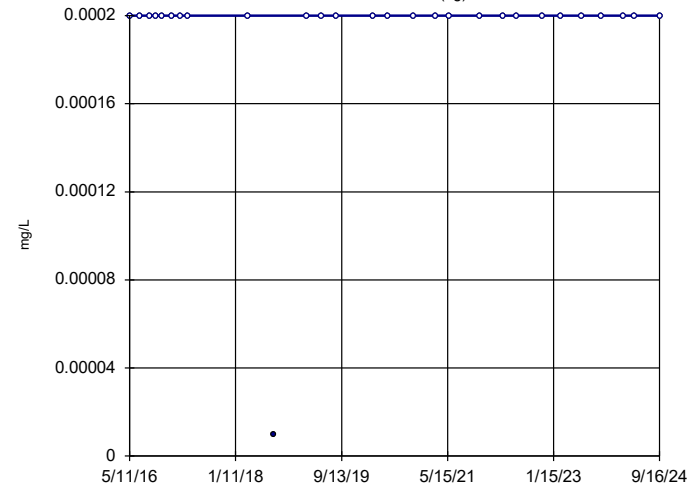


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 units per year.
 Mann-Kendall
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 Decreasing trend
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 confidence level
 ($\alpha = 0.025$ per
 tail).

Constituent: Lead, total Analysis Run 12/11/2024 11:14 AM View: Appendix IV Trend Tests
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-13 (bg)

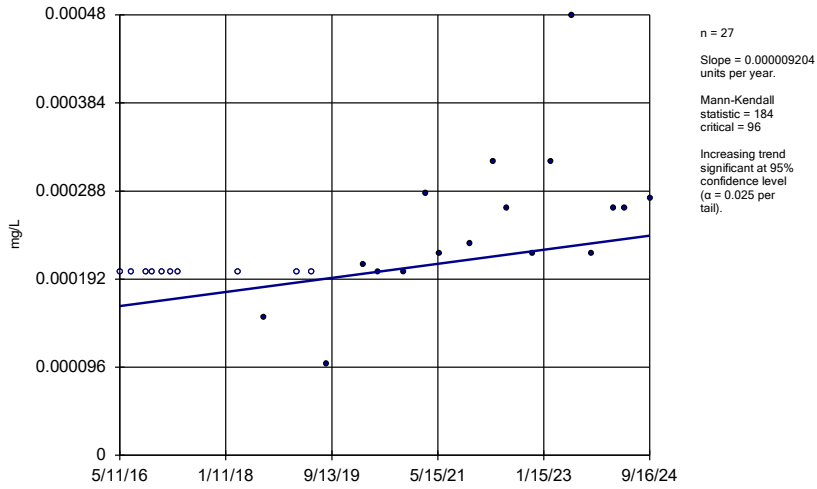


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 Mann-Kendall
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 critical = 101
 Trend not sig-
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 confidence level
 ($\alpha = 0.025$ per
 tail).

Constituent: Lead, total Analysis Run 12/11/2024 11:14 AM View: Appendix IV Trend Tests
 Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

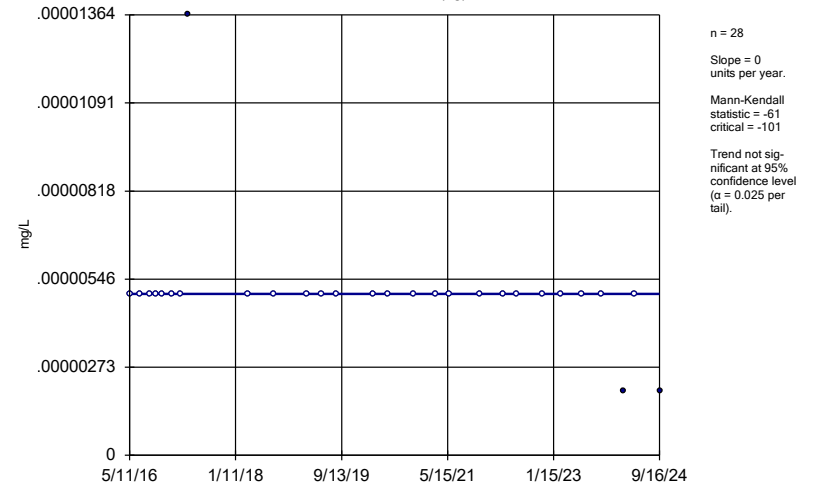
AD-33



Constituent: Lead, total Analysis Run 12/11/2024 11:14 AM View: Appendix IV Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

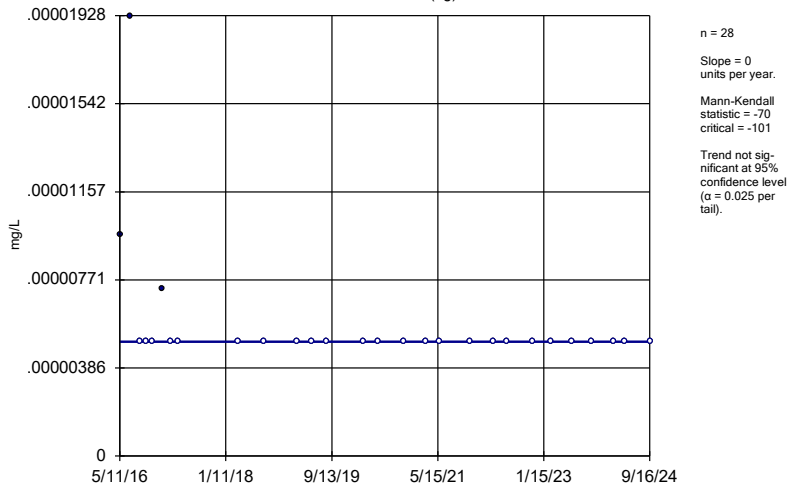
AD-12 (bg)



Constituent: Mercury, total Analysis Run 12/11/2024 11:14 AM View: Appendix IV Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

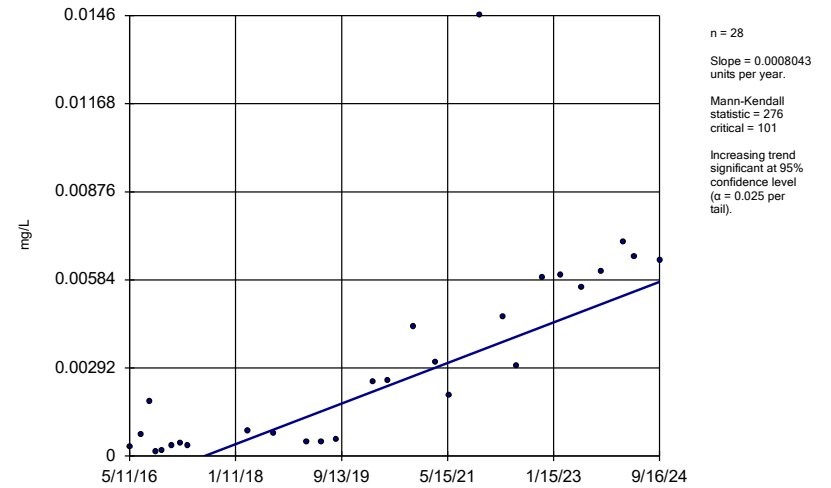
AD-13 (bg)



Constituent: Mercury, total Analysis Run 12/11/2024 11:14 AM View: Appendix IV Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

Sen's Slope Estimator

AD-33



Constituent: Mercury, total Analysis Run 12/11/2024 11:14 AM View: Appendix IV Trend Tests
Pirkey Stackout Client: Geosyntec Data: Pirkey Stackout

APPENDIX 3- Alternate Source Demonstrations

Alternate source demonstrations are included in this appendix. Alternate sources are sources or reasons that explain that statistically significant increases over background or statistically significant levels above the groundwater protection standard are not attributable to the CCR unit.

ALTERNATIVE SOURCE DEMONSTRATION REPORT- SECOND SEMIANNUAL EVENT 2023

TEXAS STATE CCR RULE

H.W. Pirkey Power Plant

Flue Gas Desulfurization Stackout Area

Hallsville, Texas

Prepared for

American Electric Power

1 Riverside Plaza
Columbus, Ohio 43215-2372

Prepared by

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Project CHA8495

February 2024

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Attachment G: Certification by a Qualified Professional Engineer

LIST OF ACRONYMS

Å	angstrom
amsl	above mean sea level
ASD	alternative source demonstration
bgs	below ground surface
CCR	coal combustion residuals
EPRI	Electric Power Research Institute
FGD	flue gas desulfurization
GWPS	groundwater protection standard
LCL	lower confidence limit
MCL	maximum contaminant level
mg/L	milligrams per liter
SPLP	Synthetic Precipitation Leaching Procedure
SSL	statistically significant level
SU	standard unit
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
µg/L	micrograms per liter
USEPA	United States Environmental Protection Agency
XRD	X-ray diffraction

1. INTRODUCTION AND SUMMARY

This alternative source demonstration (ASD) report has been prepared to address statistically significant levels (SSLs) for beryllium, cobalt, and mercury in the groundwater monitoring network at the H.W. Pirkey Plant Flue Gas Desulfurization (FGD) Stackout Area in Hallsville, Texas, following the second semiannual assessment monitoring event of 2023. The H.W. Pirkey Plant has four coal combustion residuals (CCR) storage units regulated by the Texas Commission on Environmental Quality (TCEQ) under Registration No. CCR104, including the FGD Stackout Area (**Figure 1**).

In October 2023, a semiannual assessment monitoring event was conducted at the FGD Stackout Area in accordance with Title 30, §352.951(a) of the Texas Administrative Code (TAC). The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. Groundwater protection standards (GWPSs) were established for each Appendix IV parameter in accordance with the statistical analysis plan developed for the unit (Geosyntec 2021a) and the United States Environmental Protection Agency (USEPA) document *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities: Unified Guidance* (USEPA 2009). The GWPS for each parameter was established as the greater of either the background concentration or the maximum contaminant level (MCL). To determine background concentrations, an upper tolerance limit was calculated using pooled data from the background wells collected during the background monitoring and assessment monitoring events.

Confidence intervals were recalculated for Appendix IV parameters at the compliance wells to assess whether these parameters were present at SSLs above the GWPSs. Seasonal patterns were observed for beryllium, cadmium, cobalt, combined radium, fluoride, lithium, and selenium at AD-22 (Geosyntec 2024). To correctly account for seasonality, confidence intervals for these wells and constituents were constructed using deseasonalized values. An SSL was attributed to a parameter if its lower confidence limit (LCL) exceeded the GWPS (i.e., if the entire confidence interval exceeded the GWPS). The following SSLs were identified at the Pirkey FGD Stackout Area (Geosyntec 2024):

- The deseasonalized LCL for beryllium exceeded the GWPS of 0.00400 milligrams per liter (mg/L) at AD-22 (0.00557 mg/L).
- The deseasonalized LCL for cobalt exceeded the GWPS of 0.0600 mg/L at AD-22 (0.0791 mg/L).
- The LCL for mercury exceeded the GWPS of 0.00200 mg/L at AD-33 (0.00275 mg/L).

No other SSLs were identified.

1.1 CCR Rule Requirements

TCEQ regulations regarding assessment monitoring programs for CCR landfills and surface impoundments provide owners and operators with the option to make an ASD when an SSL is identified:

In making a demonstration under this subsection, the owner or operator must, within 90 days of detecting a statistically significant level above the groundwater protection standard

of any constituent listed in Appendix IV adopted by reference in §352.1431 of this title, submit a report prepared and certified in accordance with §352.4 of this title (relating to Engineering and Geoscientific Information) to the executive director, and any local pollution agency with jurisdiction that has requested to be notified, demonstrating that a source other than a CCR unit caused the exceedance or that the exceedance resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. (30 TAC §352.951(e))

Pursuant to 30 TAC §352.951(e), Geosyntec Consultants, Inc. (Geosyntec) has prepared this ASD report to document that the SSLs identified for beryllium and cobalt at AD-22 and for mercury at AD-33 are from a source other than the FGD Stackout Area.

1.2 Demonstration of Alternative Sources

An evaluation was completed to assess possible alternative sources to which each identified SSL could be attributed. Alternative sources were categorized into the following five types, based on methodology provided by the Electric Power Research Institute (EPRI 2017):

- ASD Type I: Sampling Causes
- ASD Type II: Laboratory Causes
- ASD Type III: Statistical Evaluation Causes
- ASD Type IV: Natural Variation
- ASD Type V: Alternative Sources

A demonstration was conducted to show that the SSLs identified for beryllium, cobalt, and mercury were based on a Type IV cause and not by a release from the Pirkey FGD Stackout Area.

2. SUMMARY OF SITE CONDITIONS

The Stackout Area design and construction, regional geology and site hydrogeology, and groundwater monitoring system and flow conditions are described below.

2.1 FGD Stackout Area Design and Construction

The Pirkey FGD Stackout Area is an approximately 7-acre former FGD storage area located due west of the Pirkey Plant (**Figure 1**). It was designed for temporary stockpiling of stabilized FGD material placed on the native clay soil in the unit until it could be hauled to the on-site landfill for disposal (Arcadis 2023). Prior to closure, the natural ground surface elevation in the Stackout Area ranged from approximately 360 to 365 feet above mean sea level. Based on lithological borings advanced in the vicinity, the Stackout Area is underlain by approximately 20 feet of clay (Arcadis 2023).

A Closure Plan for the Stackout Area was developed in October 2016 and revised in May 2023 (American Electric Power [AEP] 2023). On September 1, 2023 AEP removed the final volume of CCR from the unit for the purpose of beneficial reuse and commenced closure of the unit in accordance with the requirements of 40 CFR §257.102(c) (which were adopted by the State of Texas under 30 TAC §352.1221) and the certified Closure Plan (AEP 2023). The removal of the remaining CCR material and an additional 12 inches of underlying soil was completed on September 18, 2023, and the removal was certified by Akron Consulting (2023).

2.2 Regional Geology / Site Hydrogeology

The Stackout Area is positioned on an outcrop of the Eocene Recklaw Formation, which consists predominantly of clay and fine-grained sand (Arcadis 2023). The Recklaw Formation is underlain by the Carrizo Sand, which crops out in the topographically lower southern portion of the plant. The Carrizo Sand consists of fine- to medium-grained sand interbedded with silt and clay.

The very-fine- to fine-grained clayey and silty sand located about 10 to 20 feet below the Stackout Area, with an average thickness of approximately 20 feet, is considered to be the uppermost aquifer below this CCR unit (Arcadis 2023).

2.3 Groundwater Monitoring System and Flow Conditions

The Stackout Area monitoring well network monitors groundwater within the uppermost aquifer. Geologic cross sections B-B', E-E', and F-F' from Arcadis (2023) show the subsurface structure of the uppermost aquifer (indicated on the figures as clayey silty sand, brown to gray in color) underlying the Stackout Area. These figures and a cross section location map are provided in **Attachment A**. The geologic cross sections demonstrate lateral continuity of the uppermost aquifer at and around the Stackout Area.

Groundwater flow direction at and near the Stackout Area is west-northwesterly (**Figure 1**). Groundwater flow velocities in the uppermost aquifer in the vicinity of the Stackout Area have been reported as approximately 5 to 35 feet per year. The Stackout Area monitoring well network consists of upgradient monitoring wells AD-12 and AD-13 and downgradient compliance wells AD-7R, AD-22, and AD-33, all of which are screened within the uppermost aquifer (Arcadis 2023). Downgradient well AD-7R was added to the network in December 2023 to replace well AD-7, which was plugged in September 2023 due to plant demolition activities in the area.

3. ALTERNATIVE SOURCE DEMONSTRATION

The ASD evaluation method and proposed alternative source of beryllium, cobalt, and mercury, and future groundwater sampling requirements are described below.

3.1 Proposed Alternative Source

An initial review of site geochemistry, site historical data, and laboratory quality assurance and quality control data did not identify alternative sources for beryllium, cobalt, and mercury due to Type I (sampling), Type II (laboratory), Type III (statistical evaluation), or Type V (anthropogenic) issues. Groundwater sampling, laboratory analysis, and statistical evaluations were generally completed in accordance with 30 TAC §352.931 and the draft TCEQ guidance for groundwater monitoring (TCEQ 2020). As described below, the SSLs for beryllium and cobalt have been attributed to natural variation associated with seasonal effects, which is a Type IV (natural variation) issue. The SSL for mercury has also been attributed to natural variation associated with the lithology of the uppermost aquifer.

3.1.1 Beryllium

An SSL was identified for beryllium at AD-22 using deseasonalized statistics (Geosyntec 2024). According to the *Unified Guidance*, “seasonal correction should be done both to minimize the chance of mistaking a seasonal effect for evidence of contaminated groundwater, and also to build more powerful background to compliance point tests. Problems can arise, for instance, from measurement variations associated with changing recharge rates during different seasons” (USEPA 2009a).

Previous ASDs for the FGD Stackout Area showed that beryllium concentrations at AD-22 appear to correlate with groundwater elevations (Geosyntec 2019, Geosyntec 2020a, Geosyntec 2020b, Geosyntec 2021b, Geosyntec 2021c, Geosyntec 2022, Geosyntec 2023a). This relationship generally still holds true (**Figure 2**). Beryllium concentrations at AD-22 are generally correlated with seasonal changes in other relatively mobile cationic constituents, including calcium and lithium (**Figure 3**). The correlation between beryllium and both monovalent (lithium) and divalent (calcium) cations suggests that the variability in observed beryllium concentrations is related to cation exchange behavior with clay minerals present in the native soil.

In March of 2020, the geology near AD-22 was relogged at soil boring SP-B4. Clay materials were present in the seasonally saturated zones above the permanent water table (**Figure 4**). The boring log for SP-B4 is provided in **Attachment B**, and the original boring log and well construction diagram for AD-22 is provided in **Attachment C**. At AD-22, the depth to water fluctuated between approximately 3 and 12 feet below ground surface (bgs). Clay was identified from approximately 0.7 feet bgs to 13.3 feet bgs, where it transitioned to a clayey silt (**Attachment B**). Analysis by X-ray diffraction (XRD) confirmed the presence of clay minerals within the seasonal water table and sand within the screened intervals for AD-22, as summarized in **Table 1**. The clay fraction of the uppermost samples collected from within the seasonal water table was further analyzed to identify the type of clays present. Smectite-type clays, which are 2:1-layer high-activity clays with characteristically high cation exchange capacity (compared to low-activity 1:1 clay minerals), make up the majority of the clay minerals present at those intervals.

Sorption and desorption of beryllium from smectite-type clays is well documented (You et al. 1989, Boschi and Willenbring 2016a). Desorption was found to be affected by pH, with 75% of beryllium desorbing from a smectite-type clay as pH decreased from 6.0 standard units (SU) to 3.0 SU (Boschi and Willenbring 2016b). The pH values recorded at AD-22 for samples collected under the Texas CCR Rule ranged from 3.5 to 5.1 SU, suggesting that conditions are favorable for beryllium desorption from smectite-type clays. The presence of these exchangeable clays provides further evidence that the exceedance of beryllium at AD-22 can be attributed to the effects on groundwater quality of seasonal groundwater elevation changes and the resulting cation exchange between groundwater and the exchangeable clay within the seasonal water table.

3.1.2 Cobalt

An SSL was identified for cobalt at AD-22 using deseasonalized statistics (Geosyntec 2024). As shown in previous ASDs (Geosyntec 2020a, Geosyntec 2020b, Geosyntec 2021b, Geosyntec 2021c, Geosyntec 2022, Geosyntec 2023a), the cobalt groundwater concentrations at AD-22 also appear to correlate with seasonal changes in groundwater elevation (**Figure 5**). In addition, the cobalt concentrations are well correlated with changes in other cations, including calcium and lithium (**Figure 6**), which suggests that natural variability associated with groundwater-mineral interactions within the seasonally saturated zone is governing dissolved cobalt concentrations.

A sample of the solid FGD sludge material accumulated on the FGD Stackout Area was collected in July 2019 and submitted for laboratory analyses. The solid-phase sample was leached using both Synthetic Precipitation Leaching Procedure (SPLP) analysis (SW-846 Test Method 1312 [USEPA 1994]) and Seven-Day Distilled Water Leachate Test Procedure (7-day leaching procedure) analysis (Appendix 4 of 30 TAC Chapter 335, Subchapter R [TAC 2016]) to evaluate the material as a potential source of cobalt. No changes to material handling or plant operations occurred prior to ceasing operations that would have altered the anticipated chemical composition since this sample was initially collected. Calcium-cobalt ratios for the leached sludge material and site groundwater are displayed on **Figure 7**. The concentration ratio between calcium and cobalt is consistently on the order of 100:1 at both upgradient and downgradient locations (**Figure 7**). Calcium concentrations in groundwater are generally consistent between AD-22 and upgradient well AD-13 (**Figure 8**); however, leached calcium concentrations from the FGD sludge material are approximately two to three orders of magnitude greater than concentrations in site groundwater. The difference between the ratio of calcium to cobalt in the leached FGD sludge material (about 45,000:1) compared to the ratio for groundwater suggests that dissolved calcium concentrations at AD-22 would be significantly higher if the groundwater at this location were affected by leachate.

Siderite and pyrite, both reduced iron-bearing minerals, were identified below the seasonal water table (within the saturated zone) at AD-22 (**Table 1**). Cobalt is known to undergo isomorphic substitution for iron in both siderite and pyrite (Gross 1965, Hitzman et al. 2017, Krupka and Serne 2002). This is due to the similarity of their ionic radii (approximately 1.56 angstrom [Å] for iron and 1.52 Å for cobalt [Clementi and Raimondi 1963]). The proposed substitution of cobalt for iron in the crystal lattice of pyrite has been documented in other ASDs prepared for the Pirkey Plant's East Bottom Ash Pond (Geosyntec 2023b) and West Bottom Ash Pond (Geosyntec 2023c).

Goethite (an iron hydroxide) was identified within the seasonally saturated zone and the screened interval at AD-22 (**Table 1**). The weathering of siderite and pyrite to goethite under oxidizing conditions is a well-understood phenomenon, including in formations in East Texas (Senkayi et

al. 1986, Dixon et al. 1982) and may have occurred within the seasonally saturated zone. Eh-pH (Pourbaix) diagrams can be used to illustrate the predicted speciation of specific analytes at thermodynamic equilibrium under the conditions observed for a groundwater sample. An Eh-pH diagram generated using geochemical conditions at AD-22 shows that the conditions observed at AD-22 are favorable for goethite formation (**Figure 9**). During weathering from reduced (pyrite and siderite) to oxidized (goethite) iron minerals, isomorphically substituted cobalt may be released from the mineral structure into groundwater. The mobilization of cobalt, which was released during weathering of siderite or pyrite to goethite in the seasonally saturated zone, may explain the variability in aqueous cobalt concentrations and their correlation with the groundwater elevation as more or less aquifer solids are saturated with groundwater.

3.1.3 Mercury

An SSL was identified for mercury at AD-33 (Geosyntec 2024). If the mercury detected at AD-33 were derived from CCR leachate from the FGD Stackout Area, we would anticipate similar trends for the concentrations of other CCR constituents, particularly those known to be more conservative. Boron, a geochemically conservative parameter, has high leachability from FGD material (USEPA 2009b). A release from the FGD Stackout Area would be anticipated to result in higher concentrations of boron and other conservative parameters, such as sulfate; however, the observed boron and sulfate concentrations at AD-33 do not display increasing trends (**Figure 10**). Two samples of FGD sludge material from the Stackout Area were collected in 2019 for characterization to assess if the FGD material was a likely source of mercury to groundwater at AD-33. As summarized in **Table 2**, both the historical average and the most recent boron groundwater concentrations at AD-33 are two orders of magnitude lower than the boron concentrations in leachate from both Synthetic Precipitation Leaching Procedure (SPLP) analysis (SW-846 Test Method 1312 [USEPA 1994]) and Seven-Day Distilled Water Leachate Test Procedure (7-day leaching procedure) analysis (Appendix 4 of 30 TAC Chapter 335, Subchapter R [TAC 2016]) of FGD sludge (**Attachment D**). The lack of increasing boron in AD-33 groundwater despite the relatively higher concentration of leached boron from the FGD sludge suggests groundwater at AD-33 is not impacted by the unit.

The FGD sludge material had detectable levels of total mercury at concentrations greater than those reported for two samples of aquifer solids collected from a soil boring advanced adjacent to AD-33 (**Table 3, Attachment E**). While the concentration of mercury in the aquifer solids is lower than the total mercury concentration in FGD sludge material, the low mobility of mercury from FGD suggests the FGD sludge is not the source of mercury in groundwater (USEPA 2009b, Hao et al. 2016). As shown in **Figure 11**¹, previous mercury groundwater concentrations at AD-33 were consistently at or above the mercury concentrations of leachate from SPLP analysis of FGD sludge material (**Table 2, Attachment D**). Mercury concentrations of leachate from 7-day leaching procedure analysis of FGD sludge material were below the laboratory detection limit of 0.005 mg/L. These results are in agreement with previous studies that have found that leached mercury concentrations are not correlated with total solid phase mercury in FGD samples (USEPA 2009b).

¹ Due to a change in reported concentrations of more recent data, historical mercury data at well AD-33 were truncated to represent current groundwater quality conditions (Geosyntec 2023a).

Detectable concentrations of mercury in aquifer solids at AD-33 present an alternative source of mercury in groundwater. Mercury is naturally occurring in soils and known to undergo isomorphic substitution for iron in crystalline iron minerals such as pyrite (Manceau et. al 2018). Analysis by XRD of material from the AD-33 soil boring showed detectable levels of pyrite below the seasonal water table (**Table 1**).

Reported differences between the total and dissolved mercury groundwater concentrations suggests that mercury is associated with colloidal material native from the aquifer. Dissolved concentrations of mercury at AD-33 are consistently lower than the reported total values (**Figure 11**), with most dissolved concentrations detected below the MCL of 2 µg/L. The method for measuring dissolved mercury in groundwater (EPA Method 245.7 [USEPA 2005]) involves filtering the sample through a 0.45 µm filter prior to analysis, which would remove colloid-sized particles prior to preservation. The inclusion of suspended particles (including colloids) in totals samples is likely to result in an overestimation of metals due to the mobilization of metals from the colloidal or solid to aqueous phase following acid preservation during sample collection. Thus, the lower dissolved mercury concentrations compared to total aqueous mercury suggests that mercury is associated with colloidal material from the aquifer and the SSL of mercury at AD-33 is not due to a release from the FGD Stackout Area.

3.1.4 Conceptual Site Model

The seasonal fluctuations in beryllium and cobalt concentrations at AD-22 can be attributed to variations in the amount of the aquifer solids that are in contact with groundwater as the water table elevation changes. When the water table is higher, more clay material is in contact with groundwater, allowing greater desorption of cations (including beryllium) from the cation exchange sites on the clay. In the case of cobalt, more iron oxides are in contact with groundwater as the water table rises, allowing for the release of cobalt from mineral phases where it has isomorphically substituted for iron. Thus, the observed SSLs were attributed to natural variation associated with seasonal fluctuation of beryllium and cobalt concentrations in groundwater as the amount of aquifer solids that are saturated increases. For mercury, seasonal variations in groundwater concentrations were not observed. The observed mercury concentrations in groundwater at AD-33 were attributed to interactions with mercury-bearing aquifer solids or colloids.

3.2 Sampling Requirements

Because the ASD presented above supports the position that the identified SSLs are not due to a release from the Pirkey FGD Stackout Area, the unit will remain in the assessment monitoring program. Groundwater at the unit will continue to be sampled for Appendix IV parameters semiannually.

4. CONCLUSIONS AND RECOMMENDATIONS

The preceding information serves as the ASD prepared in accordance with 30 TAC §352.951(e) and supports the position that the SSLs of beryllium and cobalt at AD-22 and mercury at AD-33 identified during the second semiannual assessment monitoring event of 2023 were not due to a release from the FGD Stackout Area. The identified SSLs were, instead, attributed to natural variation related to desorption of beryllium and seasonal dissolution of cobalt-bearing minerals comprising the aquifer solids. The mercury SSL was attributed to natural variation associated with the aquifer solids of the uppermost aquifer. Therefore, no further action is warranted, and the Pirkey FGD Stackout Area will remain in the assessment monitoring program. Certification of this ASD by a qualified professional engineer is provided in **Attachment G**.

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TABLES



**Table 1. X-Ray Diffraction Results
Alternative Source Demonstration Report
FGD Stackout Area, H. W. Pirkey Plant**

Boring Location	SP-B4		
Associated Well	AD-22		
Depth (ft bgs)	6-8	18-20	28-30
Sample Location	Within Seasonal Water Table	Below Seasonal Water Table	Within Screened Interval
Quartz	28	47.5	95
Plagioclase Feldspar	<0.5	<0.5	1
K-Feldspar	1	0.5	-
Goethite	1	-	2
Hematite	-	-	-
Chlorite	1	-	-
Siderite		10	-
Pyrite	-	2	-
Clays	*	40	2
Kaolinite	13	/	/
Illite/Mica	2		
Smectite	43		
Mixed-Layered Illite/Smectite	11		

Notes:

1. Mineral constituents are reported in percentage.
 2. Values shown as less than indicate the mineral constituent is present but below the quantification limit.
- *: The clay fraction at SP-B4-6-8 was further analyzed to characterize the types of clays present, as listed below.
 -: not detected
 ft bgs: feet below ground surface
 FGD: Flue gas desulfurization

**Table 2. Summary of Key Analytical Data
Alternative Source Demonstration Report
FGD Stackout Area, H.W. Pirkey Plant**

Sample	Type	Mercury ($\mu\text{g/L}$)	Boron (mg/L)
Pirkey Sludge FGD	SPLP	2.272	22.3
	7-Day Leaching Procedure	<5	8.44
Pirkey Sludge FGD 2	SPLP	<0.025	26.7
	7-Day Leaching Procedure	<5	16.4
AD-33	Historical Average	5.02	0.12
	Oct-23	6.12	0.094

Notes:

1. Average values were calculated using truncated mercury and boron data (March 2020 - October 2023).
2. Pirkey Sludge FGD samples were collected on July 17, 2019.
3. Non-detect values reported as less than (<) the detection limit.

CCR: coal combustion residuals

FGD: Flue Gas Desulfurization

mg/L: milligram per liter

SPLP: Synthetic Precipitation Leaching Procedure

$\mu\text{g/L}$: micrograms per liter

**Table 3. Solid Phase Mercury Data
Alternative Source Demonstration Report
FGD Stackout Area, H.W. Pirkey Plant**

Location ID	Date Sampled	Sample Depth (ft bgs)	Mercury (mg/kg)
AD-33	4/30/2018	11	0.0026
		21	0.0038
Pirkey Sludge FGD	7/17/2019	N/A	0.653
Pirkey Sludge FGD 2	7/17/2019	N/A	0.606

Notes:

1. For AD-33 locations, samples were collected from additional boreholes advanced in the immediate area of AD-33. Samples were not collected from the cuttings of the borings advanced for well installation.

FGD: Flue Gas Desulfurization

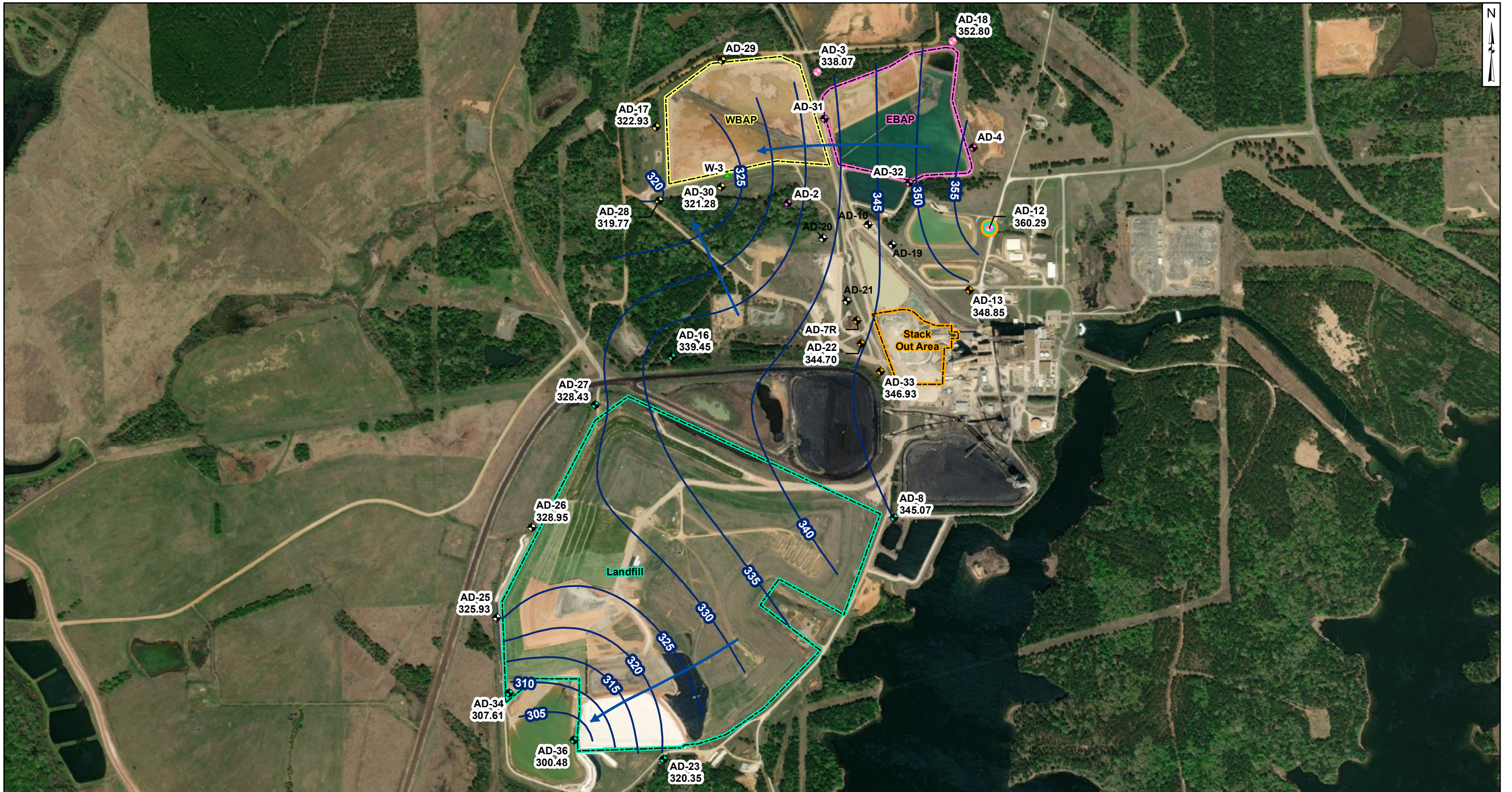
ft bgs: feet below ground surface

mg/kg: milligram per kilogram

N/A: not applicable

FIGURES





Legend

Groundwater Monitoring Wells

- Out of Network
- EBAP
- WBAP
- Landfill
- Stackout Area
- EBAP and WBAP
- All CCR Unit Networks
- Piezometer
- Groundwater Elevation Contour
- Approximate Groundwater Flow Direction

- Notes**
1. Monitoring well coordinates and water level data (collected on October 17 and 18, 2023) provided by AEP.
 2. Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation Update (Arcadis 2022) provided by AEP.
 3. Groundwater elevation units are feet above mean sea level.
 4. EBAP wells were not gauged during the October 2023 event.
 5. AD-02, AD-04, AD-10, AD-19, AD-20, AD-21, AD-24, AD-29, AD-31, AD-32, and W-3 were not gauged during the October 2023 event.
 6. AD-7R (350.92 ft msl) was not used for contouring due to an anomalous reading.
 7. AD-35 was abandoned on November 13, 2018.
 8. AD-7R will be used as a substitute for AD-07, as it was abandoned.
 9. Removal of CCR plus one foot of material was completed on July 26, 2022, for the West Pond.
 10. Removal of CCR plus one foot of material was completed on July 20, 2023, for the East Pond.
 11. Removal of CCR plus one foot of material was completed on September 18, 2023, for FGDSA.

1,000 500 1,000 Feet

Beth Ann Gross

January 19, 2024

Geosyntec Consultants, Inc.
Texas Firm
Registration No. 1182

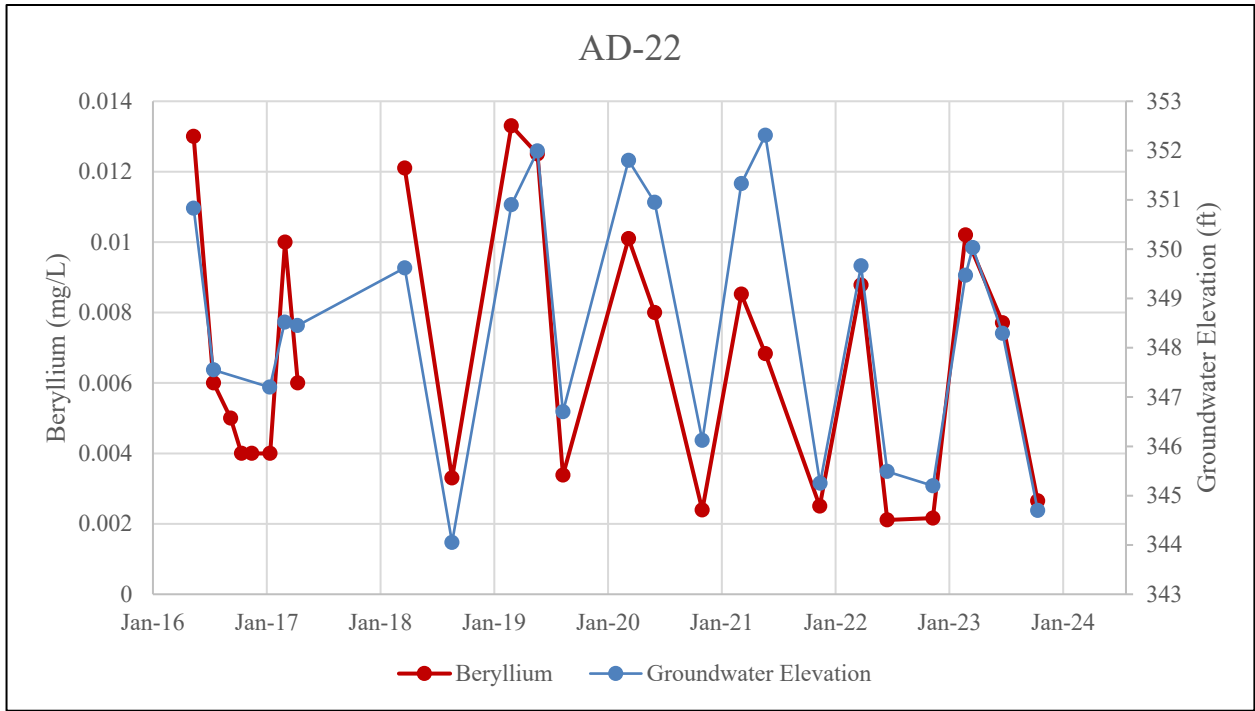
**Potentiometric Contours: Uppermost Aquifer
October 2023**

AEP Pirkey Power Plant
Hallsville, Texas

Geosyntec
consultants

Columbus, Ohio 2024/01/10

Figure 1



Notes:

1. Beryllium concentrations are shown in milligrams per liter (mg/L).
 2. Water level is shown as groundwater elevation in feet above mean sea level (ft amsl).
 3. The gap in beryllium data represents the time period in which detection monitoring took place and samples were not analyzed for beryllium.
- FGD: Flue Gas Desulfurization

Beryllium v. Groundwater Elevation

Pirkey FGD Stackout Pad

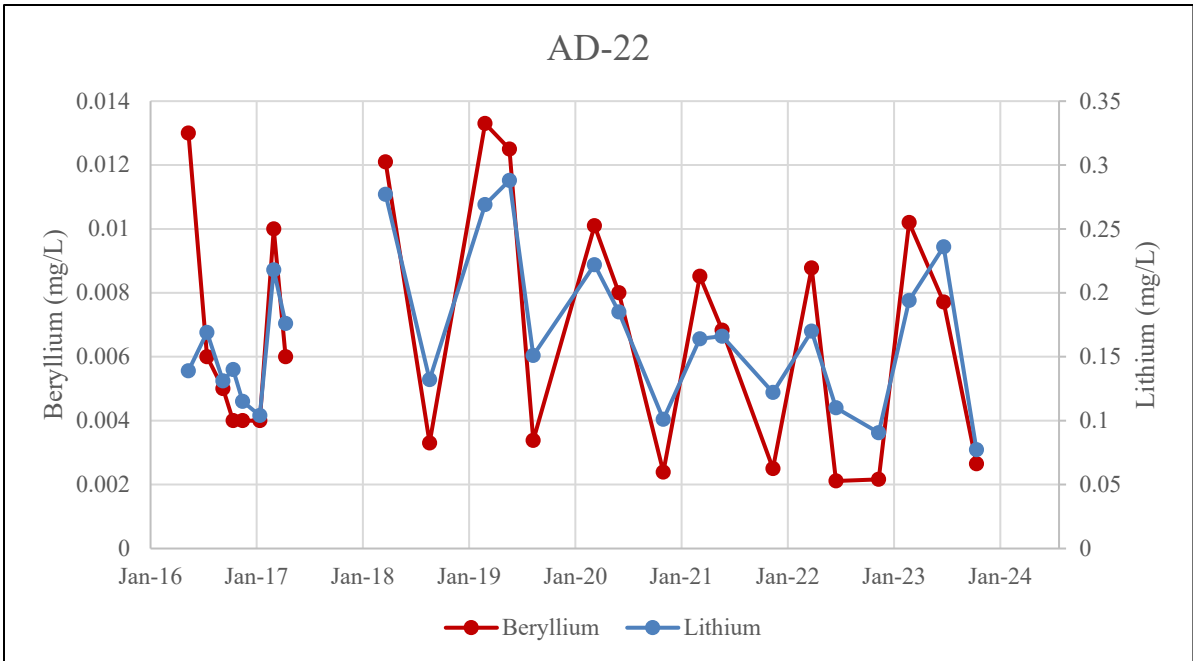
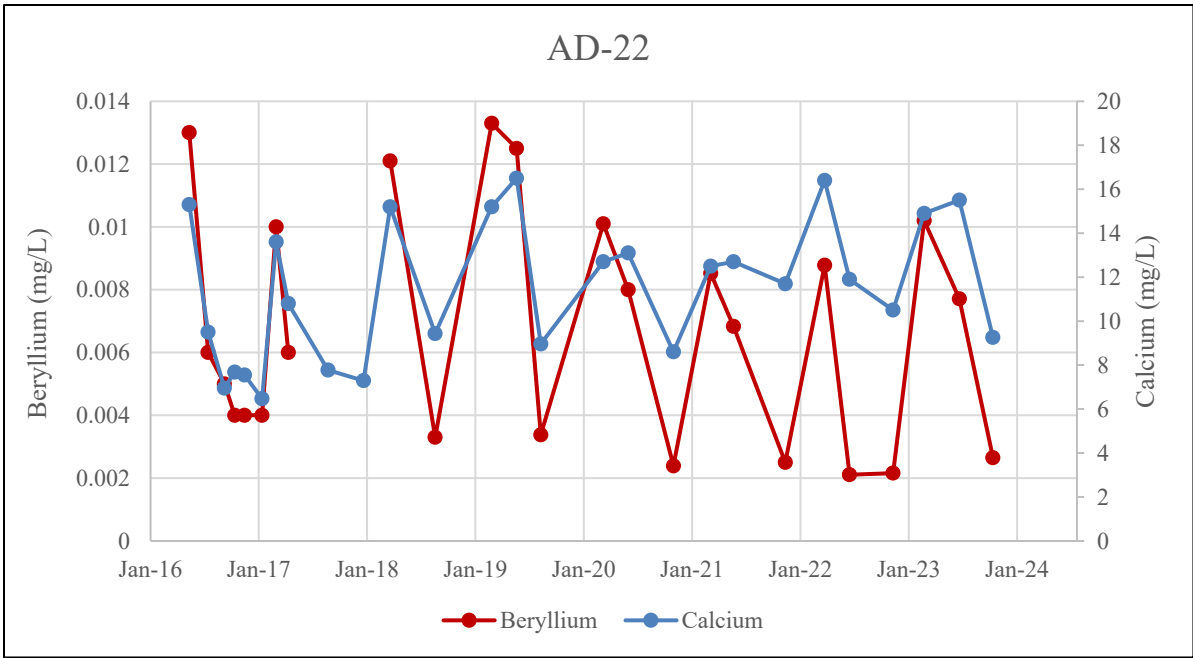


Figure

2

Columbus, Ohio

January 2024



Notes:

1. Beryllium, calcium, and lithium concentrations are shown in milligrams per liter (mg/L).

2. The gaps in beryllium and lithium data represent the time period in which detection monitoring took place and samples were not analyzed for beryllium and lithium.

FGD: flue gas desulfurization

AD-22 Beryllium v. Calcium and Lithium

Pirkey FGD Stackout Pad

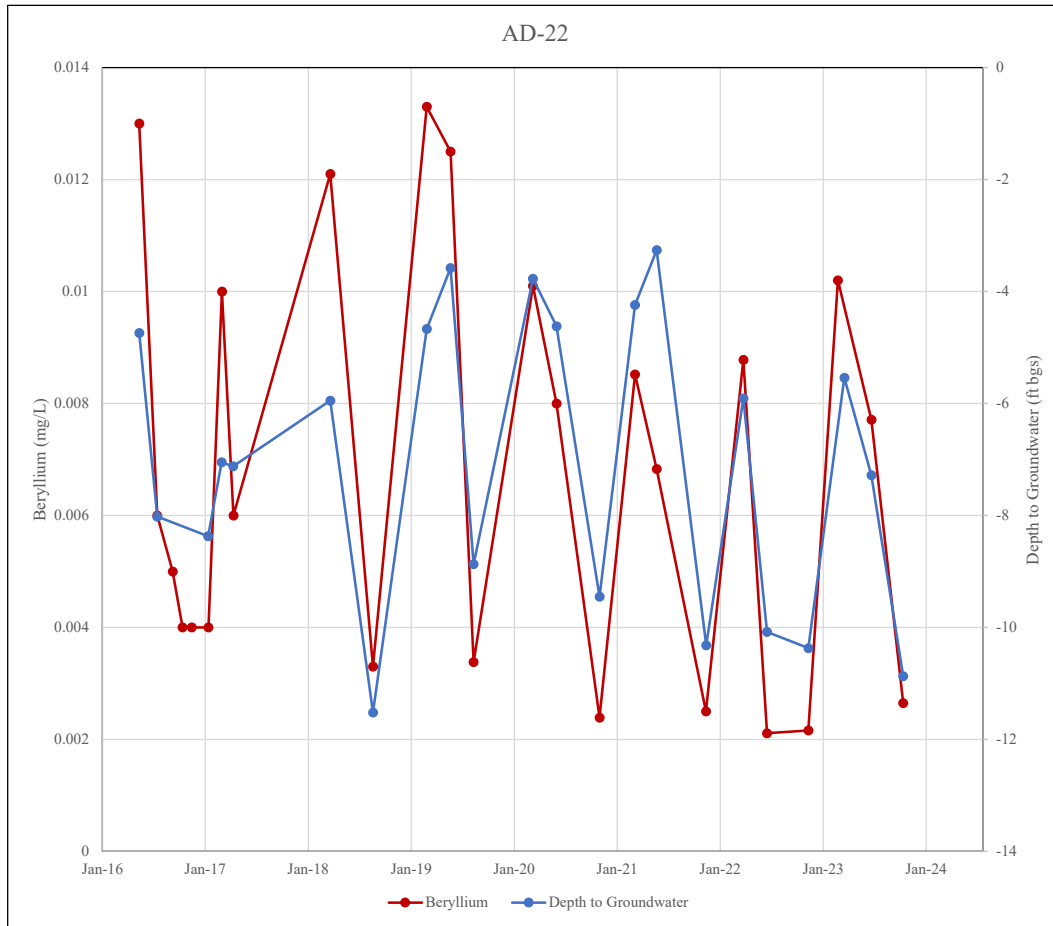


Figure

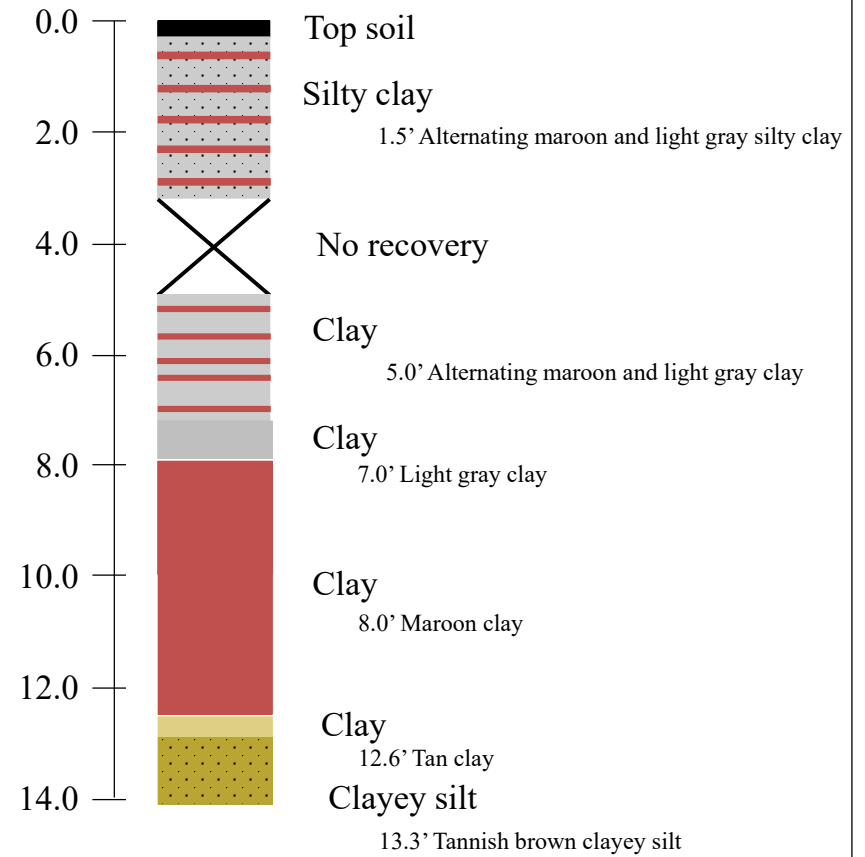
3

Columbus, Ohio

January 2024

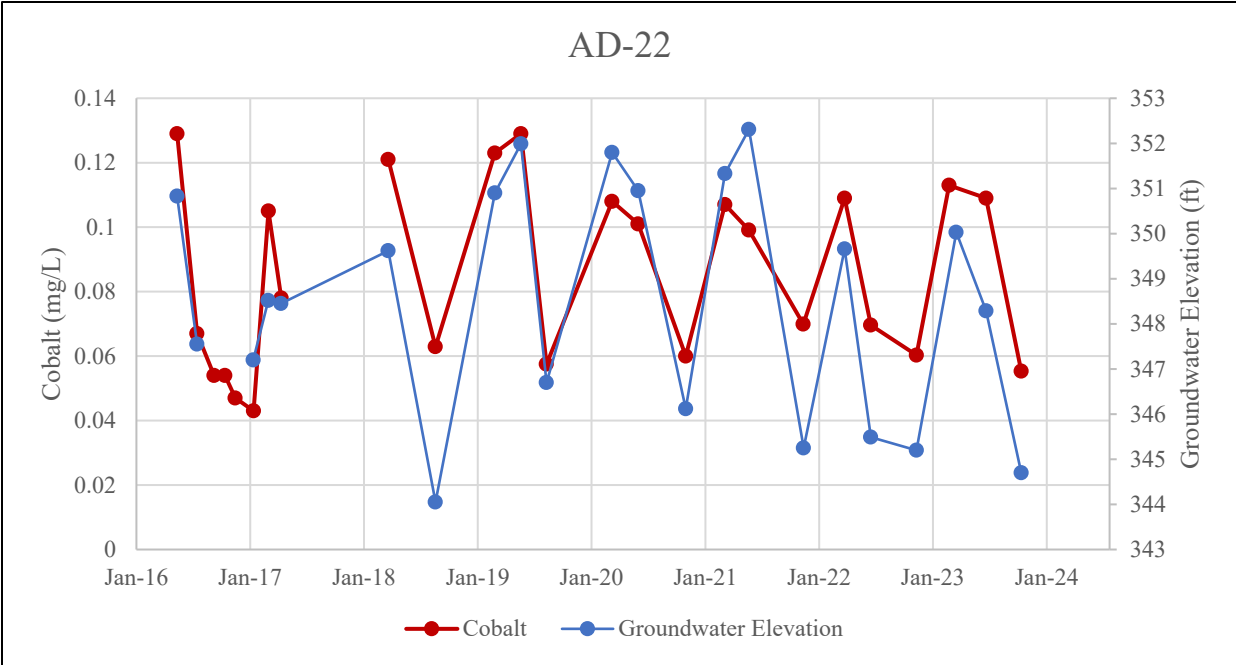


Depth (ft bgs)



Notes:
 1. A sample was collected for analysis of mineralogy from 6-8 ft bgs.
 2. This illustration represents the log for boring SP-B4. The full boring log is available in Attachment B.
 3. AD-22 is screened at the interval of 10-30 ft bgs.
 FGD: Flue Gas Desulfurization
 ft bgs: feet below ground surface
 mg/L: milligrams per liter

AD-22 Seasonal Water Table Geology H. W. Pirkey Plant – FGD Stackout Pad	
Columbus, OH	January 2024
Figure 4	



Notes:

1. Cobalt concentrations are shown in milligrams per liter (mg/L).
 2. Water level is shown as groundwater elevation in feet above mean sea level (ft amsl).
 3. The gap in cobalt data represents the time period in which detection monitoring took place and samples were not analyzed for cobalt.
- FGD: Flue Gas Desulfurization

AD-22 Cobalt v. Groundwater Elevation

Pirkey FGD Stackout Pad

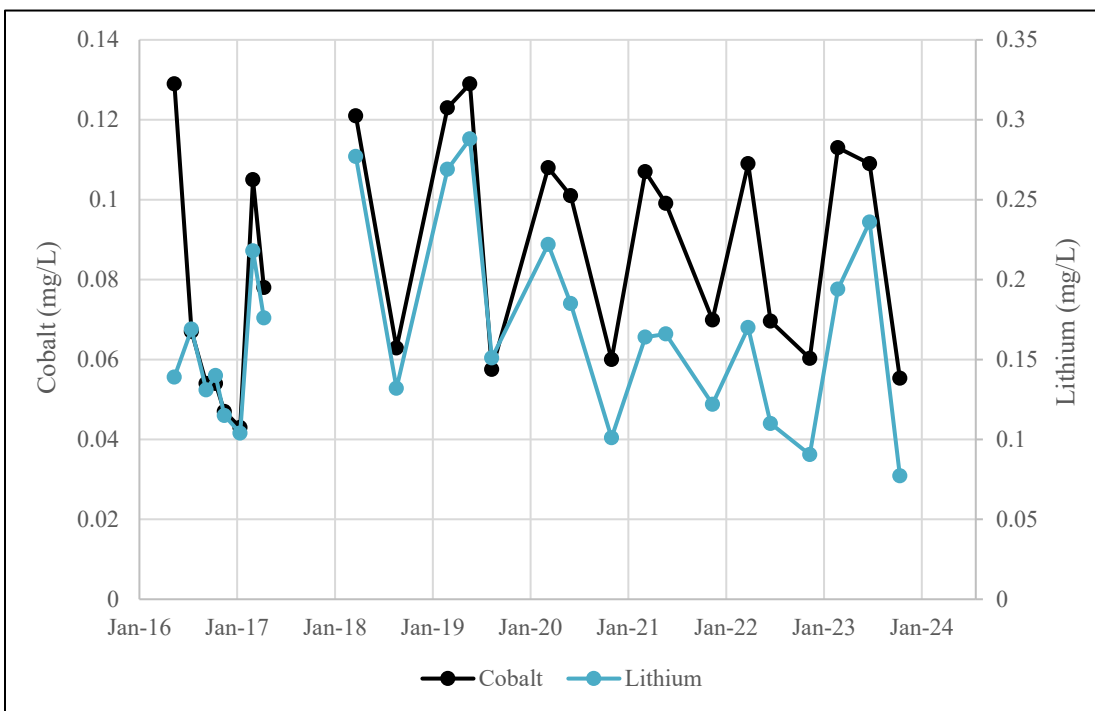
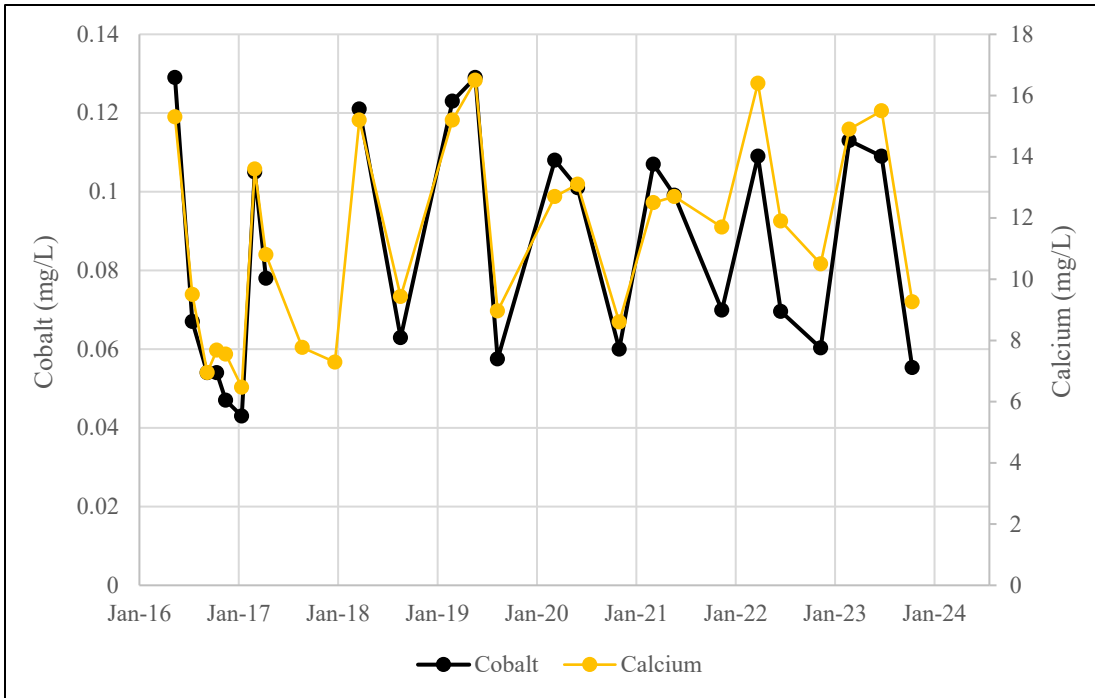


Figure

5

Columbus, Ohio

January 2024



Notes:

1. Cobalt, calcium, and lithium concentrations are shown in milligrams per liter (mg/L).

2. The gaps in cobalt and lithium data represent the time period during which detection monitoring took place and samples were not analyzed for cobalt and lithium.

FGD: Flue Gas Desulfurization

AD-22 Cobalt v. Calcium and Lithium

Pirkey FGD Stackout Pad

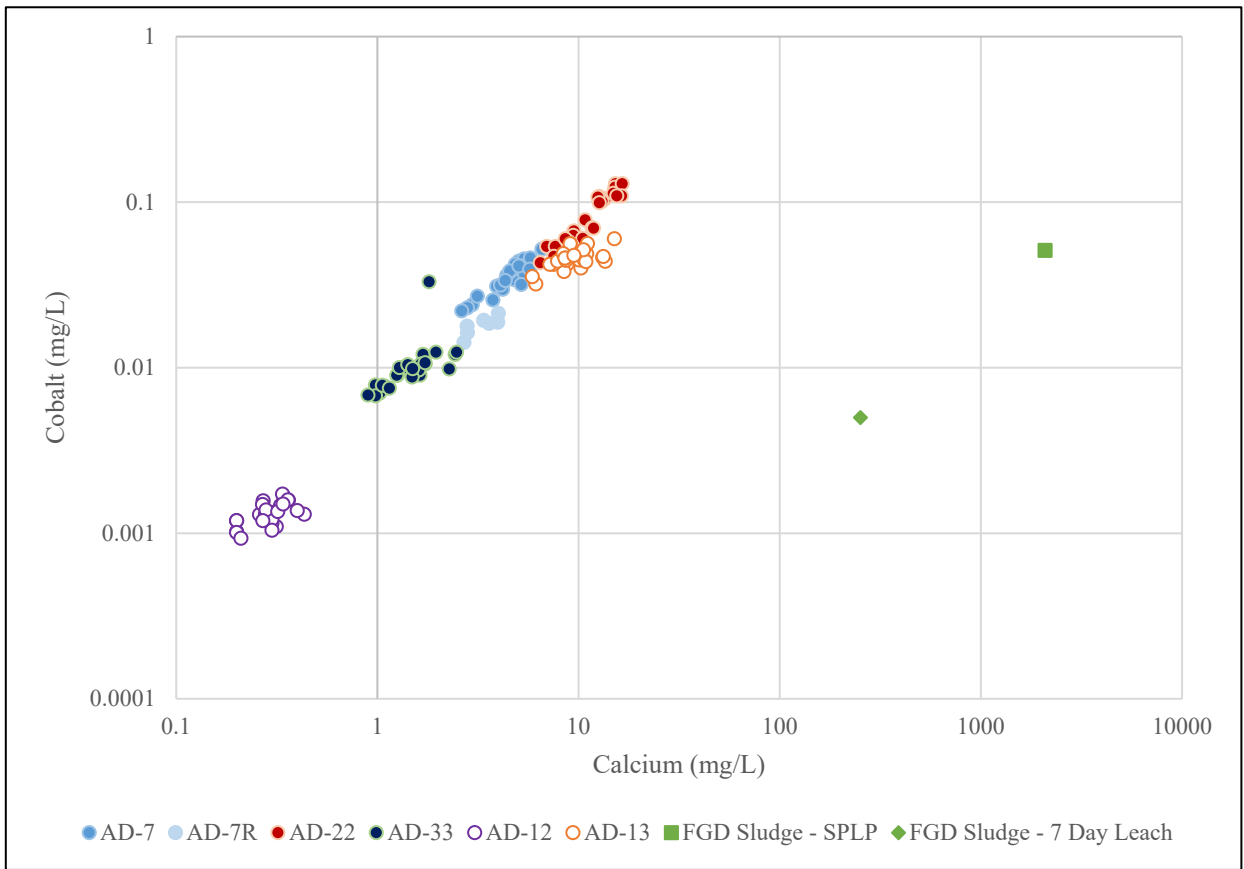


Figure

6

Columbus, Ohio

January 2024



Notes:

1. Cobalt and calcium concentrations are shown in milligrams per liter (mg/L).
2. Upgradient wells are shown with hollow circles.
3. 'FGD Sludge-SPLP' and 'FGD Sludge 7 Day Leach' present the leached concentrations of cobalt and calcium using the Synthetic Precipitation Leaching Procedure (SPLP) (SW-846 Test Method 1312) and the 7-Day Distilled Water Leachate Test Procedure (30 Texas Administration Code 335.521 Appendix 4), respectively. FGD: Flue Gas Desulfurization

Cobalt and Calcium Concentration Distribution

Pirkey FGD Stackout Pad

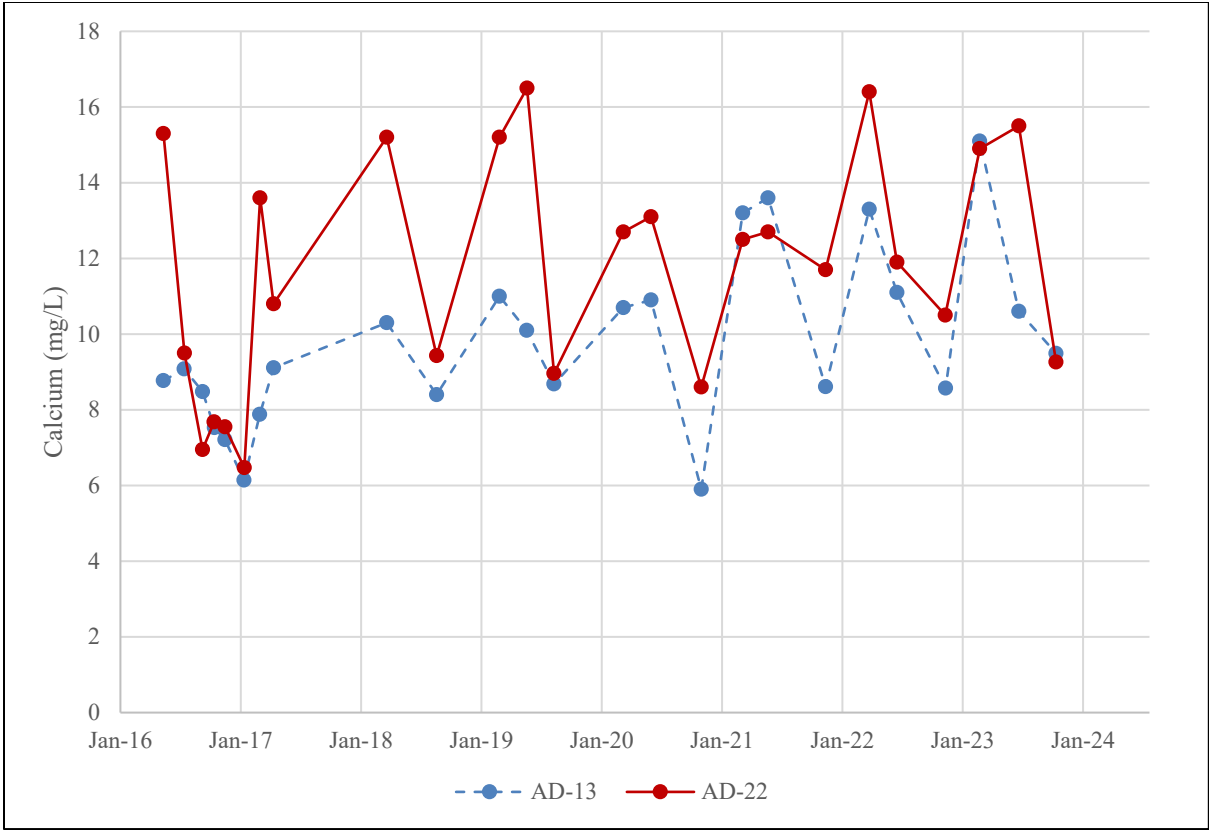


Figure

7

Columbus, Ohio

January 2024



Notes:

- 1. Calcium concentrations are shown in milligrams per liter (mg/L).
 - 2. Upgradient monitoring well AD-13 is shown with a dashed line.
- FGD: Flue Gas Desulfurization

Calcium Time Series Graph

Pirkey FGD Stackout Pad

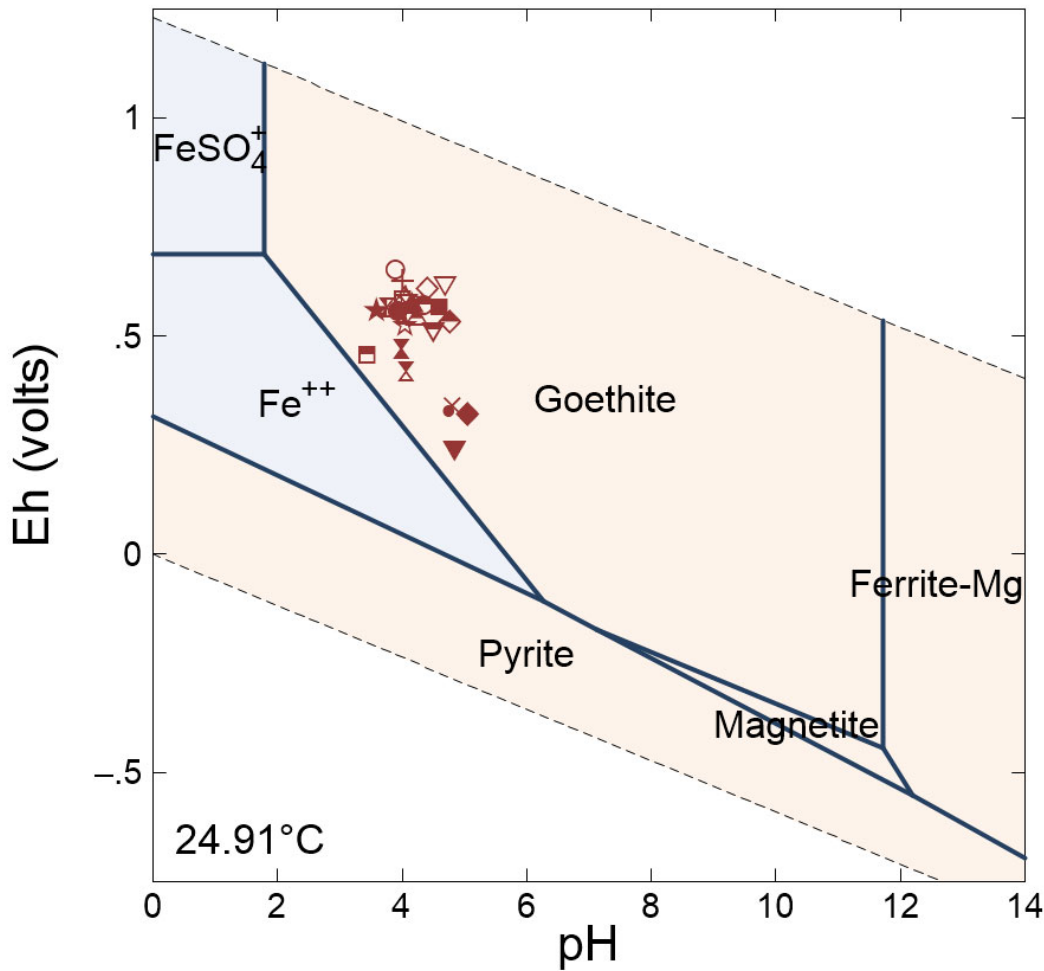


Figure

8

Columbus, Ohio

January 2024



- 11-May-16
- 14-Jul-16
- △ 07-Sep-16
- ▽ 12-Oct-16
- ◇ 14-Nov-16
- ◊ 12-Jan-17
- 01-Mar-17
- ☆ 11-Apr-17
- 23-Aug-17
- 21-Mar-18
- ▲ 20-Aug-18
- ▼ 27-Feb-19
- ◆ 22-May-19
- 12-Aug-19
- ⋈ 10-Mar-20
- ★ 02-Jun-20
- × 02-Nov-20
- + 08-Mar-21
- 24-May-21
- 15-Nov-21
- △ 28-Mar-22
- ▽ 20-Jun-22
- ◆ 14-Nov-22
- ☆ 27-Feb-23
- ⋈ 26-Jun-23
- ▼ 17-Oct-23

Notes: Groundwater concentrations of major cations and anions at AD-22 from the June 2023 sampling event were used to establish baseline conditions for the diagram. Eh and pH values for sampling dates at AD-22 are shown on the diagram.

AD-22 Eh-pH Diagram
Pirkey FGD Stackout Pad

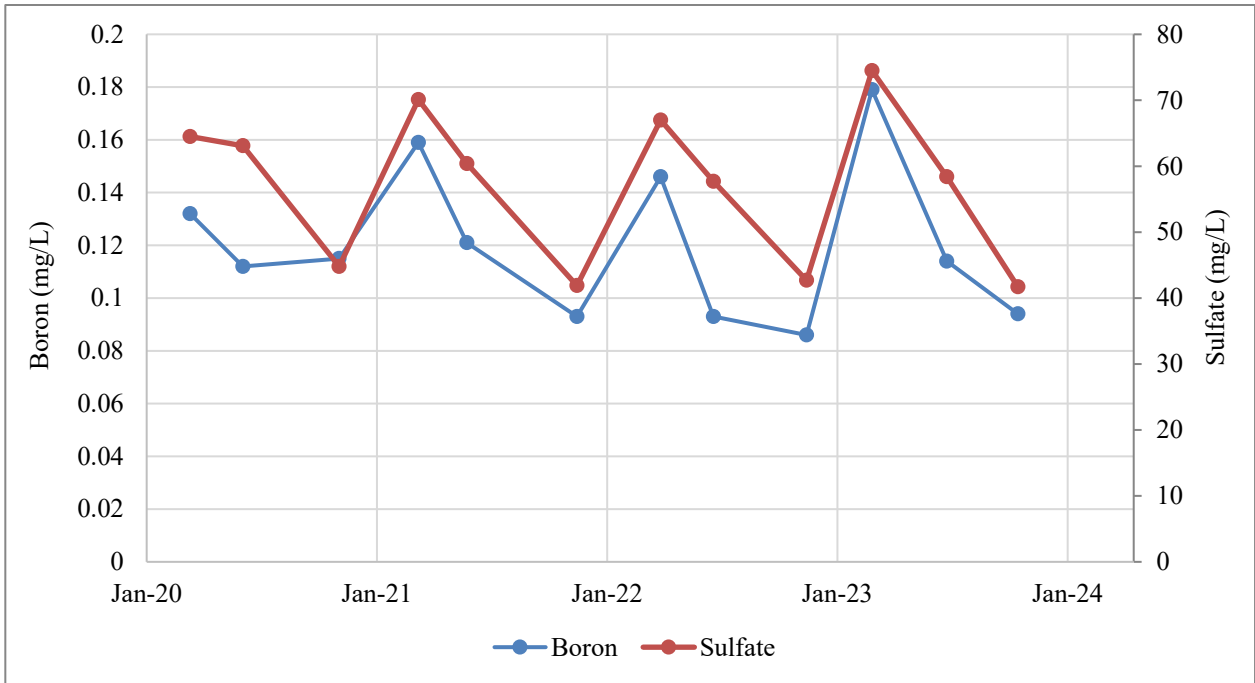


Figure

9

Columbus, Ohio

November 2023



Notes:
 1. Boron and sulfate concentrations are shown in milligrams per liter (mg/L).
 FGD: Flue Gas Desulfurization

AD-33 Boron and Sulfate Time Series Graph
 Pirkey FGD Stackout Pad

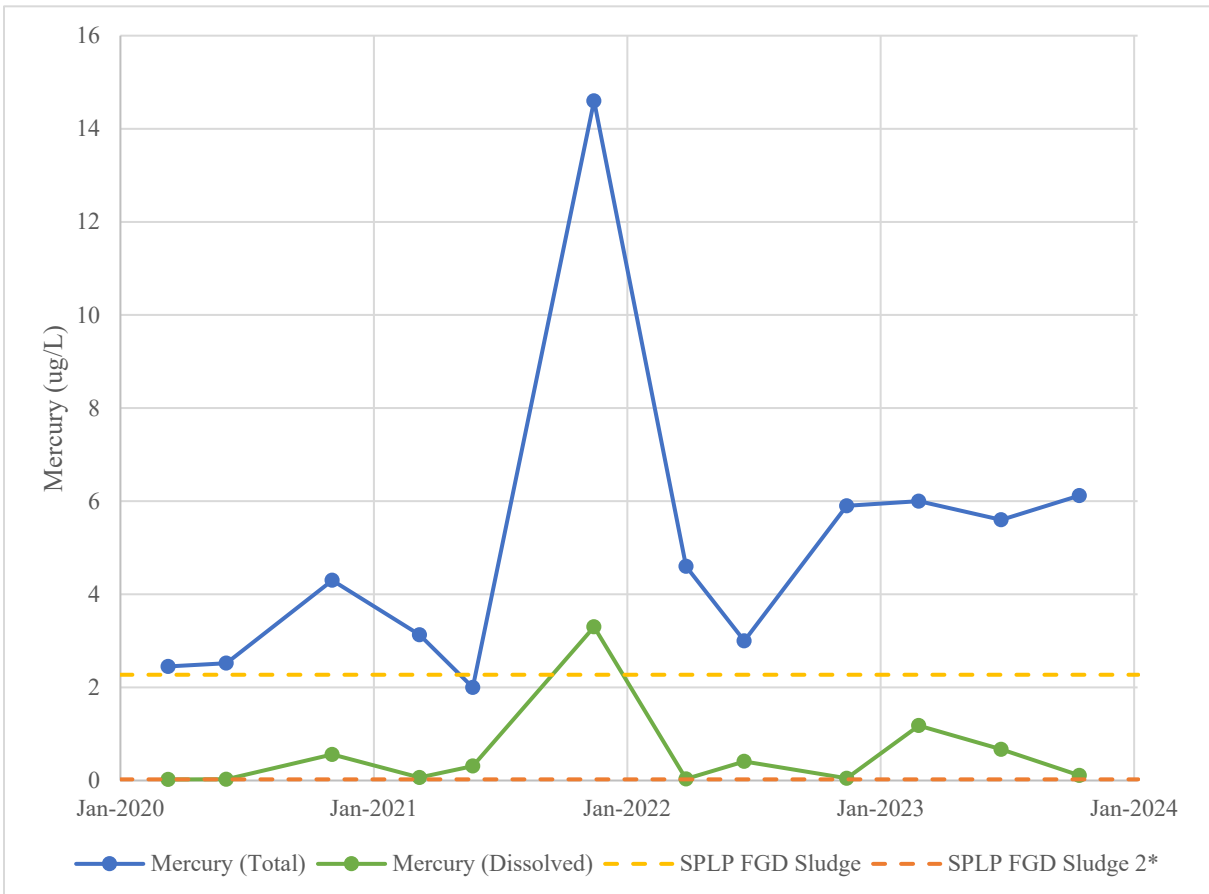


Figure

10

Columbus, Ohio

January 2024



Notes:

1. Mercury (Hg) concentrations are shown in micrograms per liter (ug/L).

2. FGD sludge samples collected on 7/17/2019.

3. 7-day leaching procedure results were not shown due to non-detects.

*: Non-detect presented as the reporting limit

FGD: Flue Gas Desulfurization

SPLP: Synthetic Precipitation Leaching Procedure

AD-33 Mercury Time Series Graph

Pirkey FGD Stackout Pad

Geosyntec
consultants



Figure

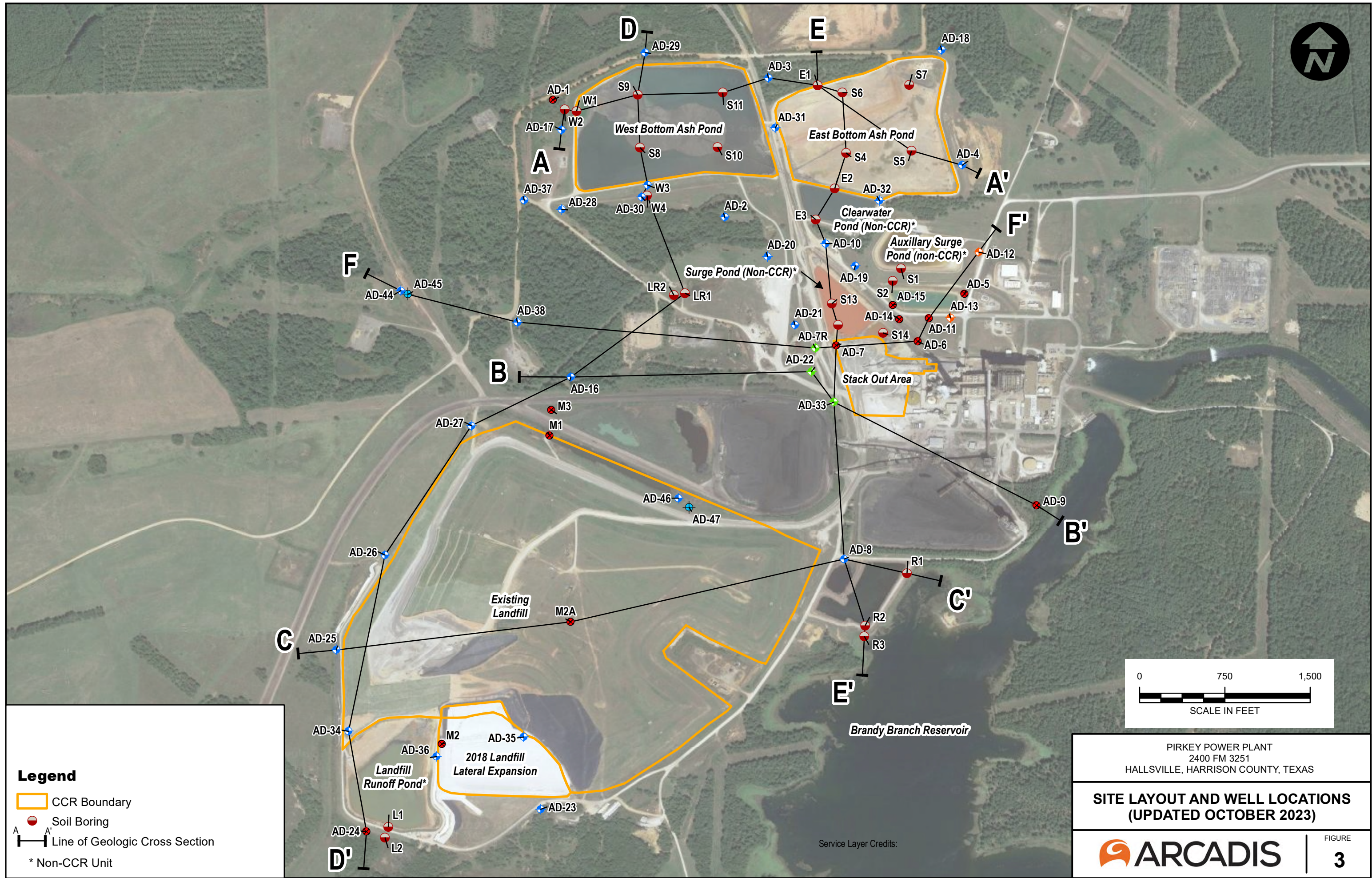
11

Columbus, Ohio

January 2024

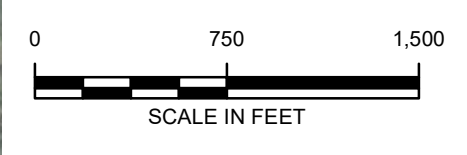
ATTACHMENT A

Geologic Cross Sections



Legend

- CCR Boundary
- Soil Boring
- A A' Line of Geologic Cross Section
- * Non-CCR Unit



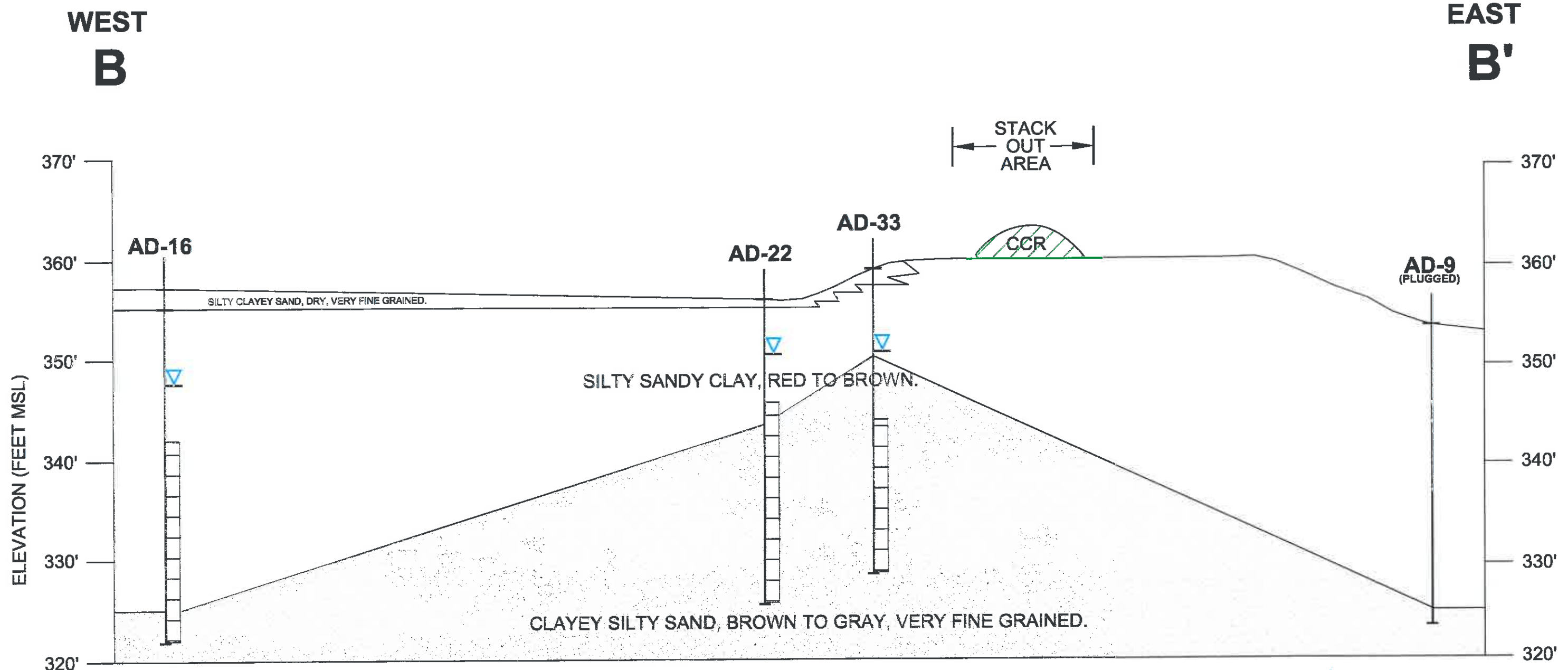
PIRKEY POWER PLANT
2400 FM 3251
HALLSVILLE, HARRISON COUNTY, TEXAS

**SITE LAYOUT AND WELL LOCATIONS
(UPDATED OCTOBER 2023)**

FIGURE
3

Service Layer Credits:

CITY: DIV/PROJECT: DB: LD: AM: PD: TM: TR: LYRON-OFF-REF: PLOT: 10/10/2023 11:27 AM BY: LEASE, DIANA
 G:\Active Projects\AEP301\03036 - Pirkey Stack Out Well Network\Report\Figure 5 Cross Sec B-B'.dwg LAYOUT: MODEL: SAVER: 2/19/2016 2:22 PM ACADVER: 24.05 (LMS TECH) PAGES: 1/1 PLOTSTYLETABLE: ---



- LEGEND**
- MONITORING WELL SCREENED INTERVAL
 - WATER LEVEL IN MONITORING WELL (1/20/16)
 - BASE OF CCR UNIT

NOTES:

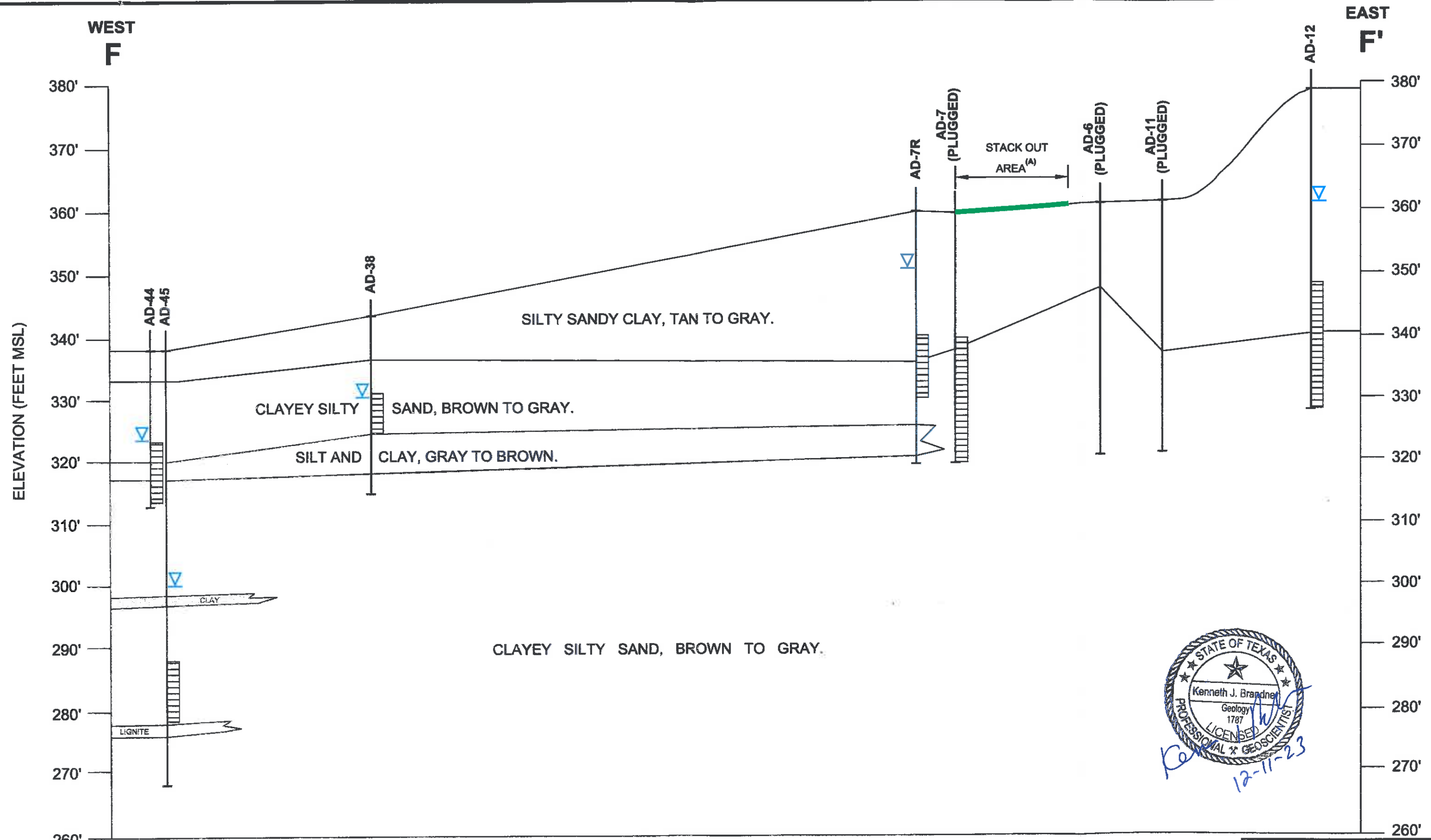
A) BASE OF STACK OUT AREA CCR UNIT LOCATED AT GRADE, ELEVATION TAKEN FROM MAY 2012 AND JUNE 23, 2015 TOPOGRAPHIC SURVEYS BY BEACON AVIATION.

B) ELEVATION OF CCR MATERIAL ABOVE STACK OUT AREA VARIES.



PIRKEY POWER PLANT 2400 FM 3251 HALLSVILLE, HARRISON COUNTY, TEXAS	
CROSS SECTION B - B'	
	FIGURE 5

CITY: D:\GROUP: DE: LD: AM: PD: TM: TR: LYRONE-OFF-REF*
 G:\Active Projects\AEP\01030088 - Primary Stack Out Well Network\Report\Figures-Maps\Figure 8 Cross Sec F-F.dwg LAYOUT: MODEL BAVED: 10/10/2023 1:32 PM ACADVER: 24.05 (LMS TECH) PAGES: 10 PLOTSTYLETABLE: --- PLOTTED: 10/11/2023 8:50 AM BY: LEASE, DIANA



LEGEND

- MONITORING WELL SCREENED INTERVAL
- WATER LEVEL IN MONITORING WELL (9/12/23)
- BASE OF CCR UNIT



NOTES: BASE OF STACK OUT AREA CCR UNIT LOCATED AT GRADE.



PIRKEY POWER PLANT 2400 FM 3251 HALLSVILLE, HARRISON COUNTY, TEXAS	
CROSS SECTION F - F'	
	FIGURE 9

ATTACHMENT B

SP-B4 Boring Log

Soil Boring Log

Project: AEP Pirkey

Boring/Well Name: _____ SP-B4

Project Location: _____ Hallsville, TX

Boring Date: __ 3/3/2020


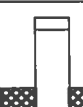

Depth Scale Feet	Water Table	Soil Profile Description	PID*
0		pp= pocket penetrometer	
		0.0'-0.4': Top soil, black silt, vegetation	
		0.4'-0.7': Brown clayey silt, good cohesion	
		0.7'-1.5': Red and light gray silty clay, moderate stiffness (pp. 2.5), high plasticity	
		1.5'-3.7': Maroon and light gray clay, high stiffness (pp. 4.5-5.0), low plasticity; iron ore present 3.1'-3.7'	
		3.7'-5.0': NO RECOVERY	
5		5.0'-7.0': Maroon and light gray clay, high stiffness (pp. 4.5-5.0), low plasticity; iron ore present throughout	
		7.0'-8.0': Light gray clay with iron ore, moderate stiffness (pp.2.5-3.0), moderate plasticity	
		8.0'-10.0': Maroon clay, moderate stiffness (pp. 3.5), moderate plasticity; iron ore present; moist at 9'	
10		10.0'-12.6': Maroon clay, moderate stiffness (pp. 3.5), moderate plasticity; iron ore present; wet at 12'	
	▼	12.6'-13.3': Tan clay, low stiffness (pp.1.5), high plasticity; wet	
		13.3'-18.5': Tan and brown clayey silt, moderate cohesion; iron ore present; wet	
15			
		18.5'-20.3': Maroon silty clay, low stiffness (pp. 1.0), moderate plasticity; iron ore; wet	
20		20.3'-21.1': Dark gray/black clay, trace silt, low stiffness (pp. 1.5), high plasticity; wet	
		21.1'-21.3': Dark gray silt, good cohesion; wet	
		21.3'-21.9': Dark gray silty clay, low stiffness (pp. 1.5), high plasticity; wet	
		21.9'-22.3': Dark gray silt, moderate cohesion; wet	
		22.3'-22.7': light brown silt; low cohesion; wet	
		22.7'-24.4': Dark gray and dark green silty clay, moderate/high stiffness (pp.3.5), moderate plasticity; wet, glauconite present	
25		24.4'-27.8': Dark green/gray fine grained sand, well sorted; wet; glauconite present	
		27.8'-30.0': Red and orange fine grained sand, well sorted, with iron ore; wet	
30			
		Samples collected at 6-8'; 18-20'; 28-30'	
		TD at 30' bgs; refusal	
		*PID readings not collected	
35			

Drill Rig Geoprobe 3230 DT
 Drilling Contractor: _____ C&S
 Driller: _____ DJ Diduch

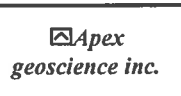
Geosyntec Consultants

ATTACHMENT C
AD-22 Boring Log and Well Installation Diagram

BORING MONITOR WELL
 APEX PROJECT NO.: 110-089 BORING NUMBER: _____ MONITOR WELL NUMBER: AD-22
 FACILITY NAME: AEP- Pirkey Power Plant FACILITY ID NO.: N/A
 FACILITY ADDRESS: Hallsville, Texas
 DRILLING COMPANY/METHOD/RIG: Apex Geoscience Inc. / Hollow-stem Augers/ CME-55 Track Rig
 DRILLER: Ed Wilson, Apex Geoscience Inc. COMPLETION DATE: 12/16/2010
 PREPARED BY: David Bedford LOGGED BY: David Bedford
 LATITUDE: N 32°27'03.3" Datum: WGS-84 WELL LOCATION: Triangle- South side Quansit Hut
 LONGITUDE: W94°29'41.3"

DEPTH (FEET)	PID (PPM)	SAMPLE INTERVAL	WELL LOG AND COMPLETION DETAILS	USCS CODE	SOIL DESCRIPTION AND COMMENTS	Odor	Moisture	
1				0-0.5	SC	Clayey sand, light brown, very fine grained	None	Moist
2				0.5-12	CL	Lean clay, light brown mottled with light gray	None	Slightly Moist
3								
4						Few iron ore (small) pebbles in clayey sandy streaks		
5								
6								
7								
8								
9								
10								
11								
12								
13				12-20	SC	Clayey sand, grayish brown with orangish brown streaks, very fine grained	None	Slightly Wet
14						Slightly wet @ 12.5' from seepage		
15						Large amount of iron ore 15-17'		
16								
17								
18						Very firm 18-18.5'		
19								
20								
21				20-25	SC	(Dense crystalline rock 21-21.1'), light brown clayey sand, greenish black, mica, black clay streaks, very fine grained, wet @ 20'	None	Wet
22								
23								
24								
25								
26				25-30	SM	Sand, greenish brown (1') grading to orangish brown, silty, very fine grained	None	Wet
27								
28								
29								
30								
31						Boring Terminated at 30'		
32								
33								
34								
35								
36								
37								
38								
39								
40								

 Cement
  Bentonite
  Filter Sand
  Water Level



Total Depth: 30 feet Riser Interval: +3 (ags)-10'
 Filter Sand (Size/Interval): 8-30' Screen Interval: 10-30'
 Grout (Type/Interval): Grout from 0-2'; Bentonite from 2-8' Water level: 12.5'
 Surface Completion Flush Above Ground 3'

Note: This log is not to be used separate from this report.

ATTACHMENT D
FGD Sludge Materials Analytical Report



AEP ANALYTICAL CHEMISTRY SERVICES

Analysis Report

02004
502 North Allen Ave.
Shreveport, LA 71101
Phone: (318) 673-3802
Fax: (318) 673-3960

Report ID : 40143	Company: SEP - Flint Creek (TW)	Address: 502 North Allen Avenue
Date Received: 07/18/2019	Contact: Terry Wehling	Shreveport, LA 71101
	Phone: (318) 673-2721	Fax: (318) 673-3960
AEP Sample ID : 227040	Collected Date: 07/17/2019	By: RF
Cust Sample ID: Dirt/Sludge	Location: H.W. Pirkey Power Plant	Matrix: Solid
Sample Desc.: Pirkey Sludge FGD Total		

Metals (227040)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Aluminum	20500	mg/Kg	12.5	1:2500	EPA 6010B 1996	07/26/2019 0:18		JDB
Antimony	0.993	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Arsenic	28.3	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Barium	142	mg/Kg	2.5	1:2500	EPA 6010B 1996	07/26/2019 0:18		JDB
Beryllium	2.12	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Boron	845	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:18	M4	JDB
Cadmium	1.68	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Calcium	77500	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:18		JDB
Chromium	30.6	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Cobalt	24.8	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Copper	30.2	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Dry Weight, Percent	94.7	%	0.001	1		07/22/2019 15:30	T5	JDB
Iron	36300	mg/Kg	12.5	1:2500	EPA 6010B 1996	07/26/2019 0:18	M4	JDB
Lead	5.31	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Lithium	11.5	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47	T5	JDB
Magnesium	7150	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:18		JDB
Manganese	498	mg/Kg	2.5	1:2500	EPA 6010B 1996	07/26/2019 0:18		JDB
Mercury	0.653	mg/Kg	0.000025	1	EPA 7471B 1998	07/24/2019 14:37		LNM
Molybdenum	8.45	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Nickel	28.8	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Potassium	1370	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:18		JDB
Selenium	36.4	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Silver	0.208	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Sodium	1230	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:18		JDB
Strontium	382	mg/Kg	2.5	1:2500	EPA 6010B 1996	07/26/2019 0:18		JDB
Thallium	0.503	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB

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AEP ANALYTICAL CHEMISTRY SERVICES

Analysis Report

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Shreveport, LA 71101
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Fax: (318) 673-3960

Report ID : 40143 Date Received: 07/18/2019	Company: SEP - Flint Creek (TW) Contact: Terry Wehling Phone: (318) 673-2721			Address: 502 North Allen Avenue Shreveport, LA 71101 Fax: (318) 673-3960				
Tin	1.28	mg/Kg	0.2	1:50	EPA 6010B 1996	07/26/2019 0:47	T5	JDB
Titanium	1360	mg/Kg	2.5	1:2500	EPA 6010B 1996	07/26/2019 0:18	M4	JDB
Vanadium	77.5	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Zinc	26	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Waste Characterization (227040)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
pH, Soil	8.44	pH		1	EPA 9045D 2002	07/25/2019 12:30		GB

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Fax: (318) 673-3960

Report ID : 40143	Company: SEP - Flint Creek (TW)	Address: 502 North Allen Avenue
Date Received: 07/18/2019	Contact: Terry Wehling	Shreveport, LA 71101
	Phone: (318) 673-2721	Fax: (318) 673-3960
AEP Sample ID : 227041	Collected Date: 07/17/2019	By: RF
Cust Sample ID: Dirt/Sludge	Location: H.W. Pirkey Power Plant	Matrix: Solid
Sample Desc.: Pirkey Sludge FGD SPLP		

SPLP (227041)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Aluminum	14.2	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Antimony	0.018	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Arsenic	0.015	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Barium	3.46	mg/L	0.05	1:50	EPA 1312/6010B 1996	07/25/2019 20:58		JDB
Beryllium	0.012	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Boron	22.3	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 20:58		JDB
Cadmium	0.002	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Calcium	2090	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 20:58		JDB
Chromium	0.005	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Cobalt	0.051	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Copper	0.009	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Iron	52.4	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 20:58		JDB
Lead	< 0.005	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Lithium	0.146	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Magnesium	62.3	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 20:58		JDB
Manganese	2.83	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Mercury	0.002272	mg/L	0.000025	1	EPA 7470A 1994	07/24/2019 14:05		LNM
Molybdenum	0.229	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Nickel	0.054	mg/L	0.025	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Potassium	9.61	mg/L	0.01	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Selenium	0.93	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Silver	< 0.001	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Sodium	35.6	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 20:58		JDB
Strontium	12.7	mg/L	0.05	1:50	EPA 1312/6010B 1996	07/25/2019 20:58		JDB
Thallium	< 0.005	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Tin	< 0.005	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB

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Analysis Report

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Shreveport, LA 71101
Phone: (318) 673-3802
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Report ID : 40143 Date Received: 07/18/2019	Company: SEP - Flint Creek (TW) Contact: Terry Wehling Phone: (318) 673-2721	Address: 502 North Allen Avenue Shreveport, LA 71101 Fax: (318) 673-3960				
Titanium	0.041 mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09	JDB
Vanadium	0.269 mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:09	JDB
Zinc	0.299 mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09	JDB

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Report ID : 40143	Company: SEP - Flint Creek (TW)	Address: 502 North Allen Avenue
Date Received: 07/18/2019	Contact: Terry Wehling	Shreveport, LA 71101
	Phone: (318) 673-2721	Fax: (318) 673-3960
AEP Sample ID : 227042	Collected Date: 07/17/2019	By: RF
Cust Sample ID: Dirt/Sludge	Location: H.W. Pirkey Power Plant	Matrix: Solid
Sample Desc.: Pirkey Sludge FGD 7 Day Leachate		

7-Day Leachate (227042)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Aluminum	0.563	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Antimony	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Arsenic	0.011	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Barium	0.134	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Beryllium	< 0.001	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Boron	8.44	mg/L	0.5	1:50	EPA 6010B 1996	08/04/2019 17:43		JDB
Cadmium	< 0.001	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Calcium	252	mg/L	0.5	1:50	EPA 6010B 1996	08/04/2019 17:43		JDB
Chromium	< 0.001	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Cobalt	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Copper	0.002	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Iron	0.211	mg/L	0.01	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Lead	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Lithium	0.069	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Magnesium	6.73	mg/L	0.01	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Manganese	0.008	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Mercury	< 0.005	mg/L	0.005	1:200	EPA 7470A 1994	07/30/2019 10:19		LNLM
Molybdenum	0.18	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Nickel	< 0.025	mg/L	0.025	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Potassium	4.82	mg/L	0.01	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Selenium	0.208	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Silver	< 0.001	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Sodium	19.8	mg/L	0.5	1:50	EPA 6010B 1996	08/04/2019 17:43		JDB
Strontium	1.6	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Thallium	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Tin	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB

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Analysis Report

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Shreveport, LA 71101
Phone: (318) 673-3802
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Report ID : 40143	Company: SEP - Flint Creek (TW)			Address: 502 North Allen Avenue			
Date Received: 07/18/2019	Contact: Terry Wehling			Shreveport, LA 71101			
	Phone: (318) 673-2721			Fax: (318) 673-3960			
Titanium	0.015	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35	JDB
Vanadium	0.03	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35	JDB
Zinc	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35	JDB

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Report ID : 40143	Company: SEP - Flint Creek (TW)	Address: 502 North Allen Avenue
Date Received: 07/18/2019	Contact: Terry Wehling	Shreveport, LA 71101
	Phone: (318) 673-2721	Fax: (318) 673-3960
AEP Sample ID : 227043	Collected Date: 07/17/2019	By: RF
Cust Sample ID: Dirt/Sludge 2	Location: H.W. Pirkey Power Plant	Matrix: Solid
Sample Desc.: Pirkey Sludge FGD 2 Total		

Metals (227043)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Aluminum	19600	mg/Kg	12.5	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Antimony	0.919	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Arsenic	22.8	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Barium	121	mg/Kg	2.5	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Beryllium	1.66	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Boron	891	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:25	T5	JDB
Cadmium	1.37	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Calcium	84500	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Chromium	28.5	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Cobalt	20.3	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Copper	26.9	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Dry Weight, Percent	97.2	%	0.001	1		07/22/2019 15:30	T5	JDB
Iron	28800	mg/Kg	12.5	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Lead	5.78	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Lithium	12	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26	T5	JDB
Magnesium	7070	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Manganese	388	mg/Kg	2.5	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Mercury	0.606	mg/Kg	0.000025	1	EPA 7471B 1998	07/24/2019 14:27		LNM
Molybdenum	11	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Nickel	25.7	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Potassium	1460	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Selenium	30.4	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Silver	0.19	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Sodium	1780	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Strontium	451	mg/Kg	2.5	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Thallium	0.562	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB

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Analysis Report

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Report ID : 40143		Company: SEP - Flint Creek (TW)			Address: 502 North Allen Avenue			
Date Received: 07/18/2019		Contact: Terry Wehling			Shreveport, LA 71101			
		Phone: (318) 673-2721			Fax: (318) 673-3960			
Tin	1.06	mg/Kg	0.2	1:50	EPA 6010B 1996	07/26/2019 1:26	T5	JDB
Titanium	1280	mg/Kg	2.5	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Vanadium	68.3	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Zinc	33.8	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Waste Characterization (227043)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
pH, Soil	8.71	pH		1	EPA 9045D 2002	07/25/2019 12:30		GB

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Phone: (318) 673-3802
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Report ID : 40143	Company: SEP - Flint Creek (TW)	Address: 502 North Allen Avenue
Date Received: 07/18/2019	Contact: Terry Wehling	Shreveport, LA 71101
	Phone: (318) 673-2721	Fax: (318) 673-3960
AEP Sample ID : 227044	Collected Date: 07/17/2019	By: RF
Cust Sample ID: Dirt/Sludge 2	Location: H.W. Pirkey Power Plant	Matrix: Solid
Sample Desc.: Pirkey Sludge FGD 2 SPLP		

SPLP (227044)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Aluminum	10.5	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Antimony	0.017	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Arsenic	< 0.005	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Barium	2.57	mg/L	0.05	1:50	EPA 1312/6010B 1996	07/25/2019 21:06		JDB
Beryllium	0.009	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Boron	26.7	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 21:06		JDB
Cadmium	0.002	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Calcium	1960	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 21:06		JDB
Chromium	0.004	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Cobalt	0.051	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Copper	0.003	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Iron	47.7	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 21:06		JDB
Lead	< 0.005	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Lithium	0.136	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Magnesium	70.2	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 21:06		JDB
Manganese	2.87	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Mercury	< 0.000025	mg/L	0.000025	1	EPA 7470A 1994	07/24/2019 14:21		LNLM
Molybdenum	0.288	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Nickel	0.071	mg/L	0.025	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Potassium	11.4	mg/L	0.01	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Selenium	0.775	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Silver	< 0.001	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Sodium	56.7	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 21:06		JDB
Strontium	13.2	mg/L	0.05	1:50	EPA 1312/6010B 1996	07/25/2019 21:06		JDB
Thallium	< 0.005	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Tin	< 0.005	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB

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AEP ANALYTICAL CHEMISTRY SERVICES

Analysis Report

02004
502 North Allen Ave.
Shreveport, LA 71101
Phone: (318) 673-3802
Fax: (318) 673-3960

Report ID : 40143 Date Received: 07/18/2019	Company: SEP - Flint Creek (TW) Contact: Terry Wehling Phone: (318) 673-2721	Address: 502 North Allen Avenue Shreveport, LA 71101 Fax: (318) 673-3960				
Titanium	0.037 mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55	JDB
Vanadium	0.194 mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:55	JDB
Zinc	0.338 mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55	JDB



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Date Received: 07/18/2019	Contact: Terry Wehling	Shreveport, LA 71101
	Phone: (318) 673-2721	Fax: (318) 673-3960
AEP Sample ID : 227045	Collected Date: 07/17/2019	By: RF
Cust Sample ID: Dirt/Sludge 2	Location: H.W. Pirkey Power Plant	Matrix: Solid
Sample Desc.: Pirkey Sludge FGD 2 7 Day Leachate		

7-Day Leachate (227045)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Aluminum	0.994	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Antimony	0.006	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Arsenic	0.031	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Barium	0.121	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Beryllium	< 0.001	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Boron	16.4	mg/L	0.5	1:50	EPA 6010B 1996	08/04/2019 17:53		JDB
Cadmium	< 0.001	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Calcium	633	mg/L	0.5	1:50	EPA 6010B 1996	08/04/2019 17:53		JDB
Chromium	< 0.001	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Cobalt	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Copper	0.003	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Iron	0.225	mg/L	0.01	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Lead	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Lithium	0.1	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Magnesium	9.54	mg/L	0.01	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Manganese	0.015	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Mercury	< 0.005	mg/L	0.005	1:200	EPA 7470A 1994	07/30/2019 10:36		LNM
Molybdenum	0.448	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Nickel	< 0.025	mg/L	0.025	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Potassium	9.02	mg/L	0.01	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Selenium	0.201	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Silver	< 0.001	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Sodium	48.3	mg/L	0.5	1:50	EPA 6010B 1996	08/04/2019 17:53		JDB
Strontium	3.79	mg/L	0.05	1:50	EPA 6010B 1996	08/04/2019 17:53		JDB
Thallium	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Tin	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB

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Report ID : 40143 Date Received: 07/18/2019	Company: SEP - Flint Creek (TW) Contact: Terry Wehling Phone: (318) 673-2721	Address: 502 North Allen Avenue Shreveport, LA 71101 Fax: (318) 673-3960					
Titanium	0.02	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45	JDB
Vanadium	0.087	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45	JDB
Zinc	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45	JDB



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Company: SEP - Flint Creek (TW)
Contact: Terry Wehling
Phone: (318) 673-2721

Address: 502 North Allen Avenue
 Shreveport, LA 71101
Fax: (318) 673-3960

Quality Control Data

* Quality control units are the same as reported analytical results

Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
7/25/2019	Aluminum	226939.1	<0.005	2	2.0229733	101.1	2	2.071639	103.6		0.4	JDB
7/25/2019	Aluminum	227041.1	<0.005	2	2.0229733	101.1	2	2.2242	111.2		0.0	JDB
7/26/2019	Aluminum	227040.1	<12.5	2	2.0358232	101.8	100	132.38333	132.4		1.2	JDB
7/25/2019	Antimony	226939.1	<0.005	0.8	0.8092462	101.2	0.8	0.8159776	102.0		0.2	JDB
7/25/2019	Antimony	227041.1	<0.005	0.8	0.8092462	101.2	0.8	0.7671843	95.9		0.5	JDB
7/26/2019	Antimony	227040.1	<0.25	0.8	0.8071122	100.9	40	32.643192	81.6		1.8	JDB
7/25/2019	Arsenic	227041.1	<0.005	0.8	0.8086795	101.1	0.8	0.7758421	97.0		0.0	JDB
7/25/2019	Arsenic	226939.1	<0.005	0.8	0.8086795	101.1	0.8	0.8086275	101.1		0.1	JDB
7/26/2019	Arsenic	226915.1	<0.25	0.8	0.7906797	98.8	40	40.306278	100.8		0.8	JDB
7/26/2019	Arsenic	227040.1	<0.25	0.8	0.7940238	99.3	40	34.433917	86.1		2.3	JDB
7/25/2019	Barium	226939.1	<0.001	0.2	0.2080557	104.0	0.2	0.209543	104.8		0.1	JDB
7/25/2019	Barium	227041.1	<0.05	0.2	0.2080557	104.0	0.2	0.1829767	91.5		0.4	JDB
7/26/2019	Barium	227040.1	<2.5	0.2	0.2112650	105.6	500	543.5715	108.7		7.2	JDB
7/25/2019	Beryllium	226939.1	<0.001	0.2	0.2122779	106.1	0.2	0.2142832	107.1		0.3	JDB
7/25/2019	Beryllium	227041.1	<0.001	0.2	0.2122779	106.1	0.2	0.1992329	99.6		0.4	JDB
7/26/2019	Beryllium	227040.1	<0.05	0.2	0.2131235	106.6	10	9.40679	94.1		0.2	JDB
7/25/2019	Boron	226939.1	<0.01	0.3	0.2995651	99.9	0.3	0.2984183	99.5		0.7	JDB
7/25/2019	Boron	227041.1	<0.5	0.3	0.2995651	99.9	0.3	0.2855333	95.2		0.5	JDB
7/25/2019	Cadmium	227041.1	<0.001	0.2	0.2069934	103.5	0.2	0.1836838	91.8		0.6	JDB
7/25/2019	Cadmium	226939.1	<0.001	0.2	0.2069934	103.5	0.2	0.2061243	103.1		0.5	JDB
7/26/2019	Cadmium	226915.1	<0.05	0.2	0.1973571	98.7	10	10.058007	100.6		1.8	JDB
7/26/2019	Cadmium	227040.1	<0.05	0.2	0.2013293	100.7	10	8.0453767	80.5		1.6	JDB
7/25/2019	Calcium	226939.1	<0.01	1	1.0087505	100.9	1	1.0243667	102.4		0.9	JDB
7/26/2019	Calcium	227040.1	<25	1	0.8616568	86.2	50	113.63333	227.3		0.8	JDB
7/25/2019	Chromium	226939.1	<0.001	0.4	0.4116387	102.9	0.4	0.4125529	103.1		0.4	JDB
7/25/2019	Chromium	227041.1	<0.001	0.4	0.4116387	102.9	0.4	0.3867339	96.7		0.3	JDB
7/26/2019	Chromium	227040.1	<0.05	0.4	0.40798	102.0	20	17.692233	88.5		1.6	JDB
7/26/2019	Chromium	226915.1	<0.05	0.4	0.4059509	101.5	20	20.758823	103.8		0.8	JDB
7/25/2019	Cobalt	227041.1	<0.005	0.2	0.2043482	102.2	0.2	0.1839347	92.0		0.4	JDB
7/25/2019	Cobalt	226939.1	<0.005	0.2	0.2043482	102.2	0.2	0.2054714	102.7		0.4	JDB
7/26/2019	Cobalt	227040.1	<0.05	0.2	0.2032547	101.6	10	7.7614833	77.6		1.8	JDB
7/25/2019	Copper	227041.1	<0.001	0.3	0.3066399	102.2	0.3	0.2963301	98.8		0.1	JDB

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Analysis Report

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Fax: (318) 673-3960

Report ID : 40143		Company: SEP - Flint Creek (TW)				Address: 502 North Allen Avenue						
Date Received: 07/18/2019		Contact: Terry Wehling				Shreveport, LA 71101						
		Phone: (318) 673-2721				Fax: (318) 673-3960						
7/25/2019	Copper	226939.1	<0.001	0.3	0.3066399	102.2	0.3	0.3109092	103.6		0.1	JDB
7/26/2019	Copper	227040.1	<0.05	0.3	0.3124104	104.1	15	15.003017	100.0		1.9	JDB
7/25/2019	Iron	226939.1	<0.01	3	3.1158893	103.9	3	3.1231158	104.1		1.0	JDB
7/25/2019	Iron	227041.1	<0.5	3	3.1158893	103.9	150	159.28837	106.2		0.8	JDB
7/26/2019	Iron	227040.1	<12.5	3	3.0861005	102.9					3.1	JDB
7/25/2019	Lead	227041.1	<0.005	1	1.0430644	104.3	1	0.9320653	93.2		0.6	JDB
7/25/2019	Lead	226939.1	<0.005	1	1.0430644	104.3	1	1.0416574	104.2		0.4	JDB
7/26/2019	Lead	226915.1	<0.25	1	1.0147827	101.5	50	51.881956	103.8		1.4	JDB
7/26/2019	Lead	227040.1	<0.25	1	1.0194305	101.9	50	41.227533	82.5		1.1	JDB
7/25/2019	Lithium	227041.1	<0.001	0.2	0.2119096	106.0	0.2	0.2353987	117.7		0.1	JDB
7/25/2019	Lithium	226939.1	<0.001	0.2	0.2119096	106.0	0.2	0.2163799	108.2		0.4	JDB
7/26/2019	Lithium	227040.1	<0.05	0.2	0.211291	105.6	10	11.698417	117.0		2.8	JDB
7/25/2019	Magnesium	226939.1	<0.01	2	2.0868175	104.3	2	2.0877567	104.4		0.2	JDB
7/25/2019	Magnesium	227041.1	<0.5	2	2.0868175	104.3	2	1.9791333	99.0		0.6	JDB
7/26/2019	Magnesium	227040.1	<25	2	2.0570549	102.9	100	76.916667	76.9		1.4	JDB
7/25/2019	Manganese	226939.1	<0.001	0.2	0.2072869	103.6	0.2	0.2077536	103.9		0.2	JDB
7/25/2019	Manganese	227041.1	<0.001	0.2	0.2072869	103.6	0.2	0.16684	83.4		0.7	JDB
7/26/2019	Manganese	227040.1	<2.5	0.2	0.2066368	103.3	500	572.398	114.5		1.1	JDB
7/24/2019	Mercury	227041.1	<0.00002	0.001	0.00097	97.0	0.2	0.16373	81.9		7.0	LNLM
7/24/2019	Mercury	227040.1	<0.00002	0.001	0.00097	97.0	0.04	0.0496	124.0		4.4	LNLM
7/30/2019	Mercury	227042.1	<0.005	0.001	0.0009	90.0	0.2	0.156162	78.1		4.0	LNLM
7/25/2019	Molybdenum	227041.1	<0.005	0.2	0.2067657	103.4	0.2	0.197727	98.9		0.5	JDB
7/25/2019	Molybdenum	226939.1	<0.005	0.2	0.2067657	103.4	0.2	0.2076129	103.8		0.4	JDB
7/26/2019	Molybdenum	227040.1	<0.05	0.2	0.2073308	103.7	10	9.2486833	92.5		0.4	JDB
7/25/2019	Nickel	227041.1	<0.025	0.5	0.5192594	103.9	0.5	0.46183	92.4		0.6	JDB
7/25/2019	Nickel	226939.1	<0.025	0.5	0.5192594	103.9	0.5	0.5209379	104.2		0.6	JDB
7/26/2019	Nickel	227040.1	<0.05	0.5	0.5228273	104.6	25	19.992767	80.0		1.9	JDB
7/25/2019	Potassium	227041.1	<0.01	10	9.3692109	93.7	10	11.11754	111.2		0.3	JDB
7/25/2019	Potassium	226939.1	<0.01	10	9.3692109	93.7	10	9.4631223	94.6		0.2	JDB
7/26/2019	Potassium	227040.1	<25	10	9.1397018	91.4	500	428.035	85.6		2.9	JDB
7/25/2019	Selenium	226939.1	<0.005	2	1.9998495	100.0	2	1.9816300	99.1		0.8	JDB
7/25/2019	Selenium	227041.1	<0.005	2	1.9998495	100.0	2	1.991203	99.6		0.7	JDB
7/26/2019	Selenium	227040.1	<0.25	2	1.9551138	97.8	100	89.733067	89.7		3.0	JDB
7/25/2019	Silver	227041.1	<0.001	0.075	0.0712930	95.1	0.075	0.0708639	94.5		0.2	JDB
7/25/2019	Silver	226939.1	<0.001	0.075	0.0712930	95.1	0.075	0.0714285	95.2		0.1	JDB
7/26/2019	Silver	227040.1	<0.05	0.075	0.0712215	95.0	3.75	3.6188628	96.5		0.5	JDB

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		Phone: (318) 673-2721				Fax: (318) 673-3960						
7/25/2019	Sodium	227041.1	<0.5	3	3.1384831	104.6	3	2.3746333	79.2		0.0	JDB
7/25/2019	Sodium	226939.1	<0.01	3	3.1384831	104.6	3	2.4693667	82.3		0.1	JDB
7/26/2019	Sodium	227040.1	<25	3	3.1256605	104.2	150	120.525	80.4		1.9	JDB
7/25/2019	Strontium	226939.1	<0.001	0.2	0.2059899	103.0	0.2	0.2081687	104.1		0.4	JDB
7/26/2019	Strontium	227040.1	<2.5	0.2	0.2078256	103.9	500	577.76733	115.6		17.9	JDB
7/25/2019	Thallium	227041.1	<0.005	0.4	0.4152040	103.8	0.4	0.3682771	92.1		1.2	JDB
7/25/2019	Thallium	226939.1	<0.005	0.4	0.4152040	103.8	0.4	0.4171124	104.3		0.0	JDB
7/26/2019	Thallium	227040.1	<0.25	0.4	0.4155052	103.9	20	15.947380	79.7		1.2	JDB
7/25/2019	Tin	226939.1	<0.005	0.7	0.6995446	99.9	0.7	0.6930628	99.0		0.2	JDB
7/25/2019	Tin	227041.1	<0.005	0.7	0.6995446	99.9	0.7	0.644164	92.0		0.2	JDB
7/26/2019	Tin	227040.1	<0.2	0.7	0.6896072	98.5	35	28.438362	81.3		0.8	JDB
7/25/2019	Titanium	227041.1	<0.005	0.2	0.2109341	105.5	0.2	0.2098874	104.9		0.2	JDB
7/25/2019	Titanium	226939.1	<0.005	0.2	0.2109341	105.5	0.2	0.2124567	106.2		0.1	JDB
7/26/2019	Titanium	227040.1	<2.5	0.2	0.2121079	106.1					1.6	JDB
7/25/2019	Vanadium	226939.1	<0.001	0.3	0.3076519	102.6	0.3	0.3104754	103.5		0.4	JDB
7/25/2019	Vanadium	227041.1	<0.001	0.3	0.3076519	102.6	0.3	0.2997157	99.9		0.6	JDB
7/26/2019	Vanadium	227040.1	<0.05	0.3	0.30789	102.6	15	15.291667	101.9		0.0	JDB
7/25/2019	Zinc	226939.1	<0.005	0.2	0.2091679	104.6	0.2	0.2081374	104.1		0.3	JDB
7/25/2019	Zinc	227041.1	<0.005	0.2	0.2091679	104.6	0.2	0.1851907	92.6		0.1	JDB
7/26/2019	Zinc	227040.1	<0.25	0.2	0.2074233	103.7	10	8.4881167	84.9		0.5	JDB

Code Code Description

- M4 The analysis of the spiked sample required a dilution such that the spike recovery calculation does not provide useful information. The associated blank spike recovery was acceptable.
- T5 This parameter is not included in the Laboratory's LELAP Laboratory Scope of Accreditation.



 Quality Assurance Officer

05-Aug-19
Report Date

Figure 1 – Chain of Custody

**American Electric Power
Analytical Chemistry Services**

CHAIN OF CUSTODY

COC 40143

Metals to analyze for each
(Totals SPLP, Deionized)
Bi, Ca, Sb, Ag, Ba, Be, Cd, Cr
Co, Pb, Li, Hg, Mn, Se, Te
and any other metals in
calibration.

OPCO/PROJECT NAME H.W Pirkey Power Plant				FAX NO.				ANALYSIS REQUESTED								
CONTACT PERSON (Please Print) Ron Franklin, Randy Rountree, Ben House				PHONE NO. (903) 927-5889												
SAMPLE SIGNATURE <i>Ron Franklin</i>				C O R M A P B	NUMBER OF CONTAINERS	Total Metals (Total for metals)	SPLP	Deionized water (each)	pH				Lab Number		REMARKS	
DATE	TIME	SAMPLE SOURCE & DESCRIPTION	SAMPLE ID													
7-17-19	1800	Pirkey Sludge FGD	Dirt Sludge	✓	✓	✓	✓	✓	✓	✓	✓	✓	227040-42	Terry Wehling		
" "	" 1800	" "	Dirt Sludge	✓	✓	✓	✓	✓	✓	✓	✓	✓	227043-45			
RELINQUISHED BY (SIGN)				DATE/TIME		RECEIVED BY				RELINQUISHED BY (SIGN)		DATE/TIME		RECEIVED BY		
RELINQUISHED BY (SIGN)				DATE/TIME		RECEIVED BY				RELINQUISHED BY (SIGN)		DATE/TIME		RECEIVED BY		
RECEIVED FOR LABORATORY						COMMENTS										
<i>Jonathan Bantill</i>						<i>7-18-19 1036</i>										



SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.
Shreveport, LA 71101
Phone 318-673-3802
FAX 318-673-3960

PROJECT RECEIPT FORM

Container Type Ice Chest <input type="checkbox"/> Bag <input checked="" type="checkbox"/> Action Pak <input type="checkbox"/> PCB Mailer <input type="checkbox"/> Bottle <input type="checkbox"/> Other _____				Delivery Type UPS <input type="checkbox"/> FEDEX <input type="checkbox"/> US Mail <input type="checkbox"/> Walk in <input checked="" type="checkbox"/> Shuttle <input type="checkbox"/> Other _____			
				Tracking # _____			

Client Terry Wehling
 Received By SOB
 Received Date 7-18-19
 Open Date 7-18-19

Sample Matrix
 DGA PCB Oil Water Oil Soil
 Solid Liquid Other _____

Container Temp Read NA
Thermometer Serial #F04103
 Correction Factor _____
 Corrected Temp _____

Project I.D. _____

Were samples received on ice? YES NO

Did container arrive in good condition? YES NO

Was sample documentation received? YES NO

Was documentation filled out properly? YES NO

Were samples labeled properly? YES NO

Were correct containers used? YES NO

Were the pH's of samples appropriately checked? YES NO

Total number of sample containers 2

Was any corrective action taken? NO Person Contacted _____
 Date & Time _____

Comments _____

ATTACHMENT E
AD-33 Soil Samples Analytical Report

Client: Burns & McDonnell

Date: 08-Jun-18

Project: 106665 PIRKEY

Work Order: 1805081

Sample ID: AD-33 (11')

Lab ID: 1805081-15

Legal Location:

Matrix: SOIL

Collection Date: 4/30/2018 16:05

Percent Moisture: 18.1

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Gamma Spectroscopy Results						
			SOP 713		Prep Date: 5/17/2018	PrepBy: MRL
Ra-226	1.29 (+/- 0.3)	G	0.47	pCi/g	NA	6/7/2018 08:54
Ra-228	1.36 (+/- 0.47)	G,TI	0.7	pCi/g	NA	6/7/2018 08:54
ICPMS Metals						
			SW6020		Prep Date: 5/14/2018	PrepBy: JML
ARSENIC	4.9		0.23	MG/KG	10	5/17/2018 01:02
BARIUM	20		0.57	MG/KG	10	5/17/2018 01:02
BERYLLIUM	0.15		0.057	MG/KG	10	5/17/2018 01:02
CADMIUM	ND		0.23	MG/KG	10	5/17/2018 01:02
COBALT	0.61		0.57	MG/KG	10	5/17/2018 01:02
CHROMIUM	9.5		1.1	MG/KG	10	5/17/2018 01:02
LITHIUM	0.25	J	2.3	MG/KG	10	5/17/2018 01:02
MOLYBDENUM	0.18	J	0.23	MG/KG	10	5/17/2018 01:02
LEAD	3.2		0.23	MG/KG	10	5/17/2018 01:02
ANTIMONY	0.086	J	0.11	MG/KG	10	5/17/2018 01:02
SELENIUM	0.81	J	1.1	MG/KG	10	5/17/2018 01:02
THALLIUM	0.044		0.011	MG/KG	10	5/17/2018 01:02
Ion Chromatography						
			EPA300.0		Prep Date: 5/10/2018	PrepBy: HMA
FLUORIDE	ND		1	MG/KG	1	5/11/2018 21:43
Mercury						
			SW7471		Prep Date: 5/11/2018	PrepBy: AJL2
MERCURY	0.0026	J	0.039	MG/KG	1	5/11/2018 16:07

Client: Burns & McDonnell

Date: 08-Jun-18

Project: 106665 PIRKEY

Work Order: 1805081

Sample ID: AD-33 (21')

Lab ID: 1805081-16

Legal Location:

Matrix: SOIL

Collection Date: 4/30/2018 16:05

Percent Moisture: 20.0

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Gamma Spectroscopy Results						
			SOP 713		Prep Date: 5/17/2018	PrepBy: MRL
Ra-226	0.7 (+/- 0.22)	LT	0.37	pCi/g	NA	6/7/2018 08:16
Ra-228	0.72 (+/- 0.5)	NQ	0.67	pCi/g	NA	6/7/2018 08:16
ICPMS Metals						
			SW6020		Prep Date: 5/14/2018	PrepBy: JML
ARSENIC	12		0.25	MG/KG	10	5/17/2018 01:05
BARIUM	9.1		0.62	MG/KG	10	5/17/2018 01:05
BERYLLIUM	0.09		0.062	MG/KG	10	5/17/2018 01:05
CADMIUM	ND		0.25	MG/KG	10	5/17/2018 01:05
COBALT	0.64		0.62	MG/KG	10	5/17/2018 01:05
CHROMIUM	4.6		1.2	MG/KG	10	5/17/2018 01:05
LITHIUM	0.24	J	2.5	MG/KG	10	5/17/2018 01:05
MOLYBDENUM	0.061	J	0.25	MG/KG	10	5/17/2018 01:05
LEAD	1.5		0.25	MG/KG	10	5/17/2018 01:05
ANTIMONY	0.19		0.12	MG/KG	10	5/17/2018 01:05
SELENIUM	0.42	J	1.2	MG/KG	10	5/17/2018 01:05
THALLIUM	0.03		0.012	MG/KG	10	5/17/2018 01:05
Ion Chromatography						
			EPA300.0		Prep Date: 5/10/2018	PrepBy: HMA
FLUORIDE	ND		1	MG/KG	1	5/11/2018 22:29
Mercury						
			SW7471		Prep Date: 5/11/2018	PrepBy: AJL2
MERCURY	0.0038	J	0.04	MG/KG	1	5/11/2018 16:09

ATTACHMENT F
AD-33 Boring Log and Well Installation Diagram



Monitor Well

Monitor Well No.: AD-33



PROJECT INFORMATION

PROJECT: Pirkey Power Plant
 PROJECT NO.: I-04-1021
 LOGGED BY: Jeffrey D. Sammons, P.G.
 SUPERVISING PG: Jeffrey D. Sammons, P.G.
 COMPLETION: 12/11/2016
 DEVELOPMENT: 12/16/2016
 SITE LOCATION: 2400 FM 3281, Hallsville, Texas
 WELL OWNER: AEP

DRILLING INFORMATION

DRILLER: Buford Collier
 DRILLER'S LICENSE NO.: 60088
 RIG TYPE: Geoprobe 3230DT
 METHOD OF DRILLING: Hollow Stem Auger
 SAMPLING METHODS: Split Core
 SURFACE ELEVATION: 382.37 (Top of Casing)
 HOLE DIAMETER: 8.25"
 LATITUDE 32 27' 38.70" LONGITUDE 94 28' 16.82"

Water Level Upon Installation
 Water Level at Time of Drilling
 Geotechnical Lab Sample
 TBPB No. 50027

DESCRIPTION	USCS	SOIL SYMBOLS	DEPTH	WATER LEVEL	SAMPLE	% MOISTURE	% FINES	LL	PL	PI	WELL CONSTRUCTION
			4								Locking Well Casing Cover Locking Well Cap Protective Well Casing Concrete Pad Ground Surface Cement Bentonite 2" Sch. 40 PVC Riser 20/40 Silica Sand 0.010" Slotted Sch. 40 PVC Well Screen PVC Bottom Cap
CLAYEY SAND: very fine to fine sand, some silt, dark brownish black and brown, very moist	SC	[Symbol]	0								
FAT CLAY: trace sand and silt, reddish brown and light gray - some iron ore gravel at 2.0' - some silt and ironstone in thin seams at 2.5', light gray, yellowish brown, and reddish brown,	CH	[Symbol]	1								
			2								
			3		29	93	74	32	42		
			4								
			5								
			6								
			7								
			8								
CLAYEY SAND: interbedded clays and fine to very fine sand and silt, some iron ore gravel, light reddish brown and light gray	SC	[Symbol]	9								
			10								
- some clay and trace of iron ore gravel at 11', light gray and reddish brown, moist			11		21	35	35	23	12		
			12								
- trace clay at 13', thin saturated ironstone and gravel seams at 13' to 16', reddish brown, light reddish brown, and light gray			13								
			14								
- dark reddish brown at 15'			15								
- clay lense at 15.5' to 16.5', light reddish brown and light gray			16								
			17								
SILTY CLAYEY SAND: very fine to fine sand, reddish brown, very moist to saturated	SM-SC	[Symbol]	18								
			19								
- some clay lenses and iron ore gravel at 20'			20								
- clayey at 20.5' to 21'			21		23	19	27	18	9		
			22								
- trace clay at 21', light gray, saturated			23								
			24								
			25								
			26								
- some iron ore gravel at 28', reddish brown, very moist			27								
			28								
CLAYEY SAND: very fine to fine sand, dark gray and gray, moist	SC	[Symbol]	29		23	30	25	18	7		
			30								

ATTACHMENT G
Certification by a Qualified Professional Engineer

CERTIFICATION BY A QUALIFIED PROFESSIONAL ENGINEER

I certify that the above described alternative source demonstration is appropriate for evaluating the groundwater monitoring data for the Pirkey FGD Stackout Area CCR management area and that the requirements of 30 TAC §352.951(e) have been met.

Beth Ann Gross
Printed Name of Licensed Professional Engineer

Beth Ann Gross
Signature



Geosyntec Consultants
2039 Centre Pointe Blvd, Suite 103
Tallahassee, Florida 32308

Texas Registered Engineering Firm
No. F-1182

79864
License Number

Texas
Licensing State

February 6, 2024
Date

ALTERNATIVE SOURCE DEMONSTRATION REPORT

2024 1st SEMIANNUAL EVENT TEXAS STATE CCR RULE

H.W. Pirkey Power Plant Flue Gas Desulfurization Stackout Area Registration No. CCR104 Hallsville, Texas

Prepared for

American Electric Power
1 Riverside Plaza
Columbus, Ohio 43215-2372

Prepared by

Geosyntec Consultants, Inc.
500 West Wilson Bridge Road, Suite 250
Worthington, Ohio 43085

Project CHA8495B

December 2024

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LIST OF ACRONYMS

Å	angstrom
ASD	alternative source demonstration
bgs	below ground surface
CCR	coal combustion residuals
EPRI	Electric Power Research Institute
FGD	flue gas desulfurization
GWPS	groundwater protection standard
LCL	lower confidence limit
mg/L	milligrams per liter
SPLP	Synthetic Precipitation Leaching Procedure
SSL	statistically significant level
SU	standard unit
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
USEPA	United States Environmental Protection Agency
XRD	X-ray diffraction

1. INTRODUCTION AND SUMMARY

This alternative source demonstration (ASD) report has been prepared to address statistically significant levels (SSLs) for beryllium, cobalt, and mercury in the groundwater monitoring network at the former Flue Gas Desulfurization (FGD) Stackout Area, located at the H.W. Pirkey Plant in Hallsville, Texas, following the first semiannual assessment monitoring event of 2024. The H.W. Pirkey Plant has four coal combustion residuals (CCR) storage units regulated by the Texas Commission on Environmental Quality (TCEQ) under Registration No. CCR104, including the FGD Stackout Area (**Figure 1**). Three of the units, including the former FGD Stackout Area, have been closed by removal, and one unit is still active.

In April 2024, a semiannual assessment monitoring event was conducted at the former FGD Stackout Area in accordance with Texas Administrative Code (TAC) Title 30, §352.951(a). The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. Confidence intervals were recalculated for Appendix IV parameters at the compliance wells to assess whether these parameters were present at SSLs above the groundwater protection standards (GWPSs). Seasonal patterns were observed for beryllium, cadmium, cobalt, combined radium, fluoride, lithium, and selenium at AD-22 (Geosyntec 2024a). To correctly account for seasonality, confidence intervals for these wells and constituents were constructed using deseasonalized values. An SSL was attributed to a parameter if its lower confidence limit (LCL) exceeded the GWPS (i.e., if the entire confidence interval exceeded the GWPS). The following SSLs were identified at the former Pirkey FGD Stackout Area (Geosyntec 2024a):

- The deseasonalized LCL for beryllium exceeded the GWPS of 0.00400 milligrams per liter (mg/L) at AD-22 (0.00541 mg/L).
- The deseasonalized LCL for cobalt exceeded the GWPS of 0.0600 mg/L at AD-22 (0.0799 mg/L).
- The LCL for mercury exceeded the GWPS of 0.00200 mg/L at AD-33 (0.00317 mg/L).

No other SSLs were identified.

1.1 CCR Rule Requirements

TCEQ regulations regarding assessment monitoring programs for CCR landfills and surface impoundments provide owners and operators with the option to make an ASD when an SSL is identified:

In making a demonstration under this subsection, the owner or operator must, within 90 days of detecting a statistically significant level above the groundwater protection standard of any constituent listed in Appendix IV adopted by reference in §352.1431 of this title, submit a report prepared and certified in accordance with §352.4 of this title (relating to Engineering and Geoscientific Information) to the executive director, and any local pollution agency with jurisdiction that has requested to be notified, demonstrating that a source other than a CCR unit caused the exceedance or that the exceedance resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. (30 TAC §352.951(e))

Pursuant to 30 TAC §352.951(e), Geosyntec Consultants, Inc. (Geosyntec) has prepared this ASD report to document that the SSLs identified for beryllium and cobalt at AD-22 and for mercury at AD-33 are from a source other than the former FGD Stackout Area.

1.2 Demonstration of Alternative Sources

An evaluation was completed to assess possible alternative sources to which each identified SSL could be attributed. Alternative sources were categorized into the following five types, based on methodology provided by the Electric Power Research Institute (EPRI 2017):

- ASD Type I: Sampling Causes
- ASD Type II: Laboratory Causes
- ASD Type III: Statistical Evaluation Causes
- ASD Type IV: Natural Variation
- ASD Type V: Alternative Sources (i.e., anthropogenic sources)

A demonstration was conducted to show that the SSLs identified for beryllium, cobalt, and mercury were based on a Type IV cause and not by a release from the former Pirkey FGD Stackout Area.

2. SUMMARY OF SITE CONDITIONS

The Stackout Area design and construction, regional geology and site hydrogeology, and groundwater monitoring system and flow conditions are described below.

2.1 FGD Stackout Area Design and Construction

The former Pirkey FGD Stackout Area was an approximately 5-acre FGD storage area located due west of the Pirkey Plant (**Figure 1**). It was designed for temporary stockpiling of stabilized FGD material placed on the native clay soil in the unit until it could be hauled to the on-site landfill for disposal (Arcadis 2023). Prior to closure, the natural ground surface elevation in the Stackout Area ranged from approximately 360 to 365 feet above mean sea level. Based on lithological borings advanced in the vicinity, the former FGD Stackout Area is underlain by approximately 20 feet of clay (Arcadis 2023).

A Closure Plan for the FGD Stackout Area was developed in October 2016 and revised in May 2023 (American Electric Power [AEP] 2023). This document detailed the closure activities which were to take place throughout the closure of the Stackout Area. AEP submitted a certified notification that the receipt of CCR materials had ceased as of September 1, 2023 and the closure activities had been initiated (AEP 2023b). Closure was conducted in accordance with the requirements of 40 CFR §257.102(c) (which were adopted by the State of Texas under 30 TAC §352.1221) and the certified Closure Plan (AEP 2023a). The removal of the remaining CCR material and an additional 12 inches of underlying soil was completed on September 18, 2023, and the removal was certified by Akron Consulting (2023).

2.2 Regional Geology / Site Hydrogeology

The former Stackout Area is positioned on an outcrop of the Eocene Recklaw Formation, which consists predominantly of clay and fine-grained sand (Arcadis 2023). The Recklaw Formation is underlain by the Carrizo Sand, which crops out in the topographically lower southern portion of the plant. The Carrizo Sand consists of fine- to medium-grained sand interbedded with silt and clay.

The very-fine- to fine-grained clayey and silty sand located about 10 to 20 feet below the former Stackout Area, with an average thickness of approximately 20 feet, is considered to be the uppermost aquifer below this CCR unit (Arcadis 2023).

2.3 Groundwater Monitoring System and Flow Conditions

The former Stackout Area monitoring well network monitors groundwater within the uppermost aquifer. Geologic cross sections B-B', E-E', and F-F' from Arcadis (2023) show the subsurface structure of the uppermost aquifer (indicated on the figures as clayey silty sand, brown to gray in color) underlying the former Stackout Area. These figures and a cross section location map are provided in **Attachment A**. The geologic cross sections demonstrate lateral continuity of the uppermost aquifer at and around the former Stackout Area.

Groundwater flow direction at and near the former Stackout Area is west-northwesterly (**Figure 1**). Groundwater flow velocities in the uppermost aquifer in the vicinity of the former Stackout Area have been reported as approximately 5 to 35 feet per year. The groundwater monitoring network for the former Stackout Area consists of upgradient monitoring wells AD-12 and AD-13

and downgradient compliance wells AD-7R, AD-22, and AD-33, all of which are screened within the uppermost aquifer (Arcadis 2023). Downgradient well AD-7R was added to the network in December 2023 to replace well AD-7, which was plugged in September 2023 due to plant demolition activities in the area.

3. ALTERNATIVE SOURCE DEMONSTRATION

The ASD evaluation method and proposed alternative source of beryllium and cobalt in AD-22, and mercury in AD-33 are described below.

3.1 Proposed Alternative Source

An initial review of site geochemistry, site historical data, and laboratory quality assurance and quality control data did not identify alternative sources for beryllium, cobalt, and mercury due to Type I (sampling), Type II (laboratory), Type III (statistical evaluation), or Type V (anthropogenic) issues. Groundwater sampling, laboratory analysis, and statistical evaluations were generally completed in accordance with 30 TAC §352.931 and the draft TCEQ guidance for groundwater monitoring (TCEQ 2020). As described below, the SSLs for beryllium and cobalt have been attributed to natural variation associated with seasonal effects, which is a Type IV (natural variation) issue. The SSL for mercury has also been attributed to a Type IV issue, in this case natural variation associated with the lithology of the uppermost aquifer.

3.1.1 Beryllium

An SSL was identified for beryllium at AD-22 using deseasonalized statistics (Geosyntec 2024a). According to the *Unified Guidance*, “seasonal correction should be done both to minimize the chance of mistaking a seasonal effect for evidence of contaminated groundwater, and also to build more powerful background to compliance point tests. Problems can arise, for instance, from measurement variations associated with changing recharge rates during different seasons” (USEPA 2009a).

Previous ASDs for the former FGD Stackout Area showed that beryllium concentrations at AD-22 appear to correlate with groundwater elevations (Geosyntec 2019, Geosyntec 2020a, Geosyntec 2020b, Geosyntec 2021b, Geosyntec 2021c, Geosyntec 2022, Geosyntec 2023a, Geosyntec 2024b, Geosyntec 2024c). This relationship generally still holds true (**Figure 2**). Beryllium concentrations at AD-22 are generally correlated with seasonal changes in other relatively mobile cationic constituents, including calcium and lithium (**Figure 3**). The correlation between beryllium and both monovalent (lithium) and divalent (calcium) cations suggests that the variability in observed beryllium concentrations is related to cation exchange behavior with clay minerals present in the native soil.

In March of 2020, the geology near AD-22 was relogged at soil boring SP-B4. Clay materials were present in the seasonally saturated zones above the permanent water table (**Figure 4**). The boring log for SP-B4 is provided in **Attachment B**, and the original boring log and well construction diagram for AD-22 is provided in **Attachment C**. At AD-22, the depth to water fluctuated between approximately 3 and 12 feet below ground surface (bgs). Clay was identified from approximately 0.7 feet bgs to 13.3 feet bgs, where it transitioned to a clayey silt (**Attachment B**). Analysis by X-ray diffraction (XRD) confirmed the presence of clay minerals within the seasonal water table and sand within the screened intervals for AD-22, as summarized in **Table 1**. The clay fraction of the uppermost samples collected from within the seasonal water table was further analyzed to identify the type of clays present. Smectite-type clays, which are 2:1-layer high-activity clays with characteristically high cation exchange capacity (compared to low-activity 1:1 clay minerals), make up the majority of the clay minerals present at those intervals.

Sorption and desorption of beryllium from smectite-type clays is well documented (You et al. 1989, Boschi and Willenbring 2016a). Desorption was found to be affected by pH, with 75% of beryllium desorbing from a smectite-type clay as pH decreased from 6.0 standard units (SU) to 3.0 SU (Boschi and Willenbring 2016b). The pH values recorded at AD-22 for samples collected under the Texas CCR Rule ranged from 3.5 to 5.1 SU, suggesting that conditions are favorable for beryllium desorption from smectite-type clays. The presence of these exchangeable clays provides further evidence that the exceedance of beryllium at AD-22 can be attributed to the effects on groundwater quality of seasonal groundwater elevation changes and the resulting cation exchange between groundwater and the exchangeable clay within the seasonal water table.

3.1.2 Cobalt

An SSL was identified for cobalt at AD-22 using deseasonalized statistics (Geosyntec 2024a). As shown in previous ASDs (Geosyntec 2020a, Geosyntec 2020b, Geosyntec 2021b, Geosyntec 2021c, Geosyntec 2022, Geosyntec 2023a, Geosyntec 2024b, Geosyntec 2024c), the cobalt groundwater concentrations at AD-22 also appear to correlate with seasonal changes in groundwater elevation (**Figure 5**). In addition, the cobalt concentrations are well correlated with changes in other cations, including calcium and lithium (**Figure 6**), which suggests that natural variability associated with groundwater-mineral interactions within the seasonally saturated zone is governing dissolved cobalt concentrations.

A sample of the solid FGD sludge material accumulated on the FGD Stackout Area was collected in July 2019 and submitted for laboratory analyses. The solid-phase sample was leached using both Synthetic Precipitation Leaching Procedure (SPLP) analysis (SW-846 Test Method 1312 [USEPA 1994]) and Seven-Day Distilled Water Leachate Test Procedure (7-day leaching procedure) analysis (Appendix 4 of 30 TAC Chapter 335, Subchapter R [TAC 2016]) to evaluate the material as a potential source of cobalt. No changes to material handling or plant operations occurred prior to ceasing operations that would have altered the anticipated chemical composition since this sample was initially collected. Calcium-cobalt ratios for the leached sludge material and site groundwater are displayed on **Figure 7**. The concentration ratio between calcium and cobalt is consistently on the order of 100:1 at both upgradient and downgradient locations (**Figure 7**). Calcium concentrations in groundwater are generally consistent between AD-22 and upgradient well AD-13 (**Figure 8**); however, leached calcium concentrations from the FGD sludge material are approximately two to three orders of magnitude greater than concentrations in site groundwater. The difference between the ratio of calcium to cobalt in the leached FGD sludge material (about 45,000:1) compared to the ratio for groundwater suggests that dissolved calcium concentrations at AD-22 would be significantly higher if the groundwater at this location were affected by leachate.

Siderite and pyrite, both reduced iron-bearing minerals, were identified below the seasonal water table (within the saturated zone) at AD-22 (**Table 1**). Cobalt is known to undergo isomorphic substitution for iron in both siderite and pyrite (Gross 1965, Hitzman et al. 2017, Krupka and Serne 2002). This is due to the similarity of their ionic radii (approximately 1.56 angstrom [Å] for iron and 1.52 Å for cobalt [Clementi and Raimondi 1963]). The proposed substitution of cobalt for iron in the crystal lattice of pyrite has been documented in the most recent ASDs prepared for the Pirkey Plant's East Bottom Ash Pond (Geosyntec 2023c) and West Bottom Ash Pond (Geosyntec 2024d) as well as early ASDs for these units.

Goethite (an iron hydroxide) was identified within the seasonally saturated zone and the screened interval at AD-22 (**Table 1**). The weathering of siderite and pyrite to goethite under oxidizing conditions is a well-understood phenomenon, including in formations in East Texas (Senkayi et al. 1986, Dixon et al. 1982) and may have occurred within the seasonally saturated zone. Eh-pH (Pourbaix) diagrams can be used to illustrate the predicted speciation of specific analytes at thermodynamic equilibrium under the conditions observed for a groundwater sample. An Eh-pH diagram generated using geochemical conditions at AD-22 shows that the conditions observed at AD-22 are favorable for goethite formation (**Figure 9**). During weathering from reduced (pyrite and siderite) to oxidized (goethite) iron minerals, isomorphically substituted cobalt may be released from the mineral structure into groundwater. The mobilization of cobalt, which was released during weathering of siderite or pyrite to goethite in the seasonally saturated zone, may explain the variability in aqueous cobalt concentrations and their correlation with the groundwater elevation as more or less aquifer solids are saturated with groundwater.

3.1.3 Mercury

An SSL was identified for mercury at AD-33 (Geosyntec 2024a). As shown in previous ASDs (Geosyntec 2023b, Geosyntec 2024b, Geosyntec 2024c), if the mercury detected at AD-33 was derived from CCR leachate from the FGD Stackout Area, we would anticipate similar trends for the concentrations of other CCR constituents, particularly those known to be more conservative. Boron, a geochemically conservative parameter, has high leachability from FGD material (USEPA 2009b). A release from the FGD Stackout Area would be anticipated to result in higher concentrations of boron and other conservative parameters, such as sulfate; however, the observed boron and sulfate concentrations at AD-33 do not display increasing trends (**Figure 10**). Two samples of FGD sludge material from the Stackout Area were collected in 2019 for characterization to assess if the FGD material was a likely source of mercury to groundwater at AD-33. As summarized in **Table 2**, both the historical average and the most recent boron groundwater concentrations at AD-33 are two orders of magnitude lower than the boron concentrations in leachate from both Synthetic Precipitation Leaching Procedure (SPLP) analysis (SW-846 Test Method 1312 [USEPA 1994]) and Seven-Day Distilled Water Leachate Test Procedure (7-day leaching procedure) analysis (Appendix 4 of 30 TAC Chapter 335, Subchapter R [TAC 2016]) of FGD sludge (**Attachment D**). The lack of increasing boron in AD-33 groundwater despite the relatively higher concentration of leached boron from the FGD sludge suggests groundwater at AD-33 is not impacted by the unit.

The FGD sludge material had detectable levels of total mercury at concentrations greater than those reported for two samples of aquifer solids collected from a soil boring advanced adjacent to AD-33 (**Table 3, Attachment E**). While the concentration of mercury in the aquifer solids is lower than the total mercury concentration in FGD sludge material, the low mobility of mercury from FGD suggests the FGD sludge is not the source of mercury in groundwater (USEPA 2009b, Hao et al. 2016). As shown in **Figure 11** previous mercury groundwater concentrations at AD-33 were consistently at or above the mercury concentrations of leachate from SPLP analysis of FGD sludge material (**Table 2, Attachment D**). Mercury concentrations of leachate from 7-day leaching procedure analysis of FGD sludge material were below the laboratory detection limit of 0.005 mg/L. These results are in agreement with previous studies that have found that leached mercury concentrations are not correlated with total solid phase mercury in FGD samples (USEPA 2009b).

Detectable concentrations of mercury in aquifer solids at AD-33 present an alternative source of mercury in groundwater. Mercury is naturally occurring in soils and known to undergo isomorphic substitution for iron in crystalline iron minerals such as pyrite (Manceau et. al 2018). Analysis by XRD of material from the AD-33 soil boring showed detectable levels of pyrite below the seasonal water table (**Table 1**).

Reported differences between the total and dissolved mercury groundwater concentrations suggests that mercury is associated with colloidal material native from the aquifer. Dissolved concentrations of mercury at AD-33 are consistently lower than the reported total values (**Figure 11**), with most dissolved concentrations detected below the MCL of 2 µg/L. The method for measuring dissolved mercury in groundwater (EPA Method 245.7 [USEPA 2005]) involves filtering the sample through a 0.45 µm filter prior to analysis, which would remove colloid-sized particles prior to preservation. The inclusion of suspended particles (including colloids) in totals samples is likely to result in an overestimation of metals due to the mobilization of metals from the colloidal or solid to aqueous phase following acid preservation during sample collection. Thus, the lower dissolved mercury concentrations compared to total aqueous mercury suggests that mercury is associated with colloidal material from the aquifer and the SSL of mercury at AD-33 is not due to a release from the former FGD Stackout Area.

3.1.4 Conceptual Site Model

The seasonal fluctuations in beryllium and cobalt concentrations at AD-22 can be attributed to variations in the amount of the aquifer solids that are in contact with groundwater as the water table elevation changes. When the water table is higher, more clay material is in contact with groundwater, allowing greater desorption of cations (including beryllium) from the cation exchange sites on the clay. In the case of cobalt, more iron oxides are in contact with groundwater as the water table rises, allowing for the release of cobalt from mineral phases where it has isomorphically substituted for iron. Thus, the observed SSLs were attributed to natural variation associated with seasonal fluctuation of beryllium and cobalt concentrations in groundwater as the amount of aquifer solids that are saturated increases. For mercury, seasonal variations in groundwater concentrations were not observed. The observed mercury concentrations in groundwater at AD-33 were attributed to interactions with mercury-bearing aquifer solids or colloids.

4. CONCLUSIONS AND RECOMMENDATIONS

The preceding information serves as the ASD prepared in accordance with 30 TAC §352.951(e) and supports the position that the SSLs of beryllium and cobalt at AD-22 and mercury at AD-33 identified during the first semiannual assessment monitoring event of 2024 were not due to a release from the former FGD Stackout Area. The identified beryllium and cobalt SSLs were, instead, attributed to natural variation related to desorption of beryllium and seasonal dissolution of cobalt-bearing minerals comprising the aquifer solids. The mercury SSL was attributed to natural variation associated with the aquifer solids of the uppermost aquifer. Therefore, no further action is warranted. Certification of this ASD by a qualified professional engineer is provided in **Attachment G**.

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TABLES

**Table 1. X-Ray Diffraction Results
Alternative Source Demonstration Report
FGD Stackout Area, H. W. Pirkey Plant**

Boring Location	SP-B4		
Associated Well	AD-22		
Depth (ft bgs)	6-8	18-20	28-30
Sample Location	Within Seasonal Water Table	Below Seasonal Water Table	Within Screened Interval
Quartz	28	47.5	95
Plagioclase Feldspar	<0.5	<0.5	1
K-Feldspar	1	0.5	-
Goethite	1	-	2
Hematite	-	-	-
Chlorite	1	-	-
Siderite		10	-
Pyrite	-	2	-
Clays	*	40	2
Kaolinite	13	/	/
Illite/Mica	2		
Smectite	43		
Mixed-Layered Illite/Smectite	11		

Notes:

1. Mineral constituents are reported in percentage.
 2. Values shown as less than indicate the mineral constituent is present but below the quantification limit.
- *: The clay fraction at SP-B4-6-8 was further analyzed to characterize the types of clays present, as listed below.
 -: not detected
 ft bgs: feet below ground surface
 FGD: Flue gas desulfurization

**Table 2. Summary of Key Analytical Data
Alternative Source Demonstration Report
FGD Stackout Area, H.W. Pirkey Plant**

Sample	Type	Mercury (µg/L)	Boron (mg/L)
Pirkey Sludge FGD	SPLP	2.272	22.3
	7-Day Leaching Procedure	<5	8.44
Pirkey Sludge FGD 2	SPLP	<0.025	26.7
	7-Day Leaching Procedure	<5	16.4
AD-33	Historical Average	5.28	0.125
	Apr-24	6.6	0.141

Notes:

1. Average values were calculated using truncated mercury and boron data (March 2020 - April 2024).
2. Pirkey Sludge FGD samples were collected on July 17, 2019.
3. Non-detect values reported as less than (<) the detection limit.

CCR: coal combustion residuals

FGD: Flue Gas Desulfurization

mg/L: milligrams per liter

SPLP: Synthetic Precipitation Leaching Procedure

µg/L: micrograms per liter

**Table 3. Solid Phase Mercury Data
Alternative Source Demonstration Report
FGD Stackout Area, H.W. Pirkey Plant**

Location ID	Date Sampled	Sample Depth (ft bgs)	Mercury (mg/kg)
AD-33	4/30/2018	11	0.0026
		21	0.0038
Pirkey Sludge FGD	7/17/2019	N/A	0.653
Pirkey Sludge FGD 2	7/17/2019	N/A	0.606

Notes:

1. For AD-33 locations, samples were collected from additional boreholes advanced in the immediate area of AD-33. Samples were not collected from the cuttings of the borings advanced for well installation.

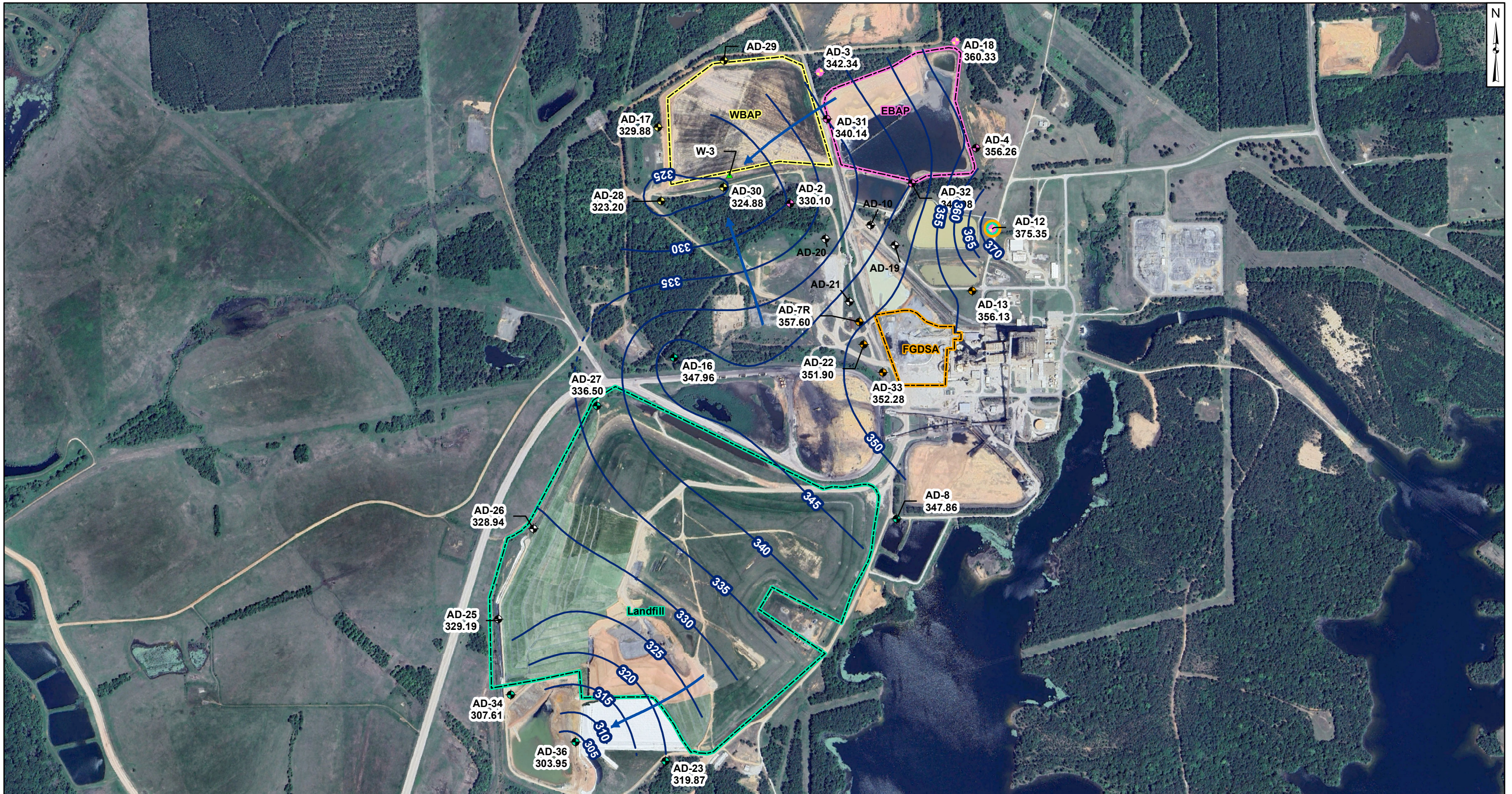
FGD: Flue Gas Desulfurization

ft bgs: feet below ground surface

mg/kg: milligram per kilogram

N/A: not applicable

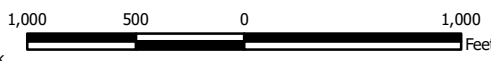
FIGURES



- Legend**
- Groundwater Monitoring Wells**
- ⊕ Out of Network
 - ⊕ East Bottom Ash Pond (EBAP)
 - ⊕ West Bottom Ash Pond (WBAP)
 - ⊕ Landfill
 - ⊕ Flue Gas Desulfurization Stackout Area (FGDSA)
 - ⊕ EBAP and WBAP

- ⊕ All CCR Unit Networks
- ▲ Piezometer
- Groundwater Elevation Contour
- - - Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction

- Notes**
1. Monitoring well coordinates and water level data (collected on April 22, 23 and 24, 2024) provided by AEP.
 2. Site features based on information available in coal combustion residual (CCR) Groundwater Monitoring Well Network Evaluation Update (Arcadis 2022) provided by AEP.
 3. Groundwater elevation units are feet above mean sea level (ft msl).
 4. AD-10, AD-19, AD-20, AD-21, AD-29, and W-3 were not gauged during the April 2024 event.
 5. AD-7R replaced AD-7, which was abandoned.
 6. AD-7R (357.60 ft msl) was not used for contouring due to an anomalous reading.
 7. Wells shaded in grey were not used for contouring.
 8. AD-35 was abandoned on November 13, 2018.
 9. Removal of CCR plus one foot of material for the WBAP was completed for on July 26, 2022.
 10. Removal of CCR plus one foot of material for the EBAP was completed on July 20, 2023, for the East Pond.
 11. Removal of CCR plus one foot of material was completed for the FGDSA on September 18, 2023.
 12. Aerial imagery provided by Google Earth Pro, dated April 21, 2023.
 13. Map is updated to incorporate Landfill survey data collected on May 1, 2024.



Beth Ann Gross
 August 19, 2024
 Geosyntec Consultants, Inc.
 Texas Firm Registration
 No. 1182



**Potentiometric Contours: Uppermost Aquifer
 April 2024**

AEP Pirkey Power Plant
 Hallsville, Texas

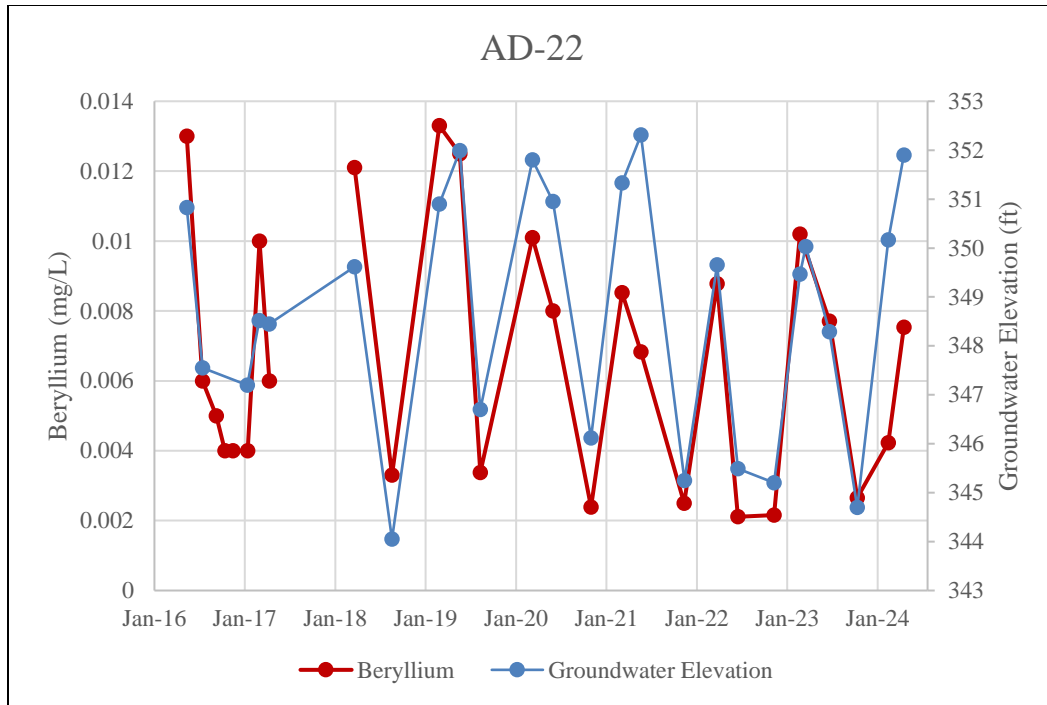
Geosyntec
 consultants

Figure

1

Columbus, Ohio

2024/07/19



Notes:

1. Beryllium concentrations are shown in milligrams per liter (mg/L).
 2. Water level is shown as groundwater elevation in feet above mean sea level (ft amsl).
 3. The gap in beryllium data represents the time period in which detection monitoring took place and samples were not analyzed for beryllium.
- FGD: Flue Gas Desulfurization

Beryllium v. Groundwater Elevation

Pirkey FGD Stackout Pad

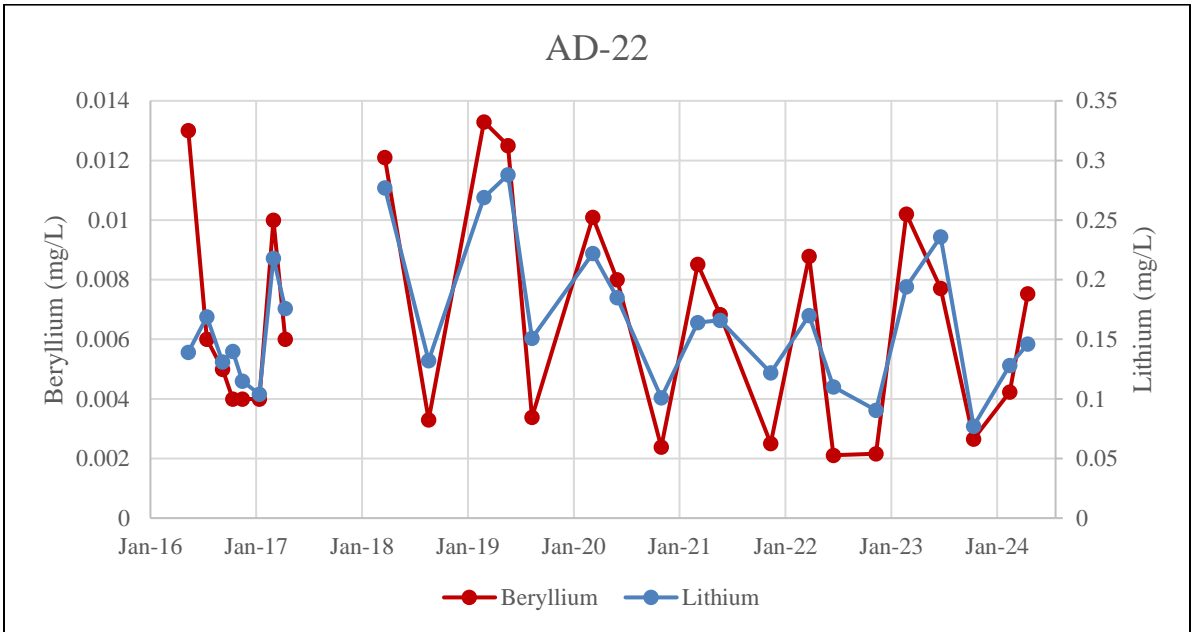
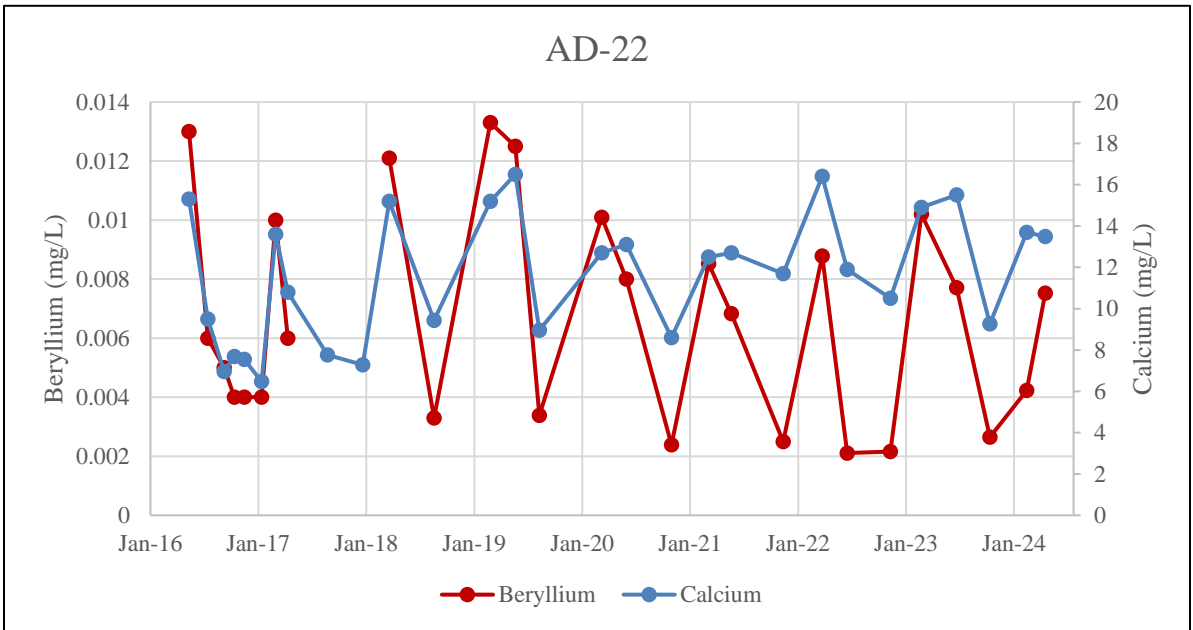


Figure

2

Columbus, Ohio

September 2024



Notes:

1. Beryllium, calcium, and lithium concentrations are shown in milligrams per liter (mg/L).

2. The gaps in beryllium and lithium data represent the time period in which detection monitoring took place and samples were not analyzed for beryllium and lithium.

FGD: flue gas desulfurization

AD-22 Beryllium v. Calcium and Lithium

Pirkey FGD Stackout Pad

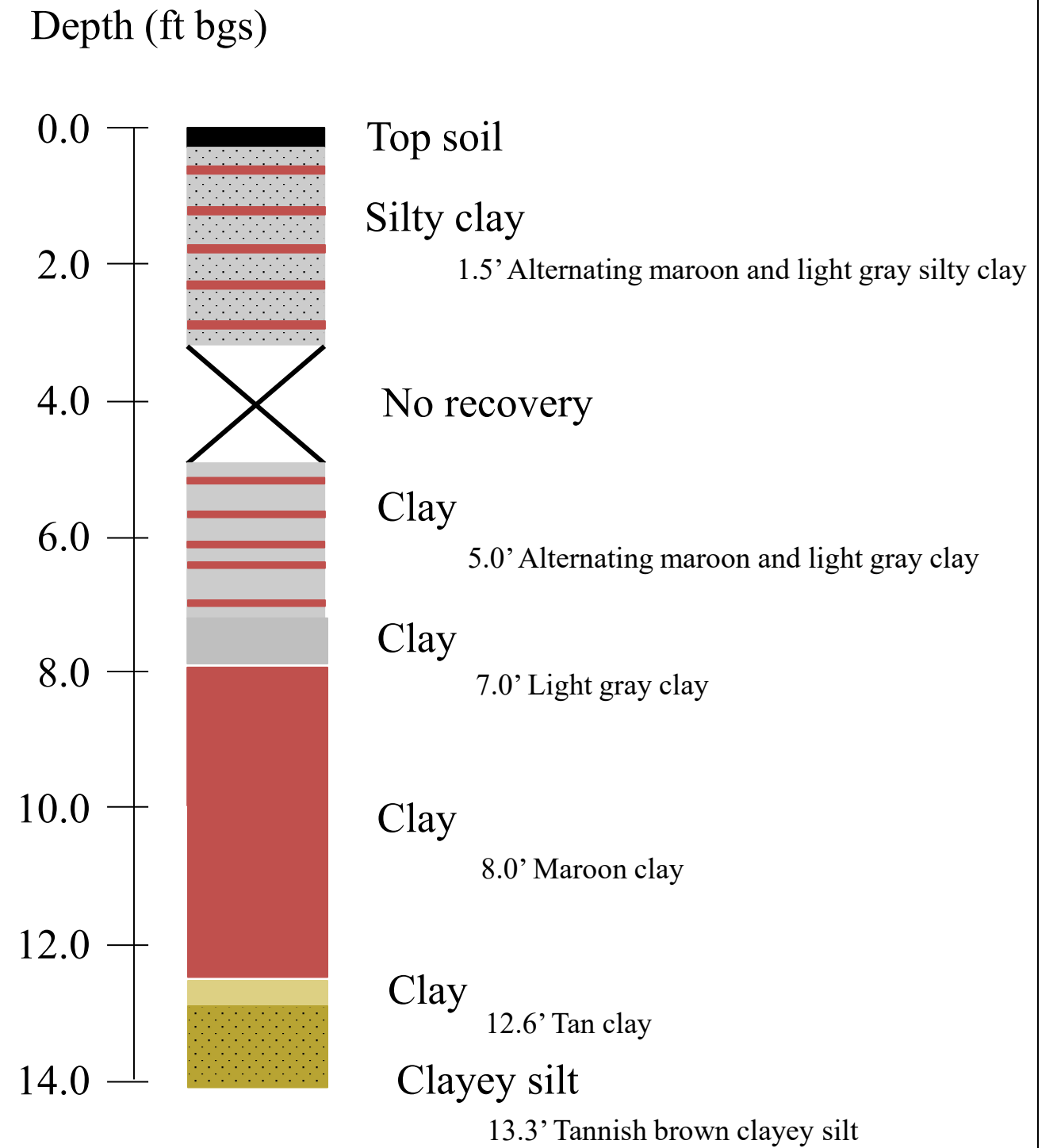
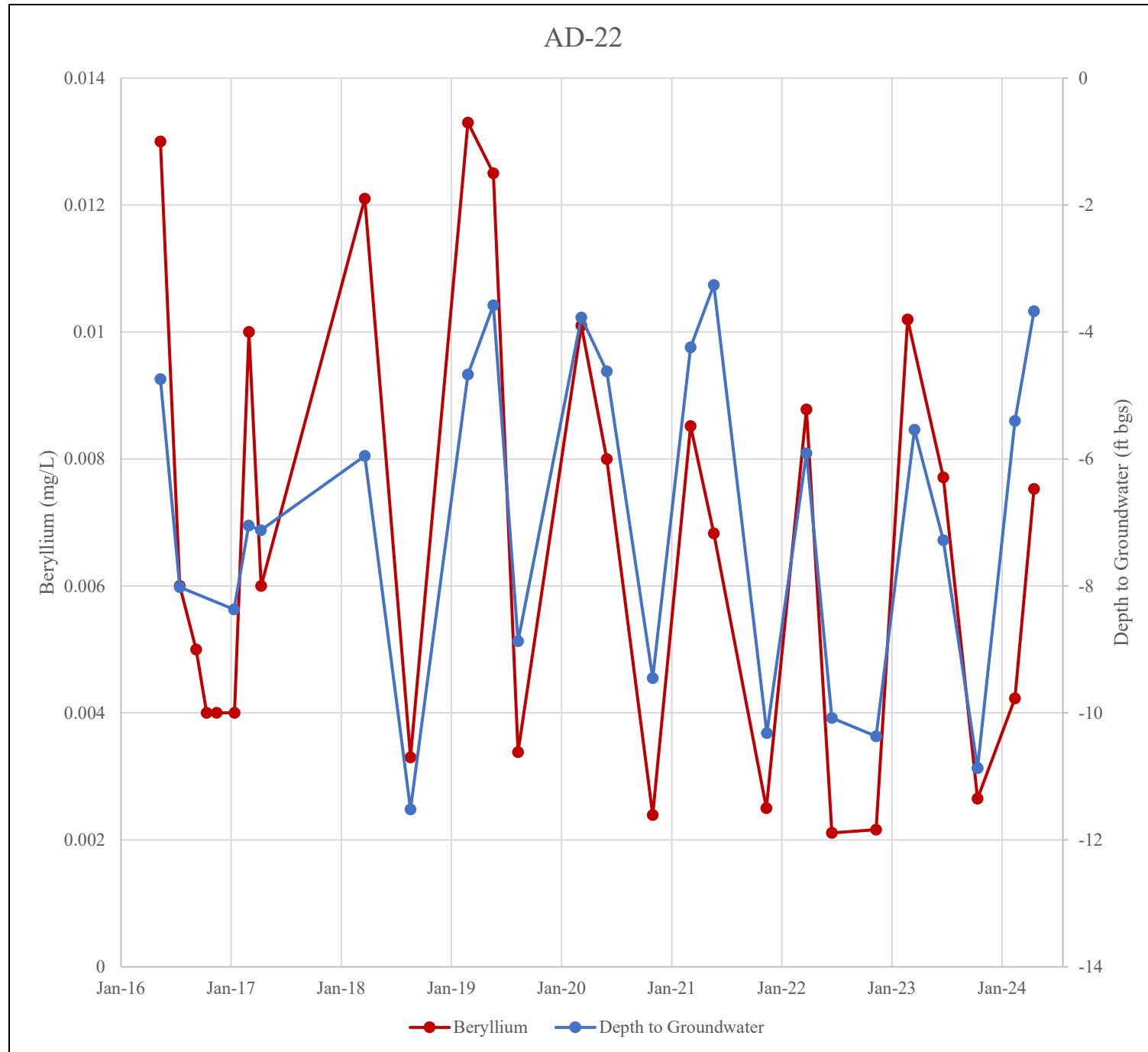


Figure

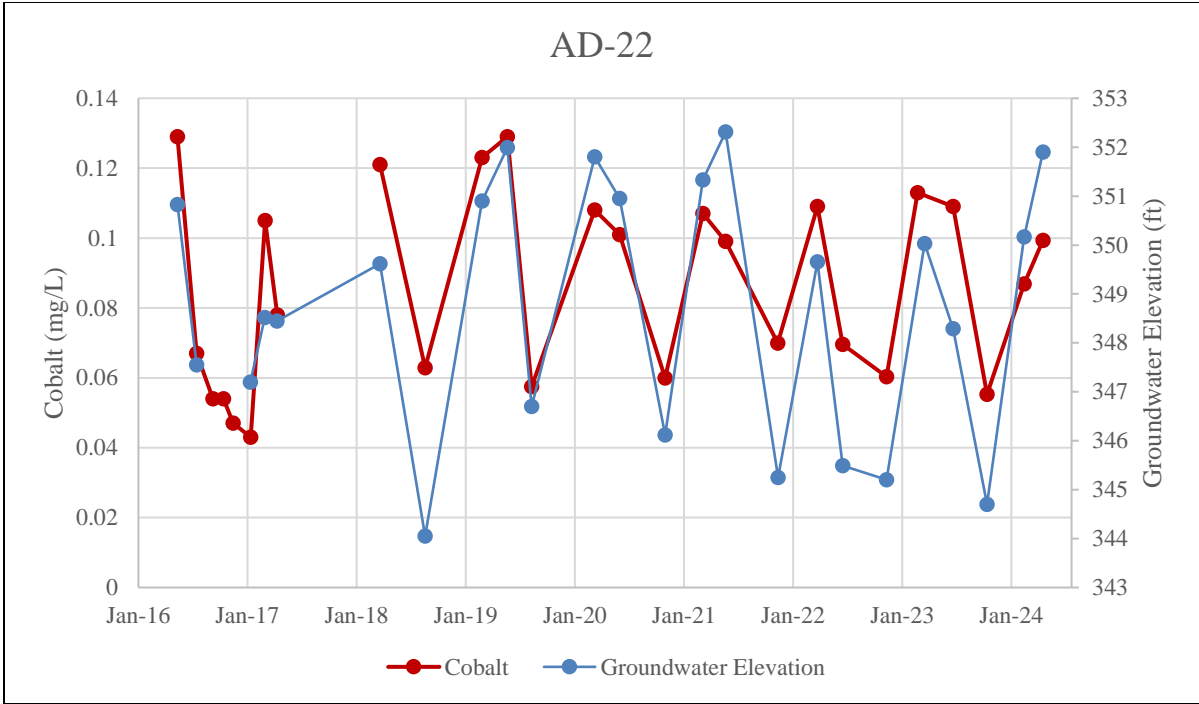
3

Columbus, Ohio

September 2024



Notes:
 1. A sample was collected for analysis of mineralogy from 6–8 ft bgs.
 2. This illustration represents the log for boring SP-B4. The full boring log is available in Attachment B.
 3. AD-22 is screened at the interval of 10–30 ft bgs.
 FGD: Flue Gas Desulfurization
 ft bgs: feet below ground surface
 mg/L: milligrams per liter



Notes:

1. Cobalt concentrations are shown in milligrams per liter (mg/L).
 2. Water level is shown as groundwater elevation in feet above mean sea level (ft amsl).
 3. The gap in cobalt data represents the time period in which detection monitoring took place and samples were not analyzed for cobalt.
- FGD: Flue Gas Desulfurization

AD-22 Cobalt v. Groundwater Elevation

Pirkey FGD Stackout Pad

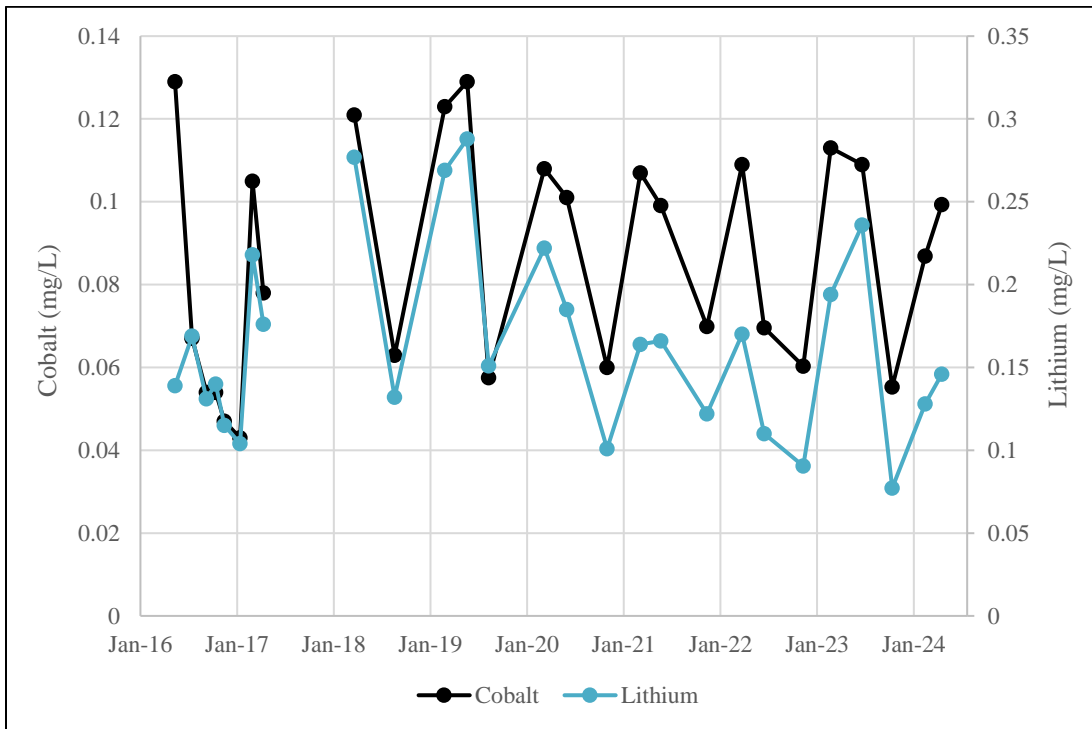
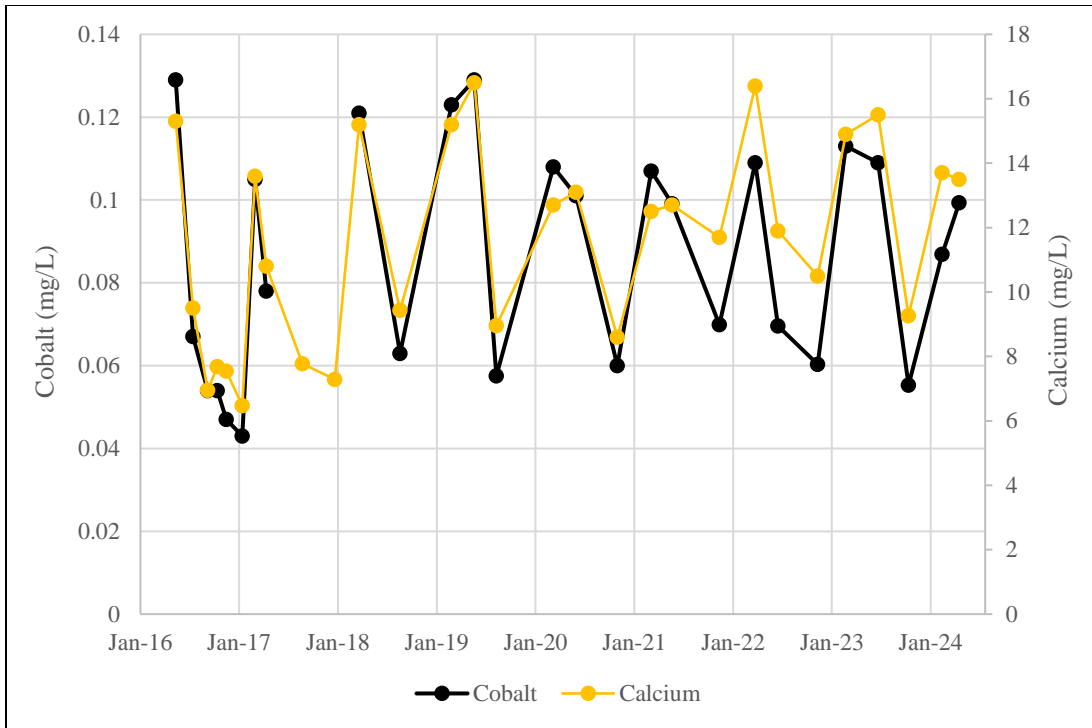


Figure

5

Columbus, Ohio

September 2024



Notes:

1. Cobalt, calcium, and lithium concentrations are shown in milligrams per liter (mg/L).

2. The gaps in cobalt and lithium data represent the time period during which detection monitoring took place and samples were not analyzed for cobalt and lithium.

FGD: Flue Gas Desulfurization

AD-22 Cobalt v. Calcium and Lithium

Pirkey FGD Stackout Pad

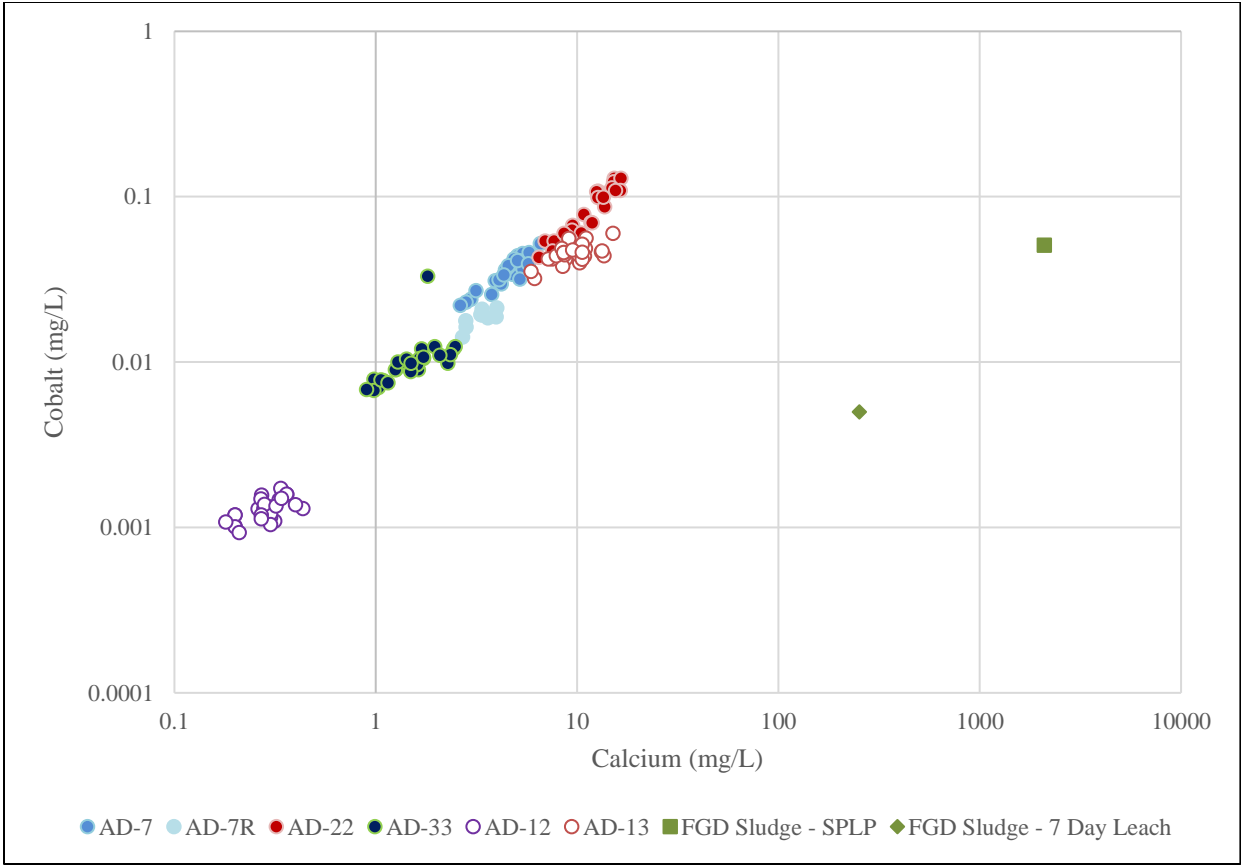


Figure

6

Columbus, Ohio

September 2024



Notes:

1. Cobalt and calcium concentrations are shown in milligrams per liter (mg/L).
2. Upgradient wells are shown with hollow circles.
3. 'FGD Sludge-SPLP' and 'FGD Sludge 7 Day Leach' present the leached concentrations of cobalt and calcium using the Synthetic Precipitation Leaching Procedure (SPLP) (SW-846 Test Method 1312) and the 7-Day Distilled Water Leachate Test Procedure (30 Texas Administration Code 335.521 Appendix 4), respectively. FGD: Flue Gas Desulfurization

Cobalt and Calcium Concentration Distribution

Pirkey FGD Stackout Pad

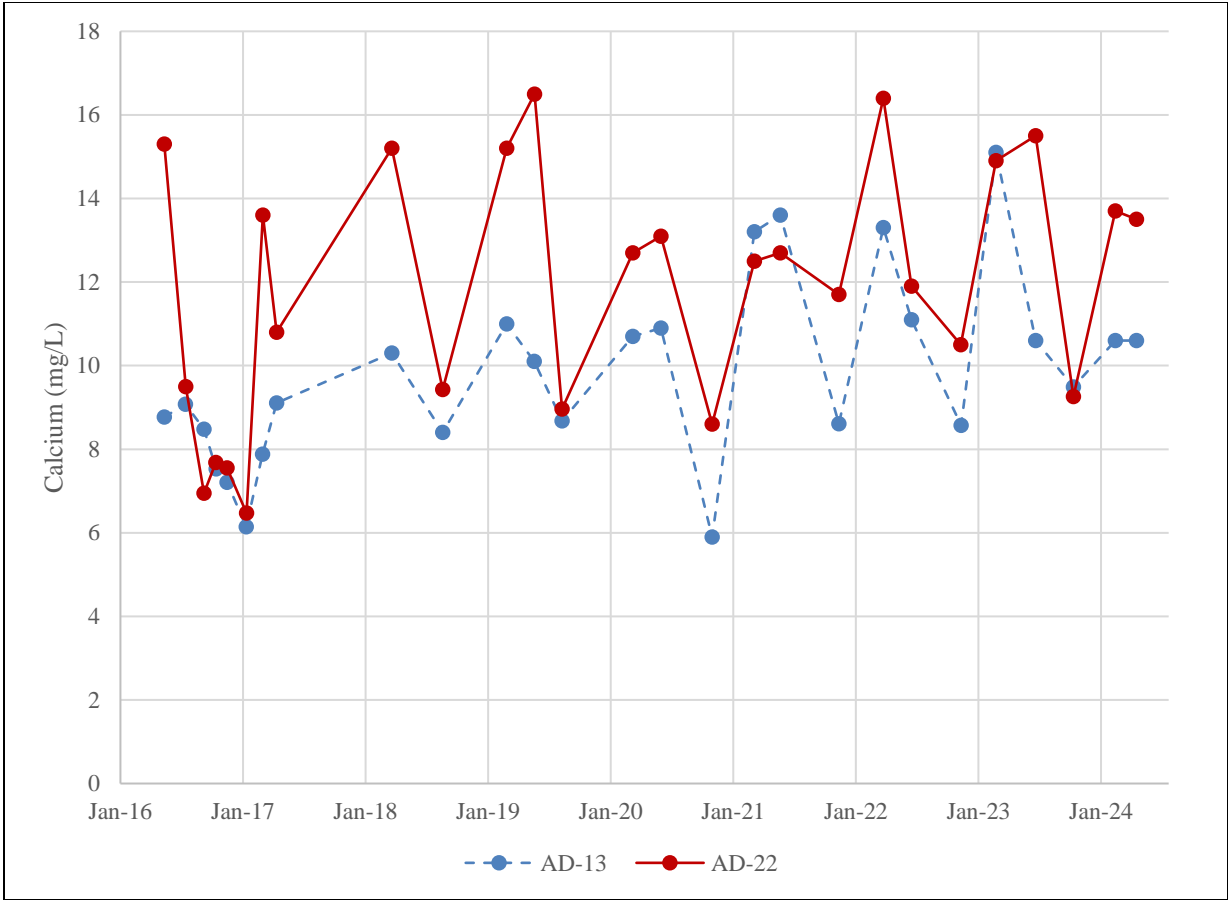


Figure

7

Columbus, Ohio

September 2024



Notes:

1. Calcium concentrations are shown in milligrams per liter (mg/L).

2. Upgradient monitoring well AD-13 is shown with a dashed line.

FGD: Flue Gas Desulfurization

Calcium Time Series Graph

Pirkey FGD Stackout Pad

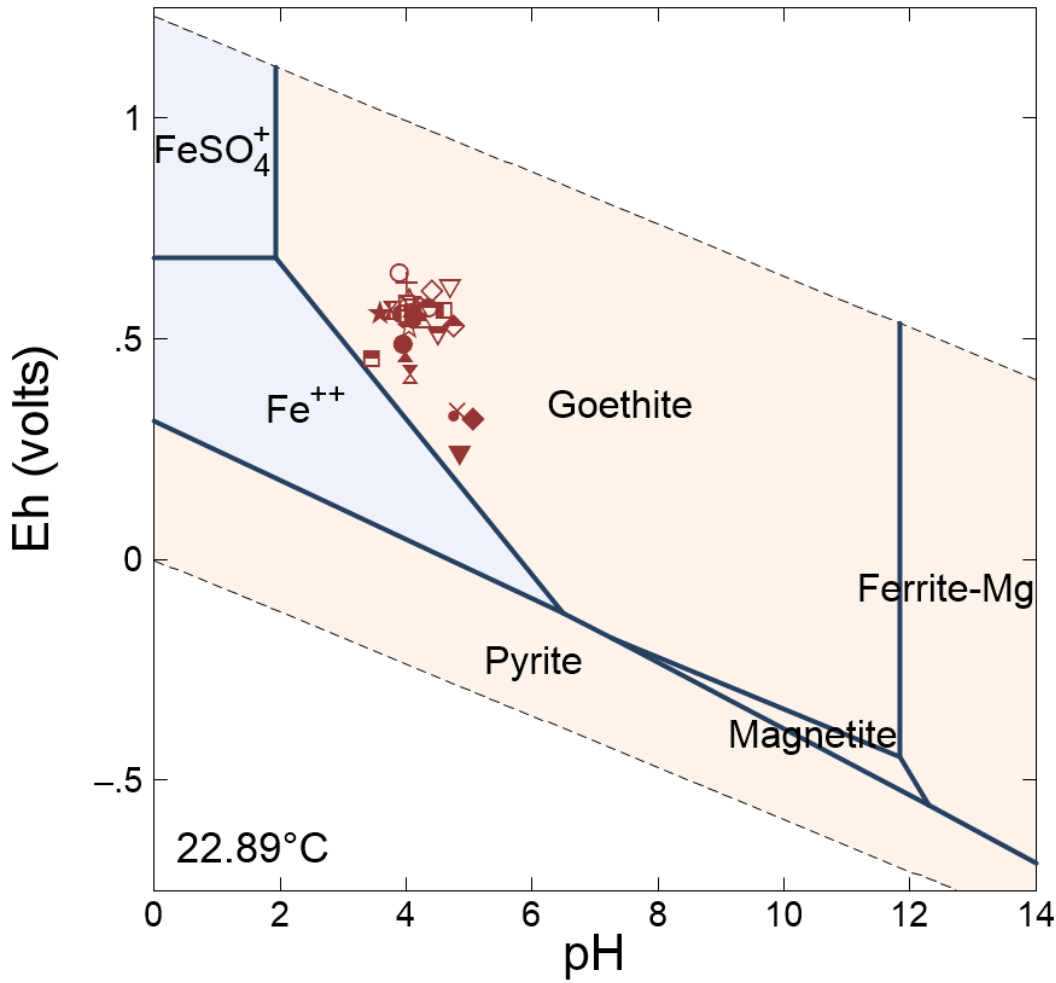


Figure

8

Columbus, Ohio

September 2024



- 11-May-16
- 14-Jul-16
- △ 07-Sep-16
- ▽ 12-Oct-16
- ◇ 14-Nov-16
- 12-Jan-17
- × 01-Mar-17
- ☆ 11-Apr-17
- 23-Aug-17
- 21-Mar-18
- ▲ 20-Aug-18
- ▼ 27-Feb-19
- ◆ 22-May-19
- 12-Aug-19
- 10-Mar-20
- ★ 02-Jun-20
- × 02-Nov-20
- + 08-Mar-21
- 24-May-21
- 15-Nov-21
- △ 28-Mar-22
- ▽ 20-Jun-22
- ◇ 14-Nov-22
- ★ 27-Feb-23
- × 26-Jun-23
- × 17-Oct-23
- 19-Feb-24
- 22-Apr-24

Notes: Groundwater concentrations of major cations and anions at AD-22 from the April 2024 sampling event were used to establish baseline conditions for the diagram. Eh and pH values for sampling dates at AD-22 are shown on the diagram.

AD-22 Eh-pH Diagram
Pirkey FGD Stackout Pad

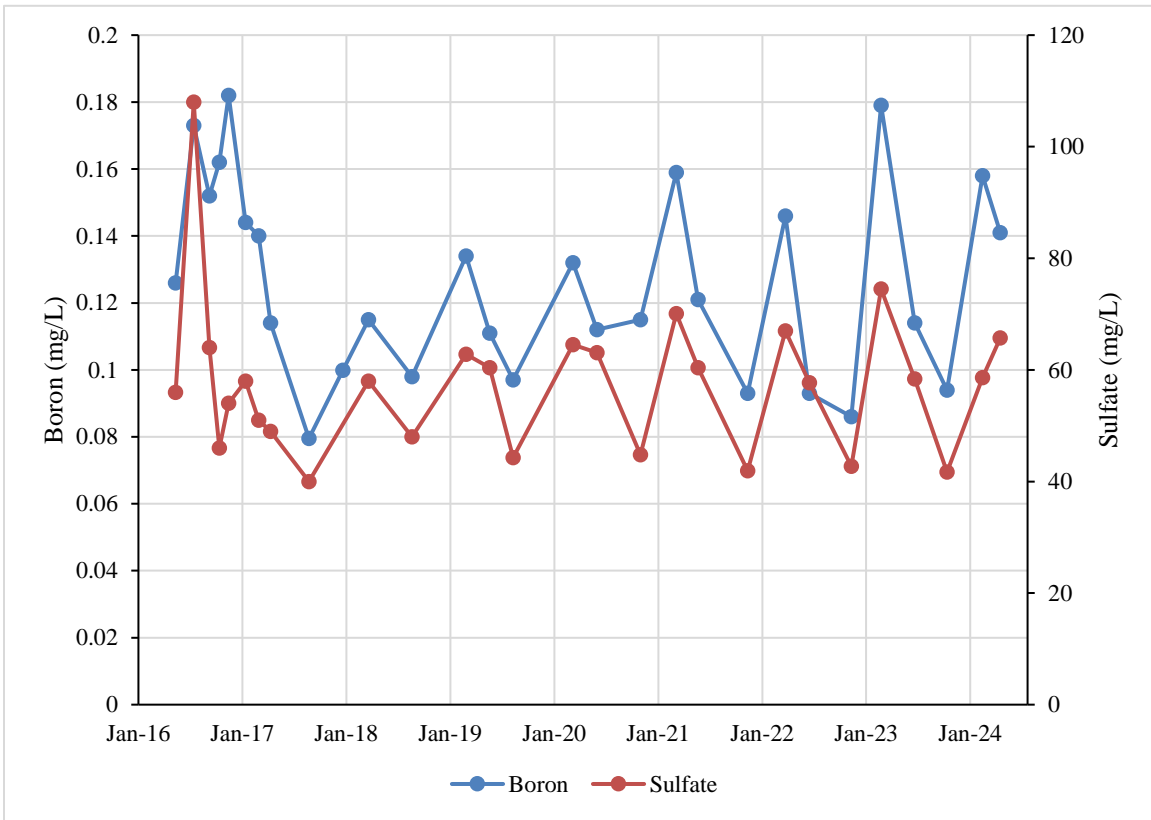


Figure

9

Columbus, Ohio

November 2024



Notes:

1. Boron and sulfate concentrations are shown in milligrams per liter (mg/L).
 FGD: Flue Gas Desulfurization

AD-33 Boron and Sulfate Time Series Graph

Pirkey FGD Stackout Pad

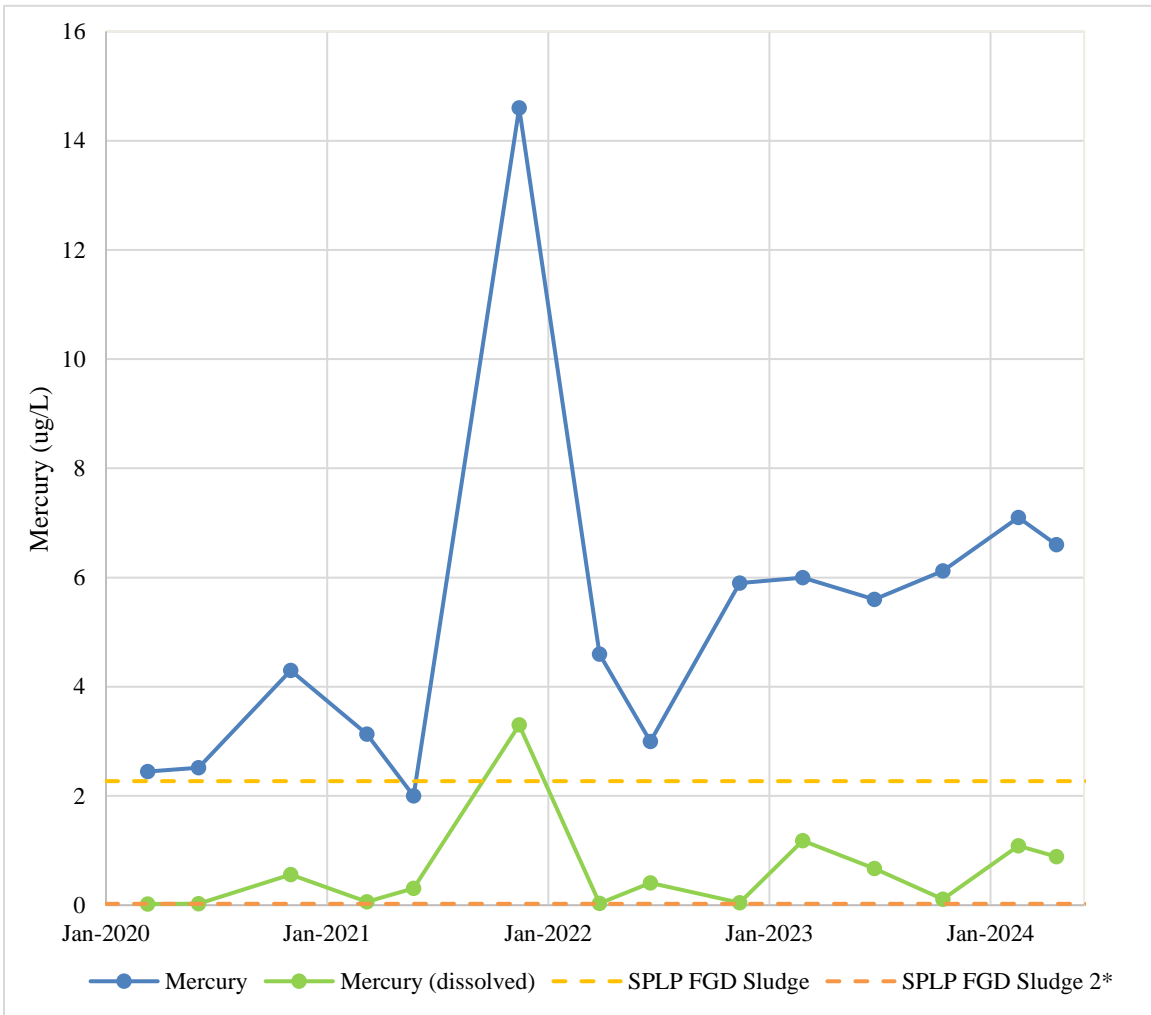


Figure

10

Columbus, Ohio

September 2024



Notes:

1. Mercury (Hg) concentrations are shown in micrograms per liter (µg/L).

2. FGD sludge samples collected on 7/17/2019.

3. 7-day leaching procedure results were not shown due to non-detects.

*: Non-detect presented as the reporting limit

FGD: Flue Gas Desulfurization

SPLP: Synthetic Precipitation Leaching Procedure

AD-33 Mercury Time Series Graph

Pirkey FGD Stackout Pad



Figure

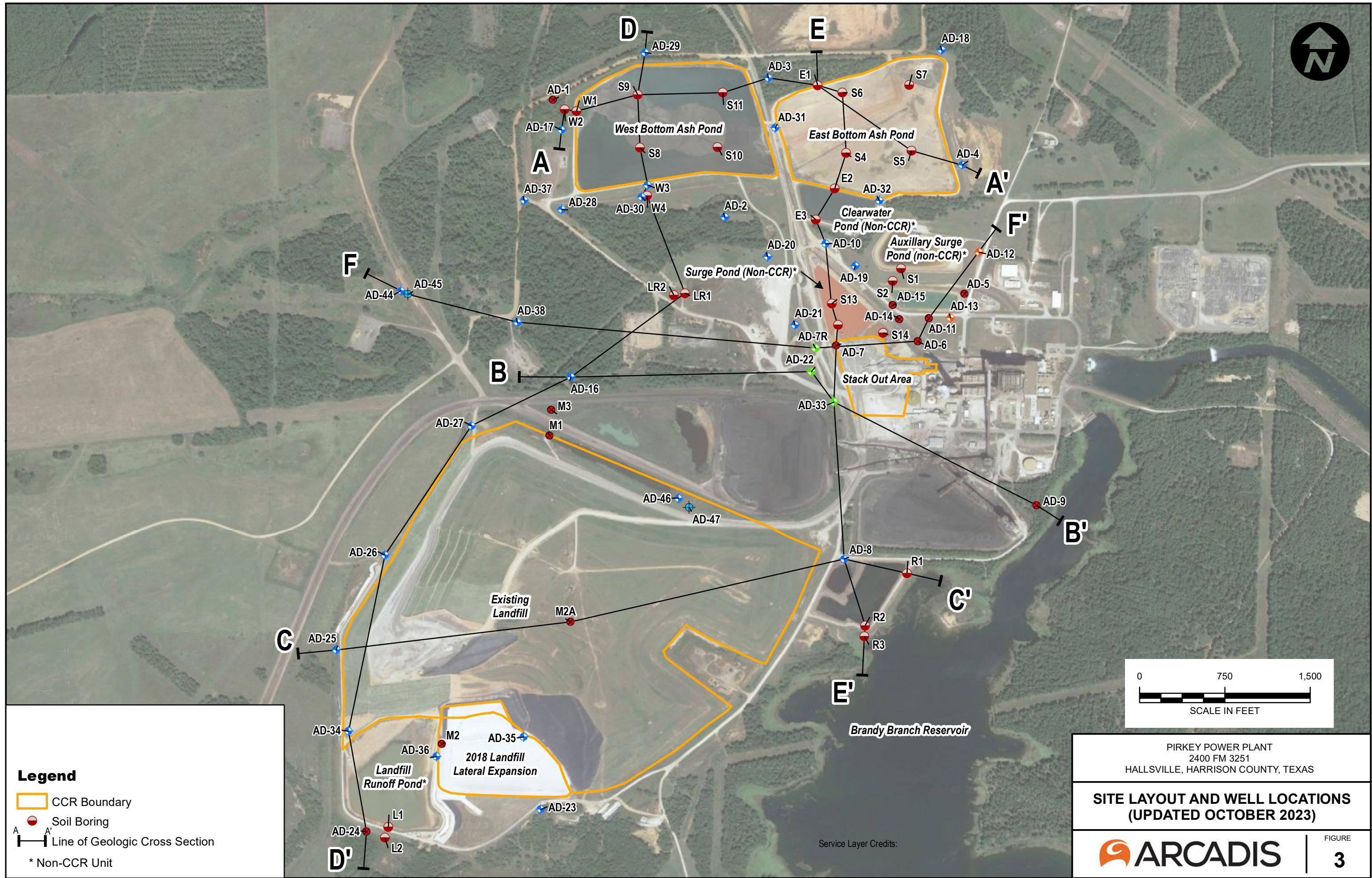
11

Columbus, Ohio

September 2024

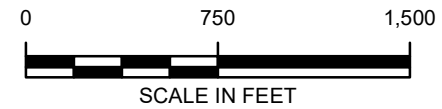
ATTACHMENT A

Geologic Cross Sections



Legend

- CCR Boundary
- Soil Boring
- A A' Line of Geologic Cross Section
- * Non-CCR Unit



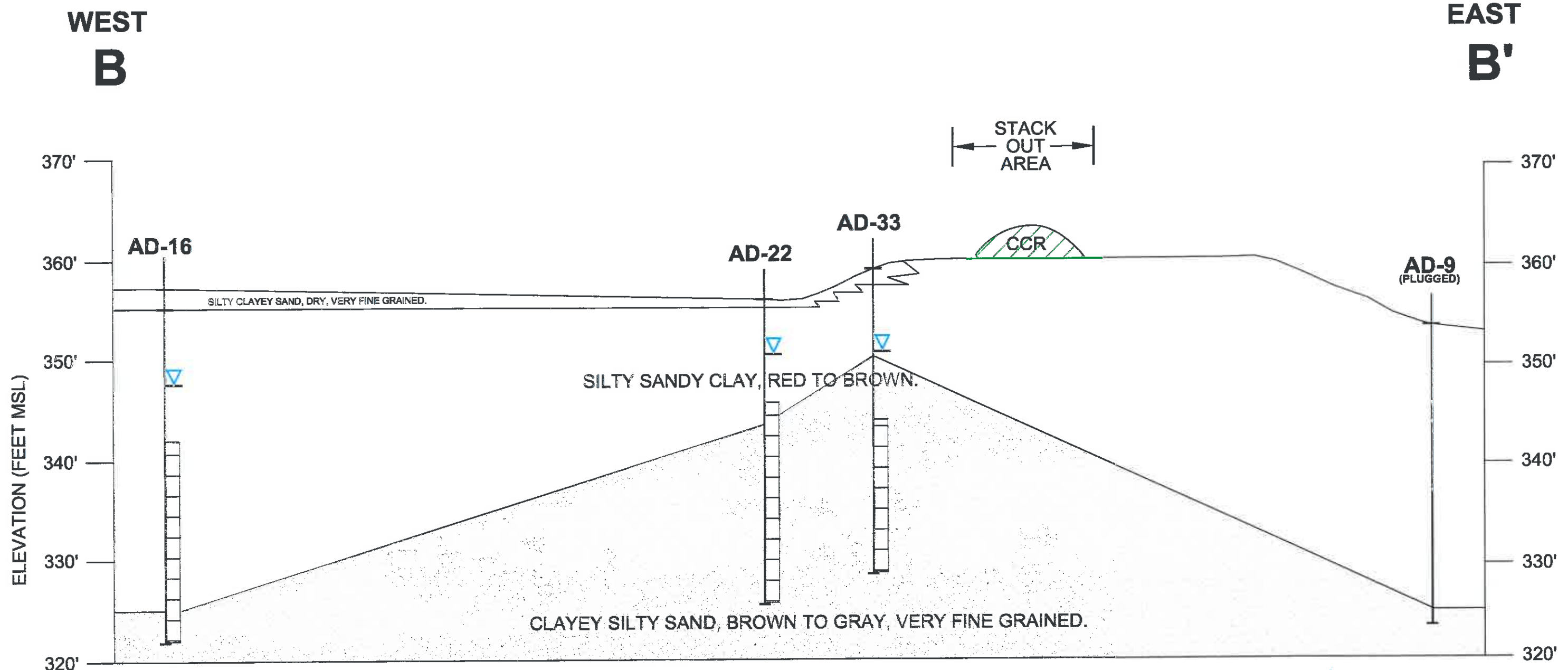
PIRKEY POWER PLANT
2400 FM 3251
HALLSVILLE, HARRISON COUNTY, TEXAS

**SITE LAYOUT AND WELL LOCATIONS
(UPDATED OCTOBER 2023)**

FIGURE
3

Service Layer Credits:

CITY: DIV/PROJECT: DB: LD: AM: PD: TM: TR: LYRON-OFF-REF: PLOTSTYLETABLE: --- PLOTTED: 10/10/2023 11:27 AM BY: LEASE, DIANA
 G:\Active Projects\AEP301\03036 - Pirkey Stack Out Well Network\Report\Figure 5 Cross Sec B-B'.dwg LAYOUT: MODEL: SAVER: 2/19/2016 2:22 PM ACADEVER: 24.05 (LMS TECH) PAGES: 5



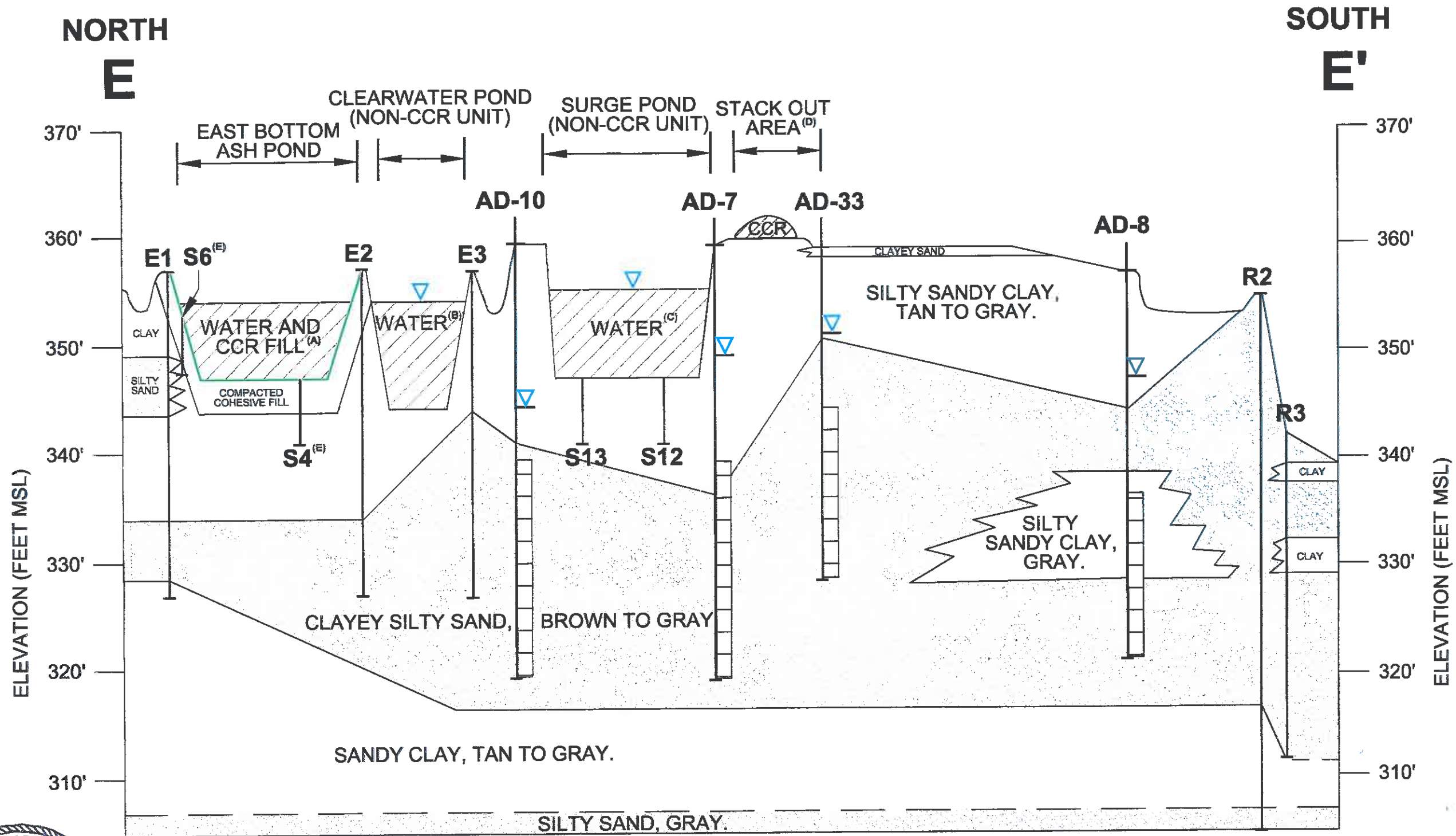
- LEGEND**
- MONITORING WELL SCREENED INTERVAL
 - WATER LEVEL IN MONITORING WELL (1/20/16)
 - BASE OF CCR UNIT

NOTES:

A) BASE OF STACK OUT AREA CCR UNIT LOCATED AT GRADE, ELEVATION TAKEN FROM MAY 2012 AND JUNE 23, 2015 TOPOGRAPHIC SURVEYS BY BEACON AVIATION.

B) ELEVATION OF CCR MATERIAL ABOVE STACK OUT AREA VARIES.

PIRKEY POWER PLANT 2400 FM 3251 HALLSVILLE, HARRISON COUNTY, TEXAS	
CROSS SECTION B - B'	
	FIGURE 5



- NOTES: A) TOP OF EAST BOTTOM ASH POND PERIMETER BERM ELEVATION IS 357'. OPERATING LEVEL IS 354' (JOHNSON & PACE, MAY 2011); BASE ELEVATION OF EAST BOTTOM ASH POND IS 347' (SARGENT & LUNDY, JANUARY 1983).
 B) TOP OF CLEARWATER POND PERIMETER BERM ELEVATION IS 357'. OPERATING LEVEL IS 354' (JOHNSON & PACE, MAY 2011). BASE ELEVATION OF CLEARWATER POND IS 344' (SARGENT & LUNDY, JANUARY 1983).
 C) BASE ELEVATION OF SURGE POND (347-352' MSL) AND POND DESIGN LEVEL (355' MSL) TAKEN FROM JANUARY 31, 1983 SARGENT & LUNDY REPORT "DESIGN SUMMARY FOR LIGNITE STORAGE AREA AND WASTEWATER POND FACILITIES".
 D) BASE OF STACK OUT AREA CCR UNIT LOCATED AT GRADE. ELEVATION TAKEN FROM MAY 2012 AND JUNE 23, 2015 TOPOGRAPHIC SURVEYS BY BEACON AVIATION.
 E) SOIL BORING INSTALLED BY SOUTHWESTERN LABORATORIES DURING ASH POND CONSTRUCTION IN 1983.



- LEGEND**
- MONITORING WELL SCREENED INTERVAL
 - WATER LEVEL IN MONITORING WELL (1/20/16)
 - BASE OF CCR UNIT

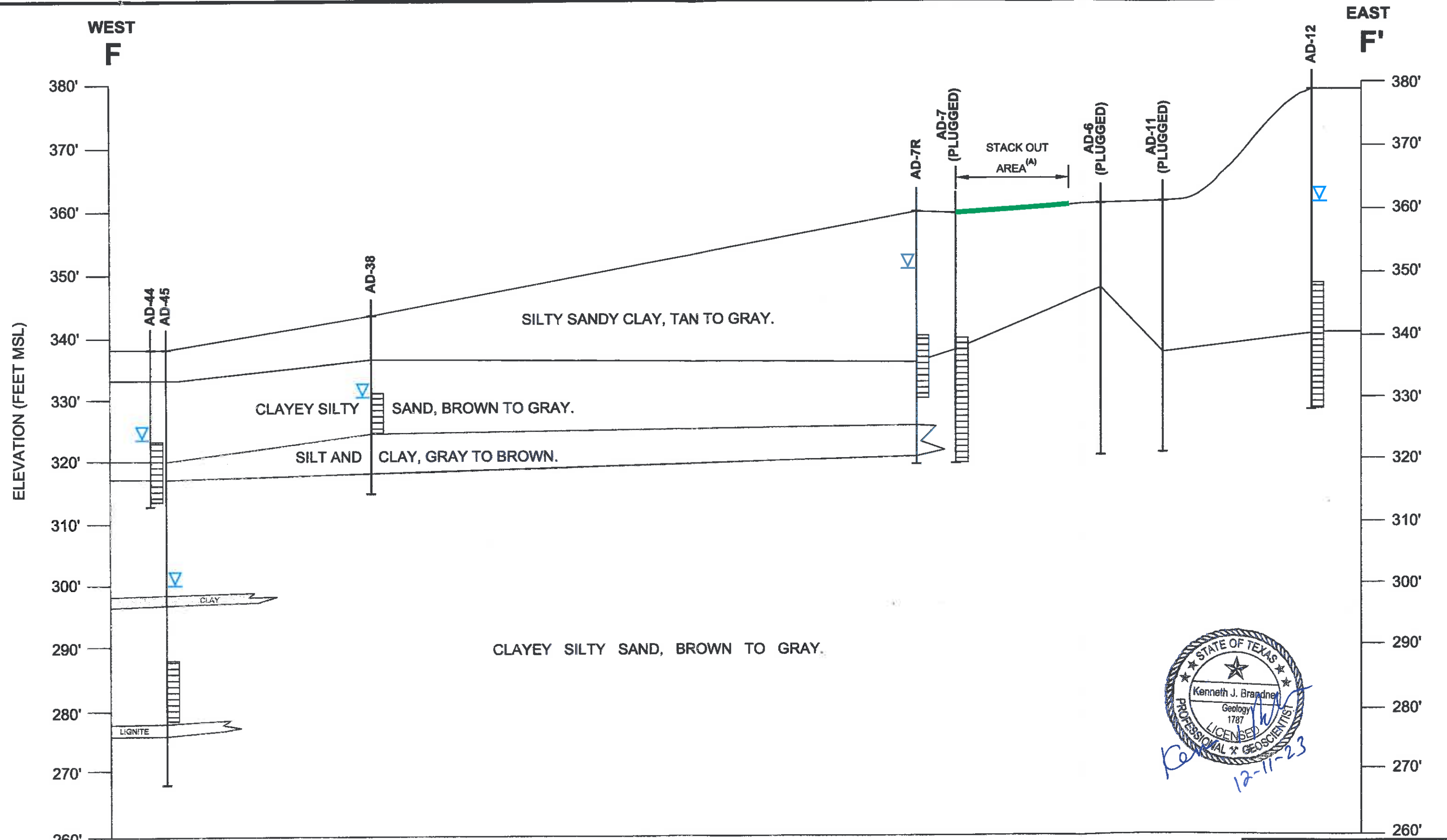
PIRKEY POWER PLANT
2400 FM 3251
HALLSVILLE, HARRISON COUNTY, TEXAS

**CROSS SECTION
E - E'**

FIGURE
8

ARCADIS

CITY: D:\GROUP: DE: LD: AM: PD: TM: TR: LYRONE-OFF-REF* G:\Active Projects\101102023\101102023-132 PM ACAD\ER-24-05 (LMS TECH) PAGES: 1-10 PLOT: 10/11/2023 8:50 AM BY: LEASE, DIANA



LEGEND

- MONITORING WELL SCREENED INTERVAL
- WATER LEVEL IN MONITORING WELL (9/12/23)
- BASE OF CCR UNIT

NOTES: BASE OF STACK OUT AREA CCR UNIT LOCATED AT GRADE.



PIRKEY POWER PLANT
2400 FM 3251
HALLSVILLE, HARRISON COUNTY, TEXAS

CROSS SECTION
F - F'

ARCADIS

FIGURE 9

ATTACHMENT B

SP-B4 Boring Log

Soil Boring Log

Project: AEP Pirkey

Boring/Well Name: _____ SP-B4

Project Location: _____ Hallsville, TX

Boring Date: __ 3/3/2020


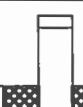

Depth Scale Feet	Water Table	Soil Profile Description	PID*
0		pp= pocket penetrometer	
		0.0'-0.4': Top soil, black silt, vegetation	
		0.4'-0.7': Brown clayey silt, good cohesion	
		0.7'-1.5': Red and light gray silty clay, moderate stiffness (pp. 2.5), high plasticity	
		1.5'-3.7': Maroon and light gray clay, high stiffness (pp. 4.5-5.0), low plasticity; iron ore present 3.1'-3.7'	
		3.7'-5.0': NO RECOVERY	
5		5.0'-7.0': Maroon and light gray clay, high stiffness (pp. 4.5-5.0), low plasticity; iron ore present throughout	
		7.0'-8.0': Light gray clay with iron ore, moderate stiffness (pp.2.5-3.0), moderate plasticity	
		8.0'-10.0': Maroon clay, moderate stiffness (pp. 3.5), moderate plasticity; iron ore present; moist at 9'	
10		10.0'-12.6': Maroon clay, moderate stiffness (pp. 3.5), moderate plasticity; iron ore present; wet at 12'	
	▼	12.6'-13.3': Tan clay, low stiffness (pp.1.5), high plasticity; wet	
		13.3'-18.5': Tan and brown clayey silt, moderate cohesion; iron ore present; wet	
15			
		18.5'-20.3': Maroon silty clay, low stiffness (pp. 1.0), moderate plasticity; iron ore; wet	
20		20.3'-21.1': Dark gray/black clay, trace silt, low stiffness (pp. 1.5), high plasticity; wet	
		21.1'-21.3': Dark gray silt, good cohesion; wet	
		21.3'-21.9': Dark gray silty clay, low stiffness (pp. 1.5), high plasticity; wet	
		21.9'-22.3': Dark gray silt, moderate cohesion; wet	
		22.3'-22.7': light brown silt; low cohesion; wet	
		22.7'-24.4': Dark gray and dark green silty clay, moderate/high stiffness (pp.3.5), moderate plasticity; wet, glauconite present	
25		24.4'-27.8': Dark green/gray fine grained sand, well sorted; wet; glauconite present	
		27.8'-30.0': Red and orange fine grained sand, well sorted, with iron ore; wet	
30			
		Samples collected at 6-8'; 18-20'; 28-30'	
		TD at 30' bgs; refusal	
		*PID readings not collected	
35			

Drill Rig Geoprobe 3230 DT
 Drilling Contractor: _____ C&S
 Driller: _____ DJ Diduch

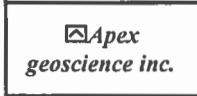
Geosyntec Consultants

ATTACHMENT C
AD-22 Boring Log and Well Installation Diagram

BORING MONITOR WELL
 APEX PROJECT NO.: 110-089 BORING NUMBER: _____ MONITOR WELL NUMBER: AD-22
 FACILITY NAME: AEP- Pirkey Power Plant FACILITY ID NO.: N/A
 FACILITY ADDRESS: Hallsville, Texas
 DRILLING COMPANY/METHOD/RIG: Apex Geoscience Inc. / Hollow-stem Augers/ CME-55 Track Rig
 DRILLER: Ed Wilson, Apex Geoscience Inc. COMPLETION DATE: 12/16/2010
 PREPARED BY: David Bedford LOGGED BY: David Bedford
 LATITUDE: N 32°27'03.3" Datum: WGS-84 WELL LOCATION: Triangle- South side Quansit Hut
 LONGITUDE: W94°29'41.3"

DEPTH (FEET)	P/D (PPM)	SAMPLE INTERVAL	WELL LOG AND COMPLETION DETAILS	USCS CODE	SOIL DESCRIPTION AND COMMENTS	Odor	Moisture	
1				0-0.5	SC	Clayey sand, light brown, very fine grained	None	Moist
2				0.5-12	CL	Lean clay, light brown mottled with light gray	None	Slightly Moist
3								
4						Few iron ore (small) pebbles in clayey sandy streaks		
5								
6								
7								
8								
9								
10								
11								
12								
13				12-20	SC	Clayey sand, grayish brown with orangish brown streaks, very fine grained	None	Slightly Wet
14						Slightly wet @ 12.5' from seepage		
15						Large amount of iron ore 15-17'		
16								
17								
18						Very firm 18-18.5'		
19								
20								
21				20-25	SC	(Dense crystalline rock 21-21.1'), light brown clayey sand, greenish black, mica, black clay streaks, very fine grained, wet @ 20'	None	Wet
22								
23								
24								
25								
26				25-30	SM	Sand, greenish brown (1') grading to orangish brown, silty, very fine grained	None	Wet
27								
28								
29								
30								
31						Boring Terminated at 30'		
32								
33								
34								
35								
36								
37								
38								
39								
40								

 Cement
  Bentonite
  Filter Sand
  Water Level



Total Depth: 30 feet Riser Interval: +3 (ags)-10'
 Filter Sand (Size/Interval): 8-30' Screen Interval: 10-30'
 Grout (Type/Interval): Grout from 0-2'; Bentonite from 2-8' Water level: 12.5'
 Surface Completion Flush Above Ground 3'

ATTACHMENT D
FGD Sludge Materials Analytical Report



AEP ANALYTICAL CHEMISTRY SERVICES

Analysis Report

02004
502 North Allen Ave.
Shreveport, LA 71101
Phone: (318) 673-3802
Fax: (318) 673-3960

Report ID : 40143	Company: SEP - Flint Creek (TW)	Address: 502 North Allen Avenue
Date Received: 07/18/2019	Contact: Terry Wehling	Shreveport, LA 71101
	Phone: (318) 673-2721	Fax: (318) 673-3960
AEP Sample ID : 227040	Collected Date: 07/17/2019	By: RF
Cust Sample ID: Dirt/Sludge	Location: H.W. Pirkey Power Plant	Matrix: Solid
Sample Desc.: Pirkey Sludge FGD Total		

Metals (227040)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Aluminum	20500	mg/Kg	12.5	1:2500	EPA 6010B 1996	07/26/2019 0:18		JDB
Antimony	0.993	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Arsenic	28.3	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Barium	142	mg/Kg	2.5	1:2500	EPA 6010B 1996	07/26/2019 0:18		JDB
Beryllium	2.12	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Boron	845	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:18	M4	JDB
Cadmium	1.68	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Calcium	77500	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:18		JDB
Chromium	30.6	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Cobalt	24.8	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Copper	30.2	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Dry Weight, Percent	94.7	%	0.001	1		07/22/2019 15:30	T5	JDB
Iron	36300	mg/Kg	12.5	1:2500	EPA 6010B 1996	07/26/2019 0:18	M4	JDB
Lead	5.31	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Lithium	11.5	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47	T5	JDB
Magnesium	7150	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:18		JDB
Manganese	498	mg/Kg	2.5	1:2500	EPA 6010B 1996	07/26/2019 0:18		JDB
Mercury	0.653	mg/Kg	0.000025	1	EPA 7471B 1998	07/24/2019 14:37		LNM
Molybdenum	8.45	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Nickel	28.8	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Potassium	1370	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:18		JDB
Selenium	36.4	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Silver	0.208	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Sodium	1230	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:18		JDB
Strontium	382	mg/Kg	2.5	1:2500	EPA 6010B 1996	07/26/2019 0:18		JDB
Thallium	0.503	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB

The results apply only to the samples as received in the laboratory. The analyses used to obtain the results meet NELAC requirement, if applicable. No part of this work may be altered in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems - without written permission of AEP Analytical Chemistry Services.



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Analysis Report

02004

502 North Allen Ave.
Shreveport, LA 71101
Phone: (318) 673-3802
Fax: (318) 673-3960

Report ID : 40143		Company: SEP - Flint Creek (TW)			Address: 502 North Allen Avenue			
Date Received: 07/18/2019		Contact: Terry Wehling			Shreveport, LA 71101			
		Phone: (318) 673-2721			Fax: (318) 673-3960			
Tin	1.28	mg/Kg	0.2	1:50	EPA 6010B 1996	07/26/2019 0:47	T5	JDB
Titanium	1360	mg/Kg	2.5	1:2500	EPA 6010B 1996	07/26/2019 0:18	M4	JDB
Vanadium	77.5	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Zinc	26	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 0:47		JDB
Waste Characterization (227040)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
pH, Soil	8.44	pH		1	EPA 9045D 2002	07/25/2019 12:30		GB

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502 North Allen Ave.
Shreveport, LA 71101
Phone: (318) 673-3802
Fax: (318) 673-3960

Report ID : 40143 Date Received: 07/18/2019	Company: SEP - Flint Creek (TW) Contact: Terry Wehling Phone: (318) 673-2721	Address: 502 North Allen Avenue Shreveport, LA 71101 Fax: (318) 673-3960
AEP Sample ID : 227041 Cust Sample ID: Dirt/Sludge Sample Desc.: Pirkey Sludge FGD SPLP	Collected Date: 07/17/2019 Location: H.W. Pirkey Power Plant	By: RF Matrix: Solid

SPLP (227041)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Aluminum	14.2	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Antimony	0.018	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Arsenic	0.015	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Barium	3.46	mg/L	0.05	1:50	EPA 1312/6010B 1996	07/25/2019 20:58		JDB
Beryllium	0.012	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Boron	22.3	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 20:58		JDB
Cadmium	0.002	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Calcium	2090	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 20:58		JDB
Chromium	0.005	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Cobalt	0.051	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Copper	0.009	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Iron	52.4	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 20:58		JDB
Lead	< 0.005	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Lithium	0.146	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Magnesium	62.3	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 20:58		JDB
Manganese	2.83	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Mercury	0.002272	mg/L	0.000025	1	EPA 7470A 1994	07/24/2019 14:05		LNM
Molybdenum	0.229	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Nickel	0.054	mg/L	0.025	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Potassium	9.61	mg/L	0.01	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Selenium	0.93	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Silver	< 0.001	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Sodium	35.6	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 20:58		JDB
Strontium	12.7	mg/L	0.05	1:50	EPA 1312/6010B 1996	07/25/2019 20:58		JDB
Thallium	< 0.005	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB
Tin	< 0.005	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09		JDB

The results apply only to the samples as received in the laboratory. The analyses used to obtain the results meet NELAC requirement, if applicable. No part of this work may be altered in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems - without written permission of AEP Analytical Chemistry Services.



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Analysis Report

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502 North Allen Ave.
Shreveport, LA 71101
Phone: (318) 673-3802
Fax: (318) 673-3960

Report ID : 40143 Date Received: 07/18/2019	Company: SEP - Flint Creek (TW) Contact: Terry Wehling Phone: (318) 673-2721	Address: 502 North Allen Avenue Shreveport, LA 71101 Fax: (318) 673-3960					
Titanium	0.041	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09	JDB
Vanadium	0.269	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:09	JDB
Zinc	0.299	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:09	JDB

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Report ID : 40143	Company: SEP - Flint Creek (TW)	Address: 502 North Allen Avenue
Date Received: 07/18/2019	Contact: Terry Wehling	Shreveport, LA 71101
	Phone: (318) 673-2721	Fax: (318) 673-3960
AEP Sample ID : 227042	Collected Date: 07/17/2019	By: RF
Cust Sample ID: Dirt/Sludge	Location: H.W. Pirkey Power Plant	Matrix: Solid
Sample Desc.: Pirkey Sludge FGD 7 Day Leachate		

7-Day Leachate (227042)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Aluminum	0.563	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Antimony	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Arsenic	0.011	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Barium	0.134	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Beryllium	< 0.001	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Boron	8.44	mg/L	0.5	1:50	EPA 6010B 1996	08/04/2019 17:43		JDB
Cadmium	< 0.001	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Calcium	252	mg/L	0.5	1:50	EPA 6010B 1996	08/04/2019 17:43		JDB
Chromium	< 0.001	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Cobalt	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Copper	0.002	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Iron	0.211	mg/L	0.01	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Lead	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Lithium	0.069	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Magnesium	6.73	mg/L	0.01	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Manganese	0.008	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Mercury	< 0.005	mg/L	0.005	1:200	EPA 7470A 1994	07/30/2019 10:19		LNLM
Molybdenum	0.18	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Nickel	< 0.025	mg/L	0.025	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Potassium	4.82	mg/L	0.01	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Selenium	0.208	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Silver	< 0.001	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Sodium	19.8	mg/L	0.5	1:50	EPA 6010B 1996	08/04/2019 17:43		JDB
Strontium	1.6	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Thallium	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB
Tin	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35		JDB

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Analysis Report

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502 North Allen Ave.
Shreveport, LA 71101
Phone: (318) 673-3802
Fax: (318) 673-3960

Report ID : 40143 Date Received: 07/18/2019	Company: SEP - Flint Creek (TW) Contact: Terry Wehling Phone: (318) 673-2721	Address: 502 North Allen Avenue Shreveport, LA 71101 Fax: (318) 673-3960				
Titanium	0.015 mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35	JDB
Vanadium	0.03 mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:35	JDB
Zinc	< 0.005 mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:35	JDB



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Phone: (318) 673-3802
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Report ID : 40143	Company: SEP - Flint Creek (TW)	Address: 502 North Allen Avenue
Date Received: 07/18/2019	Contact: Terry Wehling	Shreveport, LA 71101
	Phone: (318) 673-2721	Fax: (318) 673-3960
AEP Sample ID : 227043	Collected Date: 07/17/2019	By: RF
Cust Sample ID: Dirt/Sludge 2	Location: H.W. Pirkey Power Plant	Matrix: Solid
Sample Desc.: Pirkey Sludge FGD 2 Total		

Metals (227043)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Aluminum	19600	mg/Kg	12.5	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Antimony	0.919	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Arsenic	22.8	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Barium	121	mg/Kg	2.5	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Beryllium	1.66	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Boron	891	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:25	T5	JDB
Cadmium	1.37	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Calcium	84500	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Chromium	28.5	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Cobalt	20.3	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Copper	26.9	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Dry Weight, Percent	97.2	%	0.001	1		07/22/2019 15:30	T5	JDB
Iron	28800	mg/Kg	12.5	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Lead	5.78	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Lithium	12	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26	T5	JDB
Magnesium	7070	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Manganese	388	mg/Kg	2.5	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Mercury	0.606	mg/Kg	0.000025	1	EPA 7471B 1998	07/24/2019 14:27		LNM
Molybdenum	11	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Nickel	25.7	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Potassium	1460	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Selenium	30.4	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Silver	0.19	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Sodium	1780	mg/Kg	25	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Strontium	451	mg/Kg	2.5	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Thallium	0.562	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB

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Report ID : 40143		Company: SEP - Flint Creek (TW)			Address: 502 North Allen Avenue			
Date Received: 07/18/2019		Contact: Terry Wehling			Shreveport, LA 71101			
		Phone: (318) 673-2721			Fax: (318) 673-3960			
Tin	1.06	mg/Kg	0.2	1:50	EPA 6010B 1996	07/26/2019 1:26	T5	JDB
Titanium	1280	mg/Kg	2.5	1:2500	EPA 6010B 1996	07/26/2019 0:25		JDB
Vanadium	68.3	mg/Kg	0.05	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Zinc	33.8	mg/Kg	0.25	1:50	EPA 6010B 1996	07/26/2019 1:26		JDB
Waste Characterization (227043)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
pH, Soil	8.71	pH		1	EPA 9045D 2002	07/25/2019 12:30		GB

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Date Received: 07/18/2019	Contact: Terry Wehling	Shreveport, LA 71101
	Phone: (318) 673-2721	Fax: (318) 673-3960
AEP Sample ID : 227044	Collected Date: 07/17/2019	By: RF
Cust Sample ID: Dirt/Sludge 2	Location: H.W. Pirkey Power Plant	Matrix: Solid
Sample Desc.: Pirkey Sludge FGD 2 SPLP		

SPLP (227044)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Aluminum	10.5	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Antimony	0.017	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Arsenic	< 0.005	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Barium	2.57	mg/L	0.05	1:50	EPA 1312/6010B 1996	07/25/2019 21:06		JDB
Beryllium	0.009	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Boron	26.7	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 21:06		JDB
Cadmium	0.002	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Calcium	1960	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 21:06		JDB
Chromium	0.004	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Cobalt	0.051	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Copper	0.003	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Iron	47.7	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 21:06		JDB
Lead	< 0.005	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Lithium	0.136	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Magnesium	70.2	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 21:06		JDB
Manganese	2.87	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Mercury	< 0.000025	mg/L	0.000025	1	EPA 7470A 1994	07/24/2019 14:21		LNM
Molybdenum	0.288	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Nickel	0.071	mg/L	0.025	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Potassium	11.4	mg/L	0.01	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Selenium	0.775	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Silver	< 0.001	mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Sodium	56.7	mg/L	0.5	1:50	EPA 1312/6010B 1996	07/25/2019 21:06		JDB
Strontium	13.2	mg/L	0.05	1:50	EPA 1312/6010B 1996	07/25/2019 21:06		JDB
Thallium	< 0.005	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB
Tin	< 0.005	mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55		JDB

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Report ID : 40143 Date Received: 07/18/2019	Company: SEP - Flint Creek (TW) Contact: Terry Wehling Phone: (318) 673-2721	Address: 502 North Allen Avenue Shreveport, LA 71101 Fax: (318) 673-3960				
Titanium	0.037 mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55	JDB
Vanadium	0.194 mg/L	0.001	1	EPA 1312/6010B 1996	07/25/2019 23:55	JDB
Zinc	0.338 mg/L	0.005	1	EPA 1312/6010B 1996	07/25/2019 23:55	JDB



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AEP Sample ID : 227045 Cust Sample ID: Dirt/Sludge 2 Sample Desc.: Pirkey Sludge FGD 2 7 Day Leachate	Collected Date: 07/17/2019 Location: H.W. Pirkey Power Plant	By: RF Matrix: Solid
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7-Day Leachate (227045)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Aluminum	0.994	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Antimony	0.006	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Arsenic	0.031	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Barium	0.121	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Beryllium	< 0.001	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Boron	16.4	mg/L	0.5	1:50	EPA 6010B 1996	08/04/2019 17:53		JDB
Cadmium	< 0.001	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Calcium	633	mg/L	0.5	1:50	EPA 6010B 1996	08/04/2019 17:53		JDB
Chromium	< 0.001	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Cobalt	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Copper	0.003	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Iron	0.225	mg/L	0.01	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Lead	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Lithium	0.1	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Magnesium	9.54	mg/L	0.01	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Manganese	0.015	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Mercury	< 0.005	mg/L	0.005	1:200	EPA 7470A 1994	07/30/2019 10:36		LNLM
Molybdenum	0.448	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Nickel	< 0.025	mg/L	0.025	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Potassium	9.02	mg/L	0.01	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Selenium	0.201	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Silver	< 0.001	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Sodium	48.3	mg/L	0.5	1:50	EPA 6010B 1996	08/04/2019 17:53		JDB
Strontium	3.79	mg/L	0.05	1:50	EPA 6010B 1996	08/04/2019 17:53		JDB
Thallium	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Tin	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB

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Report ID : 40143	Company: SEP - Flint Creek (TW)	Address: 502 North Allen Avenue						
Date Received: 07/18/2019	Contact: Terry Wehling	Shreveport, LA 71101						
	Phone: (318) 673-2721	Fax: (318) 673-3960						
Titanium	0.02	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Vanadium	0.087	mg/L	0.001	1	EPA 6010B 1996	08/04/2019 19:45		JDB
Zinc	< 0.005	mg/L	0.005	1	EPA 6010B 1996	08/04/2019 19:45		JDB



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Company: SEP - Flint Creek (TW)
Contact: Terry Wehling
Phone: (318) 673-2721

Address: 502 North Allen Avenue
 Shreveport, LA 71101
Fax: (318) 673-3960

Quality Control Data

* Quality control units are the same as reported analytical results

Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
7/25/2019	Aluminum	226939.1	<0.005	2	2.0229733	101.1	2	2.071639	103.6		0.4	JDB
7/25/2019	Aluminum	227041.1	<0.005	2	2.0229733	101.1	2	2.2242	111.2		0.0	JDB
7/26/2019	Aluminum	227040.1	<12.5	2	2.0358232	101.8	100	132.38333	132.4		1.2	JDB
7/25/2019	Antimony	226939.1	<0.005	0.8	0.8092462	101.2	0.8	0.8159776	102.0		0.2	JDB
7/25/2019	Antimony	227041.1	<0.005	0.8	0.8092462	101.2	0.8	0.7671843	95.9		0.5	JDB
7/26/2019	Antimony	227040.1	<0.25	0.8	0.8071122	100.9	40	32.643192	81.6		1.8	JDB
7/25/2019	Arsenic	227041.1	<0.005	0.8	0.8086795	101.1	0.8	0.7758421	97.0		0.0	JDB
7/25/2019	Arsenic	226939.1	<0.005	0.8	0.8086795	101.1	0.8	0.8086275	101.1		0.1	JDB
7/26/2019	Arsenic	226915.1	<0.25	0.8	0.7906797	98.8	40	40.306278	100.8		0.8	JDB
7/26/2019	Arsenic	227040.1	<0.25	0.8	0.7940238	99.3	40	34.433917	86.1		2.3	JDB
7/25/2019	Barium	226939.1	<0.001	0.2	0.2080557	104.0	0.2	0.209543	104.8		0.1	JDB
7/25/2019	Barium	227041.1	<0.05	0.2	0.2080557	104.0	0.2	0.1829767	91.5		0.4	JDB
7/26/2019	Barium	227040.1	<2.5	0.2	0.2112650	105.6	500	543.5715	108.7		7.2	JDB
7/25/2019	Beryllium	226939.1	<0.001	0.2	0.2122779	106.1	0.2	0.2142832	107.1		0.3	JDB
7/25/2019	Beryllium	227041.1	<0.001	0.2	0.2122779	106.1	0.2	0.1992329	99.6		0.4	JDB
7/26/2019	Beryllium	227040.1	<0.05	0.2	0.2131235	106.6	10	9.40679	94.1		0.2	JDB
7/25/2019	Boron	226939.1	<0.01	0.3	0.2995651	99.9	0.3	0.2984183	99.5		0.7	JDB
7/25/2019	Boron	227041.1	<0.5	0.3	0.2995651	99.9	0.3	0.2855333	95.2		0.5	JDB
7/25/2019	Cadmium	227041.1	<0.001	0.2	0.2069934	103.5	0.2	0.1836838	91.8		0.6	JDB
7/25/2019	Cadmium	226939.1	<0.001	0.2	0.2069934	103.5	0.2	0.2061243	103.1		0.5	JDB
7/26/2019	Cadmium	226915.1	<0.05	0.2	0.1973571	98.7	10	10.058007	100.6		1.8	JDB
7/26/2019	Cadmium	227040.1	<0.05	0.2	0.2013293	100.7	10	8.0453767	80.5		1.6	JDB
7/25/2019	Calcium	226939.1	<0.01	1	1.0087505	100.9	1	1.0243667	102.4		0.9	JDB
7/26/2019	Calcium	227040.1	<25	1	0.8616568	86.2	50	113.63333	227.3		0.8	JDB
7/25/2019	Chromium	226939.1	<0.001	0.4	0.4116387	102.9	0.4	0.4125529	103.1		0.4	JDB
7/25/2019	Chromium	227041.1	<0.001	0.4	0.4116387	102.9	0.4	0.3867339	96.7		0.3	JDB
7/26/2019	Chromium	227040.1	<0.05	0.4	0.40798	102.0	20	17.692233	88.5		1.6	JDB
7/26/2019	Chromium	226915.1	<0.05	0.4	0.4059509	101.5	20	20.758823	103.8		0.8	JDB
7/25/2019	Cobalt	227041.1	<0.005	0.2	0.2043482	102.2	0.2	0.1839347	92.0		0.4	JDB
7/25/2019	Cobalt	226939.1	<0.005	0.2	0.2043482	102.2	0.2	0.2054714	102.7		0.4	JDB
7/26/2019	Cobalt	227040.1	<0.05	0.2	0.2032547	101.6	10	7.7614833	77.6		1.8	JDB
7/25/2019	Copper	227041.1	<0.001	0.3	0.3066399	102.2	0.3	0.2963301	98.8		0.1	JDB

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7/25/2019	Copper	226939.1	<0.001	0.3	0.3066399	102.2	0.3	0.3109092	103.6		0.1	JDB
7/26/2019	Copper	227040.1	<0.05	0.3	0.3124104	104.1	15	15.003017	100.0		1.9	JDB
7/25/2019	Iron	226939.1	<0.01	3	3.1158893	103.9	3	3.1231158	104.1		1.0	JDB
7/25/2019	Iron	227041.1	<0.5	3	3.1158893	103.9	150	159.28837	106.2		0.8	JDB
7/26/2019	Iron	227040.1	<12.5	3	3.0861005	102.9					3.1	JDB
7/25/2019	Lead	227041.1	<0.005	1	1.0430644	104.3	1	0.9320653	93.2		0.6	JDB
7/25/2019	Lead	226939.1	<0.005	1	1.0430644	104.3	1	1.0416574	104.2		0.4	JDB
7/26/2019	Lead	226915.1	<0.25	1	1.0147827	101.5	50	51.881956	103.8		1.4	JDB
7/26/2019	Lead	227040.1	<0.25	1	1.0194305	101.9	50	41.227533	82.5		1.1	JDB
7/25/2019	Lithium	227041.1	<0.001	0.2	0.2119096	106.0	0.2	0.2353987	117.7		0.1	JDB
7/25/2019	Lithium	226939.1	<0.001	0.2	0.2119096	106.0	0.2	0.2163799	108.2		0.4	JDB
7/26/2019	Lithium	227040.1	<0.05	0.2	0.211291	105.6	10	11.698417	117.0		2.8	JDB
7/25/2019	Magnesium	226939.1	<0.01	2	2.0868175	104.3	2	2.0877567	104.4		0.2	JDB
7/25/2019	Magnesium	227041.1	<0.5	2	2.0868175	104.3	2	1.9791333	99.0		0.6	JDB
7/26/2019	Magnesium	227040.1	<25	2	2.0570549	102.9	100	76.916667	76.9		1.4	JDB
7/25/2019	Manganese	226939.1	<0.001	0.2	0.2072869	103.6	0.2	0.2077536	103.9		0.2	JDB
7/25/2019	Manganese	227041.1	<0.001	0.2	0.2072869	103.6	0.2	0.16684	83.4		0.7	JDB
7/26/2019	Manganese	227040.1	<2.5	0.2	0.2066368	103.3	500	572.398	114.5		1.1	JDB
7/24/2019	Mercury	227041.1	<0.00002	0.001	0.00097	97.0	0.2	0.16373	81.9		7.0	LNLM
7/24/2019	Mercury	227040.1	<0.00002	0.001	0.00097	97.0	0.04	0.0496	124.0		4.4	LNLM
7/30/2019	Mercury	227042.1	<0.005	0.001	0.0009	90.0	0.2	0.156162	78.1		4.0	LNLM
7/25/2019	Molybdenum	227041.1	<0.005	0.2	0.2067657	103.4	0.2	0.197727	98.9		0.5	JDB
7/25/2019	Molybdenum	226939.1	<0.005	0.2	0.2067657	103.4	0.2	0.2076129	103.8		0.4	JDB
7/26/2019	Molybdenum	227040.1	<0.05	0.2	0.2073308	103.7	10	9.2486833	92.5		0.4	JDB
7/25/2019	Nickel	227041.1	<0.025	0.5	0.5192594	103.9	0.5	0.46183	92.4		0.6	JDB
7/25/2019	Nickel	226939.1	<0.025	0.5	0.5192594	103.9	0.5	0.5209379	104.2		0.6	JDB
7/26/2019	Nickel	227040.1	<0.05	0.5	0.5228273	104.6	25	19.992767	80.0		1.9	JDB
7/25/2019	Potassium	227041.1	<0.01	10	9.3692109	93.7	10	11.11754	111.2		0.3	JDB
7/25/2019	Potassium	226939.1	<0.01	10	9.3692109	93.7	10	9.4631223	94.6		0.2	JDB
7/26/2019	Potassium	227040.1	<25	10	9.1397018	91.4	500	428.035	85.6		2.9	JDB
7/25/2019	Selenium	226939.1	<0.005	2	1.9998495	100.0	2	1.9816300	99.1		0.8	JDB
7/25/2019	Selenium	227041.1	<0.005	2	1.9998495	100.0	2	1.991203	99.6		0.7	JDB
7/26/2019	Selenium	227040.1	<0.25	2	1.9551138	97.8	100	89.733067	89.7		3.0	JDB
7/25/2019	Silver	227041.1	<0.001	0.075	0.0712930	95.1	0.075	0.0708639	94.5		0.2	JDB
7/25/2019	Silver	226939.1	<0.001	0.075	0.0712930	95.1	0.075	0.0714285	95.2		0.1	JDB
7/26/2019	Silver	227040.1	<0.05	0.075	0.0712215	95.0	3.75	3.6188628	96.5		0.5	JDB

The results apply only to the samples as received in the laboratory. The analyses used to obtain the results meet NELAC requirement, if applicable. No part of this work may be altered in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems - without written permission of AEP Analytical Chemistry Services.

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AEP ANALYTICAL CHEMISTRY SERVICES

Analysis Report

02004
502 North Allen Ave.
Shreveport, LA 71101
Phone: (318) 673-3802
Fax: (318) 673-3960

Report ID : 40143		Company: SEP - Flint Creek (TW)				Address: 502 North Allen Avenue						
Date Received: 07/18/2019		Contact: Terry Wehling				Shreveport, LA 71101						
		Phone: (318) 673-2721				Fax: (318) 673-3960						
7/25/2019	Sodium	227041.1	<0.5	3	3.1384831	104.6	3	2.3746333	79.2		0.0	JDB
7/25/2019	Sodium	226939.1	<0.01	3	3.1384831	104.6	3	2.4693667	82.3		0.1	JDB
7/26/2019	Sodium	227040.1	<25	3	3.1256605	104.2	150	120.525	80.4		1.9	JDB
7/25/2019	Strontium	226939.1	<0.001	0.2	0.2059899	103.0	0.2	0.2081687	104.1		0.4	JDB
7/26/2019	Strontium	227040.1	<2.5	0.2	0.2078256	103.9	500	577.76733	115.6		17.9	JDB
7/25/2019	Thallium	227041.1	<0.005	0.4	0.4152040	103.8	0.4	0.3682771	92.1		1.2	JDB
7/25/2019	Thallium	226939.1	<0.005	0.4	0.4152040	103.8	0.4	0.4171124	104.3		0.0	JDB
7/26/2019	Thallium	227040.1	<0.25	0.4	0.4155052	103.9	20	15.947380	79.7		1.2	JDB
7/25/2019	Tin	226939.1	<0.005	0.7	0.6995446	99.9	0.7	0.6930628	99.0		0.2	JDB
7/25/2019	Tin	227041.1	<0.005	0.7	0.6995446	99.9	0.7	0.644164	92.0		0.2	JDB
7/26/2019	Tin	227040.1	<0.2	0.7	0.6896072	98.5	35	28.438362	81.3		0.8	JDB
7/25/2019	Titanium	227041.1	<0.005	0.2	0.2109341	105.5	0.2	0.2098874	104.9		0.2	JDB
7/25/2019	Titanium	226939.1	<0.005	0.2	0.2109341	105.5	0.2	0.2124567	106.2		0.1	JDB
7/26/2019	Titanium	227040.1	<2.5	0.2	0.2121079	106.1					1.6	JDB
7/25/2019	Vanadium	226939.1	<0.001	0.3	0.3076519	102.6	0.3	0.3104754	103.5		0.4	JDB
7/25/2019	Vanadium	227041.1	<0.001	0.3	0.3076519	102.6	0.3	0.2997157	99.9		0.6	JDB
7/26/2019	Vanadium	227040.1	<0.05	0.3	0.30789	102.6	15	15.291667	101.9		0.0	JDB
7/25/2019	Zinc	226939.1	<0.005	0.2	0.2091679	104.6	0.2	0.2081374	104.1		0.3	JDB
7/25/2019	Zinc	227041.1	<0.005	0.2	0.2091679	104.6	0.2	0.1851907	92.6		0.1	JDB
7/26/2019	Zinc	227040.1	<0.25	0.2	0.2074233	103.7	10	8.4881167	84.9		0.5	JDB

Code Code Description

- M4 The analysis of the spiked sample required a dilution such that the spike recovery calculation does not provide useful information. The associated blank spike recovery was acceptable.
- T5 This parameter is not included in the Laboratory's LELAP Laboratory Scope of Accreditation.



 Quality Assurance Officer

05-Aug-19
Report Date

Figure 1 - Chain of Custody

American Electric Power
Analytical Chemistry Services

CHAIN OF CUSTODY

COC 40143

OPCO/PROJECT NAME H.W. Pirkey		FAX NO.		ANALYSIS REQUESTED			
Power Plant		(903) 927-5840		Metals to analyze for each (Total SPL, Deionized) Bi, Ca, Sb, As, Ba, Be, Cd, Cr Co, Pb, Li, Hg, Ni, Se, Te and any other metals in calibration.			
CONTACT PERSON (Please Print) Ron Franklin, Randy Rountree, Ben House		PHONE NO. (903) 927-5889					
SAMPLE SIGNATURE <i>Ron Franklin</i>							
DATE	TIME	SAMPLE SOURCE & DESCRIPTION	SAMPLE ID	C G O R M A P B	NUMBER OF CONTAINERS	Lab Number	REMARKS
7-17-19	1800	Pirkey Sludge FGD	Dirt Sludge	✓	✓	927040-42	Tony Wehling
11 " "	1800	" "	Dirt Sludge	✓	✓	227043-45	
RELINQUISHED BY (SIGN)		DATE/TIME	RECEIVED BY	RELINQUISHED BY (SIGN)		DATE/TIME	RECEIVED BY
RELINQUISHED BY (SIGN)		DATE/TIME	RECEIVED BY	RELINQUISHED BY (SIGN)		DATE/TIME	RECEIVED BY
RECEIVED FOR LABORATORY		RECEIVED BY		COMMENTS			
<i>Jonathan Bandillo</i>		7-18-19 1036					



SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.
Shreveport, LA 71101
Phone 318-673-3802
FAX 318-673-3960

PROJECT RECEIPT FORM

Container Type Ice Chest <input type="checkbox"/> Bag <input checked="" type="checkbox"/> Action Pak <input type="checkbox"/> PCB Mailer <input type="checkbox"/> Bottle <input type="checkbox"/> Other _____				Delivery Type UPS <input type="checkbox"/> FEDEX <input type="checkbox"/> US Mail <input type="checkbox"/> Walk in <input checked="" type="checkbox"/> Shuttle <input type="checkbox"/> Other _____			
				Tracking # _____			

Client Terry Wehling
 Received By JOB
 Received Date 7-18-19
 Open Date 7-18-19

Sample Matrix
 DGA PCB Oil Water Oil Soil
 Solid Liquid Other _____

Container Temp Read NA
Thermometer Serial #F04103
 Correction Factor _____
 Corrected Temp _____

Project I.D. _____

Were samples received on ice? YES NO

Did container arrive in good condition? YES NO

Was sample documentation received? YES NO

Was documentation filled out properly? YES NO

Were samples labeled properly? YES NO

Were correct containers used? YES NO

Were the pH's of samples appropriately checked? YES NO

Total number of sample containers 2

Was any corrective action taken? NO Person Contacted _____
 Date & Time _____

Comments _____

ATTACHMENT E
AD-33 Soil Samples Analytical Report

Client: Burns & McDonnell
 Project: 106665 PIRKEY
 Sample ID: AD-33 (11')
 Legal Location:
 Collection Date: 4/30/2018 16:05

Date: 08-Jun-18
 Work Order: 1805081
 Lab ID: 1805081-15
 Matrix: SOIL
 Percent Moisture: 18.1

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Gamma Spectroscopy Results						
			SOP 713		Prep Date: 5/17/2018	PrepBy: MRL
Ra-226	1.29 (+/- 0.3)	G	0.47	pCi/g	NA	6/7/2018 08:54
Ra-228	1.36 (+/- 0.47)	G,TI	0.7	pCi/g	NA	6/7/2018 08:54
ICPMS Metals						
			SW6020		Prep Date: 5/14/2018	PrepBy: JML
ARSENIC	4.9		0.23	MG/KG	10	5/17/2018 01:02
BARIUM	20		0.57	MG/KG	10	5/17/2018 01:02
BERYLLIUM	0.15		0.057	MG/KG	10	5/17/2018 01:02
CADMIUM	ND		0.23	MG/KG	10	5/17/2018 01:02
COBALT	0.61		0.57	MG/KG	10	5/17/2018 01:02
CHROMIUM	9.5		1.1	MG/KG	10	5/17/2018 01:02
LITHIUM	0.25	J	2.3	MG/KG	10	5/17/2018 01:02
MOLYBDENUM	0.18	J	0.23	MG/KG	10	5/17/2018 01:02
LEAD	3.2		0.23	MG/KG	10	5/17/2018 01:02
ANTIMONY	0.086	J	0.11	MG/KG	10	5/17/2018 01:02
SELENIUM	0.81	J	1.1	MG/KG	10	5/17/2018 01:02
THALLIUM	0.044		0.011	MG/KG	10	5/17/2018 01:02
Ion Chromatography						
			EPA300.0		Prep Date: 5/10/2018	PrepBy: HMA
FLUORIDE	ND		1	MG/KG	1	5/11/2018 21:43
Mercury						
			SW7471		Prep Date: 5/11/2018	PrepBy: AJL2
MERCURY	0.0026	J	0.039	MG/KG	1	5/11/2018 16:07

Client: Burns & McDonnell

Date: 08-Jun-18

Project: 106665 PIRKEY

Work Order: 1805081

Sample ID: AD-33 (21')

Lab ID: 1805081-16

Legal Location:

Matrix: SOIL

Collection Date: 4/30/2018 16:05

Percent Moisture: 20.0

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Gamma Spectroscopy Results						
			SOP 713		Prep Date: 5/17/2018	PrepBy: MRL
Ra-226	0.7 (+/- 0.22)	LT	0.37	pCi/g	NA	6/7/2018 08:16
Ra-228	0.72 (+/- 0.5)	NQ	0.67	pCi/g	NA	6/7/2018 08:16
ICPMS Metals						
			SW6020		Prep Date: 5/14/2018	PrepBy: JML
ARSENIC	12		0.25	MG/KG	10	5/17/2018 01:05
BARIUM	9.1		0.62	MG/KG	10	5/17/2018 01:05
BERYLLIUM	0.09		0.062	MG/KG	10	5/17/2018 01:05
CADMIUM	ND		0.25	MG/KG	10	5/17/2018 01:05
COBALT	0.64		0.62	MG/KG	10	5/17/2018 01:05
CHROMIUM	4.6		1.2	MG/KG	10	5/17/2018 01:05
LITHIUM	0.24	J	2.5	MG/KG	10	5/17/2018 01:05
MOLYBDENUM	0.061	J	0.25	MG/KG	10	5/17/2018 01:05
LEAD	1.5		0.25	MG/KG	10	5/17/2018 01:05
ANTIMONY	0.19		0.12	MG/KG	10	5/17/2018 01:05
SELENIUM	0.42	J	1.2	MG/KG	10	5/17/2018 01:05
THALLIUM	0.03		0.012	MG/KG	10	5/17/2018 01:05
Ion Chromatography						
			EPA300.0		Prep Date: 5/10/2018	PrepBy: HMA
FLUORIDE	ND		1	MG/KG	1	5/11/2018 22:29
Mercury						
			SW7471		Prep Date: 5/11/2018	PrepBy: AJL2
MERCURY	0.0038	J	0.04	MG/KG	1	5/11/2018 16:09

ATTACHMENT F
AD-33 Boring Log and Well Installation Diagram



Monitor Well

Monitor Well No.: AD-33



PROJECT INFORMATION

PROJECT: Pitkey Power Plant
 PROJECT NO.: I-04-1021
 LOGGED BY: Jeffrey D. Sammons, P.G.
 SUPERVISING PG: Jeffrey D. Sammons, P.G.
 COMPLETION: 12/11/2016
 DEVELOPMENT: 12/16/2016
 SITE LOCATION: 2400 FM 3261, Hallsville, Texas
 WELL OWNER: AEP

DRILLING INFORMATION

DRILLER: Buford Collier
 DRILLER'S LICENSE NO.: 60089
 RIG TYPE: Geoprobe 3230DT
 METHOD OF DRILLING: Hollow Stem Auger
 SAMPLING METHODS: Split Core
 SURFACE ELEVATION: 362.37 (Top of Casing)
 HOLE DIAMETER: 8.25"
 LATITUDE 32 27' 38.70" LONGITUDE 94 28' 15.82"

TBPG No. 50027

Water Level Upon Installation Water Level at Time of Drilling Geotechnical Lab Sample

DESCRIPTION	USCS	SOIL SYMBOLS	DEPTH	WATER LEVEL	SAMPLE	% MOISTURE	% FINES	LL	PL	PI	WELL CONSTRUCTION
			4								<p>Locking Well Casing Cover Locking Well Cap Protective Well Casing Concrete Pad Ground Surface Cement Bentonite 2" Sch. 40 PVC Riser 20/40 Silica Sand 0.010" Slotted Sch. 40 PVC Well Screen PVC Bottom Cap</p>
CLAYEY SAND: very fine to fine sand, some silt, dark brownish black and brown, very moist	SC		0								
FAT CLAY: trace sand and silt, reddish brown and light gray - some iron ore gravel at 2.0' - some silt and ironstone in thin seams at 2.5', light gray, yellowish brown, and reddish brown,	CH		1			29	93	74	32	42	
CLAYEY SAND: Interbedded clays and fine to very fine sand and silt, some iron ore gravel, light reddish brown and light gray - some clay and trace of iron ore gravel at 11', light gray and reddish brown, moist - trace clay at 13', thin saturated ironstone and gravel seams at 13' to 16', reddish brown, light reddish brown, and light gray - dark reddish brown at 15' - clay lense at 15.5' to 16.5', light reddish brown and light gray	SC		8			21	35	35	23	12	
SILTY CLAYEY SAND: very fine to fine sand, reddish brown, very moist to saturated - some clay lenses and iron ore gravel at 20' - clayey at 20.5' to 21' - trace clay at 21', light gray, saturated	SM-SC		17			23	19	27	18	9	
CLAYEY SAND: very fine to fine sand, dark gray and gray, moist	SC		28			23	30	25	18	7	

NOTES: This log should not be used separately from the original report. Not all USCS descriptors were laboratory verified.

ATTACHMENT G
Certification by a Qualified Professional Engineer

CERTIFICATION BY A QUALIFIED PROFESSIONAL ENGINEER

I certify that the above described alternative source demonstration is appropriate for evaluating the groundwater monitoring data for the Pirkey FGD Stackout Area CCR management area and that the requirements of 30 TAC §352.951(e) have been met.

Beth Ann Gross
Printed Name of Licensed Professional Engineer

Beth Ann Gross
Signature



Geosyntec Consultants
2039 Centre Pointe Blvd, Suite 103
Tallahassee, Florida 32308

Texas Registered Engineering Firm
No. F-1182

79864
License Number

Texas
Licensing State

December 6, 2024
Date

APPENDIX 4- Field Reports

CCR Groundwater Monitoring Well Inspection Form

Facility: AEP Plantry PP Sampling Period: FEBRUARY 2024
 Sampling Contractor: EA&E Signature: [Signature]

Well No.	Well Locked	Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Casing, Housing, and Pad in Good Shape	Well Properly Labeled	Well cap present	Comments
AD-13	✓	✓	✓	✓	✓	✓	✓	
AP-33	✓	✓	✓	✓	✓	✓	✓	
AO-22	✓	✓	✓	✓	✓	✓	✓	
AO-7R	✓	✓	✓	✓	✓	✓	✓	
B-3	✓	✓	✓	✓	✓		✓	NO LABEL
AO-18	✓	✓	✓	✓	✓	✓	✓	
AO-4	✓	✓	✓		✓	✓	✓	ACCESS LIMIT
AD-2	✓	✓	✓	✓	✓	✓	✓	
AO-28	✓	✓	✓	✓	✓	✓	✓	
AO-17	✓	✓	✓	✓	✓	✓	✓	

ALONG STEEP SLOPE

Instructions: Complete form and submit to AEP Environmental Services with Field Data. Place check mark for items that are satisfactory. Unsatisfactory items should be left blank with a note in the comments section on what needs to be remedied.

CCR Groundwater Monitoring Well Inspection Form

Facility: Piney Sampling Period: Feb 2024
 Signature: [Signature] Signature: [Signature]
 Sampling Contractor: Fisk

Well No.	Well Locked	Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Casing, Housing, and Pad in Good Shape	Well Properly Labeled	Well cap present	Comments
B-2	✓	✓	✓	✓	✓	✓	✓	Well will not close
AD-12	✓	✓	✓	✓	✓	✓	✓	
AD-32	✓	✓	✓	✓	✓	✓	✓	
AD-31	✓	✓	✓	✓	✓	✓	✓	
AD-30	✓	✓	✓	✓	✓	✓	✓	
AD-36	✓	✓	✓	✓	✓	✓	✓	
AD-25	✓	✓	✓	✓	✓	✓	✓	
AD-26	✓	✓	✓	✓	✓	✓	✓	
AD-3	✓	✓	✓	✓	✓	✓	✓	

Instructions: Complete form and submit to AEP Environmental Services with Field Data. Place check mark for items that are satisfactory. Unsatisfactory items should be left blank with a note in the comments section on what needs to be remedied.

Facility Name	ATP Piping PP
Sample by	Kenny McDonald

Sample Location ID	A0-2
--------------------	------

Depth to water, feet (TOC)	15.89
Measured Total Depth, feet (TOC)	40.36

Depth to water date	02/20/24
---------------------	----------

Purge Stabilization Data								
Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
1025	16.04	220	4.50	758	1.8	3.98	433	18.58
1030	16.06	220	4.54	750	1.1	2.26	435	19.01
1035	16.04	220	4.53	758	0.0	2.20	436	19.12
1040	16.02	220	4.53	758	0.0	2.19	435	19.24

Total volume purged	
Sample appearance	Clear
Sample time	1092
Sample date	02/20/24

Facility Name	Pikeview
Sample by	19.584 Tr. Miller

Depth to water, feet (TOC)	34.56
Measured Total Depth, feet (TOC)	57.45

Sample Location ID AD.3

Depth to water date 2-26-24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
1105	34.74	220	4.91	135	26.7	1.43	414	22.42
1110	34.85	220	4.87	134	18.5	1.28	308	22.35
1115	34.92	220	4.83	133	18.1	1.20	195	22.29
1120	34.96	220	4.82	130	18.8	1.16	191	22.28

Total volume purged	
Sample appearance	Clear
Sample time	1125
Sample date	2-26-24

Facility Name	ALC PICKUPPP
Sample by	KIRBY MIDNARD

Sample Location ID	AD-7R
--------------------	-------

Depth to water, feet (TOC)	6.93
Measured Total Depth, feet (TOC)	33.03

Depth to water date	02/19/24
---------------------	----------

Purge Stabilization Data								
Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
1111	7.13	220	5.30	277	4.8	2.08	362	18.39
1116	7.17	220	5.37	268	1.6	1.95	361	18.47
1121	7.21	220	5.39	261	1.3	1.93	361	18.51
1126	7.26	220	5.39	257	1.0	1.87	360	18.54

Total volume purged	
Sample appearance	CLAR
Sample time	1128
Sample date	02/19/24

Facility Name	ALCO PULP & P.P.
Sample by	KIMMY McDONALD

Sample Location ID	AD-18
--------------------	-------

Depth to water, feet (TOC)	4.54
Measured Total Depth, feet (TOC)	28.42

Depth to water date	02/19/24
---------------------	----------

Purge Stabilization Data										
Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (μ S/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature ($^{\circ}$ C)		
1238	5.51	106	4.52	57	24.7	2.83	447	16.93		
1243	6.43	106	4.47	56	13.9	2.51	464	17.24		
				WON'T HOLD WATER						

Total volume purged	
Sample appearance	CLAR
Sample time	0829
Sample date	02/20/24

Facility Name	ATP Plant #1
Sample by	KIRBY M. DOMAN

Sample Location ID	AD-22
--------------------	-------

Depth to water, feet (TOC)	8.34
Measured Total Depth, feet (TOC)	32.70

Depth to water date	02/19/24
---------------------	----------

Purge Stabilization Data									
Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)	
1027	8.43	170	4.05	824	12.2	3.16	361	17.57	
1032	8.44	170	4.08	879	6.4	2.09	355	17.97	
1037	8.46	170	4.09	885	5.8	2.04	352	18.09	
1042	8.46	170	4.11	891	6.2	1.93	350	18.15	

Total volume purged	CLM
Sample appearance	1044
Sample time	02/19/24
Sample date	

Facility Name	Plywood
Sample by	M. St / N. Smith

Sample Location ID	AD-25
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Depth to water, feet (TOC)	9.33
Measured Total Depth, feet (TOC)	27.38

Depth to water date	2-20-24
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Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
501	9.76	125	3.86	1180	71.9	0.04	509	23.42
506	9.75	125	4.01	1100	42.8	1.01	278	22.78
511	5.86	125	4.14	1020	33.6	1.17	232	22.51
516	5.35	125	4.26	1000	33.5	1.24	221	22.46
521	6.07	125	4.29	985	33.8	1.27	216	22.37

Total volume purged	
Sample appearance	clear
Sample time	9:23
Sample date	2-20-24

Facility Name Plywood
 Sample by N. H. / H. M. / W. Y.

Depth to water, feet (TOC) 16.52
 Measured Total Depth, feet (TOC) 42.73

Sample Location ID AD-26

Depth to water date 2.20.24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
10:02	17.05	300	3.56	1870	8.5	0.04	473	22.81
10:07	17.21	300	3.67	1840	7.8	0.22	415	22.65
10:08	17.33	300	3.68	1870	6.2	0.27	319	22.63
10:17	17.48	300	3.70	1870	5.1	0.28	352	22.58
10:22	17.61	300	3.71	1880	4.5	0.31	374	22.59

Total volume purged _____
 Sample appearance Clear
 Sample time 10:24
 Sample date 2.20.24

Facility Name Pillkey
 Sample by Matt Hemilly

Sample Location ID AP-32

Depth to water, feet (TOC) 15.42
 Measured Total Depth, feet (TOC) 34.61

Depth to water date 2-21-24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (μ S/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
626	15.45	220	4.54	141	118	0.24	484	13.75
634	16.05	220	4.61	173	125	0.15	463	15.75
635	16.13	220	4.66	185	88.6	0.16	425	17.30
644	16.17	220	4.74	188	32.1	0.15	352	17.85
645	16.20	220	4.75	196	19.8	0.15	376	18.04
654	16.22	220	4.81	191	15.5	0.14	370	18.12

Total volume purged
 Sample appearance clear
 Sample time 9:56
 Sample date 2-19-24

Facility Name	Pilkus
Sample by	M. Ant / Hamill

Sample Location ID AD-36

Depth to water, feet (TOC)	6.58
Measured Total Depth, feet (TOC)	17.00

Depth to water date 2-20-24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
824	6.51	220	4.45	206	20.0	0.06	487	23.77
825	6.43	220	4.13	93	18.6	0.06	506	22.53
834	6.44	220	4.11	79	9.9	0.06	509	22.14

Total volume purged	
Sample appearance	Clear
Sample time	8:36
Sample date	2-20-24

Facility Name	Pilling
Sample by	M. H. Hamilton

Sample Location ID: B-2

Depth to water, feet (TOC)	15.85
Measured Total Depth, feet (TOC)	51.44

Depth to water date: 2-19-24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (μ S/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature ($^{\circ}$ C)
8:01	16.25	300	3.45	183	14.6	0.23	460	14.25
8:06	16.25	300	3.80	178	14.7	0.22	471	13.24
8:11	16.27	300	4.01	123	15.2	0.18	466	13.31
8:16	16.25	300	4.05	121	14.2	0.18	463	13.68

Total volume purged	
Sample appearance	Clear
Sample time	8:15
Sample date	2-19-24

Aug - 1330

CCR Groundwater Monitoring Well Inspection Form

Facility: APP P1001 PP Sampling Period: APRIL 2024
 Sampling Contractor: EAGLE Signature: [Signature]

Well No.	Well Locked	Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Casing, Housing, and Pad in Good Shape	Well Properly Labeled	Well cap present	Comments
AD-13	✓	✓	✓	✓	✓	✓	✓	
AD-7R	✓	✓	✓	✓	✓		✓	NO LABEL
AD-22	✓	✓	✓	✓	✓	✓	✓	
AD-33	✓	✓	✓	✓	✓	✓	✓	
AD-02	✓	✓	✓	✓	✓	✓	✓	
AD-36	✓	✓	✓	✓	✓	✓	✓	
AD-08	✓	✓	✓	✓	✓	✓	✓	
AD-18	✓	✓	✓	✓	✓	✓	✓	
B-3	✓	✓	✓	✓	✓		✓	NO LABEL
AD-27	✓	✓	✓	✓	✓	✓	✓	
AD-04	✓	✓	✓		✓	✓	✓	ONLY ACCESS ALONG STEPS
AD-16	✓		✓		✓	✓	✓	NEEDS NEW LOCK

Instructions: Complete form and submit to AEP Environmental Services with Field Data. Place check mark for items that are satisfactory. Unsatisfactory items should be left blank with a note in the comments section on what needs to be remedied.

AS A WHOLE MAINTENANCE IS LESS. MOWING & WEEDING AROUND WELLS DOESN'T APPEAR TO BE BEING PERFORMED

RIGHT OF WAY TO WILL NEED CLEANING

CCR Groundwater Monitoring Well Inspection Form

Facility: Pirkey
 Sampling Contractor: Egk

Sampling Period: April 2024
 Signature: [Signature]

Well No.	Well Locked	Fastener and Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Casing, Protective Cover, Barriers and Pad in Good Shape	Well Properly Labeled	Well Cap Present and Vented*	Comments
B-2				/			/	
AD-12	/	/	-	/	-	/	/	Well protected. Pad won't close
AD-32	/	-	/	/	-	-	/	
AD-31	/	/	/	-	/		-	
AD-30	/	/	-	/	-	-	/	no label
AD-28	/	-	/		/	-	-	
AD-17	/	/	/	/	-	/	/	Starting to overflow
AD-3	/	/	/	/	-	-	/	
AD-26	/	/	/		/	-	-	Starting to overflow
AD-25	/	/	/		/	/	/	overflowing; road removed
AD-34	/	/	/		/	/	/	
AD-23	/	/	/	/	/	/	/	road removed

*Not all wells will be vented, especially flush mounted wells. If that is the case, please note "flush mount well" in the comments.

Facility Name: App River OPP
 Sample by: Kenny McDaniel

Sample Location ID: A0-04

Depth to water, feet (TOC): 10.53
 Measured Total Depth, feet (TOC): 47.29

Depth to water date: 04/24/24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mv)	Temperature (°C)
0919	10.82	178	4.61	112	28.2	3.21	402	22.61
0924	10.86	178	4.61	111	27.9	3.18	404	22.62
0929	10.92	178	4.62	110	27.8	3.15	406	22.62

Total volume purged: 66 min
 Sample appearance: 0931
 Sample time: 04/24/24
 Sample date: 04/24/24

Facility Name	Atto Pinnac PP
Sample by	Kenny M. Donato

Sample Location ID AD-7K

Depth to water, feet (TOC)	5.32
Measured Total Depth, feet (TOC)	33.03

Depth to water date 04/22/24

Purge Stabilization Data										
Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0908	5.36	224	4.81	264	6.2	3.42	145	18.80		
0903	5.36	224	4.50	258	2.1	2.16	179	18.94		
0918	5.38	224	4.49	255	1.8	2.10	180	18.96		
0923	5.39	224	4.47	252	1.8	2.08	184	18.99		

Total volume purged	
Sample appearance	clear
Sample time	0925
Sample date	04/22/24

Duplicate - 1 1400

Facility Name	ATP Pumps PP
Sample by	Kenny McDonald

Sample Location ID	AD-08
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Depth to water, feet (TOC)	11.98
Measured Total Depth, feet (TOC)	31.33

Depth to water date	04/23/24
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Purge Stabilization Data									
Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (μ S/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature ($^{\circ}$ C)	
0954	12.13	200	5.13	528	6.8	2.87	280	21.43	
0959	12.13	200	5.24	533	5.1	2.06	274	21.51	
1004	12.12	200	5.26	534	4.5	1.97	274	21.54	
1009	12.12	200	5.29	539	4.2	1.93	272	21.57	

Total volume purged	
Sample appearance	Clear
Sample time	10:11
Sample date	04/23/24

Facility Name	Agri Pinnac PP
Sample by	KERRY McDONALD

Sample Location ID: A0-13

Depth to water, feet (TOC)	8.63
Measured Total Depth, feet (TOC)	40.70

Depth to water date: 04/22/24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
0803	9.91	180	6.14	451	28.2	6.21	-111	17.66
0808	9.97	180	6.05	447	20.6	5.83	-120	17.68
0813	10.02	180	6.03	439	22.4	5.79	-120	17.69
0818	10.11	180	6.02	437	21.3	5.77	-124	17.71

Total volume purged	CLM
Sample appearance	OK
Sample time	0820
Sample date	04/22/24

Facility Name	Agri Purok PP
Sample by	Armando Mac Deras

Sample Location ID: AD-16

Depth to water, feet (TOC)	12.09
Measured Total Depth, feet (TOC)	38.24

Depth to water date: 09/24/24

Purge Stabilization Data								
Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
1047	12.21	200	4.62	218	16.2	1.13	339	22.13
1052	12.21	200	4.64	218	13.3	1.07	346	22.15
1057	12.24	200	4.65	218	12.8	0.99	352	22.18
1102	12.26	200	4.68	217	12.4	0.94	357	22.23

Total volume purged	
Sample appearance	clear
Sample time	1104
Sample date	09/24/24

Facility Name: P. 1104
 Sample by: Mest / Hamilton

Sample Location ID: AD-23

Depth to water, feet (TOC): 30.23
 Measured Total Depth, feet (TOC): 38.20

Depth to water date: 4-24-24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
1038	30.56	220	3.35	117	78.6	2.17	351	23.24
1043	30.36	220	3.65	84	55.3	1.66	355	22.94
1048	30.36	220	3.63	77	42.0	1.44	402	22.80
1053	30.56	220	3.64	74	21.7	1.22	405	22.91
1058	30.36	220	3.64	72	12.3	1.18	412	22.93
1103	30.36	220	3.65	71	12.4	1.16	415	22.55

Total volume purged: _____
 Sample appearance: Clear
 Sample time: 11:05
 Sample date: 4-24-24

Facility Name
 Sample by

P. Hill
 Matt Hamilton

Sample Location ID

AD-30

Depth to water, feet (TOC)
 Measured Total Depth, feet (TOC)

17.14
 27.13

Depth to water date

4-23-24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (μ S/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
816	17.25	220	3.55	306	57.2	2.08	523	17.41
821	17.25	220	3.84	256	62.9	1.22	527	18.42
826	17.25	220	3.82	284	37.9	1.16	527	14.22
831	17.25	220	3.84	245	20.6	1.04	524	14.36
836	17.26	220	3.84	291	7.8	0.95	520	14.52
841	17.26	220	3.84	259	7.7	0.91	518	11.57

Total volume purged
 Sample appearance
 Sample time
 Sample date

0
 clear
 843
 4-23-24

Facility Name	P. Veey
Sample by	M. H. Hamilton

Sample Location ID	AD-31
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Depth to water, feet (TOC)	20.61
Measured Total Depth, feet (TOC)	37.32

Depth to water date	ADD-BA
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4-22-24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
1058	21.08	220	3.43	245	55.1	8.31	377	21.83
1103	21.15	220	3.38	255	42.5	0.57	377	21.97
1108	21.15	220	3.41	259	35.1	0.43	373	22.14
1113	21.23	220	3.43	261	30.2	0.37	374	23.18
1118	21.26	220	3.44	261	30.4	0.36	376	22.11

Total volume purged	
Sample appearance	Clear
Sample time	1120
Sample date	4-22-24

Facility Name Pikey
 Sample by M.H. Hamilton

Sample Location ID AP-32

Depth to water, feet (TOC) 14.20
 Measured Total Depth, feet (TOC) 34.65

Depth to water date 4-22-24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
1008	14.85	220	4.74	86	25	1.44	445	20.13
1013	15.11	220	4.84	190	61.2	0.55	399	20.66
1018	15.20	220	4.88	201	54.1	0.43	330	20.71
1023	15.24	220	4.92	213	43.4	0.36	258	21.07
1028	15.27	220	4.93	217	35.6	0.33	224	21.16
1033	15.29	220	4.94	222	35.6	0.31	208	21.28

Total volume purged
 Sample appearance Clear
 Sample time 1033
 Sample date 4-22-24

Facility Name	ACAP/AMC/PP
Sample by	KERRY M. DENARD

Sample Location ID: AD-33

Depth to water, feet (TOC)	10.09
Measured Total Depth, feet (TOC)	32.50

Depth to water date: 04/22/24

Purge Stabilization Data									
Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond ($\mu\text{S}/\text{cm}$)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature ($^{\circ}\text{C}$)	
1101	10.20	220	4.15	207	1.3	2.21	336	25.31	
1106	10.20	220	4.15	196	1.0	2.18	334	25.28	
1111	10.21	220	4.15	196	1.1	2.15	330	25.26	

Total volume purged	CLPAA
Sample appearance	113
Sample time	04/22/24
Sample date	

Facility Name	ATP PinkyAPP
Sample by	Kenny M. Denard

Sample Location ID	AD-36
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Depth to water, feet (TOC)	5.25
Measured Total Depth, feet (TOC)	17.10

Depth to water date	04/23/24
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Purge Stabilization Data									
Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)	
0903	5.47	160	4.68	95	3.7	2.13	372	19.72	
0908	5.49	160	4.69	88	2.6	1.86	373	19.94	
0913	5.50	160	4.69	85	2.4	1.83	373	19.97	
0918	5.54	160	4.67	85	2.2	1.79	370	20.09	

Total volume purged	CLM
Sample appearance	0920
Sample time	04/23/24
Sample date	

Facility Name
 Sample by
 P. Riley
 Y-M Hamilton

Sample Location ID
 B-2

Depth to water, feet (TOC)
 Measured Total Depth, feet (TOC)
 13.89

Depth to water date
 4.22.24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
825	14.53	300	3.66	177	8.5	5.93	466	16.88
830	14.65	300	4.26	113	33.4	0.80	412	18.46
835	14.68	300	4.36	120	28.7	0.60	354	18.12
840	14.70	300	4.44	122	27.5	0.51	371	18.65
845	14.71	300	4.51	123	27.7	0.50	363	18.68

Total volume purged
 Sample appearance
 Sample time
 Sample date
 0
 Clear
 847
 4.22.24

Duplicate
 1215

Facility Name: Academy pp
 Sample by: KAMPY MCPHAD

Sample Location ID: B-3

Depth to water, feet (TOC): 10.30
 Measured Total Depth, feet (TOC): 37.49

Depth to water date: 04/24/24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
0758	11.16	110	5.40	207	5.3	2.84	330	22.55
0803	12.28	110	5.42	211	4.8	2.80	325	22.55

Total volume purged: CLAN
 Sample appearance: 1002
 Sample time: 04/24/24
 Sample date: 04/24/24

CCR Groundwater Monitoring Well Inspection Form

Facility: Pinnon PP

Sampling Period: SEPTEMBER 2024

Sampling Contractor: EAGLE ENVIRONMENTAL

Signature: [Signature]

Well No.	Well Locked	Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Casing, Housing, and Pad in Good Shape	Well Properly Labeled	Well cap present	Comments
AD-13	✓	✓	✓	✓	✓	✓	✓	
AD-7R	✓	✓	✓	✓	✓		✓	NOLABEL
AD-22	✓	✓	✓	✓	✓	✓	✓	
AD-33	✓	✓	✓	✓		✓	✓	WELL PAD STATION NOT FLOAT
AD-19	✓	✓	✓	✓	✓	✓	✓	
AD-10	✓	✓	✓	✓	✓	✓	✓	
AD-21	✓	✓	✓	✓	✓	✓	✓	
AD-20	✓	✓	✓	✓	✓	✓	✓	
AD-02	✓	✓	✓	✓	✓	✓	✓	
AD-04	✓	✓	✓		✓	✓	✓	NO GOOD ACCESS STEEP HILL OR OVERGROWN MUDDY AREA
AD-18	✓	✓	✓	✓	✓	✓	✓	
B-3	✓	✓	✓		✓		✓	NEED MOWING NO LABEL

17.31
22.13
8.21
21.17

Instructions: Complete form and submit to AEP Environmental Services with Field Data. Place check mark for items that are satisfactory. Unsatisfactory items should be left blank with a note in the comments section on what needs to be remedied.

CCR Groundwater Monitoring Well Inspection Form

Facility: Pierson PP
 Sampling Contractor: EAGLE ENVIRONMENTAL

Sampling Period: SEPTEMBER 2024
 Signature: [Signature]

Well No.	Well Locked	Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Casing, Housing, and Pad in Good Shape	Well Properly Labeled	Well cap present	Comments
AD-16					✓	✓	✓	TRAIL TO WELL OVERGROWN NEEDS NEW LOCK FUNCTION ISSUE
AD-34	✓	✓	✓		✓	✓	✓	ACCESS ROAD HAS BEEN REMOVED
AD-08	✓	✓	✓	✓	✓	✓	✓	
AD-25	✓	✓	✓		✓	✓	✓	ROAD NOT MAINTAINED OVERGROWN, ROAD HAS DITCH CUT IN IT

Instructions: Complete form and submit to AEP Environmental Services with Field Data. Place check mark for items that are satisfactory. Unsatisfactory items should be left blank with a note in the comments section on what needs to be remedied.

CCR Groundwater Monitoring Well Inspection Form

Facility: Pitney

Sampling Contractor: Engk

Sampling Period: Sept 2024

Signature: [Signature]

Well No.	Well Locked	Fastener and Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Casing, Protective Cover, Barriers and Pad in Good Shape	Well Properly Labeled	Well Cap Present and Vented*	Comments
B-2					✓		✓	lid will not close no label 0 Verigyma
AD-12	✓	✓	✓	✓	✓	✓	✓	
AD-32	✓	✓	✓	✓	✓	✓	✓	
AD-31	✓	✓	✓	✓	✓	✓	✓	
AD-30	✓	✓	✓	✓	✓	✓	✓	
AD-28	✓	✓	✓	✓	✓	✓	✓	
AD-17	✓	✓	✓	✓	✓	✓	✓	0 Verigyma
AD-3	✓	✓	✓	✓	✓	✓	✓	
AD-36	✓	✓	✓	✓	✓	✓	✓	
AD-23	✓	✓	✓	✓	✓	✓	✓	
AD-27	✓	✓	✓	✓	✓	✓	✓	no path to well need access
AD-26	✓	✓	✓	✓	✓	✓	✓	no path to well need access need access ↳ below ↳ below

*Not all wells will be vented, especially flush mounted wells. If that is the case, please note "flush mount well" in the comments.

Facility Name	Flannery PP
Sample by	R. Cray McDaniel

Sample Location ID	A0-02
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Depth to water, feet (TOC)	16.93
Measured Total Depth, feet (TOC)	40.36

Depth to water date	09/17/24
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Purge Stabilization Data								
Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
0741	17.04	210	4.04	713	1.7	3.01	398	22.92
0746	17.08	210	4.02	728	1.0	2.30	398	22.83
0751	17.12	210	4.02	737	1.4	2.27	398	22.81
0756	17.14	210	4.00	741	1.2	2.25	402	22.74

Total volume purged	
Sample appearance	CLM
Sample time	0758
Sample date	09/17/24

Facility Name: P. Coley
 Sample by: M-H Hamilton

Sample Location ID: AD-3
 Depth to water date: 9-17-24

Depth to water, feet (TOC): 36.22
 Measured Total Depth, feet (TOC): 57.41

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
1039	36.55	220	4.36	126	39.3	3.45	431	24.34
1044	36.67	220	4.31	130	53.1	0.97	424	22.64
1048	36.77	220	4.28	130	20.1	0.88	415	22.36
1054	36.85	220	4.26	130	20.2	0.62	408	22.34
1059	36.95	220	4.27	130	20.1	0.60	404	22.33

Total volume purged: Clear
 Sample appearance: 1101
 Sample time: 9-17-24
 Sample date:

Facility Name	<i>Pinney pp</i>
Sample by	<i>Kenny McDevitt</i>

Sample Location ID	<i>AD-04</i>
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Depth to water, feet (TOC)	<i>19.23</i>
Measured Total Depth, feet (TOC)	<i>47.29</i>

Depth to water date	<i>09/17/24</i>
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Purge Stabilization Data										
Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
<i>0908</i>	<i>19.48</i>	<i>182</i>	<i>5.04</i>	<i>106</i>	<i>47.6</i>	<i>3.28</i>	<i>421</i>	<i>24.27</i>		
<i>0913</i>	<i>19.51</i>	<i>182</i>	<i>4.96</i>	<i>110</i>	<i>51.2</i>	<i>2.41</i>	<i>420</i>	<i>24.31</i>		
<i>0918</i>	<i>19.51</i>	<i>182</i>	<i>4.95</i>	<i>108</i>	<i>55.7</i>	<i>2.37</i>	<i>418</i>	<i>24.34</i>		
<i>0923</i>	<i>19.52</i>	<i>182</i>	<i>4.94</i>	<i>105</i>	<i>54.8</i>	<i>2.35</i>	<i>418</i>	<i>24.37</i>		
<i>0928</i>	<i>19.52</i>	<i>182</i>	<i>4.94</i>	<i>103</i>	<i>55.1</i>	<i>2.35</i>	<i>416</i>	<i>24.35</i>		
<i>0933</i>	<i>19.55</i>	<i>182</i>	<i>4.94</i>	<i>103</i>	<i>55.4</i>	<i>2.33</i>	<i>415</i>	<i>24.33</i>		

Total volume purged	
Sample appearance	<i>700510 REPOS & BLOW</i>
Sample time	<i>0935</i>
Sample date	<i>09/17/24</i>

Facility Name
 Sample by

102609 PP
 KERRY McPOMERED

Sample Location ID

A0-08

Depth to water, feet (TOC)
 Measured Total Depth, feet (TOC)

12.82
 31.33

Depth to water date

09/18/24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
0945	12.87	210	5.99	445	13.2	6.05	247	27.02
0950	12.87	210	5.96	434	11.6	2.51	239	26.88
0955	12.89	210	5.94	428	9.8	1.47	233	26.47
1000	12.91	210	5.91	427	10.2	1.42	225	26.87
1005	12.92	210	5.90	426	9.7	1.38	220	27.12

Total volume purged
 Sample appearance
 Sample time
 Sample date

6.666
 Clear
 1007
 09/18/24

Facility Name: Pilkey
 Sample by: 908t Hamilton

Depth to water, feet (TOC): 16.42
 Measured Total Depth, feet (TOC): 52.00

Sample Location ID: AD-12

Depth to water date: 9-16-24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
917	16.68	300	3.16	46	9.2	13.12	405	24.52
922	17.05	300	2.98	42	12.1	2.53	431	24.71
927	17.21	300	2.95	41	12.6	2.74	446	25.18
932	17.36	300	2.59	41	12.4	2.66	450	25.07

Total volume purged: Clear
 Sample appearance: Clear
 Sample time: 924
 Sample date: 9-16-24

Facility Name	P, AKOY PP
Sample by	K. M. M. M. C. D. S. A. S.

Sample Location ID	APD-13
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Depth to water, feet (TOC)	13.29
Measured Total Depth, feet (TOC)	40.70

Depth to water date	09/16/24
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Purge Stabilization Data									
Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)	
0756	13.42	176	5.52	431	9.1	5.02	334	24.22	
0801	13.47	176	5.67	426	8.4	4.38	325	24.24	
0806	13.53	176	5.72	410	8.0	4.33	313	24.26	
0811	13.58	176	5.75	407	7.7	4.31	300	24.31	

Total volume purged	
Sample appearance	Clear
Sample time	0813
Sample date	09/16/24

Facility Name	Flannery pp
Sample by	Kerry McDonald

Sample Location ID	AD-25
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Depth to water, feet (TOC)	9.89
Measured Total Depth, feet (TOC)	27.38

Depth to water date	9/18/24
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Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
1058	10.00	120	3.56	957	26.2	2.45	377	28.14
1103	10.10	120	3.69	1010	15.5	1.27	340	24.58
1108	10.19	120	3.69	1020	12.1	0.96	329	24.65
1113	10.27	120	3.72	1030	9.9	0.88	318	24.62
1118	10.38	120	3.73	1030	9.9	0.82	311	24.49

Total volume purged	
Sample appearance	Clear
Sample time	1120
Sample date	09/18/24

Facility Name	Phillips
Sample by	Monty Harrison

Depth to water, feet (TOC)	26.6
Measured Total Depth, feet (TOC)	27.15

Sample Location ID	AD-30
Depth to water date	9-17-29

Purge Stabilization Data									
Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)	
803	21.09	220	3.88	351	37.7	1.57	473	24.14	
808	21.11	220	3.64	354	46.9	0.91	465	23.62	
813	21.12	220	3.68	354	13.6	0.84	464	23.66	
818	21.13	220	3.66	354	9.8	0.76	463	23.68	
823	21.13	220	3.67	355	9.8	0.73	461	23.73	

Total volume purged	
Sample appearance	Clear
Sample time	8:25
Sample date	9-17-24

Facility Name	Pillbox
Sample by	M. A. A. / J. A. A.

Depth to water, feet (TOC)	23.23
Measured Total Depth, feet (TOC)	37.32

Sample Location ID: A11-31

Depth to water date: 8-16-24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
1059	23.619	220	3.15	241	39	0.52	383	25.76
1104	23.55	220	3.01	255	20.6	0.53	382	24.97
1105	23.60	220	2.91	262	18.5	0.76	350	24.50
1124	23.62	220	2.98	264	55.6	0.68	345	24.91
1175	23.63	220	3.02	265	73.6	0.57	335	25.00
1124	23.64	220	3.03	266	64.5	0.55	336	24.74
1124	23.64	220	3.03	267	67.3	0.60	336	24.67
1134	23.65	220	3.04	267	66.9	0.61	338	24.63

Total volume purged	
Sample appearance	clear
Sample time	1136
Sample date	8-16-24

Facility Name	Pikeeey
Sample by	Ment Hamilton

Sample Location ID	AD-32
Depth to water date	9-16-24

Depth to water, feet (TOC)	17.16
Measured Total Depth, feet (TOC)	34.65

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
1005	17.163	220	4.57	236	258	1.30	421	24.76
1010	17.85	220	4.73	244	114	0.77	271	24.67
1015	17.91	220	4.74	246	79.5	0.64	190	24.05
1020	17.94	220	4.82	245	78.1	0.62	147	24.05
1025	17.96	220	4.83	244	77.5	0.60	202	24.03
1030	17.97	220	4.84	244	77.6	0.59	204	24.02

Total volume purged	
Sample appearance	turbid
Sample time	1032
Sample date	9-16-24

Facility Name	Piphey PP
Sample by	K. N. P. (D. N. W. L.)

Sample Location ID	40-33
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Depth to water, feet (TOC)	12.64
Measured Total Depth, feet (TOC)	32.50

Depth to water date	09/16/24
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Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
1113	12.08	228	4.02	207	0.2	4.18	341	24.68
1118	12.69	228	3.97	206	0.0	4.07	341	24.62
1123	12.69	228	3.97	204	0.0	3.98	341	24.58
1125								

Total volume purged	6 L/min
Sample appearance	1125
Sample time	09/16/24
Sample date	

Facility Name	Packman PP
Sample by	K (MRY) M (D) cm Acad

Sample Location ID	AD-34
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Depth to water, feet (TOC)	TOC
Measured Total Depth, feet (TOC)	26.05

Depth to water date	09/18/24
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Purge Stabilization Data									
Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond ($\mu\text{S/cm}$)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature ($^{\circ}\text{C}$)	
0858	0.81	122	3.95	1460	9.7	3.68	341	25.16	
0903	0.85	122	3.98	1480	7.6	3.51	334	25.52	
0908	0.90	122	3.98	1500	6.9	3.47	327	25.53	
0913	0.92	122	4.00	1520	6.4	3.39	324	25.51	

Total volume purged	
Sample appearance	CLM/A
Sample time	0915
Sample date	09/18/24

Facility Name: Pinkus Pl
 Sample by: Kenny McDonald

Sample Location ID: B-3

Depth to water, feet (TOC): 16.92
 Measured Total Depth, feet (TOC): 37.49

Depth to water date: 09/17/24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (μ S/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)
1032	18.01	100	5.21	216	4.8	3.30	326	22.19
1037	19.13	100	5.05	220	3.9	2.57	304	22.43

Total volume purged: Clean
 Sample appearance: 0816
 Sample time: 09/18/24
 Sample date:

APPENDIX 5- Analytical Laboratory Reports



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-2

Customer Description:

Lab Number: 240666-001

Preparation:

Date Collected: 02/20/2024 11:42 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 13:17	EPA 200.8-1994, Rev. 5.4
Arsenic	1.19	µg/L	1	0.10	0.03		GES	03/04/2024 13:17	EPA 200.8-1994, Rev. 5.4
Barium	17.3	µg/L	1	0.20	0.05		GES	03/04/2024 13:17	EPA 200.8-1994, Rev. 5.4
Beryllium	1.06	µg/L	5	0.25	0.04		GES	03/04/2024 13:43	EPA 200.8-1994, Rev. 5.4
Boron	3.45	mg/L	1	0.050	0.007		GES	03/04/2024 13:17	EPA 200.8-1994, Rev. 5.4
Cadmium	0.133	µg/L	1	0.020	0.004		GES	03/04/2024 13:17	EPA 200.8-1994, Rev. 5.4
Calcium	4.37	mg/L	1	0.05	0.01		GES	03/04/2024 13:17	EPA 200.8-1994, Rev. 5.4
Chromium	0.47	µg/L	1	0.30	0.07		GES	03/04/2024 13:17	EPA 200.8-1994, Rev. 5.4
Cobalt	31.9	µg/L	1	0.020	0.005		GES	03/04/2024 13:17	EPA 200.8-1994, Rev. 5.4
Lead	0.73	µg/L	1	0.20	0.05		GES	03/04/2024 13:17	EPA 200.8-1994, Rev. 5.4
Lithium	0.0825	mg/L	5	0.0015	0.0004		GES	03/04/2024 13:43	EPA 200.8-1994, Rev. 5.4
Magnesium	9.04	mg/L	1	0.100	0.006		GES	03/04/2024 13:17	EPA 200.8-1994, Rev. 5.4
Mercury	48	ng/L	2	10	4		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 13:17	EPA 200.8-1994, Rev. 5.4
Potassium	1.58	mg/L	1	0.100	0.008		GES	03/04/2024 13:17	EPA 200.8-1994, Rev. 5.4
Selenium	4.61	µg/L	1	0.50	0.04		GES	03/04/2024 13:17	EPA 200.8-1994, Rev. 5.4
Sodium	126	mg/L	1	0.20	0.01		GES	03/04/2024 13:17	EPA 200.8-1994, Rev. 5.4
Strontium	0.0649	mg/L	1	0.00200	0.00005		GES	03/04/2024 13:17	EPA 200.8-1994, Rev. 5.4
Thallium	0.13	µg/L	1	0.20	0.02	J1	GES	03/04/2024 13:17	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.03	pCi/L	0.21	0.26		ST	02/29/2024 13:12	SW-846 9315-1986, Rev. 0
Carrier Recovery	95.0	%						
Radium-228	0.85	pCi/L	0.14	0.43		ST	03/01/2024 16:58	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	89.8	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-2

Customer Description:

Lab Number: 240666-001-01

Preparation: Dissolved

Date Collected: 02/20/2024 11:42 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.013	µg/L	1	0.100	0.008	J1	GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4
Arsenic	1.13	µg/L	1	0.10	0.03		GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4
Barium	17.3	µg/L	1	0.20	0.05		GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4
Beryllium	0.99	µg/L	5	0.25	0.04		GES	03/04/2024 13:53	EPA 200.8-1994, Rev. 5.4
Boron	3.50	mg/L	1	0.050	0.007		GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4
Cadmium	0.140	µg/L	1	0.020	0.004		GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4
Calcium	4.37	mg/L	1	0.05	0.01		GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4
Chromium	0.56	µg/L	1	0.30	0.07		GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4
Cobalt	32.0	µg/L	1	0.020	0.005		GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4
Iron	0.162	mg/L	1	0.020	0.003		GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4
Lead	0.77	µg/L	1	0.20	0.05		GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4
Lithium	0.0815	mg/L	5	0.0015	0.0004		GES	03/04/2024 13:53	EPA 200.8-1994, Rev. 5.4
Magnesium	9.07	mg/L	1	0.100	0.006		GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4
Manganese	0.111	mg/L	1	0.00100	0.00008		GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4
Potassium	1.59	mg/L	1	0.100	0.008		GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4
Selenium	4.19	µg/L	1	0.50	0.04		GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4
Sodium	128	mg/L	1	0.20	0.01		GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4
Strontium	0.0641	mg/L	1	0.00200	0.00005		GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4
Thallium	0.13	µg/L	1	0.20	0.02	J1	GES	03/04/2024 13:22	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-3

Customer Description:

Lab Number: 240666-002

Preparation:

Date Collected: 02/20/2024 12:25 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.008	µg/L	1	0.100	0.008	J1	GES	03/04/2024 13:28	EPA 200.8-1994, Rev. 5.4
Arsenic	0.10	µg/L	1	0.10	0.03		GES	03/04/2024 13:28	EPA 200.8-1994, Rev. 5.4
Barium	57.7	µg/L	1	0.20	0.05		GES	03/04/2024 13:28	EPA 200.8-1994, Rev. 5.4
Beryllium	0.21	µg/L	5	0.25	0.04	J1	GES	03/04/2024 13:58	EPA 200.8-1994, Rev. 5.4
Boron	0.037	mg/L	1	0.050	0.007	J1	GES	03/04/2024 13:28	EPA 200.8-1994, Rev. 5.4
Cadmium	0.024	µg/L	1	0.020	0.004		GES	03/04/2024 13:28	EPA 200.8-1994, Rev. 5.4
Calcium	3.55	mg/L	1	0.05	0.01		GES	03/04/2024 13:28	EPA 200.8-1994, Rev. 5.4
Chromium	0.49	µg/L	1	0.30	0.07		GES	03/04/2024 13:28	EPA 200.8-1994, Rev. 5.4
Cobalt	3.07	µg/L	1	0.020	0.005		GES	03/04/2024 13:28	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	03/04/2024 13:28	EPA 200.8-1994, Rev. 5.4
Lithium	0.0511	mg/L	5	0.0015	0.0004		GES	03/04/2024 13:58	EPA 200.8-1994, Rev. 5.4
Magnesium	1.64	mg/L	1	0.100	0.006		GES	03/04/2024 13:28	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 13:28	EPA 200.8-1994, Rev. 5.4
Potassium	2.21	mg/L	1	0.100	0.008		GES	03/04/2024 13:28	EPA 200.8-1994, Rev. 5.4
Selenium	0.07	µg/L	1	0.50	0.04	J1	GES	03/04/2024 13:28	EPA 200.8-1994, Rev. 5.4
Sodium	8.79	mg/L	1	0.20	0.01		GES	03/04/2024 13:28	EPA 200.8-1994, Rev. 5.4
Strontium	0.0245	mg/L	1	0.00200	0.00005		GES	03/04/2024 13:28	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.02	J1	GES	03/04/2024 13:28	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.06	pCi/L	0.21	0.23		ST	02/29/2024 13:12	SW-846 9315-1986, Rev. 0
Carrier Recovery	93.0	%						
Radium-228	0.19	pCi/L	0.12	0.40		ST	03/01/2024 16:58	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	99.3	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-3

Customer Description:

Lab Number: 240666-002-01

Preparation: Dissolved

Date Collected: 02/20/2024 12:25 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4
Arsenic	0.11	µg/L	1	0.10	0.03		GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4
Barium	55.2	µg/L	1	0.20	0.05		GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4
Beryllium	0.11	µg/L	5	0.25	0.04	J1	GES	03/04/2024 14:03	EPA 200.8-1994, Rev. 5.4
Boron	0.035	mg/L	1	0.050	0.007	J1	GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4
Cadmium	0.014	µg/L	1	0.020	0.004	J1	GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4
Calcium	3.52	mg/L	1	0.05	0.01		GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4
Chromium	0.36	µg/L	1	0.30	0.07		GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4
Cobalt	2.74	µg/L	1	0.020	0.005		GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4
Iron	0.582	mg/L	1	0.020	0.003		GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4
Lead	0.08	µg/L	1	0.20	0.05	J1	GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4
Lithium	0.0513	mg/L	5	0.0015	0.0004		GES	03/04/2024 14:03	EPA 200.8-1994, Rev. 5.4
Magnesium	1.48	mg/L	1	0.100	0.006		GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4
Manganese	0.0307	mg/L	1	0.00100	0.00008		GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4
Potassium	2.20	mg/L	1	0.100	0.008		GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4
Sodium	8.71	mg/L	1	0.20	0.01		GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4
Strontium	0.0244	mg/L	1	0.00200	0.00005		GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	03/04/2024 13:33	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-4

Customer Description:

Lab Number: 240666-003

Preparation:

Date Collected: 02/20/2024 10:31 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 13:38	EPA 200.8-1994, Rev. 5.4
Arsenic	0.13	µg/L	1	0.10	0.03		GES	03/04/2024 13:38	EPA 200.8-1994, Rev. 5.4
Barium	148	µg/L	1	0.20	0.05		GES	03/04/2024 13:38	EPA 200.8-1994, Rev. 5.4
Beryllium	0.33	µg/L	5	0.25	0.04		GES	03/04/2024 14:09	EPA 200.8-1994, Rev. 5.4
Boron	0.018	mg/L	1	0.050	0.007	J1	GES	03/04/2024 13:38	EPA 200.8-1994, Rev. 5.4
Cadmium	0.027	µg/L	1	0.020	0.004		GES	03/04/2024 13:38	EPA 200.8-1994, Rev. 5.4
Calcium	3.23	mg/L	1	0.05	0.01		GES	03/04/2024 13:38	EPA 200.8-1994, Rev. 5.4
Chromium	0.34	µg/L	1	0.30	0.07		GES	03/04/2024 13:38	EPA 200.8-1994, Rev. 5.4
Cobalt	3.44	µg/L	1	0.020	0.005		GES	03/04/2024 13:38	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	03/04/2024 13:38	EPA 200.8-1994, Rev. 5.4
Lithium	0.0252	mg/L	5	0.0015	0.0004		GES	03/04/2024 14:09	EPA 200.8-1994, Rev. 5.4
Magnesium	0.694	mg/L	1	0.100	0.006		GES	03/04/2024 13:38	EPA 200.8-1994, Rev. 5.4
Mercury	6	ng/L	1	5	2		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 13:38	EPA 200.8-1994, Rev. 5.4
Potassium	2.35	mg/L	1	0.100	0.008		GES	03/04/2024 13:38	EPA 200.8-1994, Rev. 5.4
Selenium	0.06	µg/L	1	0.50	0.04	J1	GES	03/04/2024 13:38	EPA 200.8-1994, Rev. 5.4
Sodium	7.01	mg/L	1	0.20	0.01		GES	03/04/2024 13:38	EPA 200.8-1994, Rev. 5.4
Strontium	0.0263	mg/L	1	0.00200	0.00005		GES	03/04/2024 13:38	EPA 200.8-1994, Rev. 5.4
Thallium	0.10	µg/L	1	0.20	0.02	J1	GES	03/04/2024 13:38	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.86	pCi/L	0.19	0.29		ST	02/29/2024 13:12	SW-846 9315-1986, Rev. 0
Carrier Recovery	96.1	%						
Radium-228	0.92	pCi/L	0.12	0.38		ST	03/01/2024 16:58	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	92.4	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-4

Customer Description:

Lab Number: 240666-003-01

Preparation: Dissolved

Date Collected: 02/20/2024 10:31 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4
Arsenic	0.04	µg/L	1	0.10	0.03	J1	GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4
Barium	120	µg/L	1	0.20	0.05		GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4
Beryllium	0.20	µg/L	5	0.25	0.04	J1	GES	03/04/2024 14:14	EPA 200.8-1994, Rev. 5.4
Boron	0.017	mg/L	1	0.050	0.007	J1	GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4
Cadmium	0.017	µg/L	1	0.020	0.004	J1	GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4
Calcium	2.54	mg/L	1	0.05	0.01		GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4
Chromium	0.27	µg/L	1	0.30	0.07	J1	GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4
Cobalt	3.09	µg/L	1	0.020	0.005		GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4
Iron	0.013	mg/L	1	0.020	0.003	J1	GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4
Lead	0.10	µg/L	1	0.20	0.05	J1	GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4
Lithium	0.0268	mg/L	5	0.0015	0.0004		GES	03/04/2024 14:14	EPA 200.8-1994, Rev. 5.4
Magnesium	0.548	mg/L	1	0.100	0.006		GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4
Manganese	0.0242	mg/L	1	0.00100	0.00008		GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4
Mercury	2	ng/L	1	5	2	J1	RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4
Potassium	2.25	mg/L	1	0.100	0.008		GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4
Sodium	6.73	mg/L	1	0.20	0.01		GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4
Strontium	0.0216	mg/L	1	0.00200	0.00005		GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4
Thallium	0.10	µg/L	1	0.20	0.02	J1	GES	03/04/2024 13:48	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-7R

Customer Description:

Lab Number: 240666-004

Preparation:

Date Collected: 02/19/2024 12:28 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4
Arsenic	0.29	µg/L	1	0.10	0.03		GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4
Barium	50.7	µg/L	1	0.20	0.05		GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4
Beryllium	1.93	µg/L	1	0.050	0.007		GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4
Boron	0.066	mg/L	1	0.050	0.007		GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4
Cadmium	0.330	µg/L	1	0.020	0.004		GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4
Calcium	3.32	mg/L	1	0.05	0.01		GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4
Chromium	0.23	µg/L	1	0.30	0.07	J1	GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4
Cobalt	19.4	µg/L	1	0.020	0.005		GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4
Lead	0.07	µg/L	1	0.20	0.05	J1	GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4
Lithium	0.0616	mg/L	1	0.00030	0.00007		GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4
Magnesium	5.22	mg/L	1	0.100	0.006		GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4
Mercury	126	ng/L	2	10	4		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4
Potassium	2.12	mg/L	1	0.100	0.008		GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4
Selenium	0.73	µg/L	1	0.50	0.04		GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4
Sodium	26.3	mg/L	1	0.20	0.01		GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4
Strontium	0.0374	mg/L	1	0.00200	0.00005		GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4
Thallium	0.15	µg/L	1	0.20	0.02	J1	GES	03/04/2024 14:19	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	2.40	pCi/L	0.31	0.22		ST	02/29/2024 14:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	84.9	%						
Radium-228	0.86	pCi/L	0.14	0.45		ST	03/01/2024 16:58	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	91.7	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-7R

Customer Description:

Lab Number: 240666-004-01

Preparation: Dissolved

Date Collected: 02/19/2024 12:28 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Arsenic	0.08	µg/L	1	0.10	0.03	J1	GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Barium	49.4	µg/L	1	0.20	0.05		GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Beryllium	1.62	µg/L	1	0.050	0.007		GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Boron	0.063	mg/L	1	0.050	0.007		GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Cadmium	0.297	µg/L	1	0.020	0.004		GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Calcium	3.12	mg/L	1	0.05	0.01		GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Chromium	0.26	µg/L	1	0.30	0.07	J1	GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Cobalt	18.2	µg/L	1	0.020	0.005		GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Iron	2.11	mg/L	1	0.020	0.003		GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Lead	0.07	µg/L	1	0.20	0.05	J1	GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Lithium	0.0629	mg/L	1	0.00030	0.00007		GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Magnesium	4.88	mg/L	1	0.100	0.006		GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Manganese	0.0579	mg/L	1	0.00100	0.00008		GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Mercury	60	ng/L	1	5	2		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Potassium	2.09	mg/L	1	0.100	0.008		GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Selenium	0.05	µg/L	1	0.50	0.04	J1	GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Sodium	25.3	mg/L	1	0.20	0.01		GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Strontium	0.0352	mg/L	1	0.00200	0.00005		GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4
Thallium	0.14	µg/L	1	0.20	0.02	J1	GES	03/04/2024 14:29	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-12

Customer Description:

Lab Number: 240666-005

Preparation:

Date Collected: 02/19/2024 10:01 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.010	µg/L	1	0.100	0.008	J1	GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4
Arsenic	0.07	µg/L	1	0.10	0.03	J1	GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4
Barium	21.7	µg/L	1	0.20	0.05		GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4
Beryllium	0.127	µg/L	1	0.050	0.007		GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4
Boron	0.016	mg/L	1	0.050	0.007	J1	GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4
Cadmium	0.009	µg/L	1	0.020	0.004	J1	GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4
Calcium	0.27	mg/L	1	0.05	0.01		GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4
Chromium	0.50	µg/L	1	0.30	0.07		GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4
Cobalt	1.13	µg/L	1	0.020	0.005		GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4
Lead	0.06	µg/L	1	0.20	0.05	J1	GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4
Lithium	0.00547	mg/L	1	0.00030	0.00007		GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4
Magnesium	0.379	mg/L	1	0.100	0.006		GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4
Mercury	2	ng/L	1	5	2	J1	RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4
Potassium	0.286	mg/L	1	0.100	0.008		GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4
Selenium	0.19	µg/L	1	0.50	0.04	J1	GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4
Sodium	4.34	mg/L	1	0.20	0.01		GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4
Strontium	0.00359	mg/L	1	0.00200	0.00005		GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	03/04/2024 14:40	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.78	pCi/L	0.18	0.20		ST	02/29/2024 14:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	95.2	%						
Radium-228	0.22	pCi/L	0.12	0.41		ST	03/01/2024 16:58	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	88.6	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-12

Customer Description:

Lab Number: 240666-005-01

Preparation: Dissolved

Date Collected: 02/19/2024 10:01 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.011	µg/L	1	0.100	0.008	J1	GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Arsenic	0.05	µg/L	1	0.10	0.03	J1	GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Barium	6.59	µg/L	1	0.20	0.05		GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Beryllium	0.026	µg/L	1	0.050	0.007	J1	GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Boron	0.016	mg/L	1	0.050	0.007	J1	GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Calcium	0.09	mg/L	1	0.05	0.01		GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Chromium	0.31	µg/L	1	0.30	0.07		GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Cobalt	0.307	µg/L	1	0.020	0.005		GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Iron	0.012	mg/L	1	0.020	0.003	J1	GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Lithium	0.00496	mg/L	1	0.00030	0.00007		GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Magnesium	0.113	mg/L	1	0.100	0.006		GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Manganese	0.00095	mg/L	1	0.00100	0.00008	J1	GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Potassium	0.279	mg/L	1	0.100	0.008		GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Selenium	0.14	µg/L	1	0.50	0.04	J1	GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Sodium	4.00	mg/L	1	0.20	0.01		GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Strontium	0.00113	mg/L	1	0.00200	0.00005	J1	GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	03/04/2024 14:50	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-13

Customer Description:

Lab Number: 240666-006

Preparation:

Date Collected: 02/19/2024 09:44 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4
Arsenic	0.74	µg/L	1	0.10	0.03		GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4
Barium	45.1	µg/L	1	0.20	0.05		GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4
Beryllium	0.290	µg/L	1	0.050	0.007		GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4
Boron	0.068	mg/L	1	0.050	0.007		GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4
Calcium	10.6	mg/L	1	0.05	0.01		GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4
Chromium	0.29	µg/L	1	0.30	0.07	J1	GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4
Cobalt	41.9	µg/L	1	0.020	0.005		GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4
Lithium	0.134	mg/L	1	0.00030	0.00007		GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4
Magnesium	12.4	mg/L	1	0.100	0.006		GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4
Potassium	4.84	mg/L	1	0.100	0.008		GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4
Sodium	20.5	mg/L	1	0.20	0.01		GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4
Strontium	0.0985	mg/L	1	0.00200	0.00005		GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4
Thallium	0.02	µg/L	1	0.20	0.02	J1	GES	03/04/2024 16:22	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.22	pCi/L	0.23	0.25		ST	02/29/2024 14:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	84.2	%						
Radium-228	0.75	pCi/L	0.13	0.41		TTP	03/07/2024 15:20	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	87.7	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-13

Customer Description:

Lab Number: 240666-006-01

Preparation: Dissolved

Date Collected: 02/19/2024 09:44 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Arsenic	0.29	µg/L	1	0.10	0.03		GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Barium	43.5	µg/L	1	0.20	0.05		GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Beryllium	0.255	µg/L	1	0.050	0.007		GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Boron	0.067	mg/L	1	0.050	0.007		GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Calcium	10.2	mg/L	1	0.05	0.01		GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Chromium	0.33	µg/L	1	0.30	0.07		GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Cobalt	41.1	µg/L	1	0.020	0.005		GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Iron	15.9	mg/L	1	0.020	0.003		GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Lithium	0.134	mg/L	1	0.00030	0.00007		GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Magnesium	12.0	mg/L	1	0.100	0.006		GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Manganese	0.404	mg/L	1	0.00100	0.00008		GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Potassium	4.71	mg/L	1	0.100	0.008		GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Sodium	20.3	mg/L	1	0.20	0.01		GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Strontium	0.0959	mg/L	1	0.00200	0.00005		GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	03/04/2024 16:33	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-17

Customer Description:

Lab Number: 240666-007

Preparation:

Date Collected: 02/20/2024 13:30 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4
Arsenic	0.23	µg/L	1	0.10	0.03		GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4
Barium	85.2	µg/L	1	0.20	0.05		GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4
Beryllium	0.310	µg/L	1	0.050	0.007		GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4
Boron	0.034	mg/L	1	0.050	0.007	J1	GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4
Cadmium	0.020	µg/L	1	0.020	0.004		GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4
Calcium	0.14	mg/L	1	0.05	0.01		GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4
Chromium	0.57	µg/L	1	0.30	0.07		GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4
Cobalt	4.40	µg/L	1	0.020	0.005		GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4
Lead	0.08	µg/L	1	0.20	0.05	J1	GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4
Lithium	0.00998	mg/L	1	0.00030	0.00007		GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4
Magnesium	1.37	mg/L	1	0.100	0.006		GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4
Mercury	131	ng/L	4	20	7		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4
Potassium	0.372	mg/L	1	0.100	0.008		GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4
Selenium	0.16	µg/L	1	0.50	0.04	J1	GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4
Sodium	6.11	mg/L	1	0.20	0.01		GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4
Strontium	0.00683	mg/L	1	0.00200	0.00005		GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	03/04/2024 16:43	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	2.15	pCi/L	0.27	0.22		ST	02/29/2024 14:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	103	%						
Radium-228	1	pCi/L	0.15	0.49		TTP	03/07/2024 15:20	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	93.6	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-17

Customer Description:

Lab Number: 240666-007-01

Preparation: Dissolved

Date Collected: 02/20/2024 13:30 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Arsenic	0.04	µg/L	1	0.10	0.03	J1	GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Barium	77.6	µg/L	1	0.20	0.05		GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Beryllium	0.174	µg/L	1	0.050	0.007		GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Boron	0.036	mg/L	1	0.050	0.007	J1	GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Cadmium	0.015	µg/L	1	0.020	0.004	J1	GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Calcium	0.15	mg/L	1	0.05	0.01		GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Chromium	0.31	µg/L	1	0.30	0.07		GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Cobalt	3.98	µg/L	1	0.020	0.005		GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Iron	0.004	mg/L	1	0.020	0.003	J1	GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Lead	0.06	µg/L	1	0.20	0.05	J1	GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Lithium	0.0105	mg/L	1	0.00030	0.00007		GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Magnesium	1.24	mg/L	1	0.100	0.006		GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Manganese	0.00288	mg/L	1	0.00100	0.00008		GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Mercury	65	ng/L	1	5	2		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Potassium	0.358	mg/L	1	0.100	0.008		GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Sodium	6.20	mg/L	1	0.20	0.01		GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Strontium	0.00630	mg/L	1	0.00200	0.00005		GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	03/04/2024 16:53	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-18

Customer Description:

Lab Number: 240666-008

Preparation:

Date Collected: 02/20/2024 09:29 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.019	µg/L	1	0.100	0.008	J1	GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4
Arsenic	1.17	µg/L	1	0.10	0.03		GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4
Barium	83.1	µg/L	1	0.20	0.05		GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4
Beryllium	0.100	µg/L	1	0.050	0.007		GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4
Boron	0.013	mg/L	1	0.050	0.007	J1	GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4
Cadmium	0.013	µg/L	1	0.020	0.004	J1	GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4
Calcium	0.27	mg/L	1	0.05	0.01		GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4
Chromium	0.95	µg/L	1	0.30	0.07		GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4
Cobalt	1.05	µg/L	1	0.020	0.005		GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4
Lead	0.30	µg/L	1	0.20	0.05		GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4
Lithium	0.0151	mg/L	1	0.00030	0.00007		GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4
Magnesium	0.365	mg/L	1	0.100	0.006		GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4
Mercury	14	ng/L	1	5	2		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4
Potassium	0.901	mg/L	1	0.100	0.008		GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4
Selenium	0.23	µg/L	1	0.50	0.04	J1	GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4
Sodium	5.80	mg/L	1	0.20	0.01		GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4
Strontium	0.00539	mg/L	1	0.00200	0.00005		GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.02	J1	GES	03/04/2024 17:03	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.57	pCi/L	0.13	0.15		ST	02/29/2024 14:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	111	%						
Radium-228	0.85	pCi/L	0.17	0.55		TTP	03/07/2024 15:20	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	91.2	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-18

Customer Description:

Lab Number: 240666-008-01

Preparation: Dissolved

Date Collected: 02/20/2024 09:29 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Arsenic	0.07	µg/L	1	0.10	0.03	J1	GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Barium	32.4	µg/L	1	0.20	0.05		GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Beryllium	0.007	µg/L	1	0.050	0.007	J1	GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Boron	0.012	mg/L	1	0.050	0.007	J1	GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Calcium	0.14	mg/L	1	0.05	0.01		GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Chromium	0.40	µg/L	1	0.30	0.07		GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Cobalt	0.506	µg/L	1	0.020	0.005		GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Iron	0.040	mg/L	1	0.020	0.003		GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Lithium	0.0163	mg/L	1	0.00030	0.00007		GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Magnesium	0.131	mg/L	1	0.100	0.006		GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Manganese	0.00192	mg/L	1	0.00100	0.00008		GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Mercury	5	ng/L	1	5	2		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Potassium	0.947	mg/L	1	0.100	0.008		GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Selenium	0.04	µg/L	1	0.50	0.04	J1	GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Sodium	5.84	mg/L	1	0.20	0.01		GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Strontium	0.00229	mg/L	1	0.00200	0.00005		GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	03/04/2024 17:14	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-22

Customer Description:

Lab Number: 240666-009

Preparation:

Date Collected: 02/19/2024 11:44 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4
Arsenic	1.20	µg/L	1	0.10	0.03		GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4
Barium	20.1	µg/L	1	0.20	0.05		GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4
Beryllium	4.23	µg/L	1	0.050	0.007		GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4
Boron	0.050	mg/L	1	0.050	0.007		GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4
Cadmium	0.922	µg/L	1	0.020	0.004		GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4
Calcium	13.7	mg/L	1	0.05	0.01		GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4
Chromium	0.39	µg/L	1	0.30	0.07		GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4
Cobalt	86.9	µg/L	1	0.020	0.005		GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4
Lead	0.23	µg/L	1	0.20	0.05		GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4
Lithium	0.128	mg/L	1	0.00030	0.00007		GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4
Magnesium	19.8	mg/L	1	0.100	0.006		GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4
Mercury	262	ng/L	4	20	7		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4
Potassium	3.91	mg/L	1	0.100	0.008		GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4
Selenium	4.57	µg/L	1	0.50	0.04		GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4
Sodium	94.8	mg/L	1	0.20	0.01		GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4
Strontium	0.125	mg/L	1	0.00200	0.00005		GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4
Thallium	0.18	µg/L	1	0.20	0.02	J1	GES	03/04/2024 17:24	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.46	pCi/L	0.25	0.31		ST	02/29/2024 14:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	88.8	%						
Radium-228	1.83	pCi/L	0.16	0.48		TTP	03/07/2024 15:20	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	89.4	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-22

Customer Description:

Lab Number: 240666-009-01

Preparation: Dissolved

Date Collected: 02/19/2024 11:44 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Arsenic	1.20	µg/L	1	0.10	0.03		GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Barium	20.2	µg/L	1	0.20	0.05		GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Beryllium	4.08	µg/L	1	0.050	0.007		GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Boron	0.052	mg/L	1	0.050	0.007		GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Cadmium	0.937	µg/L	1	0.020	0.004		GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Calcium	13.9	mg/L	1	0.05	0.01		GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Chromium	0.48	µg/L	1	0.30	0.07		GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Cobalt	88.2	µg/L	1	0.020	0.005		GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Iron	20.0	mg/L	1	0.020	0.003		GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Lead	0.25	µg/L	1	0.20	0.05		GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Lithium	0.127	mg/L	1	0.00030	0.00007		GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Magnesium	19.9	mg/L	1	0.100	0.006		GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Manganese	0.361	mg/L	1	0.00100	0.00008		GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Mercury	93	ng/L	1	5	2		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Potassium	3.99	mg/L	1	0.100	0.008		GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Selenium	4.60	µg/L	1	0.50	0.04		GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Sodium	94.7	mg/L	1	0.20	0.01		GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Strontium	0.127	mg/L	1	0.00200	0.00005		GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4
Thallium	0.18	µg/L	1	0.20	0.02	J1	GES	03/04/2024 17:34	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-28

Customer Description:

Lab Number: 240666-010

Preparation:

Date Collected: 02/20/2024 12:34 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.008	µg/L	1	0.100	0.008	J1	GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4
Arsenic	0.10	µg/L	1	0.10	0.03		GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4
Barium	124	µg/L	1	0.20	0.05		GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4
Beryllium	0.917	µg/L	1	0.050	0.007		GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4
Boron	0.333	mg/L	1	0.050	0.007		GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4
Cadmium	0.063	µg/L	1	0.020	0.004		GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4
Calcium	1.34	mg/L	1	0.05	0.01		GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4
Chromium	0.38	µg/L	1	0.30	0.07		GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4
Cobalt	14.4	µg/L	1	0.020	0.005		GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4
Lithium	0.0207	mg/L	1	0.00030	0.00007		GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4
Magnesium	3.20	mg/L	1	0.100	0.006		GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4
Mercury	17	ng/L	1	5	2		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4
Potassium	0.757	mg/L	1	0.100	0.008		GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4
Selenium	0.32	µg/L	1	0.50	0.04	J1	GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4
Sodium	7.87	mg/L	1	0.20	0.01		GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4
Strontium	0.0251	mg/L	1	0.00200	0.00005		GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4
Thallium	0.02	µg/L	1	0.20	0.02	J1	GES	03/04/2024 17:44	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	3.97	pCi/L	0.46	0.29		ST	02/29/2024 14:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	89.2	%						
Radium-228	1.87	pCi/L	0.17	0.51		TTP	03/07/2024 15:20	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	90.4	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-28

Customer Description:

Lab Number: 240666-010-01

Preparation: Dissolved

Date Collected: 02/20/2024 12:34 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Arsenic	0.04	µg/L	1	0.10	0.03	J1	GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Barium	117	µg/L	1	0.20	0.05		GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Beryllium	0.649	µg/L	1	0.050	0.007		GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Boron	0.339	mg/L	1	0.050	0.007		GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Cadmium	0.055	µg/L	1	0.020	0.004		GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Calcium	1.28	mg/L	1	0.05	0.01		GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Chromium	0.35	µg/L	1	0.30	0.07		GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Cobalt	13.3	µg/L	1	0.020	0.005		GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Iron	0.009	mg/L	1	0.020	0.003	J1	GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Lead	0.09	µg/L	1	0.20	0.05	J1	GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Lithium	0.0201	mg/L	1	0.00030	0.00007		GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Magnesium	2.93	mg/L	1	0.100	0.006		GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Manganese	0.0359	mg/L	1	0.00100	0.00008		GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Mercury	7	ng/L	1	5	2		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Potassium	0.778	mg/L	1	0.100	0.008		GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Selenium	0.13	µg/L	1	0.50	0.04	J1	GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Sodium	7.20	mg/L	1	0.20	0.01		GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Strontium	0.0230	mg/L	1	0.00200	0.00005		GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4
Thallium	0.02	µg/L	1	0.20	0.02	J1	GES	03/04/2024 17:55	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-30

Customer Description:

Lab Number: 240666-011

Preparation:

Date Collected: 02/19/2024 12:31 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4
Arsenic	0.25	µg/L	1	0.10	0.03		GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4
Barium	61.3	µg/L	1	0.20	0.05		GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4
Beryllium	0.097	µg/L	1	0.050	0.007		GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4
Boron	1.50	mg/L	1	0.050	0.007		GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4
Cadmium	0.012	µg/L	1	0.020	0.004	J1	GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4
Calcium	0.44	mg/L	1	0.05	0.01		GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4
Chromium	0.53	µg/L	1	0.30	0.07		GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4
Cobalt	3.33	µg/L	1	0.020	0.005		GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4
Lithium	0.00870	mg/L	1	0.00030	0.00007		GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4
Magnesium	1.75	mg/L	1	0.100	0.006		GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4
Mercury	22	ng/L	2	10	4		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4
Potassium	0.742	mg/L	1	0.100	0.008		GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4
Selenium	0.31	µg/L	1	0.50	0.04	J1	GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4
Sodium	66.9	mg/L	1	0.20	0.01		GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4
Strontium	0.00776	mg/L	1	0.00200	0.00005		GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	03/04/2024 19:53	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.27	pCi/L	0.23	0.26		ST	02/29/2024 14:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	91.2	%						
Radium-228	0.99	pCi/L	0.13	0.40		TTP	03/07/2024 15:20	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	90.7	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-30

Customer Description:

Lab Number: 240666-011-01

Preparation: Dissolved

Date Collected: 02/19/2024 12:31 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Arsenic	0.08	µg/L	1	0.10	0.03	J1	GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Barium	38.4	µg/L	1	0.20	0.05		GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Beryllium	0.037	µg/L	1	0.050	0.007	J1	GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Boron	1.52	mg/L	1	0.050	0.007		GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Cadmium	0.008	µg/L	1	0.020	0.004	J1	GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Calcium	0.34	mg/L	1	0.05	0.01		GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Chromium	0.40	µg/L	1	0.30	0.07		GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Cobalt	2.43	µg/L	1	0.020	0.005		GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Iron	0.006	mg/L	1	0.020	0.003	J1	GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Lithium	0.00847	mg/L	1	0.00030	0.00007		GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Magnesium	1.34	mg/L	1	0.100	0.006		GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Manganese	0.00822	mg/L	1	0.00100	0.00008		GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Mercury	11	ng/L	1	5	2		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Potassium	0.749	mg/L	1	0.100	0.008		GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Selenium	0.16	µg/L	1	0.50	0.04	J1	GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Sodium	66.8	mg/L	1	0.20	0.01		GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Strontium	0.00616	mg/L	1	0.00200	0.00005		GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	03/04/2024 20:03	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-31

Customer Description:

Lab Number: 240666-012

Preparation:

Date Collected: 02/19/2024 11:42 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 20:13	EPA 200.8-1994, Rev. 5.4
Arsenic	0.40	µg/L	1	0.10	0.03		GES	03/04/2024 20:13	EPA 200.8-1994, Rev. 5.4
Barium	33.3	µg/L	1	0.20	0.05		GES	03/04/2024 20:13	EPA 200.8-1994, Rev. 5.4
Beryllium	1.26	µg/L	5	0.25	0.04		GES	03/04/2024 20:18	EPA 200.8-1994, Rev. 5.4
Boron	0.022	mg/L	1	0.050	0.007	J1	GES	03/04/2024 20:13	EPA 200.8-1994, Rev. 5.4
Cadmium	0.069	µg/L	1	0.020	0.004		GES	03/04/2024 20:13	EPA 200.8-1994, Rev. 5.4
Calcium	2.54	mg/L	1	0.05	0.01		GES	03/04/2024 20:13	EPA 200.8-1994, Rev. 5.4
Chromium	0.56	µg/L	1	0.30	0.07		GES	03/04/2024 20:13	EPA 200.8-1994, Rev. 5.4
Cobalt	9.47	µg/L	1	0.020	0.005		GES	03/04/2024 20:13	EPA 200.8-1994, Rev. 5.4
Lead	0.30	µg/L	1	0.20	0.05		GES	03/04/2024 20:13	EPA 200.8-1994, Rev. 5.4
Lithium	0.0979	mg/L	5	0.0015	0.0004		GES	03/04/2024 20:18	EPA 200.8-1994, Rev. 5.4
Magnesium	3.42	mg/L	1	0.100	0.006		GES	03/04/2024 20:13	EPA 200.8-1994, Rev. 5.4
Mercury	120	ng/L	10	50	20		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 20:13	EPA 200.8-1994, Rev. 5.4
Potassium	1.63	mg/L	1	0.100	0.008		GES	03/04/2024 20:13	EPA 200.8-1994, Rev. 5.4
Selenium	0.39	µg/L	1	0.50	0.04	J1	GES	03/04/2024 20:13	EPA 200.8-1994, Rev. 5.4
Sodium	29.5	mg/L	1	0.20	0.01		GES	03/04/2024 20:13	EPA 200.8-1994, Rev. 5.4
Strontium	0.0364	mg/L	1	0.00200	0.00005		GES	03/04/2024 20:13	EPA 200.8-1994, Rev. 5.4
Thallium	0.09	µg/L	1	0.20	0.02	J1	GES	03/04/2024 20:13	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	2.93	pCi/L	0.34	0.23		ST	02/29/2024 14:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	90.4	%						
Radium-228	2.80	pCi/L	0.18	0.52		TTP	03/07/2024 15:20	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	88.7	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-31

Customer Description:

Lab Number: 240666-012-01

Preparation: Dissolved

Date Collected: 02/19/2024 11:42 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.013	µg/L	1	0.100	0.008	J1	GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4
Arsenic	0.24	µg/L	1	0.10	0.03		GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4
Barium	32.8	µg/L	1	0.20	0.05		GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4
Beryllium	0.92	µg/L	5	0.25	0.04		GES	03/04/2024 20:29	EPA 200.8-1994, Rev. 5.4
Boron	0.023	mg/L	1	0.050	0.007	J1	GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4
Cadmium	0.072	µg/L	1	0.020	0.004		GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4
Calcium	2.55	mg/L	1	0.05	0.01		GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4
Chromium	0.43	µg/L	1	0.30	0.07		GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4
Cobalt	9.67	µg/L	1	0.020	0.005		GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4
Iron	0.269	mg/L	1	0.020	0.003		GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4
Lead	0.35	µg/L	1	0.20	0.05		GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4
Lithium	0.0848	mg/L	5	0.0015	0.0004		GES	03/04/2024 20:29	EPA 200.8-1994, Rev. 5.4
Magnesium	3.33	mg/L	1	0.100	0.006		GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4
Manganese	0.0253	mg/L	1	0.00100	0.00008		GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4
Mercury	12	ng/L	1	5	2		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4
Potassium	1.65	mg/L	1	0.100	0.008		GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4
Selenium	0.15	µg/L	1	0.50	0.04	J1	GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4
Sodium	29.6	mg/L	1	0.20	0.01		GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4
Strontium	0.0361	mg/L	1	0.00200	0.00005		GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4
Thallium	0.09	µg/L	1	0.20	0.02	J1	GES	03/04/2024 20:24	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-32

Customer Description:

Lab Number: 240666-013

Preparation:

Date Collected: 02/19/2024 10:56 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.010	µg/L	1	0.100	0.008	J1	GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Arsenic	3.94	µg/L	1	0.10	0.03		GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Barium	26.2	µg/L	1	0.20	0.05		GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Beryllium	0.182	µg/L	1	0.050	0.007		GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Boron	0.161	mg/L	1	0.050	0.007		GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Cadmium	0.014	µg/L	1	0.020	0.004	J1	GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Calcium	4.08	mg/L	1	0.05	0.01		GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Chromium	0.45	µg/L	1	0.30	0.07		GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Cobalt	8.24	µg/L	1	0.020	0.005		GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Lead	0.08	µg/L	1	0.20	0.05	J1	GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Lithium	0.0542	mg/L	1	0.00030	0.00007		GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Magnesium	4.51	mg/L	1	0.100	0.006		GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Mercury	470	ng/L	20	100	40		RLP	03/05/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Potassium	2.64	mg/L	1	0.100	0.008		GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Selenium	0.13	µg/L	1	0.50	0.04	J1	GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Silver	<0.007	µg/L	1	0.050	0.007	U1	GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Sodium	16.4	mg/L	1	0.20	0.01		GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Strontium	0.0606	mg/L	1	0.00200	0.00005		GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4
Thallium	0.07	µg/L	1	0.20	0.02	J1	GES	03/04/2024 20:34	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.28	pCi/L	0.23	0.31		ST	02/29/2024 14:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	88.4	%						
Radium-228	1.75	pCi/L	0.15	0.45		TTP	03/07/2024 15:20	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	91.5	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-32

Customer Description:

Lab Number: 240666-013-01

Preparation: Dissolved

Date Collected: 02/19/2024 10:56 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Arsenic	2.91	µg/L	1	0.10	0.03		GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Barium	25.5	µg/L	1	0.20	0.05		GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Beryllium	0.155	µg/L	1	0.050	0.007		GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Boron	0.166	mg/L	1	0.050	0.007		GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Cadmium	0.012	µg/L	1	0.020	0.004	J1	GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Calcium	4.00	mg/L	1	0.05	0.01		GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Chromium	0.30	µg/L	1	0.30	0.07		GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Cobalt	7.97	µg/L	1	0.020	0.005		GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Iron	8.75	mg/L	1	0.020	0.003		GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Lithium	0.0538	mg/L	1	0.00030	0.00007		GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Magnesium	4.41	mg/L	1	0.100	0.006		GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Manganese	0.0651	mg/L	1	0.00100	0.00008		GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Mercury	2	ng/L	1	5	2	J1	RLP	03/05/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Potassium	2.72	mg/L	1	0.100	0.008		GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Selenium	0.04	µg/L	1	0.50	0.04	J1	GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Silver	<0.007	µg/L	1	0.050	0.007	U1	GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Sodium	16.8	mg/L	1	0.20	0.01		GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Strontium	0.0595	mg/L	1	0.00200	0.00005		GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4
Thallium	0.07	µg/L	1	0.20	0.02	J1	GES	03/04/2024 20:44	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-33

Customer Description:

Lab Number: 240666-014

Preparation:

Date Collected: 02/19/2024 10:35 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4
Arsenic	0.67	µg/L	1	0.10	0.03		GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4
Barium	46.5	µg/L	1	0.20	0.05		GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4
Beryllium	1.28	µg/L	1	0.050	0.007		GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4
Boron	0.158	mg/L	1	0.050	0.007		GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4
Cadmium	0.059	µg/L	1	0.020	0.004		GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4
Calcium	2.35	mg/L	1	0.05	0.01		GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4
Chromium	0.38	µg/L	1	0.30	0.07		GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4
Cobalt	11.1	µg/L	1	0.020	0.005		GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4
Lead	0.27	µg/L	1	0.20	0.05		GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4
Lithium	0.0205	mg/L	1	0.00030	0.00007		GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4
Magnesium	4.42	mg/L	1	0.100	0.006		GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4
Mercury	7100	ng/L	100	500	200		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4
Potassium	0.305	mg/L	1	0.100	0.008		GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4
Selenium	2.65	µg/L	1	0.50	0.04		GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4
Sodium	17.6	mg/L	1	0.20	0.01		GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4
Strontium	0.0376	mg/L	1	0.00200	0.00005		GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	03/04/2024 20:54	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.67	pCi/L	0.12	0.13	P1	ST	03/20/2024 11:53	SW-846 9315-1986, Rev. 0
Carrier Recovery	92.6	%						
Radium-228	2.43	pCi/L	0.16	0.47		TTP	03/07/2024 15:20	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	92.8	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: AD-33

Customer Description:

Lab Number: 240666-014-01

Preparation: Dissolved

Date Collected: 02/19/2024 10:35 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Arsenic	0.63	µg/L	1	0.10	0.03		GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Barium	48.2	µg/L	1	0.20	0.05		GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Beryllium	1.27	µg/L	1	0.050	0.007		GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Boron	0.162	mg/L	1	0.050	0.007		GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Cadmium	0.063	µg/L	1	0.020	0.004		GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Calcium	2.75	mg/L	1	0.05	0.01		GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Chromium	0.42	µg/L	1	0.30	0.07		GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Cobalt	11.4	µg/L	1	0.020	0.005		GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Iron	0.019	mg/L	1	0.020	0.003	J1	GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Lead	0.30	µg/L	1	0.20	0.05		GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Lithium	0.0207	mg/L	1	0.00030	0.00007		GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Magnesium	4.47	mg/L	1	0.100	0.006		GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Manganese	0.00800	mg/L	1	0.00100	0.00008		GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Mercury	1090	ng/L	20	100	40		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Potassium	0.309	mg/L	1	0.100	0.008		GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Selenium	2.25	µg/L	1	0.50	0.04		GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Sodium	18.2	mg/L	1	0.20	0.01		GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Strontium	0.0389	mg/L	1	0.00200	0.00005		GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	03/04/2024 21:05	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: Duplicate

Customer Description:

Lab Number: 240666-015

Preparation:

Date Collected: 02/19/2024 15:00 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4
Arsenic	0.74	µg/L	1	0.10	0.03		GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4
Barium	47.6	µg/L	1	0.20	0.05		GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4
Beryllium	1.26	µg/L	1	0.050	0.007		GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4
Boron	0.160	mg/L	1	0.050	0.007		GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4
Cadmium	0.058	µg/L	1	0.020	0.004		GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4
Calcium	2.36	mg/L	1	0.05	0.01		GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4
Chromium	0.32	µg/L	1	0.30	0.07		GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4
Cobalt	11.3	µg/L	1	0.020	0.005		GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4
Lead	0.28	µg/L	1	0.20	0.05		GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4
Lithium	0.0200	mg/L	1	0.00030	0.00007		GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4
Magnesium	4.46	mg/L	1	0.100	0.006		GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4
Mercury	6800	ng/L	100	500	200		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4
Potassium	0.303	mg/L	1	0.100	0.008		GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4
Selenium	2.61	µg/L	1	0.50	0.04		GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4
Sodium	18.1	mg/L	1	0.20	0.01		GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4
Strontium	0.0385	mg/L	1	0.00200	0.00005		GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	03/04/2024 21:15	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: Duplicate

Customer Description:

Lab Number: 240666-015-01

Preparation: Dissolved

Date Collected: 02/19/2024 15:00 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Arsenic	0.62	µg/L	1	0.10	0.03		GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Barium	47.8	µg/L	1	0.20	0.05		GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Beryllium	1.31	µg/L	1	0.050	0.007		GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Boron	0.161	mg/L	1	0.050	0.007		GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Cadmium	0.064	µg/L	1	0.020	0.004		GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Calcium	2.37	mg/L	1	0.05	0.01		GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Chromium	0.37	µg/L	1	0.30	0.07		GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Cobalt	11.2	µg/L	1	0.020	0.005		GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Iron	0.019	mg/L	1	0.020	0.003	J1	GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Lead	0.30	µg/L	1	0.20	0.05		GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Lithium	0.0211	mg/L	1	0.00030	0.00007		GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Magnesium	4.41	mg/L	1	0.100	0.006		GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Manganese	0.00793	mg/L	1	0.00100	0.00008		GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Mercury	1080	ng/L	20	100	40		RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Potassium	0.304	mg/L	1	0.100	0.008		GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Selenium	2.27	µg/L	1	0.50	0.04		GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Sodium	17.9	mg/L	1	0.20	0.01		GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Strontium	0.0386	mg/L	1	0.00200	0.00005		GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	03/04/2024 21:25	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: Equipment Blank

Customer Description:

Lab Number: 240666-016

Preparation:

Date Collected: 02/19/2024 12:11 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4
Calcium	<0.01	mg/L	1	0.05	0.01	U1	GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4
Chromium	0.25	µg/L	1	0.30	0.07	J1	GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4
Cobalt	0.022	µg/L	1	0.020	0.005		GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00007	mg/L	1	0.00030	0.00007	U1	GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.006	mg/L	1	0.100	0.006	U1	GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4
Potassium	<0.008	mg/L	1	0.100	0.008	U1	GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4
Sodium	<0.01	mg/L	1	0.20	0.01	U1	GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4
Strontium	0.00006	mg/L	1	0.00200	0.00005	J1	GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	03/04/2024 22:58	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Customer Sample ID: Field Blank

Customer Description:

Lab Number: 240666-017

Preparation:

Date Collected: 02/20/2024 12:32 EST

Date Received: 02/23/2024 12:31 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4
Calcium	<0.01	mg/L	1	0.05	0.01	U1	GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4
Chromium	0.27	µg/L	1	0.30	0.07	J1	GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4
Cobalt	0.032	µg/L	1	0.020	0.005		GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00007	mg/L	1	0.00030	0.00007	U1	GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.006	mg/L	1	0.100	0.006	U1	GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	02/28/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4
Potassium	<0.008	mg/L	1	0.100	0.008	U1	GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4
Sodium	0.48	mg/L	1	0.20	0.01		GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4
Strontium	<0.00005	mg/L	1	0.00200	0.00005	U1	GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	03/04/2024 23:03	EPA 200.8-1994, Rev. 5.4

240666

Job Comments:

Original report issued 4/1/24. Report reissued 8/12/24 with "Preparation" corrected on 24066-017.

240666-001

Comments:

TG-32



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

240666-001-01

Comments:

TG-32

240666-002

Comments:

TG-32

240666-002-01

Comments:

TG-32

240666-003

Comments:

TG-32

240666-003-01

Comments:

TG-32

240666-004

Comments:

TG-32



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

240666-004-01

Comments:

TG-32

240666-005

Comments:

TG-32

240666-005-01

Comments:

TG-32

240666-006

Comments:

TG-32

240666-006-01

Comments:

TG-32



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

240666-007

Comments:

TG-32

240666-007-01

Comments:

TG-32

240666-008

Comments:

TG-32

240666-008-01

Comments:

TG-32

240666-009

Comments:

TG-32

240666-009-01

Comments:

TG-32



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

240666-010

Comments:

TG-32

240666-010-01

Comments:

TG-32

240666-011

Comments:

TG-32

240666-011-01

Comments:

TG-32

240666-012

Comments:

TG-32



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

240666-012-01

Comments:

TG-32

240666-013

Comments:

TG-32

240666-013-01

Comments:

TG-32

240666-014

Comments:

TG-32

240666-014-01

Comments:

TG-32

240666-015

Comments:

TG-32



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

240666-015-01
Comments:

TG-32

240666-016
Comments:

TG-32

240666-017
Comments:

TG-32



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Reissued

Job ID: 240666

Customer: Pirkey Power Station

Date Reported: 08/12/2024

Report Verification

This report and the above data have been confirmed by the following analyst.

Michael Ohlinger, Chemist

Email: msohlinger@aep.com

Phone: 614-836-4184

Audinet: 8-210-4184

THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED. ALL TIMES LISTED ARE IN THE EASTERN TIME ZONE.

Data Qualifier Legend

U1 - Not detected at or below method detection limit (MDL).

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

P1 - The precision between duplicate results was above acceptance limits.

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125

Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Site Contact: *81 2* Date:

For Lab Use Only:
COC/Order #: *242666*

Project Name: Pirkey - CCR
Contact Name: Leslie Fuerschbach
Contact Phone: 318-423-3805
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days)

Sample Identification	Sample Date	Sample Time	Sample Type (C-Comp, G-Grab)	Matrix	# of Cont.	Sampler(s) Initials				Sample Specific Notes	
						B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Mo, Se, TL and Na, K, Mg, Sr	Field-filter 250 mL bottle, then pH<2, HNO ₃	1 L bottle, Cool, 0-6°C	Three (six every 10th) L bottles, pH<2, HNO ₃		Field-Filter 250 mL PTFE lined bottle, HCL ⁺ , pH<2
AD-2	2/20/2024	1042	G	GW	7	X	X	X	X	X	
AD-3	2/20/2024	1125	G	GW	7	X	X	X	X	X	
AD-4	2/20/2024	931	G	GW	7	X	X	X	X	X	
AD-7R	2/19/2024	1128	G	GW	7	X	X	X	X	X	
AD-12	2/19/2024	901	G	GW	7	X	X	X	X	X	
AD-13	2/19/2024	844	G	GW	7	X	X	X	X	X	
AD-17	2/20/2024	1230	G	GW	7	X	X	X	X	X	
AD-18	2/20/2024	829	G	GW	7	X	X	X	X	X	
AD-22	2/19/2024	1044	G	GW	7	X	X	X	X	X	
AD-28	2/20/2024	1134	G	GW	7	X	X	X	X	X	
AD-30	2/19/2024	1131	G	GW	7	X	X	X	X	X	

Preservation Used: 1= Ice, 2= HCl, 3= H2SO4, 4=HNO3, 5=NaOH, 6= Other _____; F= filter in field
* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:
TG-32

Relinquished by: <i>Matt Hamilton</i>	Company: <i>East</i>	Date/Time: <i>1/6/24</i>	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: <i>Michael Ohly</i>	Date/Time: <i>2/23/24</i>
Relinquished by:	Company:	Date/Time:		Date/Time: <i>1/00</i>

Dolan Chemical Laboratory (DCL)

4001 Bixby Road
 Groveport, Ohio 43125
 Jonathan Bernhill (318-673-3803)
 Contacts: Michael Ohlinger (614-836-4184)

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Site Contact:

Date:

For Lab Use Only:

COC/Order #:

Project Name: Pirkey - CCR

Contact Name: Leslie Fuerschbach

Contact Phone: 318-423-3805

Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days)

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO ₃		Field-filter 250 mL bottle, then pH<2, HNO ₃		1 L bottle, Cool, 0-6°C		Three (six every 10th) L bottles, pH<2, HNO ₃		Field-Filter 250 mL PTFE lined bottle, HCL**, pH<2		250 mL PTFE lined bottle, HCL**, pH<2	
							B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Mo, Se, TL and Na, K, Mg, Sr	X	B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Fe, Mn, Mo, Pb, Se, TL and Na, K, Mg, Sr	X	TDS, F, Cl, SO ₄ , and Br, Alkalinity	X	Ra-226, Ra-228	X	Hg	X	Hg	X
AD-31	2/19/2024	1042	G	GW	7		X	X				X	X					
AD-32	2/19/2024	956	G	GW	7		X	X				X	X					
AD-33	2/19/2024	935	G	GW	10		X	X				X	X					
DUPLICATE	2/29/2024	1400	G	GW	4		X	X					X					
EQUIPMENT BLANK	2/19/2024	1111	G	GW	2		X											
FIELD BLANK	2/20/2024	1132	G	GW	2		X											
Preservation Used: 1= Ice, 2= HCl, 3= H2SO4, 4=HNO3, 5=NaOH, 6= Other _____; F= filter in field							4	F4	1	4	F2	2						

* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

TG-32

Relinquished by: *[Signature]* Company: *ESK* Date/Time: *16* Received by: *[Signature]* Date/Time: *2/23/24*

Relinquished by: *[Signature]* Company: *ESK* Date/Time: *2/23/24* Received in Laboratory by: *[Signature]* Date/Time: *2/23/24*

Relinquished by: *[Signature]* Company: *ESK* Date/Time: *2/23/24* Received in Laboratory by: *[Signature]* Date/Time: *2/23/24*

AEP WATER & WASTE SAMPLE RECEIPT FORM

<u>Package Type</u> <input checked="" type="radio"/> Cooler <input type="radio"/> Box <input type="radio"/> Bag <input type="radio"/> Envelope		<u>Delivery Type</u> PONY <input checked="" type="radio"/> UPS <input checked="" type="radio"/> FedEx <input type="radio"/> USPS Other _____	
Plant/Customer <u>Pittkey</u>		Number of Plastic Containers: <u>77</u>	
Opened By <u>NLG / MSO / MKR</u>		Number of Glass Containers: <u>—</u>	
Date/Time <u>2/23/24 1000</u>		Number of Mercury Containers: <u>32</u>	
Were all temperatures within 0-6°C? Y / N or <input checked="" type="radio"/> N/A Initial: _____ on ice / no ice (IR Gun Ser# <u>2213689000</u> , Expir. <u>03/24/2024</u>) - If No, specify each deviation: _____			
Was container in good condition? <input checked="" type="radio"/> Y / <input type="radio"/> N Comments _____			
Was Chain of Custody received? <input checked="" type="radio"/> Y / <input type="radio"/> N Comments _____			
Requested turnaround: <u>Routine</u> If RUSH, who was notified? _____			
pH (15 min)	Cr ⁺⁶ (pres) (24 hr)	NO ₂ or NO ₃ (48 hr)	ortho-PO ₄ (48 hr) Hg-diss (pres) (48 hr)

Was COC filled out properly? Y / N Comments _____

Were samples labeled properly? Y / N Comments _____

Were correct containers used? Y / N Comments _____

Was pH checked & Color Coding done? Y / N or N/A Initial & Date: MGR / WLG 2/23/24

pH paper (circle one): MQuant,PN1.09535.0001,LOT# _____ [OR] Lab Rat,PN4801,LOT# X000RWDG21 Exp 03/15/2025

- Was Add'l Preservative needed? Y / N If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / N Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# 240666 Initial & Date & Time : _____

Logged by MSO Comments: _____

Reviewed by MGR _____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Radium Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Sunita Timsina
Name (printed)


Signature

Chemist Associate
Official Title

03/14/2024
Date

Radium Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Station
Reviewer Name: Sunita Timsina
LRC Date: 03/14/2024
Laboratory Job Number: 240666
Prep Batch Number(s): PB24031105

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Radium Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	NA	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Radium Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Station
Reviewer Name: Sunita Timsina
LRC Date: 03/14/2024
Laboratory Job Number: 240666
Prep Batch Number(s): PB24031105

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Radium Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Radium Laboratory Review Checklist

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Station
Reviewer Name: Sunita Timsina
LRC Date: 03/14/2024
Laboratory Job Number: 240666
Prep Batch Number(s): PB24031105

Exception Report No.	Description

¹ Items identified by the letter “R” must be available as a hard copy or as a .pdf file. Items identified by the letter “S” should be retained and made available upon request for the appropriate retention period.
² O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).
³ NA - Not applicable; NR - Not reviewed.
⁴ Exception Report identification number; an Exception Report should be completed for an item if the result is “No” or “NR.”

Radium Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

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 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Tamisha Palmer

Name (printed)



Signature

Chemical Technician, Principal

Official Title

03/05/2024

Date

Radium Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey Power Plant

Reviewer Name: Tamisha Palmer

LRC Date: 03/05/2024

Laboratory Job Number: 240666

Prep Batch Number(s): PB24022311

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Radium Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Radium Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey Power Plant

Reviewer Name: Tamisha Palmer

LRC Date: 03/05/2024

Laboratory Job Number: 240666

Prep Batch Number(s): PB24022311

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Radium Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Radium Laboratory Review Checklist

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey Power Plant

Reviewer Name: Tamisha Palmer

LRC Date: 03/05/2024

Laboratory Job Number: 240666

Prep Batch Number(s): PB24022311

Exception Report No.	Description

¹ Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

² O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).

³ NA - Not applicable; NR - Not reviewed.

⁴ Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Mercury Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- NR R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Susann Sulzmann Susann Sulzmann Senior Chemist 03/26/24
Name (printed) Signature Official Title Date

Mercury Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Station
Reviewer Name: Susann Sulzmann
LRC Date: 03/26/24
Laboratory Job Number: 240666
Prep Batch Number(s): 24022702, 24022703, 24022704, 24022803, 24030501

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	yes	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Mercury Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	yes	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	yes	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Mercury Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Station
Reviewer Name: Susann Sulzmann
LRC Date: 03/26/24
Laboratory Job Number: 240666
Prep Batch Number(s): 24022702, 24022703, 24022704, 24022803, 24030501

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Mercury Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Mercury Laboratory Review Checklist

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Station
Reviewer Name: Susann Sulzmann
LRC Date: 03/26/24
Laboratory Job Number: 240666
Prep Batch Number(s): 24022702, 24022703, 24022704, 24022803, 24030501

Exception Report No.	Description
ER1	CCB acceptance criteria is CCB<MQL.

¹ Items identified by the letter “R” must be available as a hard copy or as a .pdf file. Items identified by the letter “S” should be retained and made available upon request for the appropriate retention period.
² O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).
³ NA - Not applicable; NR - Not reviewed.
⁴ Exception Report identification number; an Exception Report should be completed for an item if the result is “No” or “NR.”

ICP-MS Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Jonathan Barnhill		Lab Supervisor	3/22/24
Name (printed)	Signature	Official Title	Date

ICP-MS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey CCR
Reviewer Name: Jonathan Barnhill
LRC Date: 3/22/24
Laboratory Job Number: 240666
Prep Batch Number(s): PB24022905 PB24022909 QC2403028

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	No	ER1
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

ICP-MS Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

ICP-MS Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey CCR
Reviewer Name: Jonathan Barnhill
LRC Date: 3/22/24
Laboratory Job Number: 240666
Prep Batch Number(s): PB24022905 PB24022909 QC2403028

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER2
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	Yes	
	I	Were ion abundance data within the method-required QC limits?	Yes	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	Yes	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

ICP-MS Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

ICP-MS Laboratory Review Checklist

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey CCR
Reviewer Name: Jonathan Barnhill
LRC Date: 3/22/24
Laboratory Job Number: 240666
Prep Batch Number(s): PB24022905 PB24022909 QC2403028

Exception Report No.	Description
ER1	Linear Dynamic Range (LDR) study used to determine upper limit of analyte calibration.
ER2	CCB acceptance criteria is $CCB < 2.2 * MDL$.

¹ Items identified by the letter “R” must be available as a hard copy or as a .pdf file. Items identified by the letter “S” should be retained and made available upon request for the appropriate retention period.
² O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).
³ NA - Not applicable; NR - Not reviewed.
⁴ Exception Report identification number; an Exception Report should be completed for an item if the result is “No” or “NR.”



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 240640

Customer: Pirkey Power Station

Date Reported: 03/08/2024

Customer Sample ID: AD-2

Customer Description:

Lab Number: 240640-001

Preparation:

Date Collected: 02/20/2024 11:42 EST

Date Received: 02/22/2024 09:50 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.44	mg/L	2	0.10	0.02		CRJ	03/04/2024 22:16	EPA 300.1 -1997, Rev. 1.0
Chloride	31.4	mg/L	2	0.04	0.01		CRJ	03/04/2024 22:16	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.29	mg/L	2	0.06	0.02		CRJ	03/04/2024 22:16	EPA 300.1 -1997, Rev. 1.0
Sulfate	292	mg/L	10	3.0	0.6		CRJ	03/04/2024 21:40	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	02/22/2024 14:07	SM 2320B-2011
TDS, Filterable Residue	540	mg/L	1	50	20		ELT	02/23/2024 08:58	SM 2540C-2015

Customer Sample ID: AD-3

Customer Description:

Lab Number: 240640-002

Preparation:

Date Collected: 02/20/2024 12:25 EST

Date Received: 02/22/2024 09:50 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.05	mg/L	2	0.10	0.02	J1	CRJ	03/04/2024 21:04	EPA 300.1 -1997, Rev. 1.0
Chloride	5.55	mg/L	2	0.04	0.01		CRJ	03/04/2024 21:04	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.03	mg/L	2	0.06	0.02	J1	CRJ	03/04/2024 21:04	EPA 300.1 -1997, Rev. 1.0
Sulfate	22.3	mg/L	2	0.6	0.1		CRJ	03/04/2024 21:04	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	02/22/2024 14:07	SM 2320B-2011
TDS, Filterable Residue	140	mg/L	1	50	20		ELT	02/23/2024 09:05	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 240640

Customer: Pirkey Power Station

Date Reported: 03/08/2024

Customer Sample ID: AD-4

Customer Description:

Lab Number: 240640-003

Preparation:

Date Collected: 02/20/2024 10:31 EST

Date Received: 02/22/2024 09:50 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.18	mg/L	2	0.10	0.02		CRJ	03/04/2024 23:28	EPA 300.1 -1997, Rev. 1.0
Chloride	4.35	mg/L	2	0.04	0.01		CRJ	03/04/2024 23:28	EPA 300.1 -1997, Rev. 1.0
Fluoride	<0.02	mg/L	2	0.06	0.02	U1	CRJ	03/04/2024 23:28	EPA 300.1 -1997, Rev. 1.0
Sulfate	19.9	mg/L	2	0.6	0.1		CRJ	03/04/2024 23:28	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	02/22/2024 14:07	SM 2320B-2011
TDS, Filterable Residue	180	mg/L	1	50	20		ELT	02/23/2024 09:05	SM 2540C-2015

Customer Sample ID: AD-7R

Customer Description:

Lab Number: 240640-004

Preparation:

Date Collected: 02/19/2024 12:28 EST

Date Received: 02/22/2024 09:50 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.77	mg/L	2	0.10	0.02		CRJ	03/05/2024 00:03	EPA 300.1 -1997, Rev. 1.0
Chloride	21.3	mg/L	2	0.04	0.01		CRJ	03/05/2024 00:03	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.15	mg/L	2	0.06	0.02		CRJ	03/05/2024 00:03	EPA 300.1 -1997, Rev. 1.0
Sulfate	57.8	mg/L	2	0.6	0.1		CRJ	03/05/2024 00:03	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	02/22/2024 14:07	SM 2320B-2011
TDS, Filterable Residue	210	mg/L	1	50	20		ELT	02/23/2024 09:11	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 240640

Customer: Pirkey Power Station

Date Reported: 03/08/2024

Customer Sample ID: AD-12

Customer Description:

Lab Number: 240640-005

Preparation:

Date Collected: 02/19/2024 10:01 EST

Date Received: 02/22/2024 09:50 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.05	mg/L	2	0.10	0.02	J1	CRJ	03/05/2024 00:39	EPA 300.1 -1997, Rev. 1.0
Chloride	5.87	mg/L	2	0.04	0.01		CRJ	03/05/2024 00:39	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.11	mg/L	2	0.06	0.02		CRJ	03/05/2024 00:39	EPA 300.1 -1997, Rev. 1.0
Sulfate	3.1	mg/L	2	0.6	0.1		CRJ	03/05/2024 00:39	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	02/22/2024 14:07	SM 2320B-2011
TDS, Filterable Residue	60	mg/L	1	50	20		ELT	02/23/2024 09:11	SM 2540C-2015

Customer Sample ID: AD-13

Customer Description:

Lab Number: 240640-006

Preparation:

Date Collected: 02/19/2024 09:44 EST

Date Received: 02/22/2024 09:50 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.23	mg/L	2	0.10	0.02		CRJ	03/05/2024 03:03	EPA 300.1 -1997, Rev. 1.0
Chloride	35.5	mg/L	2	0.04	0.01		CRJ	03/05/2024 03:03	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.42	mg/L	2	0.06	0.02		CRJ	03/05/2024 03:03	EPA 300.1 -1997, Rev. 1.0
Sulfate	70.5	mg/L	2	0.6	0.1		CRJ	03/05/2024 03:03	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	02/22/2024 14:07	SM 2320B-2011
TDS, Filterable Residue	210	mg/L	1	50	20		ELT	02/23/2024 09:41	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 240640

Customer: Pirkey Power Station

Date Reported: 03/08/2024

Customer Sample ID: AD-17

Customer Description:

Lab Number: 240640-007

Preparation:

Date Collected: 02/20/2024 13:30 EST

Date Received: 02/22/2024 09:50 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.14	mg/L	2	0.10	0.02		CRJ	03/05/2024 01:51	EPA 300.1 -1997, Rev. 1.0
Chloride	12.0	mg/L	2	0.04	0.01		CRJ	03/05/2024 01:51	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.15	mg/L	2	0.06	0.02		CRJ	03/05/2024 01:51	EPA 300.1 -1997, Rev. 1.0
Sulfate	3.4	mg/L	2	0.6	0.1		CRJ	03/05/2024 01:51	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	02/22/2024 14:07	SM 2320B-2011
TDS, Filterable Residue	50	mg/L	1	50	20		ELT	02/23/2024 09:41	SM 2540C-2015

Customer Sample ID: AD-18

Customer Description:

Lab Number: 240640-008

Preparation:

Date Collected: 02/20/2024 09:29 EST

Date Received: 02/22/2024 09:50 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.03	mg/L	2	0.10	0.02	J1	CRJ	03/05/2024 04:50	EPA 300.1 -1997, Rev. 1.0
Chloride	4.67	mg/L	2	0.04	0.01		CRJ	03/05/2024 04:50	EPA 300.1 -1997, Rev. 1.0
Fluoride	<0.02	mg/L	2	0.06	0.02	U1	CRJ	03/05/2024 04:50	EPA 300.1 -1997, Rev. 1.0
Sulfate	8.1	mg/L	2	0.6	0.1		CRJ	03/05/2024 04:50	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	02/22/2024 14:07	SM 2320B-2011
TDS, Filterable Residue	110	mg/L	1	50	20		ELT	02/23/2024 09:47	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 240640

Customer: Pirkey Power Station

Date Reported: 03/08/2024

Customer Sample ID: AD-22

Customer Description:

Lab Number: 240640-009

Preparation:

Date Collected: 02/19/2024 11:44 EST

Date Received: 02/22/2024 09:50 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.52	mg/L	2	0.10	0.02		CRJ	03/05/2024 08:32	EPA 300.1 -1997, Rev. 1.0
Chloride	87.7	mg/L	25	0.5	0.1		CRJ	03/05/2024 04:15	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.55	mg/L	2	0.06	0.02		CRJ	03/05/2024 08:32	EPA 300.1 -1997, Rev. 1.0
Sulfate	291	mg/L	25	8	2		CRJ	03/05/2024 04:15	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	02/22/2024 14:07	SM 2320B-2011
TDS, Filterable Residue	620	mg/L	1	50	20		ELT	02/23/2024 09:47	SM 2540C-2015

Customer Sample ID: AD-28

Customer Description:

Lab Number: 240640-010

Preparation:

Date Collected: 02/20/2024 12:34 EST

Date Received: 02/22/2024 09:50 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.07	mg/L	2	0.10	0.02	J1	CRJ	03/05/2024 10:19	EPA 300.1 -1997, Rev. 1.0
Chloride	4.54	mg/L	2	0.04	0.01		CRJ	03/05/2024 10:19	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.97	mg/L	2	0.06	0.02		CRJ	03/05/2024 10:19	EPA 300.1 -1997, Rev. 1.0
Sulfate	26.9	mg/L	2	0.6	0.1		CRJ	03/05/2024 10:19	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	02/22/2024 14:07	SM 2320B-2011
TDS, Filterable Residue	90	mg/L	1	50	20		ELT	02/23/2024 09:53	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 240640

Customer: Pirkey Power Station

Date Reported: 03/08/2024

Customer Sample ID: AD-30

Customer Description:

Lab Number: 240640-011

Preparation:

Date Collected: 02/19/2024 12:31 EST

Date Received: 02/22/2024 09:50 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.17	mg/L	2	0.10	0.02		CRJ	03/07/2024 13:46	EPA 300.1 -1997, Rev. 1.0
Chloride	15.6	mg/L	2	0.04	0.01		CRJ	03/07/2024 13:46	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.03	mg/L	2	0.06	0.02	J1	CRJ	03/07/2024 13:46	EPA 300.1 -1997, Rev. 1.0
Sulfate	118	mg/L	10	3.0	0.6		CRJ	03/05/2024 10:55	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	02/22/2024 14:07	SM 2320B-2011
TDS, Filterable Residue	250	mg/L	1	50	20		ELT	02/23/2024 09:53	SM 2540C-2015

Customer Sample ID: AD-31

Customer Description:

Lab Number: 240640-012

Preparation:

Date Collected: 02/19/2024 11:42 EST

Date Received: 02/22/2024 09:50 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.25	mg/L	2	0.10	0.02		CRJ	03/05/2024 12:43	EPA 300.1 -1997, Rev. 1.0
Chloride	17.7	mg/L	2	0.04	0.01		CRJ	03/05/2024 12:43	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.09	mg/L	2	0.06	0.02		CRJ	03/05/2024 12:43	EPA 300.1 -1997, Rev. 1.0
Sulfate	70.9	mg/L	2	0.6	0.1		CRJ	03/05/2024 12:43	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	02/22/2024 14:07	SM 2320B-2011
TDS, Filterable Residue	250	mg/L	1	50	20		ELT	02/23/2024 10:13	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 240640

Customer: Pirkey Power Station

Date Reported: 03/08/2024

Customer Sample ID: AD-32

Customer Description:

Lab Number: 240640-013

Preparation:

Date Collected: 02/19/2024 10:56 EST

Date Received: 02/22/2024 09:50 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.33	mg/L	2	0.10	0.02		CRJ	03/05/2024 09:08	EPA 300.1 -1997, Rev. 1.0
Chloride	9.68	mg/L	2	0.04	0.01		CRJ	03/05/2024 09:08	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.25	mg/L	2	0.06	0.02		CRJ	03/05/2024 09:08	EPA 300.1 -1997, Rev. 1.0
Sulfate	48.4	mg/L	2	0.6	0.1		CRJ	03/05/2024 09:08	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	14	mg/L	1	20	5	J1	MGK	02/22/2024 14:07	SM 2320B-2011
TDS, Filterable Residue	150	mg/L	1	50	20		ELT	02/23/2024 10:13	SM 2540C-2015

Customer Sample ID: AD-33

Customer Description:

Lab Number: 240640-014

Preparation:

Date Collected: 02/19/2024 10:35 EST

Date Received: 02/22/2024 09:50 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.31	mg/L	2	0.10	0.02		CRJ	03/05/2024 15:42	EPA 300.1 -1997, Rev. 1.0
Chloride	9.41	mg/L	2	0.04	0.01		CRJ	03/05/2024 15:42	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.30	mg/L	2	0.06	0.02		CRJ	03/05/2024 15:42	EPA 300.1 -1997, Rev. 1.0
Sulfate	58.6	mg/L	2	0.6	0.1		CRJ	03/05/2024 15:42	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	02/22/2024 14:07	SM 2320B-2011
TDS, Filterable Residue	160	mg/L	1	50	20		ELT	02/23/2024 10:25	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 240640

Customer: Pirkey Power Station

Date Reported: 03/08/2024

Customer Sample ID: Duplicate

Customer Description:

Lab Number: 240640-015

Preparation:

Date Collected: 02/19/2024 15:00 EST

Date Received: 02/22/2024 09:50 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.32	mg/L	2	0.10	0.02		CRJ	03/07/2024 13:10	EPA 300.1 -1997, Rev. 1.0
Chloride	9.39	mg/L	2	0.04	0.01		CRJ	03/07/2024 13:10	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.30	mg/L	2	0.06	0.02		CRJ	03/07/2024 13:10	EPA 300.1 -1997, Rev. 1.0
Sulfate	58.6	mg/L	2	0.6	0.1		CRJ	03/07/2024 13:10	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	02/22/2024 14:07	SM 2320B-2011
TDS, Filterable Residue	170	mg/L	1	50	20		ELT	02/23/2024 10:36	SM 2540C-2015

Customer Sample ID: Field Blank

Customer Description:

Lab Number: 240640-016

Preparation:

Date Collected: 02/20/2024 12:32 EST

Date Received: 02/22/2024 09:50 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	<0.02	mg/L	2	0.10	0.02	U1	CRJ	03/05/2024 15:06	EPA 300.1 -1997, Rev. 1.0
Chloride	0.10	mg/L	2	0.04	0.01		CRJ	03/05/2024 15:06	EPA 300.1 -1997, Rev. 1.0
Fluoride	<0.02	mg/L	2	0.06	0.02	U1	CRJ	03/05/2024 15:06	EPA 300.1 -1997, Rev. 1.0
Sulfate	<0.1	mg/L	2	0.6	0.1	U1	CRJ	03/05/2024 15:06	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	02/22/2024 14:07	SM 2320B-2011
TDS, Filterable Residue	40	mg/L	1	50	20	J1	ELT	02/23/2024 10:42	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 240640

Customer: Pirkey Power Station

Date Reported: 03/08/2024

Report Verification

This report and the above data have been confirmed by the following analyst.

Michael Ohlinger, Chemist

Email: msohlinger@aep.com

Phone: 614-836-4184

Audinet: 8-210-4184

THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED. ALL TIMES LISTED ARE IN THE EASTERN TIME ZONE.

Data Qualifier Legend

U1 - Not detected at or below method detection limit (MDL).

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

Dolan Chemical Laboratory (DCL)
 4001 Bixby Road
 Groveport, Ohio 43125
 Contacts: Jonathan Barnhill (318-673-3803)
 Michael Ohlinger (614-836-4164)

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Site Contact:

Date:

For Lab Use Only:

COC/Order #:

240640

Project Name: Pirkey - CCR

Contact Name: Leslie Fuerschbach

Contact Phone: 318-423-3805

Sampler(s): Matt Hamilton Kenny McDonald

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Analysis Turnaround Time (in Calendar Days)						Sample Specific Notes
						250 mL bottle, pH<2, HNO ₃	Field-filter 250 mL bottle, then pH<2, HNO ₃	1 L bottle, Cool, 0-5°C	Three (six every 10th) L bottles, pH<2, HNO ₃	40 mL Glass vial or 250 mL PTFE lined bottle, HCL ⁺ , pH<2	40 mL Glass vial or 250 mL PTFE lined bottle, HCL ⁺ , pH<2	
AD-2	2/20/2024	1042	G	GW	1	B, Ca, Li, Sb, As, Ba, Bi, Cd, Cr, Co, Pb, Mn, Mo, Ni, P, Se, Tl, V, Zn, Sr, and Na, K, Mg, Sr	B, Ca, Li, Sb, As, Ba, Bi, Cd, Cr, Co, Pb, Mn, Mo, Ni, P, Se, Tl, V, Zn, Sr and Na, K, Mg, Sr	TDS, F, Cl, SO ₄ , Br, and Alkalinity	Ra-226, Ra-228	Hg	Hg	
AD-3	2/20/2024	1125	G	GW	1							
AD-4	2/20/2024	931	G	GW	1							
AD-7R	2/19/2024	1128	G	GW	1							
AD-12	2/19/2024	901	G	GW	1							
AD-13	2/19/2024	844	G	GW	1							
AD-17	2/20/2024	1230	G	GW	1							
AD-18	2/20/2024	829	G	GW	1							
AD-22	2/19/2024	1044	G	GW	1							
AD-28	2/20/2024	1134	G	GW	1							
AD-30	2/19/2024	1131	G	GW	1							
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other						4	F4	1	4	2	2	

* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/CC Requirements & Comments:

TG-32

Relinquished by: <i>Matt Hamilton</i>	Company: <i>Fsgk</i>	Date/Time: 2-21-24 160	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: <i>Matt Hamilton</i>	Date/Time: 2/22/24 0956

AEP WATER & WASTE SAMPLE RECEIPT FORM

<u>Package Type</u>			<u>Delivery Type</u>				
<input checked="" type="radio"/> Cooler	<input type="radio"/> Box	<input type="radio"/> Bag	<input type="radio"/> Envelope	<input type="radio"/> PONY	<input type="radio"/> UPS	<input checked="" type="radio"/> FedEx	<input type="radio"/> USPS
				Other _____			
Plant/Customer <u>Pittkey Power Station</u>			Number of Plastic Containers: <u>16</u>				
Opened By <u>Missyha Williams</u>			Number of Glass Containers: _____				
Date/Time <u>02/22/24 9:50 AM</u>			Number of Mercury Containers: _____				
Were all temperatures within 0-6°C? <input checked="" type="radio"/> Y / <input type="radio"/> N or N/A Initial: <u>mbc</u> <input checked="" type="radio"/> on ice / <input type="radio"/> no ice (IR Gun Ser# <u>2213689000</u> , Expir. <u>03/24/2024</u>) - If No, specify each deviation: _____							
Was container in good condition? <input checked="" type="radio"/> Y / <input type="radio"/> N Comments _____							
Was Chain of Custody received? <input checked="" type="radio"/> Y / <input type="radio"/> N Comments _____							
Requested turnaround: <u>28 days</u> If RUSH, who was notified? _____							
pH (15 min)		Cr ⁶⁺ (pres) (24 hr)		NO ₂ or NO ₃ (48 hr)		ortho-PO ₄ (48 hr)	Hg-diss (pres) (48 hr)

Was COC filled out properly? Y / N Comments _____

Were samples labeled properly? Y / N Comments _____

Were correct containers used? Y / N Comments _____

Was pH checked & Color Coding done? Y / N or N/A Initial & Date: mbc 02/22/24

pH paper (circle one): MQuant,PN1.09535.0001,LOT# _____ [OR] Lab Rat,PN4801,LOT# X000RWDG21 Exp 03/15/2025

- Was Add'l Preservative needed? Y / N If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / N Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# 240640 Initial & Date & Time : _____

Logged by WCG Comments: _____

Reviewed by _____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Ion Chromatography Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

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Tim Arnold _____ Principle Chemist 3/8/2024
Name (printed) Signature Official Title Date

Ion Chromatography Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: CCR
Reviewer Name: Tim Arnold
LRC Date: 3/8/2024
Laboratory Job Number: 240640
Prep Batch Number(s): QC2403053

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	Yes	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	Yes	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	Yes	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Ion Chromatography Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Ion Chromatography Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: CCR
Reviewer Name: Tim Arnold
LRC Date: 3/8/2024
Laboratory Job Number: 240640
Prep Batch Number(s): QC2403053

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Ion Chromatography Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

TDS Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

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Michael Ohlinger		Chemist	3/8/2024
Name (printed)	Signature	Official Title	Date

TDS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey - CCR
Reviewer Name: Michael Ohlinger
LRC Date: 3/8/2024
Laboratory Job Number: 240640
Prep Batch Number(s): QC2402232

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	NA	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

TDS Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

TDS Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey - CCR
Reviewer Name: Michael Ohlinger
LRC Date: 3/8/2024
Laboratory Job Number: 240640
Prep Batch Number(s): QC2402232

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	NA	
	I	Was the number of standards recommended in the method used for all analytes?	NA	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	NA	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	NA	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

TDS Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Alkalinity Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

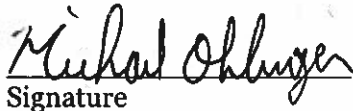
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 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Michael Ohlinger
Name (printed)


Signature

Chemist
Official Title

3/8/2024
Date

Alkalinity Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey CCR
Reviewer Name: Michael Ohlinger
LRC Date: 3/8/2024
Laboratory Job Number: 240640
Prep Batch Number(s): QC2402191

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Alkalinity Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Alkalinity Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey CCR
Reviewer Name: Michael Ohlinger
LRC Date: 3/8/2024
Laboratory Job Number: 240640
Prep Batch Number(s): QC2402191

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	NA	
	I	Was the number of standards recommended in the method used for all analytes?	NA	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	NA	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	NA	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Alkalinity Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-2

Customer Description:

Lab Number: 241410-001

Preparation:

Date Collected: 04/23/2024 09:21 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/07/2024 19:31	EPA 200.8-1994, Rev. 5.4
Arsenic	2.05	µg/L	1	0.10	0.03		GES	05/07/2024 19:31	EPA 200.8-1994, Rev. 5.4
Barium	14.8	µg/L	1	0.20	0.05		GES	05/07/2024 19:31	EPA 200.8-1994, Rev. 5.4
Beryllium	1.03	µg/L	5	0.25	0.04		GES	05/08/2024 08:29	EPA 200.8-1994, Rev. 5.4
Boron	3.18	mg/L	1	0.050	0.007		GES	05/07/2024 19:31	EPA 200.8-1994, Rev. 5.4
Cadmium	0.135	µg/L	1	0.020	0.004		GES	05/07/2024 19:31	EPA 200.8-1994, Rev. 5.4
Calcium	4.51	mg/L	1	0.05	0.02		GES	05/07/2024 19:31	EPA 200.8-1994, Rev. 5.4
Chromium	0.54	µg/L	1	0.30	0.07		GES	05/07/2024 19:31	EPA 200.8-1994, Rev. 5.4
Cobalt	33.0	µg/L	1	0.020	0.005		GES	05/07/2024 19:31	EPA 200.8-1994, Rev. 5.4
Lead	0.65	µg/L	1	0.20	0.05		GES	05/07/2024 19:31	EPA 200.8-1994, Rev. 5.4
Lithium	0.0739	mg/L	5	0.0015	0.0003		GES	05/08/2024 08:29	EPA 200.8-1994, Rev. 5.4
Magnesium	9.21	mg/L	1	0.100	0.009		GES	05/07/2024 19:31	EPA 200.8-1994, Rev. 5.4
Mercury	56	ng/L	1	5	2		RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 19:31	EPA 200.8-1994, Rev. 5.4
Potassium	1.43	mg/L	1	0.10	0.01		GES	05/07/2024 19:31	EPA 200.8-1994, Rev. 5.4
Selenium	6.51	µg/L	1	0.50	0.04		GES	05/07/2024 19:31	EPA 200.8-1994, Rev. 5.4
Sodium	111	mg/L	1	0.20	0.02		GES	05/07/2024 19:31	EPA 200.8-1994, Rev. 5.4
Strontium	0.0635	mg/L	1	0.00200	0.00005		GES	05/07/2024 19:31	EPA 200.8-1994, Rev. 5.4
Thallium	0.13	µg/L	1	0.20	0.02	J1	GES	05/07/2024 19:31	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.55	pCi/L	0.13	0.16		ST	05/21/2024 09:02	SW-846 9315-1986, Rev. 0
Carrier Recovery	91.9	%						
Radium-228	1.63	pCi/L	0.17	0.50		TTP	05/24/2024 13:03	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	83.4	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-2

Customer Description:

Lab Number: 241410-001-01

Preparation: Dissolved

Date Collected: 04/23/2024 09:21 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.023	µg/L	1	0.100	0.008	J1	GES	05/07/2024 19:36	EPA 200.8-1994, Rev. 5.4
Arsenic	2.06	µg/L	1	0.10	0.03		GES	05/07/2024 19:36	EPA 200.8-1994, Rev. 5.4
Barium	15.5	µg/L	1	0.20	0.05		GES	05/07/2024 19:36	EPA 200.8-1994, Rev. 5.4
Beryllium	1.10	µg/L	5	0.25	0.04		GES	05/08/2024 08:34	EPA 200.8-1994, Rev. 5.4
Cadmium	0.138	µg/L	1	0.020	0.004		GES	05/07/2024 19:36	EPA 200.8-1994, Rev. 5.4
Chromium	0.54	µg/L	1	0.30	0.07		GES	05/07/2024 19:36	EPA 200.8-1994, Rev. 5.4
Cobalt	34.1	µg/L	1	0.020	0.005		GES	05/07/2024 19:36	EPA 200.8-1994, Rev. 5.4
Iron	0.198	mg/L	1	0.020	0.003		GES	05/07/2024 19:36	EPA 200.8-1994, Rev. 5.4
Lead	0.73	µg/L	1	0.20	0.05		GES	05/07/2024 19:36	EPA 200.8-1994, Rev. 5.4
Lithium	0.0784	mg/L	5	0.0015	0.0003		GES	05/08/2024 08:34	EPA 200.8-1994, Rev. 5.4
Manganese	0.112	mg/L	1	0.00100	0.00007		GES	05/07/2024 19:36	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 19:36	EPA 200.8-1994, Rev. 5.4
Selenium	6.84	µg/L	1	0.50	0.04		GES	05/07/2024 19:36	EPA 200.8-1994, Rev. 5.4
Thallium	0.13	µg/L	1	0.20	0.02	J1	GES	05/07/2024 19:36	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-3

Customer Description:

Lab Number: 241410-002

Preparation:

Date Collected: 04/23/2024 12:04 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/07/2024 19:41	EPA 200.8-1994, Rev. 5.4
Arsenic	0.25	µg/L	1	0.10	0.03		GES	05/07/2024 19:41	EPA 200.8-1994, Rev. 5.4
Barium	65.2	µg/L	1	0.20	0.05		GES	05/07/2024 19:41	EPA 200.8-1994, Rev. 5.4
Beryllium	0.24	µg/L	5	0.25	0.04	J1	GES	05/08/2024 08:39	EPA 200.8-1994, Rev. 5.4
Boron	0.038	mg/L	1	0.050	0.007	J1	GES	05/07/2024 19:41	EPA 200.8-1994, Rev. 5.4
Cadmium	0.017	µg/L	1	0.020	0.004	J1	GES	05/07/2024 19:41	EPA 200.8-1994, Rev. 5.4
Calcium	4.32	mg/L	1	0.05	0.02		GES	05/07/2024 19:41	EPA 200.8-1994, Rev. 5.4
Chromium	0.24	µg/L	1	0.30	0.07	J1	GES	05/07/2024 19:41	EPA 200.8-1994, Rev. 5.4
Cobalt	3.57	µg/L	1	0.020	0.005		GES	05/07/2024 19:41	EPA 200.8-1994, Rev. 5.4
Lead	0.05	µg/L	1	0.20	0.05	J1	GES	05/07/2024 19:41	EPA 200.8-1994, Rev. 5.4
Lithium	0.0599	mg/L	5	0.0015	0.0003		GES	05/08/2024 08:39	EPA 200.8-1994, Rev. 5.4
Magnesium	1.93	mg/L	1	0.100	0.009		GES	05/07/2024 19:41	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 19:41	EPA 200.8-1994, Rev. 5.4
Potassium	2.28	mg/L	1	0.10	0.01		GES	05/07/2024 19:41	EPA 200.8-1994, Rev. 5.4
Selenium	0.06	µg/L	1	0.50	0.04	J1	GES	05/07/2024 19:41	EPA 200.8-1994, Rev. 5.4
Sodium	8.66	mg/L	1	0.20	0.02		GES	05/07/2024 19:41	EPA 200.8-1994, Rev. 5.4
Strontium	0.0298	mg/L	1	0.00200	0.00005		GES	05/07/2024 19:41	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.02	J1	GES	05/07/2024 19:41	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.66	pCi/L	0.13	0.15		ST	05/21/2024 09:02	SW-846 9315-1986, Rev. 0
Carrier Recovery	100	%						
Radium-228	1.15	pCi/L	0.15	0.46		TTP	05/24/2024 13:03	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	87.3	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-3

Customer Description:

Lab Number: 241410-002-01

Preparation: Dissolved

Date Collected: 04/23/2024 12:04 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.017	µg/L	1	0.100	0.008	J1	GES	05/07/2024 19:47	EPA 200.8-1994, Rev. 5.4
Arsenic	0.22	µg/L	1	0.10	0.03		GES	05/07/2024 19:47	EPA 200.8-1994, Rev. 5.4
Barium	67.0	µg/L	1	0.20	0.05		GES	05/07/2024 19:47	EPA 200.8-1994, Rev. 5.4
Beryllium	0.26	µg/L	5	0.25	0.04		GES	05/08/2024 08:45	EPA 200.8-1994, Rev. 5.4
Cadmium	0.017	µg/L	1	0.020	0.004	J1	GES	05/07/2024 19:47	EPA 200.8-1994, Rev. 5.4
Chromium	0.28	µg/L	1	0.30	0.07	J1	GES	05/07/2024 19:47	EPA 200.8-1994, Rev. 5.4
Cobalt	3.78	µg/L	1	0.020	0.005		GES	05/07/2024 19:47	EPA 200.8-1994, Rev. 5.4
Iron	1.21	mg/L	1	0.020	0.003		GES	05/07/2024 19:47	EPA 200.8-1994, Rev. 5.4
Lead	0.11	µg/L	1	0.20	0.05	J1	GES	05/07/2024 19:47	EPA 200.8-1994, Rev. 5.4
Lithium	0.0633	mg/L	5	0.0015	0.0003		GES	05/08/2024 08:45	EPA 200.8-1994, Rev. 5.4
Manganese	0.0427	mg/L	1	0.00100	0.00007		GES	05/07/2024 19:47	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 19:47	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	05/07/2024 19:47	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.02	J1	GES	05/07/2024 19:47	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-4

Customer Description:

Lab Number: 241410-003

Preparation:

Date Collected: 04/24/2024 10:31 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.014	µg/L	1	0.100	0.008	J1	GES	05/07/2024 19:52	EPA 200.8-1994, Rev. 5.4
Arsenic	0.44	µg/L	1	0.10	0.03		GES	05/07/2024 19:52	EPA 200.8-1994, Rev. 5.4
Barium	97.2	µg/L	1	0.20	0.05		GES	05/07/2024 19:52	EPA 200.8-1994, Rev. 5.4
Beryllium	0.64	µg/L	5	0.25	0.04		GES	05/08/2024 08:50	EPA 200.8-1994, Rev. 5.4
Boron	0.017	mg/L	1	0.050	0.007	J1	GES	05/07/2024 19:52	EPA 200.8-1994, Rev. 5.4
Cadmium	0.020	µg/L	1	0.020	0.004		GES	05/07/2024 19:52	EPA 200.8-1994, Rev. 5.4
Calcium	2.26	mg/L	1	0.05	0.02		GES	05/07/2024 19:52	EPA 200.8-1994, Rev. 5.4
Chromium	0.31	µg/L	1	0.30	0.07		GES	05/07/2024 19:52	EPA 200.8-1994, Rev. 5.4
Cobalt	5.95	µg/L	1	0.020	0.005		GES	05/07/2024 19:52	EPA 200.8-1994, Rev. 5.4
Lead	0.06	µg/L	1	0.20	0.05	J1	GES	05/07/2024 19:52	EPA 200.8-1994, Rev. 5.4
Lithium	0.0395	mg/L	5	0.0015	0.0003		GES	05/08/2024 08:50	EPA 200.8-1994, Rev. 5.4
Magnesium	1.18	mg/L	1	0.100	0.009		GES	05/07/2024 19:52	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 19:52	EPA 200.8-1994, Rev. 5.4
Potassium	2.36	mg/L	1	0.10	0.01		GES	05/07/2024 19:52	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	05/07/2024 19:52	EPA 200.8-1994, Rev. 5.4
Sodium	8.05	mg/L	1	0.20	0.02		GES	05/07/2024 19:52	EPA 200.8-1994, Rev. 5.4
Strontium	0.0189	mg/L	1	0.00200	0.00005		GES	05/07/2024 19:52	EPA 200.8-1994, Rev. 5.4
Thallium	0.07	µg/L	1	0.20	0.02	J1	GES	05/07/2024 19:52	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.67	pCi/L	0.13	0.18		ST	05/21/2024 09:02	SW-846 9315-1986, Rev. 0
Carrier Recovery	106	%						
Radium-228	1.12	pCi/L	0.19	0.60		TTP	05/24/2024 13:03	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	79.0	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-4

Customer Description:

Lab Number: 241410-003-01

Preparation: Dissolved

Date Collected: 04/24/2024 10:31 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.014	µg/L	1	0.100	0.008	J1	GES	05/07/2024 19:57	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	05/07/2024 19:57	EPA 200.8-1994, Rev. 5.4
Barium	96.5	µg/L	1	0.20	0.05		GES	05/07/2024 19:57	EPA 200.8-1994, Rev. 5.4
Beryllium	0.66	µg/L	5	0.25	0.04		GES	05/08/2024 08:55	EPA 200.8-1994, Rev. 5.4
Cadmium	0.011	µg/L	1	0.020	0.004	J1	GES	05/07/2024 19:57	EPA 200.8-1994, Rev. 5.4
Chromium	0.28	µg/L	1	0.30	0.07	J1	GES	05/07/2024 19:57	EPA 200.8-1994, Rev. 5.4
Cobalt	5.86	µg/L	1	0.020	0.005		GES	05/07/2024 19:57	EPA 200.8-1994, Rev. 5.4
Iron	0.025	mg/L	1	0.020	0.003		GES	05/07/2024 19:57	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	05/07/2024 19:57	EPA 200.8-1994, Rev. 5.4
Lithium	0.0411	mg/L	5	0.0015	0.0003		GES	05/08/2024 08:55	EPA 200.8-1994, Rev. 5.4
Manganese	0.0497	mg/L	1	0.00100	0.00007		GES	05/07/2024 19:57	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 19:57	EPA 200.8-1994, Rev. 5.4
Selenium	0.05	µg/L	1	0.50	0.04	J1	GES	05/07/2024 19:57	EPA 200.8-1994, Rev. 5.4
Thallium	0.07	µg/L	1	0.20	0.02	J1	GES	05/07/2024 19:57	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-7R

Customer Description:

Lab Number: 241410-004

Preparation:

Date Collected: 04/22/2024 10:25 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/07/2024 20:02	EPA 200.8-1994, Rev. 5.4
Arsenic	0.38	µg/L	1	0.10	0.03		GES	05/07/2024 20:02	EPA 200.8-1994, Rev. 5.4
Barium	41.3	µg/L	1	0.20	0.05		GES	05/07/2024 20:02	EPA 200.8-1994, Rev. 5.4
Beryllium	2.37	µg/L	5	0.25	0.04		GES	05/08/2024 09:00	EPA 200.8-1994, Rev. 5.4
Boron	0.049	mg/L	1	0.050	0.007	J1	GES	05/07/2024 20:02	EPA 200.8-1994, Rev. 5.4
Cadmium	0.310	µg/L	1	0.020	0.004		GES	05/07/2024 20:02	EPA 200.8-1994, Rev. 5.4
Calcium	3.37	mg/L	1	0.05	0.02		GES	05/07/2024 20:02	EPA 200.8-1994, Rev. 5.4
Chromium	0.23	µg/L	1	0.30	0.07	J1	GES	05/07/2024 20:02	EPA 200.8-1994, Rev. 5.4
Cobalt	20.9	µg/L	1	0.020	0.005		GES	05/07/2024 20:02	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	05/07/2024 20:02	EPA 200.8-1994, Rev. 5.4
Lithium	0.0790	mg/L	5	0.0015	0.0003		GES	05/08/2024 09:00	EPA 200.8-1994, Rev. 5.4
Magnesium	5.03	mg/L	1	0.100	0.009		GES	05/07/2024 20:02	EPA 200.8-1994, Rev. 5.4
Mercury	<4	ng/L	2	10	4	U1	RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 20:02	EPA 200.8-1994, Rev. 5.4
Potassium	1.99	mg/L	1	0.10	0.01		GES	05/07/2024 20:02	EPA 200.8-1994, Rev. 5.4
Selenium	1.00	µg/L	1	0.50	0.04		GES	05/07/2024 20:02	EPA 200.8-1994, Rev. 5.4
Sodium	23.4	mg/L	1	0.20	0.02		GES	05/07/2024 20:02	EPA 200.8-1994, Rev. 5.4
Strontium	0.0366	mg/L	1	0.00200	0.00005		GES	05/07/2024 20:02	EPA 200.8-1994, Rev. 5.4
Thallium	0.14	µg/L	1	0.20	0.02	J1	GES	05/07/2024 20:02	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.16	pCi/L	0.18	0.16		ST	05/21/2024 09:02	SW-846 9315-1986, Rev. 0
Carrier Recovery	99.8	%						
Radium-228	1.46	pCi/L	0.18	0.55		TTP	05/24/2024 13:03	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	87.3	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-7R

Customer Description:

Lab Number: 241410-004-01

Preparation: Dissolved

Date Collected: 04/22/2024 10:25 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/07/2024 20:07	EPA 200.8-1994, Rev. 5.4
Arsenic	0.37	µg/L	1	0.10	0.03		GES	05/07/2024 20:07	EPA 200.8-1994, Rev. 5.4
Barium	41.7	µg/L	1	0.20	0.05		GES	05/07/2024 20:07	EPA 200.8-1994, Rev. 5.4
Beryllium	1.96	µg/L	1	0.050	0.007		GES	05/07/2024 20:07	EPA 200.8-1994, Rev. 5.4
Cadmium	0.318	µg/L	1	0.020	0.004		GES	05/07/2024 20:07	EPA 200.8-1994, Rev. 5.4
Chromium	0.25	µg/L	1	0.30	0.07	J1	GES	05/07/2024 20:07	EPA 200.8-1994, Rev. 5.4
Cobalt	21.0	µg/L	1	0.020	0.005		GES	05/07/2024 20:07	EPA 200.8-1994, Rev. 5.4
Iron	5.21	mg/L	1	0.020	0.003		GES	05/07/2024 20:07	EPA 200.8-1994, Rev. 5.4
Lead	0.06	µg/L	1	0.20	0.05	J1	GES	05/07/2024 20:07	EPA 200.8-1994, Rev. 5.4
Lithium	0.0678	mg/L	1	0.00030	0.00006		GES	05/07/2024 20:07	EPA 200.8-1994, Rev. 5.4
Manganese	0.0649	mg/L	1	0.00100	0.00007		GES	05/07/2024 20:07	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 20:07	EPA 200.8-1994, Rev. 5.4
Selenium	1.03	µg/L	1	0.50	0.04		GES	05/07/2024 20:07	EPA 200.8-1994, Rev. 5.4
Thallium	0.14	µg/L	1	0.20	0.02	J1	GES	05/07/2024 20:07	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-8

Customer Description:

Lab Number: 241410-005

Preparation:

Date Collected: 04/23/2024 11:11 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.999	mg/L	1	0.050	0.007		GES	05/07/2024 20:12	EPA 200.8-1994, Rev. 5.4
Calcium	87.7	mg/L	1	0.05	0.02		GES	05/07/2024 20:12	EPA 200.8-1994, Rev. 5.4
Magnesium	6.27	mg/L	1	0.100	0.009		GES	05/07/2024 20:12	EPA 200.8-1994, Rev. 5.4
Potassium	1.19	mg/L	1	0.10	0.01		GES	05/07/2024 20:12	EPA 200.8-1994, Rev. 5.4
Sodium	11.5	mg/L	1	0.20	0.02		GES	05/07/2024 20:12	EPA 200.8-1994, Rev. 5.4
Strontium	0.526	mg/L	1	0.00200	0.00005		GES	05/07/2024 20:12	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-12

Customer Description:

Lab Number: 241410-006

Preparation:

Date Collected: 04/22/2024 10:44 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4
Arsenic	0.09	µg/L	1	0.10	0.03	J1	GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4
Barium	19.3	µg/L	1	0.20	0.05		GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4
Beryllium	0.121	µg/L	1	0.050	0.007		GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4
Boron	0.015	mg/L	1	0.050	0.007	J1	GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4
Cadmium	0.007	µg/L	1	0.020	0.004	J1	GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4
Calcium	0.18	mg/L	1	0.05	0.02		GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4
Chromium	0.34	µg/L	1	0.30	0.07		GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4
Cobalt	1.08	µg/L	1	0.020	0.005		GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4
Lead	0.08	µg/L	1	0.20	0.05	J1	GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4
Lithium	0.00462	mg/L	1	0.00030	0.00006		GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4
Magnesium	0.342	mg/L	1	0.100	0.009		GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4
Potassium	0.20	mg/L	1	0.10	0.01		GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4
Selenium	0.31	µg/L	1	0.50	0.04	J1	GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4
Sodium	3.75	mg/L	1	0.20	0.02		GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4
Strontium	0.00203	mg/L	1	0.00200	0.00005		GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	05/07/2024 20:17	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.83	pCi/L	0.15	0.14		ST	05/21/2024 09:02	SW-846 9315-1986, Rev. 0
Carrier Recovery	106	%						
Radium-228	1.79	pCi/L	0.21	0.64		TTP	05/24/2024 13:03	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	74.6	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-12

Customer Description:

Lab Number: 241410-006-01

Preparation: Dissolved

Date Collected: 04/22/2024 10:44 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.037	µg/L	1	0.100	0.008	J1	GES	05/07/2024 21:34	EPA 200.8-1994, Rev. 5.4
Arsenic	0.07	µg/L	1	0.10	0.03	J1	GES	05/07/2024 21:34	EPA 200.8-1994, Rev. 5.4
Barium	19.5	µg/L	1	0.20	0.05		GES	05/07/2024 21:34	EPA 200.8-1994, Rev. 5.4
Beryllium	0.129	µg/L	1	0.050	0.007		GES	05/07/2024 21:34	EPA 200.8-1994, Rev. 5.4
Cadmium	0.007	µg/L	1	0.020	0.004	J1	GES	05/07/2024 21:34	EPA 200.8-1994, Rev. 5.4
Chromium	0.25	µg/L	1	0.30	0.07	J1	GES	05/07/2024 21:34	EPA 200.8-1994, Rev. 5.4
Cobalt	1.07	µg/L	1	0.020	0.005		GES	05/07/2024 21:34	EPA 200.8-1994, Rev. 5.4
Iron	0.020	mg/L	1	0.020	0.003		GES	05/07/2024 21:34	EPA 200.8-1994, Rev. 5.4
Lead	0.12	µg/L	1	0.20	0.05	J1	GES	05/07/2024 21:34	EPA 200.8-1994, Rev. 5.4
Lithium	0.00490	mg/L	1	0.00030	0.00006		GES	05/07/2024 21:34	EPA 200.8-1994, Rev. 5.4
Manganese	0.00313	mg/L	1	0.00100	0.00007		GES	05/07/2024 21:34	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 21:34	EPA 200.8-1994, Rev. 5.4
Selenium	0.26	µg/L	1	0.50	0.04	J1	GES	05/07/2024 21:34	EPA 200.8-1994, Rev. 5.4
Thallium	0.02	µg/L	1	0.20	0.02	J1	GES	05/07/2024 21:34	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-13

Customer Description:

Lab Number: 241410-007

Preparation:

Date Collected: 04/22/2024 09:20 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/07/2024 21:39	EPA 200.8-1994, Rev. 5.4
Arsenic	0.54	µg/L	1	0.10	0.03		GES	05/07/2024 21:39	EPA 200.8-1994, Rev. 5.4
Barium	34.9	µg/L	1	0.20	0.05		GES	05/07/2024 21:39	EPA 200.8-1994, Rev. 5.4
Beryllium	0.163	µg/L	1	0.050	0.007		GES	05/07/2024 21:39	EPA 200.8-1994, Rev. 5.4
Boron	0.066	mg/L	1	0.050	0.007		GES	05/07/2024 21:39	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	05/07/2024 21:39	EPA 200.8-1994, Rev. 5.4
Calcium	10.6	mg/L	1	0.05	0.02		GES	05/07/2024 21:39	EPA 200.8-1994, Rev. 5.4
Chromium	0.22	µg/L	1	0.30	0.07	J1	GES	05/07/2024 21:39	EPA 200.8-1994, Rev. 5.4
Cobalt	46.2	µg/L	1	0.020	0.005		GES	05/07/2024 21:39	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	05/07/2024 21:39	EPA 200.8-1994, Rev. 5.4
Lithium	0.135	mg/L	1	0.00030	0.00006		GES	05/07/2024 21:39	EPA 200.8-1994, Rev. 5.4
Magnesium	13.2	mg/L	1	0.100	0.009		GES	05/07/2024 21:39	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 21:39	EPA 200.8-1994, Rev. 5.4
Potassium	4.83	mg/L	1	0.10	0.01		GES	05/07/2024 21:39	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	05/07/2024 21:39	EPA 200.8-1994, Rev. 5.4
Sodium	19.9	mg/L	1	0.20	0.02		GES	05/08/2024 10:01	EPA 200.8-1994, Rev. 5.4
Strontium	0.0787	mg/L	1	0.00200	0.00005		GES	05/07/2024 21:39	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	05/07/2024 21:39	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.65	pCi/L	0.15	0.23		ST	05/21/2024 09:02	SW-846 9315-1986, Rev. 0
Carrier Recovery	92.6	%						
Radium-228	2.02	pCi/L	0.20	0.59		TTP	05/24/2024 13:03	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	86.1	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-13

Customer Description:

Lab Number: 241410-007-01

Preparation: Dissolved

Date Collected: 04/22/2024 09:20 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/07/2024 21:45	EPA 200.8-1994, Rev. 5.4
Arsenic	0.32	µg/L	1	0.10	0.03		GES	05/07/2024 21:45	EPA 200.8-1994, Rev. 5.4
Barium	33.9	µg/L	1	0.20	0.05		GES	05/07/2024 21:45	EPA 200.8-1994, Rev. 5.4
Beryllium	0.151	µg/L	1	0.050	0.007		GES	05/07/2024 21:45	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	05/07/2024 21:45	EPA 200.8-1994, Rev. 5.4
Chromium	0.19	µg/L	1	0.30	0.07	J1	GES	05/07/2024 21:45	EPA 200.8-1994, Rev. 5.4
Cobalt	44.9	µg/L	1	0.020	0.005		GES	05/07/2024 21:45	EPA 200.8-1994, Rev. 5.4
Iron	33.8	mg/L	1	0.020	0.003		GES	05/07/2024 21:45	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	05/07/2024 21:45	EPA 200.8-1994, Rev. 5.4
Lithium	0.133	mg/L	1	0.00030	0.00006		GES	05/07/2024 21:45	EPA 200.8-1994, Rev. 5.4
Manganese	0.447	mg/L	1	0.00100	0.00007		GES	05/07/2024 21:45	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 21:45	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	05/07/2024 21:45	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	05/07/2024 21:45	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-16

Customer Description:

Lab Number: 241410-008

Preparation:

Date Collected: 04/24/2024 12:04 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.013	mg/L	1	0.050	0.007	J1	GES	05/07/2024 21:50	EPA 200.8-1994, Rev. 5.4
Calcium	1.13	mg/L	1	0.05	0.02		GES	05/07/2024 21:50	EPA 200.8-1994, Rev. 5.4
Magnesium	2.37	mg/L	1	0.100	0.009		GES	05/07/2024 21:50	EPA 200.8-1994, Rev. 5.4
Potassium	1.53	mg/L	1	0.10	0.01		GES	05/07/2024 21:50	EPA 200.8-1994, Rev. 5.4
Sodium	13.5	mg/L	1	0.20	0.02		GES	05/08/2024 10:12	EPA 200.8-1994, Rev. 5.4
Strontium	0.0135	mg/L	1	0.00200	0.00005		GES	05/07/2024 21:50	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-17

Customer Description:

Lab Number: 241410-009

Preparation:

Date Collected: 04/23/2024 12:16 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4
Arsenic	0.09	µg/L	1	0.10	0.03	J1	GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4
Barium	47.6	µg/L	1	0.20	0.05		GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4
Beryllium	0.221	µg/L	1	0.050	0.007		GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4
Boron	0.020	mg/L	1	0.050	0.007	J1	GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4
Cadmium	0.011	µg/L	1	0.020	0.004	J1	GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4
Calcium	0.04	mg/L	1	0.05	0.02	J1	GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4
Chromium	0.37	µg/L	1	0.30	0.07		GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4
Cobalt	1.99	µg/L	1	0.020	0.005		GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4
Lithium	0.00705	mg/L	1	0.00030	0.00006		GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4
Magnesium	0.899	mg/L	1	0.100	0.009		GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4
Mercury	51	ng/L	4	20	8		RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4
Potassium	0.15	mg/L	1	0.10	0.01		GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4
Selenium	0.11	µg/L	1	0.50	0.04	J1	GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4
Sodium	3.85	mg/L	1	0.20	0.02		GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4
Strontium	0.00224	mg/L	1	0.00200	0.00005		GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	05/07/2024 21:55	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.45	pCi/L	0.11	0.15		ST	05/21/2024 09:02	SW-846 9315-1986, Rev. 0
Carrier Recovery	101	%						
Radium-228	1.35	pCi/L	0.15	0.44		TTP	05/24/2024 13:02	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	83.0	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-17

Customer Description:

Lab Number: 241410-009-01

Preparation: Dissolved

Date Collected: 04/23/2024 11:16 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/07/2024 22:00	EPA 200.8-1994, Rev. 5.4
Arsenic	0.05	µg/L	1	0.10	0.03	J1	GES	05/07/2024 22:00	EPA 200.8-1994, Rev. 5.4
Barium	46.3	µg/L	1	0.20	0.05		GES	05/07/2024 22:00	EPA 200.8-1994, Rev. 5.4
Beryllium	0.196	µg/L	1	0.050	0.007		GES	05/07/2024 22:00	EPA 200.8-1994, Rev. 5.4
Cadmium	0.010	µg/L	1	0.020	0.004	J1	GES	05/07/2024 22:00	EPA 200.8-1994, Rev. 5.4
Chromium	0.38	µg/L	1	0.30	0.07		GES	05/07/2024 22:00	EPA 200.8-1994, Rev. 5.4
Cobalt	1.95	µg/L	1	0.020	0.005		GES	05/07/2024 22:00	EPA 200.8-1994, Rev. 5.4
Iron	0.004	mg/L	1	0.020	0.003	J1	GES	05/07/2024 22:00	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	05/07/2024 22:00	EPA 200.8-1994, Rev. 5.4
Lithium	0.00647	mg/L	1	0.00030	0.00006		GES	05/07/2024 22:00	EPA 200.8-1994, Rev. 5.4
Manganese	0.00240	mg/L	1	0.00100	0.00007		GES	05/07/2024 22:00	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 22:00	EPA 200.8-1994, Rev. 5.4
Selenium	0.09	µg/L	1	0.50	0.04	J1	GES	05/07/2024 22:00	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	05/07/2024 22:00	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-18

Customer Description:

Lab Number: 241410-010

Preparation:

Date Collected: 04/23/2024 11:58 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/07/2024 22:05	EPA 200.8-1994, Rev. 5.4
Arsenic	0.19	µg/L	1	0.10	0.03		GES	05/07/2024 22:05	EPA 200.8-1994, Rev. 5.4
Barium	76.6	µg/L	1	0.20	0.05		GES	05/07/2024 22:05	EPA 200.8-1994, Rev. 5.4
Beryllium	0.083	µg/L	1	0.050	0.007		GES	05/07/2024 22:05	EPA 200.8-1994, Rev. 5.4
Boron	0.008	mg/L	1	0.050	0.007	J1	GES	05/07/2024 22:05	EPA 200.8-1994, Rev. 5.4
Cadmium	0.010	µg/L	1	0.020	0.004	J1	GES	05/07/2024 22:05	EPA 200.8-1994, Rev. 5.4
Calcium	0.19	mg/L	1	0.05	0.02		GES	05/07/2024 22:05	EPA 200.8-1994, Rev. 5.4
Chromium	0.32	µg/L	1	0.30	0.07		GES	05/07/2024 22:05	EPA 200.8-1994, Rev. 5.4
Cobalt	0.851	µg/L	1	0.020	0.005		GES	05/07/2024 22:05	EPA 200.8-1994, Rev. 5.4
Lead	0.06	µg/L	1	0.20	0.05	J1	GES	05/07/2024 22:05	EPA 200.8-1994, Rev. 5.4
Lithium	0.0130	mg/L	1	0.00030	0.00006		GES	05/07/2024 22:05	EPA 200.8-1994, Rev. 5.4
Magnesium	0.294	mg/L	1	0.100	0.009		GES	05/07/2024 22:05	EPA 200.8-1994, Rev. 5.4
Mercury	8	ng/L	1	5	2		RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 22:05	EPA 200.8-1994, Rev. 5.4
Potassium	0.74	mg/L	1	0.10	0.01		GES	05/07/2024 22:05	EPA 200.8-1994, Rev. 5.4
Selenium	0.11	µg/L	1	0.50	0.04	J1	GES	05/07/2024 22:05	EPA 200.8-1994, Rev. 5.4
Sodium	5.64	mg/L	1	0.20	0.02		GES	05/08/2024 10:27	EPA 200.8-1994, Rev. 5.4
Strontium	0.00415	mg/L	1	0.00200	0.00005		GES	05/07/2024 22:05	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	05/07/2024 22:05	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.42	pCi/L	0.11	0.18		ST	05/21/2024 09:02	SW-846 9315-1986, Rev. 0
Carrier Recovery	104	%						
Radium-228	0.57	pCi/L	0.13	0.42		TTP	05/24/2024 13:02	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	85.9	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-18

Customer Description:

Lab Number: 241410-010-01

Preparation: Dissolved

Date Collected: 04/23/2024 11:58 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.020	µg/L	1	0.100	0.008	J1	GES	05/07/2024 22:10	EPA 200.8-1994, Rev. 5.4
Arsenic	0.07	µg/L	1	0.10	0.03	J1	GES	05/07/2024 22:10	EPA 200.8-1994, Rev. 5.4
Barium	80.5	µg/L	1	0.20	0.05		GES	05/07/2024 22:10	EPA 200.8-1994, Rev. 5.4
Beryllium	0.084	µg/L	1	0.050	0.007		GES	05/07/2024 22:10	EPA 200.8-1994, Rev. 5.4
Cadmium	0.011	µg/L	1	0.020	0.004	J1	GES	05/07/2024 22:10	EPA 200.8-1994, Rev. 5.4
Chromium	0.41	µg/L	1	0.30	0.07		GES	05/07/2024 22:10	EPA 200.8-1994, Rev. 5.4
Cobalt	0.921	µg/L	1	0.020	0.005		GES	05/07/2024 22:10	EPA 200.8-1994, Rev. 5.4
Iron	0.031	mg/L	1	0.020	0.003		GES	05/07/2024 22:10	EPA 200.8-1994, Rev. 5.4
Lead	0.07	µg/L	1	0.20	0.05	J1	GES	05/07/2024 22:10	EPA 200.8-1994, Rev. 5.4
Lithium	0.0135	mg/L	1	0.00030	0.00006		GES	05/07/2024 22:10	EPA 200.8-1994, Rev. 5.4
Manganese	0.00407	mg/L	1	0.00100	0.00007		GES	05/07/2024 22:10	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 22:10	EPA 200.8-1994, Rev. 5.4
Selenium	0.08	µg/L	1	0.50	0.04	J1	GES	05/07/2024 22:10	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	05/07/2024 22:10	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-22

Customer Description:

Lab Number: 241410-011

Preparation:

Date Collected: 04/22/2024 11:22 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/07/2024 22:15	EPA 200.8-1994, Rev. 5.4
Arsenic	3.54	µg/L	1	0.10	0.03		GES	05/07/2024 22:15	EPA 200.8-1994, Rev. 5.4
Barium	16.2	µg/L	1	0.20	0.05		GES	05/07/2024 22:15	EPA 200.8-1994, Rev. 5.4
Beryllium	7.53	µg/L	1	0.050	0.007	M1	GES	05/07/2024 22:15	EPA 200.8-1994, Rev. 5.4
Boron	0.064	mg/L	1	0.050	0.007		GES	05/07/2024 22:15	EPA 200.8-1994, Rev. 5.4
Cadmium	1.22	µg/L	1	0.020	0.004		GES	05/07/2024 22:15	EPA 200.8-1994, Rev. 5.4
Calcium	13.5	mg/L	1	0.05	0.02		GES	05/07/2024 22:15	EPA 200.8-1994, Rev. 5.4
Chromium	0.43	µg/L	1	0.30	0.07		GES	05/07/2024 22:15	EPA 200.8-1994, Rev. 5.4
Cobalt	99.3	µg/L	1	0.020	0.005	M1	GES	05/07/2024 22:15	EPA 200.8-1994, Rev. 5.4
Lead	0.23	µg/L	1	0.20	0.05		GES	05/07/2024 22:15	EPA 200.8-1994, Rev. 5.4
Lithium	0.146	mg/L	1	0.00030	0.00006	M1	GES	05/07/2024 22:15	EPA 200.8-1994, Rev. 5.4
Magnesium	19.9	mg/L	1	0.100	0.009		GES	05/07/2024 22:15	EPA 200.8-1994, Rev. 5.4
Mercury	66	ng/L	4	20	8		RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 22:15	EPA 200.8-1994, Rev. 5.4
Potassium	3.81	mg/L	1	0.10	0.01		GES	05/07/2024 22:15	EPA 200.8-1994, Rev. 5.4
Selenium	11.9	µg/L	1	0.50	0.04		GES	05/07/2024 22:15	EPA 200.8-1994, Rev. 5.4
Sodium	90.3	mg/L	5	1.0	0.1		GES	05/08/2024 10:37	EPA 200.8-1994, Rev. 5.4
Strontium	0.129	mg/L	1	0.00200	0.00005		GES	05/07/2024 22:15	EPA 200.8-1994, Rev. 5.4
Thallium	0.20	µg/L	1	0.20	0.02		GES	05/07/2024 22:15	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.78	pCi/L	0.23	0.17		ST	05/21/2024 09:02	SW-846 9315-1986, Rev. 0
Carrier Recovery	95.0	%						
Radium-228	1.24	pCi/L	0.14	0.40	O2, P2	TTP	06/05/2024 13:38	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	56.2	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-22

Customer Description:

Lab Number: 241410-011-01

Preparation: Dissolved

Date Collected: 04/22/2024 11:22 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.015	µg/L	1	0.100	0.008	J1	GES	05/07/2024 22:31	EPA 200.8-1994, Rev. 5.4
Arsenic	3.76	µg/L	1	0.10	0.03		GES	05/07/2024 22:31	EPA 200.8-1994, Rev. 5.4
Barium	16.7	µg/L	1	0.20	0.05		GES	05/07/2024 22:31	EPA 200.8-1994, Rev. 5.4
Beryllium	7.18	µg/L	1	0.050	0.007		GES	05/07/2024 22:31	EPA 200.8-1994, Rev. 5.4
Cadmium	1.30	µg/L	1	0.020	0.004		GES	05/07/2024 22:31	EPA 200.8-1994, Rev. 5.4
Chromium	0.44	µg/L	1	0.30	0.07		GES	05/07/2024 22:31	EPA 200.8-1994, Rev. 5.4
Cobalt	106	µg/L	1	0.020	0.005		GES	05/07/2024 22:31	EPA 200.8-1994, Rev. 5.4
Iron	17.8	mg/L	1	0.020	0.003		GES	05/07/2024 22:31	EPA 200.8-1994, Rev. 5.4
Lead	0.23	µg/L	1	0.20	0.05		GES	05/07/2024 22:31	EPA 200.8-1994, Rev. 5.4
Lithium	0.141	mg/L	1	0.00030	0.00006		GES	05/07/2024 22:31	EPA 200.8-1994, Rev. 5.4
Manganese	0.347	mg/L	1	0.00100	0.00007		GES	05/07/2024 22:31	EPA 200.8-1994, Rev. 5.4
Mercury	9	ng/L	1	5	2		RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/07/2024 22:31	EPA 200.8-1994, Rev. 5.4
Selenium	12.1	µg/L	1	0.50	0.04		GES	05/07/2024 22:31	EPA 200.8-1994, Rev. 5.4
Thallium	0.24	µg/L	1	0.20	0.02		GES	05/07/2024 22:31	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-23

Customer Description:

Lab Number: 241410-012

Preparation:

Date Collected: 04/24/2024 12:05 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.207	mg/L	1	0.050	0.007		GES	05/08/2024 00:14	EPA 200.8-1994, Rev. 5.4
Calcium	0.22	mg/L	1	0.05	0.02		GES	05/08/2024 00:14	EPA 200.8-1994, Rev. 5.4
Magnesium	0.197	mg/L	1	0.100	0.009		GES	05/08/2024 00:14	EPA 200.8-1994, Rev. 5.4
Potassium	2.51	mg/L	1	0.10	0.01		GES	05/08/2024 00:14	EPA 200.8-1994, Rev. 5.4
Sodium	3.54	mg/L	1	0.20	0.02		GES	05/08/2024 12:25	EPA 200.8-1994, Rev. 5.4
Strontium	0.00254	mg/L	1	0.00200	0.00005		GES	05/08/2024 00:14	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-27

Customer Description:

Lab Number: 241410-013

Preparation:

Date Collected: 04/24/2024 09:30 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.037	mg/L	1	0.050	0.007	J1	GES	05/08/2024 00:19	EPA 200.8-1994, Rev. 5.4
Calcium	3.89	mg/L	1	0.05	0.02		GES	05/08/2024 00:19	EPA 200.8-1994, Rev. 5.4
Magnesium	4.97	mg/L	1	0.100	0.009		GES	05/08/2024 00:19	EPA 200.8-1994, Rev. 5.4
Potassium	1.87	mg/L	1	0.10	0.01		GES	05/08/2024 00:19	EPA 200.8-1994, Rev. 5.4
Sodium	8.79	mg/L	1	0.20	0.02		GES	05/08/2024 12:30	EPA 200.8-1994, Rev. 5.4
Strontium	0.0560	mg/L	1	0.00200	0.00005		GES	05/08/2024 00:19	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-28

Customer Description:

Lab Number: 241410-014

Preparation:

Date Collected: 04/23/2024 10:28 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4
Arsenic	0.12	µg/L	1	0.10	0.03		GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4
Barium	121	µg/L	1	0.20	0.05		GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4
Beryllium	0.770	µg/L	1	0.050	0.007		GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4
Boron	0.290	mg/L	1	0.050	0.007		GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4
Cadmium	0.055	µg/L	1	0.020	0.004		GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4
Calcium	1.19	mg/L	1	0.05	0.02		GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4
Chromium	0.38	µg/L	1	0.30	0.07		GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4
Cobalt	13.0	µg/L	1	0.020	0.005		GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4
Lead	0.07	µg/L	1	0.20	0.05	J1	GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4
Lithium	0.0179	mg/L	1	0.00030	0.00006		GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4
Magnesium	2.81	mg/L	1	0.100	0.009		GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4
Mercury	13	ng/L	1	5	2		RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4
Potassium	0.61	mg/L	1	0.10	0.01		GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4
Selenium	0.33	µg/L	1	0.50	0.04	J1	GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4
Sodium	5.13	mg/L	1	0.20	0.02		GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4
Strontium	0.0209	mg/L	1	0.00200	0.00005		GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	05/08/2024 00:24	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.56	pCi/L	0.13	0.22		ST	05/21/2024 09:02	SW-846 9315-1986, Rev. 0
Carrier Recovery	98.4	%						
Radium-228	0.99	pCi/L	0.19	0.60	02, P2	TTP	06/05/2024 13:38	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	75.8	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-28

Customer Description:

Lab Number: 241410-014-01

Preparation: Dissolved

Date Collected: 04/23/2024 10:28 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/08/2024 00:29	EPA 200.8-1994, Rev. 5.4
Arsenic	0.10	µg/L	1	0.10	0.03		GES	05/08/2024 00:29	EPA 200.8-1994, Rev. 5.4
Barium	124	µg/L	1	0.20	0.05		GES	05/08/2024 00:29	EPA 200.8-1994, Rev. 5.4
Beryllium	0.755	µg/L	1	0.050	0.007		GES	05/08/2024 00:29	EPA 200.8-1994, Rev. 5.4
Cadmium	0.052	µg/L	1	0.020	0.004		GES	05/08/2024 00:29	EPA 200.8-1994, Rev. 5.4
Chromium	0.22	µg/L	1	0.30	0.07	J1	GES	05/08/2024 00:29	EPA 200.8-1994, Rev. 5.4
Cobalt	13.0	µg/L	1	0.020	0.005		GES	05/08/2024 00:29	EPA 200.8-1994, Rev. 5.4
Iron	0.008	mg/L	1	0.020	0.003	J1	GES	05/08/2024 00:29	EPA 200.8-1994, Rev. 5.4
Lead	0.05	µg/L	1	0.20	0.05	J1	GES	05/08/2024 00:29	EPA 200.8-1994, Rev. 5.4
Lithium	0.0186	mg/L	1	0.00030	0.00006		GES	05/08/2024 00:29	EPA 200.8-1994, Rev. 5.4
Manganese	0.0382	mg/L	1	0.00100	0.00007		GES	05/08/2024 00:29	EPA 200.8-1994, Rev. 5.4
Mercury	5	ng/L	1	5	2		RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/08/2024 00:29	EPA 200.8-1994, Rev. 5.4
Selenium	0.27	µg/L	1	0.50	0.04	J1	GES	05/08/2024 00:29	EPA 200.8-1994, Rev. 5.4
Thallium	0.02	µg/L	1	0.20	0.02	J1	GES	05/08/2024 00:29	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-30

Customer Description:

Lab Number: 241410-015

Preparation:

Date Collected: 04/23/2024 09:43 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/08/2024 00:34	EPA 200.8-1994, Rev. 5.4
Arsenic	0.15	µg/L	1	0.10	0.03		GES	05/08/2024 00:34	EPA 200.8-1994, Rev. 5.4
Barium	49.9	µg/L	1	0.20	0.05		GES	05/08/2024 00:34	EPA 200.8-1994, Rev. 5.4
Beryllium	0.122	µg/L	1	0.050	0.007		GES	05/08/2024 00:34	EPA 200.8-1994, Rev. 5.4
Boron	1.13	mg/L	1	0.050	0.007		GES	05/08/2024 00:34	EPA 200.8-1994, Rev. 5.4
Cadmium	0.012	µg/L	1	0.020	0.004	J1	GES	05/08/2024 00:34	EPA 200.8-1994, Rev. 5.4
Calcium	0.38	mg/L	1	0.05	0.02		GES	05/08/2024 00:34	EPA 200.8-1994, Rev. 5.4
Chromium	0.42	µg/L	1	0.30	0.07		GES	05/08/2024 00:34	EPA 200.8-1994, Rev. 5.4
Cobalt	3.30	µg/L	1	0.020	0.005		GES	05/08/2024 00:34	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	05/08/2024 00:34	EPA 200.8-1994, Rev. 5.4
Lithium	0.00736	mg/L	1	0.00030	0.00006		GES	05/08/2024 00:34	EPA 200.8-1994, Rev. 5.4
Magnesium	1.72	mg/L	1	0.100	0.009		GES	05/08/2024 00:34	EPA 200.8-1994, Rev. 5.4
Mercury	23	ng/L	1	5	2		RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/08/2024 00:34	EPA 200.8-1994, Rev. 5.4
Potassium	0.70	mg/L	1	0.10	0.01		GES	05/08/2024 00:34	EPA 200.8-1994, Rev. 5.4
Selenium	0.30	µg/L	1	0.50	0.04	J1	GES	05/08/2024 00:34	EPA 200.8-1994, Rev. 5.4
Sodium	56.1	mg/L	1	0.20	0.02		GES	05/08/2024 12:45	EPA 200.8-1994, Rev. 5.4
Strontium	0.00645	mg/L	1	0.00200	0.00005		GES	05/08/2024 00:34	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	05/08/2024 00:34	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.21	pCi/L	0.08	0.16		ST	05/21/2024 11:31	SW-846 9315-1986, Rev. 0
Carrier Recovery	92.4	%						
Radium-228	0.68	pCi/L	0.17	0.54	02, P2	TTP	06/05/2024 13:38	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	83.0	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-30

Customer Description:

Lab Number: 241410-015-01

Preparation: Dissolved

Date Collected: 04/23/2024 09:43 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/08/2024 00:39	EPA 200.8-1994, Rev. 5.4
Arsenic	0.11	µg/L	1	0.10	0.03		GES	05/08/2024 00:39	EPA 200.8-1994, Rev. 5.4
Barium	48.3	µg/L	1	0.20	0.05		GES	05/08/2024 00:39	EPA 200.8-1994, Rev. 5.4
Beryllium	0.124	µg/L	1	0.050	0.007		GES	05/08/2024 00:39	EPA 200.8-1994, Rev. 5.4
Cadmium	0.010	µg/L	1	0.020	0.004	J1	GES	05/08/2024 00:39	EPA 200.8-1994, Rev. 5.4
Chromium	0.32	µg/L	1	0.30	0.07		GES	05/08/2024 00:39	EPA 200.8-1994, Rev. 5.4
Cobalt	3.34	µg/L	1	0.020	0.005		GES	05/08/2024 00:39	EPA 200.8-1994, Rev. 5.4
Iron	0.005	mg/L	1	0.020	0.003	J1	GES	05/08/2024 00:39	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	05/08/2024 00:39	EPA 200.8-1994, Rev. 5.4
Lithium	0.00741	mg/L	1	0.00030	0.00006		GES	05/08/2024 00:39	EPA 200.8-1994, Rev. 5.4
Manganese	0.0147	mg/L	1	0.00100	0.00007		GES	05/08/2024 00:39	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/08/2024 00:39	EPA 200.8-1994, Rev. 5.4
Selenium	0.30	µg/L	1	0.50	0.04	J1	GES	05/08/2024 00:39	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	GES	05/08/2024 00:39	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-31

Customer Description:

Lab Number: 241410-016

Preparation:

Date Collected: 04/22/2024 12:20 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/08/2024 00:44	EPA 200.8-1994, Rev. 5.4
Arsenic	0.44	µg/L	1	0.10	0.03		GES	05/08/2024 00:44	EPA 200.8-1994, Rev. 5.4
Barium	33.3	µg/L	1	0.20	0.05		GES	05/08/2024 00:44	EPA 200.8-1994, Rev. 5.4
Beryllium	1.04	µg/L	5	0.25	0.04		GES	05/08/2024 12:56	EPA 200.8-1994, Rev. 5.4
Boron	0.022	mg/L	1	0.050	0.007	J1	GES	05/08/2024 00:44	EPA 200.8-1994, Rev. 5.4
Cadmium	0.064	µg/L	1	0.020	0.004		GES	05/08/2024 00:44	EPA 200.8-1994, Rev. 5.4
Calcium	2.45	mg/L	1	0.05	0.02		GES	05/08/2024 00:44	EPA 200.8-1994, Rev. 5.4
Chromium	0.55	µg/L	1	0.30	0.07		GES	05/08/2024 00:44	EPA 200.8-1994, Rev. 5.4
Cobalt	9.38	µg/L	1	0.020	0.005		GES	05/08/2024 00:44	EPA 200.8-1994, Rev. 5.4
Lead	0.31	µg/L	1	0.20	0.05		GES	05/08/2024 00:44	EPA 200.8-1994, Rev. 5.4
Lithium	0.0792	mg/L	5	0.0015	0.0003		GES	05/08/2024 12:56	EPA 200.8-1994, Rev. 5.4
Magnesium	3.62	mg/L	1	0.100	0.009		GES	05/08/2024 00:44	EPA 200.8-1994, Rev. 5.4
Mercury	430	ng/L	10	50	20		RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/08/2024 00:44	EPA 200.8-1994, Rev. 5.4
Potassium	1.52	mg/L	1	0.10	0.01		GES	05/08/2024 00:44	EPA 200.8-1994, Rev. 5.4
Selenium	0.51	µg/L	1	0.50	0.04		GES	05/08/2024 00:44	EPA 200.8-1994, Rev. 5.4
Sodium	31.0	mg/L	5	1.0	0.1		GES	05/08/2024 12:56	EPA 200.8-1994, Rev. 5.4
Strontium	0.0357	mg/L	1	0.00200	0.00005		GES	05/08/2024 00:44	EPA 200.8-1994, Rev. 5.4
Thallium	0.09	µg/L	1	0.20	0.02	J1	GES	05/08/2024 00:44	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.42	pCi/L	0.11	0.16		ST	05/21/2024 11:31	SW-846 9315-1986, Rev. 0
Carrier Recovery	93.2	%						
Radium-228	2.12	pCi/L	0.17	0.48	02, P2	TTP	06/05/2024 13:38	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	84.1	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-31

Customer Description:

Lab Number: 241410-016-01

Preparation: Dissolved

Date Collected: 04/22/2024 12:20 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.027	µg/L	1	0.100	0.008	J1	GES	05/08/2024 00:49	EPA 200.8-1994, Rev. 5.4
Arsenic	0.29	µg/L	1	0.10	0.03		GES	05/08/2024 00:49	EPA 200.8-1994, Rev. 5.4
Barium	32.4	µg/L	1	0.20	0.05		GES	05/08/2024 00:49	EPA 200.8-1994, Rev. 5.4
Beryllium	1.02	µg/L	5	0.25	0.04		GES	05/08/2024 13:01	EPA 200.8-1994, Rev. 5.4
Cadmium	0.063	µg/L	1	0.020	0.004		GES	05/08/2024 00:49	EPA 200.8-1994, Rev. 5.4
Chromium	0.38	µg/L	1	0.30	0.07		GES	05/08/2024 00:49	EPA 200.8-1994, Rev. 5.4
Cobalt	9.05	µg/L	1	0.020	0.005		GES	05/08/2024 00:49	EPA 200.8-1994, Rev. 5.4
Iron	0.125	mg/L	1	0.020	0.003		GES	05/08/2024 00:49	EPA 200.8-1994, Rev. 5.4
Lead	0.31	µg/L	1	0.20	0.05		GES	05/08/2024 00:49	EPA 200.8-1994, Rev. 5.4
Lithium	0.0780	mg/L	5	0.0015	0.0003		GES	05/08/2024 13:01	EPA 200.8-1994, Rev. 5.4
Manganese	0.0230	mg/L	1	0.00100	0.00007		GES	05/08/2024 00:49	EPA 200.8-1994, Rev. 5.4
Mercury	17	ng/L	1	5	2		RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/08/2024 00:49	EPA 200.8-1994, Rev. 5.4
Selenium	0.44	µg/L	1	0.50	0.04	J1	GES	05/08/2024 00:49	EPA 200.8-1994, Rev. 5.4
Thallium	0.09	µg/L	1	0.20	0.02	J1	GES	05/08/2024 00:49	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-32

Customer Description:

Lab Number: 241410-017

Preparation:

Date Collected: 04/22/2024 11:33 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/08/2024 00:55	EPA 200.8-1994, Rev. 5.4
Arsenic	3.46	µg/L	1	0.10	0.03		GES	05/08/2024 00:55	EPA 200.8-1994, Rev. 5.4
Barium	40.3	µg/L	1	0.20	0.05		GES	05/08/2024 00:55	EPA 200.8-1994, Rev. 5.4
Beryllium	0.449	µg/L	1	0.050	0.007		GES	05/08/2024 00:55	EPA 200.8-1994, Rev. 5.4
Boron	0.231	mg/L	1	0.050	0.007		GES	05/08/2024 00:55	EPA 200.8-1994, Rev. 5.4
Cadmium	0.035	µg/L	1	0.020	0.004		GES	05/08/2024 00:55	EPA 200.8-1994, Rev. 5.4
Calcium	5.63	mg/L	1	0.05	0.02		GES	05/08/2024 00:55	EPA 200.8-1994, Rev. 5.4
Chromium	0.34	µg/L	1	0.30	0.07		GES	05/08/2024 00:55	EPA 200.8-1994, Rev. 5.4
Cobalt	13.2	µg/L	1	0.020	0.005		GES	05/08/2024 00:55	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	05/08/2024 00:55	EPA 200.8-1994, Rev. 5.4
Lithium	0.0567	mg/L	1	0.00030	0.00006		GES	05/08/2024 00:55	EPA 200.8-1994, Rev. 5.4
Magnesium	6.18	mg/L	1	0.100	0.009		GES	05/08/2024 00:55	EPA 200.8-1994, Rev. 5.4
Mercury	180	ng/L	20	100	40		RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/08/2024 00:55	EPA 200.8-1994, Rev. 5.4
Potassium	2.65	mg/L	1	0.10	0.01		GES	05/08/2024 00:55	EPA 200.8-1994, Rev. 5.4
Selenium	0.48	µg/L	1	0.50	0.04	J1	GES	05/08/2024 00:55	EPA 200.8-1994, Rev. 5.4
Sodium	19.6	mg/L	1	0.20	0.02		GES	05/08/2024 13:06	EPA 200.8-1994, Rev. 5.4
Strontium	0.0806	mg/L	1	0.00200	0.00005		GES	05/08/2024 00:55	EPA 200.8-1994, Rev. 5.4
Thallium	0.07	µg/L	1	0.20	0.02	J1	GES	05/08/2024 00:55	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.48	pCi/L	0.12	0.21		ST	05/21/2024 11:31	SW-846 9315-1986, Rev. 0
Carrier Recovery	92.3	%						
Radium-228	1.16	pCi/L	0.17	0.51	O2, P2	TTP	06/05/2024 13:38	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	83.0	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-32

Customer Description:

Lab Number: 241410-017-01

Preparation: Dissolved

Date Collected: 04/22/2024 11:33 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.018	µg/L	1	0.100	0.008	J1	GES	05/08/2024 01:00	EPA 200.8-1994, Rev. 5.4
Arsenic	2.44	µg/L	1	0.10	0.03		GES	05/08/2024 01:00	EPA 200.8-1994, Rev. 5.4
Barium	40.1	µg/L	1	0.20	0.05		GES	05/08/2024 01:00	EPA 200.8-1994, Rev. 5.4
Beryllium	0.472	µg/L	1	0.050	0.007		GES	05/08/2024 01:00	EPA 200.8-1994, Rev. 5.4
Cadmium	0.037	µg/L	1	0.020	0.004		GES	05/08/2024 01:00	EPA 200.8-1994, Rev. 5.4
Chromium	0.21	µg/L	1	0.30	0.07	J1	GES	05/08/2024 01:00	EPA 200.8-1994, Rev. 5.4
Cobalt	13.1	µg/L	1	0.020	0.005		GES	05/08/2024 01:00	EPA 200.8-1994, Rev. 5.4
Iron	10.9	mg/L	1	0.020	0.003	M1	GES	05/08/2024 01:00	EPA 200.8-1994, Rev. 5.4
Lead	0.07	µg/L	1	0.20	0.05	J1	GES	05/08/2024 01:00	EPA 200.8-1994, Rev. 5.4
Lithium	0.0569	mg/L	1	0.00030	0.00006	M1	GES	05/08/2024 01:00	EPA 200.8-1994, Rev. 5.4
Manganese	0.0827	mg/L	1	0.00100	0.00007		GES	05/08/2024 01:00	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/08/2024 01:00	EPA 200.8-1994, Rev. 5.4
Selenium	0.47	µg/L	1	0.50	0.04	J1	GES	05/08/2024 01:00	EPA 200.8-1994, Rev. 5.4
Thallium	0.07	µg/L	1	0.20	0.02	J1	GES	05/08/2024 01:00	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-33

Customer Description:

Lab Number: 241410-018

Preparation:

Date Collected: 04/22/2024 12:13 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/08/2024 02:17	EPA 200.8-1994, Rev. 5.4
Arsenic	1.00	µg/L	1	0.10	0.03		GES	05/08/2024 02:17	EPA 200.8-1994, Rev. 5.4
Barium	42.2	µg/L	1	0.20	0.05		GES	05/08/2024 02:17	EPA 200.8-1994, Rev. 5.4
Beryllium	1.31	µg/L	1	0.050	0.007		GES	05/08/2024 02:17	EPA 200.8-1994, Rev. 5.4
Boron	0.141	mg/L	1	0.050	0.007		GES	05/08/2024 02:17	EPA 200.8-1994, Rev. 5.4
Cadmium	0.058	µg/L	1	0.020	0.004		GES	05/08/2024 02:17	EPA 200.8-1994, Rev. 5.4
Calcium	2.08	mg/L	1	0.05	0.02		GES	05/08/2024 02:17	EPA 200.8-1994, Rev. 5.4
Chromium	0.23	µg/L	1	0.30	0.07	J1	GES	05/08/2024 02:17	EPA 200.8-1994, Rev. 5.4
Cobalt	11.0	µg/L	1	0.020	0.005		GES	05/08/2024 02:17	EPA 200.8-1994, Rev. 5.4
Lead	0.27	µg/L	1	0.20	0.05		GES	05/08/2024 02:17	EPA 200.8-1994, Rev. 5.4
Lithium	0.0199	mg/L	1	0.00030	0.00006		GES	05/08/2024 02:17	EPA 200.8-1994, Rev. 5.4
Magnesium	4.36	mg/L	1	0.100	0.009		GES	05/08/2024 02:17	EPA 200.8-1994, Rev. 5.4
Mercury	6600	ng/L	100	500	200		RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/08/2024 02:17	EPA 200.8-1994, Rev. 5.4
Potassium	0.26	mg/L	1	0.10	0.01		GES	05/08/2024 02:17	EPA 200.8-1994, Rev. 5.4
Selenium	3.18	µg/L	1	0.50	0.04		GES	05/08/2024 02:17	EPA 200.8-1994, Rev. 5.4
Sodium	17.7	mg/L	1	0.20	0.02		GES	05/08/2024 14:23	EPA 200.8-1994, Rev. 5.4
Strontium	0.0350	mg/L	1	0.00200	0.00005		GES	05/08/2024 02:17	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	05/08/2024 02:17	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.73	pCi/L	0.15	0.18		ST	05/21/2024 11:31	SW-846 9315-1986, Rev. 0
Carrier Recovery	87.2	%						
Radium-228	0.88	pCi/L	0.12	0.38	02, P2	TTP	06/05/2024 13:38	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	89.1	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-33

Customer Description:

Lab Number: 241410-018-01

Preparation: Dissolved

Date Collected: 04/22/2024 12:13 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.030	µg/L	1	0.100	0.008	J1	GES	05/08/2024 02:22	EPA 200.8-1994, Rev. 5.4
Arsenic	1.04	µg/L	1	0.10	0.03		GES	05/08/2024 02:22	EPA 200.8-1994, Rev. 5.4
Barium	42.7	µg/L	1	0.20	0.05		GES	05/08/2024 02:22	EPA 200.8-1994, Rev. 5.4
Beryllium	1.28	µg/L	1	0.050	0.007		GES	05/08/2024 02:22	EPA 200.8-1994, Rev. 5.4
Cadmium	0.058	µg/L	1	0.020	0.004		GES	05/08/2024 02:22	EPA 200.8-1994, Rev. 5.4
Chromium	0.23	µg/L	1	0.30	0.07	J1	GES	05/08/2024 02:22	EPA 200.8-1994, Rev. 5.4
Cobalt	11.3	µg/L	1	0.020	0.005		GES	05/08/2024 02:22	EPA 200.8-1994, Rev. 5.4
Iron	0.015	mg/L	1	0.020	0.003	J1	GES	05/08/2024 02:22	EPA 200.8-1994, Rev. 5.4
Lead	0.29	µg/L	1	0.20	0.05		GES	05/08/2024 02:22	EPA 200.8-1994, Rev. 5.4
Lithium	0.0194	mg/L	1	0.00030	0.00006		GES	05/08/2024 02:22	EPA 200.8-1994, Rev. 5.4
Manganese	0.00682	mg/L	1	0.00100	0.00007		GES	05/08/2024 02:22	EPA 200.8-1994, Rev. 5.4
Mercury	890	ng/L	20	100	40		RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/08/2024 02:22	EPA 200.8-1994, Rev. 5.4
Selenium	3.36	µg/L	1	0.50	0.04		GES	05/08/2024 02:22	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	05/08/2024 02:22	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-34

Customer Description:

Lab Number: 241410-019

Preparation:

Date Collected: 04/24/2024 11:11 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.057	mg/L	1	0.050	0.007		GES	05/08/2024 02:27	EPA 200.8-1994, Rev. 5.4
Calcium	40.5	mg/L	1	0.05	0.02		GES	05/08/2024 02:27	EPA 200.8-1994, Rev. 5.4
Magnesium	34.9	mg/L	1	0.100	0.009		GES	05/08/2024 02:27	EPA 200.8-1994, Rev. 5.4
Potassium	6.93	mg/L	1	0.10	0.01		GES	05/08/2024 02:27	EPA 200.8-1994, Rev. 5.4
Sodium	15.8	mg/L	1	0.20	0.02		GES	05/08/2024 14:33	EPA 200.8-1994, Rev. 5.4
Strontium	0.437	mg/L	1	0.00200	0.00005		GES	05/08/2024 02:27	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: AD-36

Customer Description:

Lab Number: 241410-020

Preparation:

Date Collected: 04/23/2024 10:20 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.053	mg/L	1	0.050	0.007		GES	05/08/2024 02:32	EPA 200.8-1994, Rev. 5.4
Calcium	0.75	mg/L	1	0.05	0.02		GES	05/08/2024 02:32	EPA 200.8-1994, Rev. 5.4
Magnesium	2.28	mg/L	1	0.100	0.009		GES	05/08/2024 02:32	EPA 200.8-1994, Rev. 5.4
Potassium	1.56	mg/L	1	0.10	0.01		GES	05/08/2024 02:32	EPA 200.8-1994, Rev. 5.4
Sodium	6.51	mg/L	1	0.20	0.02		GES	05/08/2024 14:38	EPA 200.8-1994, Rev. 5.4
Strontium	0.0113	mg/L	1	0.00200	0.00005		GES	05/08/2024 02:32	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: Duplicate 1

Customer Description:

Lab Number: 241410-021

Preparation:

Date Collected: 04/22/2024 15:00 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/08/2024 02:37	EPA 200.8-1994, Rev. 5.4
Arsenic	0.37	µg/L	1	0.10	0.03		GES	05/08/2024 02:37	EPA 200.8-1994, Rev. 5.4
Barium	41.0	µg/L	1	0.20	0.05		GES	05/08/2024 02:37	EPA 200.8-1994, Rev. 5.4
Beryllium	1.93	µg/L	1	0.050	0.007		GES	05/08/2024 02:37	EPA 200.8-1994, Rev. 5.4
Boron	0.048	mg/L	1	0.050	0.007	J1	GES	05/08/2024 02:37	EPA 200.8-1994, Rev. 5.4
Cadmium	0.311	µg/L	1	0.020	0.004		GES	05/08/2024 02:37	EPA 200.8-1994, Rev. 5.4
Calcium	3.32	mg/L	1	0.05	0.02		GES	05/08/2024 02:37	EPA 200.8-1994, Rev. 5.4
Chromium	0.27	µg/L	1	0.30	0.07	J1	GES	05/08/2024 02:37	EPA 200.8-1994, Rev. 5.4
Cobalt	20.6	µg/L	1	0.020	0.005		GES	05/08/2024 02:37	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	05/08/2024 02:37	EPA 200.8-1994, Rev. 5.4
Lithium	0.0639	mg/L	1	0.00030	0.00006		GES	05/08/2024 02:37	EPA 200.8-1994, Rev. 5.4
Magnesium	4.93	mg/L	1	0.100	0.009		GES	05/08/2024 02:37	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/06/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/08/2024 02:37	EPA 200.8-1994, Rev. 5.4
Potassium	1.99	mg/L	1	0.10	0.01		GES	05/08/2024 02:37	EPA 200.8-1994, Rev. 5.4
Selenium	1.06	µg/L	1	0.50	0.04		GES	05/08/2024 02:37	EPA 200.8-1994, Rev. 5.4
Sodium	25.9	mg/L	1	0.20	0.02		GES	05/08/2024 14:43	EPA 200.8-1994, Rev. 5.4
Strontium	0.0360	mg/L	1	0.00200	0.00005		GES	05/08/2024 02:37	EPA 200.8-1994, Rev. 5.4
Thallium	0.14	µg/L	1	0.20	0.02	J1	GES	05/08/2024 02:37	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: Duplicate 1

Customer Description:

Lab Number: 241410-021-01

Preparation: Dissolved

Date Collected: 04/22/2024 15:00 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/08/2024 02:42	EPA 200.8-1994, Rev. 5.4
Arsenic	0.37	µg/L	1	0.10	0.03		GES	05/08/2024 02:42	EPA 200.8-1994, Rev. 5.4
Barium	40.1	µg/L	1	0.20	0.05		GES	05/08/2024 02:42	EPA 200.8-1994, Rev. 5.4
Beryllium	1.99	µg/L	1	0.050	0.007		GES	05/08/2024 02:42	EPA 200.8-1994, Rev. 5.4
Cadmium	0.313	µg/L	1	0.020	0.004		GES	05/08/2024 02:42	EPA 200.8-1994, Rev. 5.4
Chromium	0.25	µg/L	1	0.30	0.07	J1	GES	05/08/2024 02:42	EPA 200.8-1994, Rev. 5.4
Cobalt	20.6	µg/L	1	0.020	0.005		GES	05/08/2024 02:42	EPA 200.8-1994, Rev. 5.4
Iron	5.10	mg/L	1	0.020	0.003		GES	05/08/2024 02:42	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	05/08/2024 02:42	EPA 200.8-1994, Rev. 5.4
Lithium	0.0655	mg/L	1	0.00030	0.00006		GES	05/08/2024 02:42	EPA 200.8-1994, Rev. 5.4
Manganese	0.0630	mg/L	1	0.00100	0.00007		GES	05/08/2024 02:42	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/06/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/08/2024 02:42	EPA 200.8-1994, Rev. 5.4
Selenium	1.00	µg/L	1	0.50	0.04		GES	05/08/2024 02:42	EPA 200.8-1994, Rev. 5.4
Thallium	0.14	µg/L	1	0.20	0.02	J1	GES	05/08/2024 02:42	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: Equipment Blank

Customer Description:

Lab Number: 241410-022

Preparation:

Date Collected: 04/23/2024 10:53 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/08/2024 02:48	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	05/08/2024 02:48	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	GES	05/08/2024 02:48	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	05/08/2024 02:48	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	05/08/2024 02:48	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	05/08/2024 02:48	EPA 200.8-1994, Rev. 5.4
Calcium	<0.02	mg/L	1	0.05	0.02	U1	GES	05/08/2024 02:48	EPA 200.8-1994, Rev. 5.4
Chromium	0.23	µg/L	1	0.30	0.07	J1	GES	05/08/2024 02:48	EPA 200.8-1994, Rev. 5.4
Cobalt	0.007	µg/L	1	0.020	0.005	J1	GES	05/08/2024 02:48	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	05/08/2024 02:48	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00006	mg/L	1	0.00030	0.00006	U1	GES	05/08/2024 02:48	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.009	mg/L	1	0.100	0.009	U1	GES	05/08/2024 02:48	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/08/2024 02:48	EPA 200.8-1994, Rev. 5.4
Potassium	<0.01	mg/L	1	0.10	0.01	U1	GES	05/08/2024 02:48	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	05/08/2024 02:48	EPA 200.8-1994, Rev. 5.4
Sodium	<0.02	mg/L	1	0.20	0.02	U1	GES	05/08/2024 14:54	EPA 200.8-1994, Rev. 5.4
Strontium	<0.00005	mg/L	1	0.00200	0.00005	U1	GES	05/08/2024 02:48	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	05/08/2024 02:48	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Customer Sample ID: Field Blank

Customer Description:

Lab Number: 241410-023

Preparation:

Date Collected: 04/23/2024 10:56 EDT

Date Received: 04/29/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	GES	05/08/2024 02:53	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	05/08/2024 02:53	EPA 200.8-1994, Rev. 5.4
Barium	0.10	µg/L	1	0.20	0.05	J1	GES	05/08/2024 02:53	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	05/08/2024 02:53	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	05/08/2024 02:53	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	05/08/2024 02:53	EPA 200.8-1994, Rev. 5.4
Calcium	<0.02	mg/L	1	0.05	0.02	U1	GES	05/08/2024 02:53	EPA 200.8-1994, Rev. 5.4
Chromium	0.26	µg/L	1	0.30	0.07	J1	GES	05/08/2024 02:53	EPA 200.8-1994, Rev. 5.4
Cobalt	0.025	µg/L	1	0.020	0.005		GES	05/08/2024 02:53	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	05/08/2024 02:53	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00006	mg/L	1	0.00030	0.00006	U1	GES	05/08/2024 02:53	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.009	mg/L	1	0.100	0.009	U1	GES	05/08/2024 02:53	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	05/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	05/08/2024 02:53	EPA 200.8-1994, Rev. 5.4
Potassium	<0.01	mg/L	1	0.10	0.01	U1	GES	05/08/2024 02:53	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	05/08/2024 02:53	EPA 200.8-1994, Rev. 5.4
Sodium	<0.02	mg/L	1	0.20	0.02	U1	GES	05/08/2024 14:59	EPA 200.8-1994, Rev. 5.4
Strontium	<0.00005	mg/L	1	0.00200	0.00005	U1	GES	05/08/2024 02:53	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	05/08/2024 02:53	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241410

Customer: Pirkey Power Station

Date Reported: 06/11/2024

Report Verification

This report and the above data have been confirmed by the following analyst.

Michael Ohlinger, Chemist

Email: msohlinger@aep.com

Phone: 614-836-4184

Audinet: 8-210-4184

THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED. ALL TIMES LISTED ARE IN THE EASTERN TIME ZONE.

Data Qualifier Legend

- U1 - Not detected at or below method detection limit (MDL).
- J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
- M1 - The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.
- O2 - Client did not provide additional bottles; therefore, the MS and duplicate are missing in this batch.
- P2 - The precision on the laboratory control sample duplicate (LCSD) was above acceptance limits.

Chain of Custody Record

Dolan Chemical Laboratory (DCL)
 4001 Bixby Road
 Groveport, Ohio 43125
 Michael Ohlinger (614-936-4184)
 Contacts: Dave Conover (614-936-4219)

Program: Coal Combustion Residuals (CCR)

Site Contact:

Date:

COC/Order #:

For Lab Use Only:

Project Name: Pirkey PP CCR
 Contact Name: Leslie Fuerschbach
 Contact Phone: 318-673-2744

Analysis Turnaround Time (in Calendar Days)
 (C Routine (28 days for Monitoring Wells))

291410

Sampler(s): Matt Hamilton Kenny McDonald

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	Analytes					Sample Specific Notes						
							Sb, As, B, Ba, Be, Ca, Cd, Cr, Co, K, Li, Mg, Mo, Na, Pb, Se, Sr, Ti	Field-filter 250 mL bottle, then pH<2, HNO ₃	Three (six every 10th*) 1 L bottles, pH<2, HNO ₃	Mercury	Dissolved Mercury		250 mL Glass bottle, HCL **, pH<2					
AD-27	4/24/2024	830	G	GW	1		X											
AD-28	4/23/2024	928	G	GW	7		X											
AD-30	4/23/2024	843	G	GW	7		X											
AD-31	4/22/2024	1120	G	GW	7		X											
AD-32	4/22/2024	1033	G	GW	7		X											
AD-33	4/22/2024	1113	G	GW	7		X											
AD-34	4/24/2024	1011	G	GW	1			X										
AD-36	4/23/2024	920	G	GW	1				X									
Duplicate 1	4/22/2024	1400	G	GW	4		X											
Equipment Blank	4/23/2024	953	G	GW	2		X											
Field Blank	4/23/2024	956	G	GW	2		X											

* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

TG-32 needed

Relinquished by: <i>John Tendon</i>	Company: <i>E-516</i>	Date/Time: <i>4-25-24 15:00</i>	Received by: <i>Michael Ohlinger</i>	Date/Time: <i>4/29/24</i>
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: <i>John Tendon</i>	Date/Time: <i>4/29/24</i>

Chain of Custody Record

Dolan Chemical Laboratory (DCL)
 4001 Bixby Road
 Groveport, Ohio 43125
 Michael Ohlinger (614-836-4184)
 Contacts: Dave Conover (614-836-4219)

Program: Coal Combustion Residuals (CCR)

Site Contact:

Date:

COC/Order #

For Lab Use Only:

Project Name: Pirkey PP CCR
 Contact Name: Leslie Fuerschbach
 Contact Phone: 318-673-2744

Analysis Turnaround Time (in Calendar Days)
 ☉ Routine (28 days for Monitoring Wells)

241410

Sampler(s): Matt Hamilton Kenny McDonald

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	Analytes				Sample Specific Notes	
							Sb, As, B, Ba, Be, Ca, Cd, Cr, Co, K, Li, Mg, Mo, Na, Pb, Se, Sr, Ti	Field-filter 250 mL bottle, then pH<2, HNO ₃	Three (six every 10hr ⁺) 1 L bottles, pH<2, HNO ₃	Mercury		Dissolved Mercury
AD-2	4/23/2024	821	G	GW	7		X	X	X	X		
AD-3	4/23/2024	1104	G	GW	7		X	X	X	X		
AD-4	4/24/2024	931	G	GW	7		X	X	X	X		
AD-7R	4/22/2024	925	G	GW	10		X	X	X	X		
AD-8	4/23/2024	1011	G	GW	1						X	
AD-12	4/22/2024	944	G	GW	7		X	X	X	X		
AD-13	4/22/2024	820	G	GW	7		X	X	X	X		
AD-16	4/24/2024	1104	G	GW	1						X	
AD-17	4/23/2024	1016	G	GW	7		X	X	X	X		
AD-18	4/23/2024	1058	G	GW	7		X	X	X	X		
AD-22	4/22/2024	1022	G	GW	7		X	X	X	X		
AD-23	4/24/2023	1105	G	GW	1						X	

* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

TG-32 needed

Relinquished by: <i>[Signature]</i>	Company: <i>Esjk</i>	Date/Time: <i>4-25-24</i>	Received By: <i>[Signature]</i>	Date/Time: <i>4/29/24</i>
Relinquished by: <i>[Signature]</i>	Company: <i>[Blank]</i>	Date/Time: <i>[Blank]</i>	Received by: <i>[Signature]</i>	Date/Time: <i>[Blank]</i>
Relinquished by: <i>[Blank]</i>	Company: <i>[Blank]</i>	Date/Time: <i>[Blank]</i>	Received In Laboratory by: <i>[Signature]</i>	Date/Time: <i>[Blank]</i>

AEP WATER & WASTE SAMPLE RECEIPT FORM

<p><u>Package Type</u></p> <p><input checked="" type="radio"/> Cooler <input type="radio"/> Box <input type="radio"/> Bag <input type="radio"/> Envelope</p>	<p><u>Delivery Type</u></p> <p>PONY UPS <input checked="" type="radio"/> FedEx USPS</p> <p>Other _____</p>			
Plant/Customer <u>Pitkey</u>	Number of Plastic Containers: <u>9A 24 4/29</u> ^{M50}			
Opened By <u>MGR/M50</u>	Number of Glass Containers: _____			
Date/Time <u>4/29/24</u>	Number of Mercury Containers: <u>32</u>			
Were all temperatures within 0-6°C? Y / N or <input checked="" type="radio"/> N/A Initial: _____ on ice / <input checked="" type="radio"/> no ice (IR Gun Ser# <u>240009843</u> , Expir. <u>01/03/2026</u>) - If No, specify each deviation: _____				
Was container in good condition? <input checked="" type="radio"/> Y / N Comments _____				
Was Chain of Custody received? <input checked="" type="radio"/> Y / N Comments _____				
Requested turnaround: <u>Rush</u> If RUSH, who was notified? _____				
pH (15 min)	Cr ⁶ (pres) (24 hr)	NO ₂ or NO ₃ (48 hr)	ortho-PO ₄ (48 hr)	Hg-diss (pres) (48 hr)

Was COC filled out properly? Y / N Comments _____

Were samples labeled properly? Y / N Comments _____

Were correct containers used? Y / N Comments _____

Was pH checked & Color Coding done? Y / N or N/A Initial & Date: MGR 4/29/24 ^{SS 4-30-24}

pH paper (circle one): MQuant,PN1.09535.0001,LOT# _____ [OR] Lab Rat,PN4801,LOT# X000RWG21 Exp 11/15/2024

- Was Add'l Preservative needed? Y / N If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / N Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# 241416 Initial & Date & Time : _____

Logged by M50 Comments: _____

Reviewed by BPedril _____
5/1/24 _____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Radium Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Tamisha T. Palmer

Name (printed)



Signature

Chemical Technician , Principal

Official Title

06/10/2024

Date

Radium Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Plant
Reviewer Name: Tamisha Palmer
LRC Date: 06/10/2024
Laboratory Job Number: 241410
Prep Batch Number(s): PB24051607, PB24051608

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Radium Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes, No	ER1
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes, No	ER1
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Radium Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Plant
Reviewer Name: Tamisha Palmer
LRC Date: 06/10/2024
Laboratory Job Number: 241410
Prep Batch Number(s): PB24051607, PB24051608

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Radium Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Radium Laboratory Review Checklist


Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

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- R1 Field chain-of-custody documentation
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 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- NA R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

<u>Tamisha Palmer</u>		<u>Chemical Technician, Principal</u>	<u>06/05/2024</u>
Name (printed)	Signature	Official Title	Date

Radium Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Plant
Reviewer Name: Tamisha Palmer
LRC Date: 0528/2024, 06/05/2024
Laboratory Job Number: 241410
Prep Batch Number(s): PB24050221, PB24050222

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Radium Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes, No	ER1
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes, No	ER2
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes, No	ER2
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes, No	ER2
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes, No	ER2
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	NA	
	I	Were analytical duplicates analyzed at the appropriate frequency?	NA	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	NA	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Radium Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Plant
Reviewer Name: Tamisha Palmer
LRC Date: 0528/2024, 06/05/2024
Laboratory Job Number: 241410
Prep Batch Number(s): PB24050221, PB24050222

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Radium Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Radium Laboratory Review Checklist

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Plant
Reviewer Name: Tamisha Palmer
LRC Date: 0528/2024, 06/05/2024
Laboratory Job Number: 241410
Prep Batch Number(s): PB24050221, PB24050222

Exception Report No.	Description
ER1	The RPD between the LCS and LCSD were outside the 25% criteria for PB24050222
ER2	Sample was repped and there was not enough sample available for MS,MSD

¹ Items identified by the letter “R” must be available as a hard copy or as a .pdf file. Items identified by the letter “S” should be retained and made available upon request for the appropriate retention period.
² O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).
³ NA - Not applicable; NR - Not reviewed.
⁴ Exception Report identification number; an Exception Report should be completed for an item if the result is “No” or “NR.”

ICP-MS Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- NA R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Jonathan Barnhill

Name (printed)

Signature of the Laboratory Supervisor
The use of a stamp or seal in lieu of a signature is acceptable only
if the stamp or seal is signed by the Laboratory Supervisor.
NELAC 5.5.10.10

Signature

Lab Supervisor

Official Title

05/29/2024

Date

ICP-MS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey CCR
Reviewer Name: Jonathan Barnhill
LRC Date: 05/29/2024
Laboratory Job Number: 241410
Prep Batch Number(s): PB24050205 PB24050207 QC2405069 QC2405077

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	No	ER1
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

ICP-MS Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	No	ER3
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

ICP-MS Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey CCR
Reviewer Name: Jonathan Barnhill
LRC Date: 05/29/2024
Laboratory Job Number: 241410
Prep Batch Number(s): PB24050205 PB24050207 QC2405069 QC2405077

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER2
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	Yes	
	I	Were ion abundance data within the method-required QC limits?	Yes	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	Yes	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

ICP-MS Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

ICP-MS Laboratory Review Checklist

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey CCR
Reviewer Name: Jonathan Barnhill
LRC Date: 05/29/2024
Laboratory Job Number: 241410
Prep Batch Number(s): PB24050205 PB24050207 QC2405069 QC2405077

Exception Report No.	Description
ER1	Linear Dynamic Range (LDR) study used to determine upper limit of analyte calibration.
ER2	CCB acceptance criteria is $CCB < 2.2 * MDL$.
ER3	Matrix Spike failed for Be, Co & Li on sample 241410-011
ER3	Matrix Spike failed for Fe & Li on sample 241410-017-01

¹ Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
² O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).
³ NA - Not applicable; NR - Not reviewed.
⁴ Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Mercury Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

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- R2 Sample identification cross-reference
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Susann Sulzmann Susann Sulzmann Senior Chemist 6-10-2024
Name (printed) Signature Official Title Date

Mercury Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Station
Reviewer Name: Susann Sulzmann
LRC Date: 06-10-2024
Laboratory Job Number: 241410
Prep Batch Number(s): PB24050201, PB24050202, PB24050301

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	Yes	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Mercury Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Mercury Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Station
Reviewer Name: Susann Sulzmann
LRC Date: 06-10-2024
Laboratory Job Number: 241410
Prep Batch Number(s): PB24050201, PB24050202, PB24050301

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Mercury Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241393

Customer: Pirkey Power Station

Date Reported: 06/05/2024

Customer Sample ID: AD-2

Customer Description:

Lab Number: 241393-001

Preparation:

Date Collected: 04/23/2024 09:21 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.44	mg/L	2	0.10	0.02		CRJ	05/09/2024 18:59	EPA 300.1 -1997, Rev. 1.0
Chloride	31.2	mg/L	2	0.06	0.02		CRJ	05/09/2024 18:59	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.27	mg/L	2	0.06	0.02		CRJ	05/09/2024 18:59	EPA 300.1 -1997, Rev. 1.0
Sulfate	309	mg/L	10	3.0	0.6		CRJ	05/09/2024 15:09	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	570	mg/L	1	50	20		ELT	04/29/2024 06:46	SM 2540C-2015

Customer Sample ID: AD-3

Customer Description:

Lab Number: 241393-002

Preparation:

Date Collected: 04/23/2024 12:04 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.08	mg/L	2	0.10	0.02	J1	CRJ	05/09/2024 15:41	EPA 300.1 -1997, Rev. 1.0
Chloride	5.83	mg/L	2	0.06	0.02		CRJ	05/09/2024 15:41	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.05	mg/L	2	0.06	0.02	J1	CRJ	05/09/2024 15:41	EPA 300.1 -1997, Rev. 1.0
Sulfate	28.5	mg/L	2	0.6	0.1		CRJ	05/09/2024 15:41	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	160	mg/L	1	50	20		ELT	04/29/2024 06:54	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241393

Customer: Pirkey Power Station

Date Reported: 06/05/2024

Customer Sample ID: AD-4

Customer Description:

Lab Number: 241393-003

Preparation:

Date Collected: 04/24/2024 10:31 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.32	mg/L	2	0.10	0.02		CRJ	05/09/2024 16:14	EPA 300.1 -1997, Rev. 1.0
Chloride	3.97	mg/L	2	0.06	0.02		CRJ	05/09/2024 16:14	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.07	mg/L	2	0.06	0.02		CRJ	05/09/2024 16:14	EPA 300.1 -1997, Rev. 1.0
Sulfate	20.3	mg/L	2	0.6	0.1		CRJ	05/09/2024 16:14	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	140	mg/L	1	50	20		ELT	04/29/2024 06:54	SM 2540C-2015

Customer Sample ID: AD-7R

Customer Description:

Lab Number: 241393-004

Preparation:

Date Collected: 04/22/2024 10:25 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.61	mg/L	2	0.10	0.02		CRJ	05/09/2024 16:47	EPA 300.1 -1997, Rev. 1.0
Chloride	20.6	mg/L	2	0.06	0.02		CRJ	05/09/2024 16:47	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.16	mg/L	2	0.06	0.02		CRJ	05/09/2024 16:47	EPA 300.1 -1997, Rev. 1.0
Sulfate	73.6	mg/L	2	0.6	0.1		CRJ	05/09/2024 16:47	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	220	mg/L	1	50	20		ELT	04/29/2024 06:54	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241393

Customer: Pirkey Power Station

Date Reported: 06/05/2024

Customer Sample ID: AD-8

Customer Description:

Lab Number: 241393-005

Preparation:

Date Collected: 04/23/2024 11:11 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.60	mg/L	2	0.10	0.02		CRJ	05/09/2024 18:26	EPA 300.1 -1997, Rev. 1.0
Chloride	4.81	mg/L	2	0.06	0.02		CRJ	05/09/2024 18:26	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.28	mg/L	2	0.06	0.02		CRJ	05/09/2024 18:26	EPA 300.1 -1997, Rev. 1.0
Sulfate	168	mg/L	10	3.0	0.6		CRJ	05/09/2024 17:53	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	126	mg/L	1	20	5		MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	390	mg/L	1	50	20		ELT	04/29/2024 06:54	SM 2540C-2015

Customer Sample ID: AD-12

Customer Description:

Lab Number: 241393-006

Preparation:

Date Collected: 04/22/2024 10:44 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.07	mg/L	2	0.10	0.02	J1	CRJ	05/09/2024 21:44	EPA 300.1 -1997, Rev. 1.0
Chloride	4.86	mg/L	2	0.06	0.02		CRJ	05/09/2024 21:44	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.08	mg/L	2	0.06	0.02		CRJ	05/09/2024 21:44	EPA 300.1 -1997, Rev. 1.0
Sulfate	4.2	mg/L	2	0.6	0.1		CRJ	05/09/2024 21:44	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	60	mg/L	1	50	20		ELT	04/29/2024 07:00	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241393

Customer: Pirkey Power Station

Date Reported: 06/05/2024

Customer Sample ID: AD-13

Customer Description:

Lab Number: 241393-007

Preparation:

Date Collected: 04/22/2024 09:20 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.27	mg/L	2	0.10	0.02		CRJ	05/09/2024 20:38	EPA 300.1 -1997, Rev. 1.0
Chloride	42.2	mg/L	10	0.3	0.1		CRJ	05/09/2024 20:05	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.34	mg/L	2	0.06	0.02		CRJ	05/09/2024 20:38	EPA 300.1 -1997, Rev. 1.0
Sulfate	84.9	mg/L	2	0.6	0.1		CRJ	05/09/2024 20:38	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	220	mg/L	1	50	20		ELT	04/29/2024 07:00	SM 2540C-2015

Customer Sample ID: AD-16

Customer Description:

Lab Number: 241393-008

Preparation:

Date Collected: 04/24/2024 12:04 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.18	mg/L	2	0.10	0.02		CRJ	05/10/2024 01:01	EPA 300.1 -1997, Rev. 1.0
Chloride	26.1	mg/L	2	0.06	0.02		CRJ	05/10/2024 01:01	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.09	mg/L	2	0.06	0.02		CRJ	05/10/2024 01:01	EPA 300.1 -1997, Rev. 1.0
Sulfate	14.8	mg/L	2	0.6	0.1		CRJ	05/10/2024 01:01	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	120	mg/L	1	50	20		ELT	04/29/2024 07:00	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241393

Customer: Pirkey Power Station

Date Reported: 06/05/2024

Customer Sample ID: AD-17

Customer Description:

Lab Number: 241393-009

Preparation:

Date Collected: 04/23/2024 11:16 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.10	mg/L	2	0.10	0.02		CRJ	05/10/2024 01:34	EPA 300.1 -1997, Rev. 1.0
Chloride	6.44	mg/L	2	0.06	0.02		CRJ	05/10/2024 01:34	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.09	mg/L	2	0.06	0.02		CRJ	05/10/2024 01:34	EPA 300.1 -1997, Rev. 1.0
Sulfate	2.1	mg/L	2	0.6	0.1		CRJ	05/10/2024 01:34	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	40	mg/L	1	50	20	J1	ELT	04/29/2024 07:00	SM 2540C-2015

Customer Sample ID: AD-18

Customer Description:

Lab Number: 241393-010

Preparation:

Date Collected: 04/23/2024 11:58 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.07	mg/L	2	0.10	0.02	J1	CRJ	05/10/2024 02:07	EPA 300.1 -1997, Rev. 1.0
Chloride	5.39	mg/L	2	0.06	0.02		CRJ	05/10/2024 02:07	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.02	mg/L	2	0.06	0.02	J1	CRJ	05/10/2024 02:07	EPA 300.1 -1997, Rev. 1.0
Sulfate	7.2	mg/L	2	0.6	0.1		CRJ	05/10/2024 02:07	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	90	mg/L	1	50	20		ELT	04/29/2024 07:08	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241393

Customer: Pirkey Power Station

Date Reported: 06/05/2024

Customer Sample ID: AD-22

Customer Description:

Lab Number: 241393-011

Preparation:

Date Collected: 04/22/2024 11:22 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.40	mg/L	2	0.10	0.02		CRJ	05/10/2024 04:19	EPA 300.1 -1997, Rev. 1.0
Chloride	70.5	mg/L	25	0.8	0.3		CRJ	05/10/2024 03:46	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.75	mg/L	2	0.06	0.02		CRJ	05/10/2024 04:19	EPA 300.1 -1997, Rev. 1.0
Sulfate	360	mg/L	25	8	2		CRJ	05/10/2024 03:46	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	610	mg/L	1	50	20		ELT	04/29/2024 07:08	SM 2540C-2015

Customer Sample ID: AD-23

Customer Description:

Lab Number: 241393-012

Preparation:

Date Collected: 04/24/2024 12:05 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.25	mg/L	2	0.10	0.02		CRJ	05/10/2024 02:40	EPA 300.1 -1997, Rev. 1.0
Chloride	8.65	mg/L	2	0.06	0.02		CRJ	05/10/2024 02:40	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.06	mg/L	2	0.06	0.02		CRJ	05/10/2024 02:40	EPA 300.1 -1997, Rev. 1.0
Sulfate	7.1	mg/L	2	0.6	0.1		CRJ	05/10/2024 02:40	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	70	mg/L	1	50	20		ELT	04/29/2024 07:08	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241393

Customer: Pirkey Power Station

Date Reported: 06/05/2024

Customer Sample ID: AD-27

Customer Description:

Lab Number: 241393-013

Preparation:

Date Collected: 04/24/2024 09:30 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.39	mg/L	2	0.10	0.02		CRJ	05/10/2024 05:25	EPA 300.1 -1997, Rev. 1.0
Chloride	14.4	mg/L	2	0.06	0.02		CRJ	05/10/2024 05:25	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.16	mg/L	2	0.06	0.02		CRJ	05/10/2024 05:25	EPA 300.1 -1997, Rev. 1.0
Sulfate	60.4	mg/L	2	0.6	0.1		CRJ	05/10/2024 05:25	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	200	mg/L	1	50	20		ELT	04/29/2024 07:08	SM 2540C-2015

Customer Sample ID: AD-28

Customer Description:

Lab Number: 241393-014

Preparation:

Date Collected: 04/23/2024 10:28 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.09	mg/L	2	0.10	0.02	J1	CRJ	05/10/2024 07:36	EPA 300.1 -1997, Rev. 1.0
Chloride	3.90	mg/L	2	0.06	0.02		CRJ	05/10/2024 07:36	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.79	mg/L	2	0.06	0.02		CRJ	05/10/2024 07:36	EPA 300.1 -1997, Rev. 1.0
Sulfate	24.7	mg/L	2	0.6	0.1		CRJ	05/10/2024 07:36	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	100	mg/L	1	50	20		ELT	04/29/2024 07:17	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241393

Customer: Pirkey Power Station

Date Reported: 06/05/2024

Customer Sample ID: AD-30

Customer Description:

Lab Number: 241393-015

Preparation:

Date Collected: 04/23/2024 09:43 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.16	mg/L	2	0.10	0.02		CRJ	05/10/2024 06:30	EPA 300.1 -1997, Rev. 1.0
Chloride	12.2	mg/L	2	0.06	0.02		CRJ	05/10/2024 06:30	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.05	mg/L	2	0.06	0.02	J1	CRJ	05/10/2024 06:30	EPA 300.1 -1997, Rev. 1.0
Sulfate	104	mg/L	10	3.0	0.6		CRJ	05/10/2024 05:58	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	220	mg/L	1	50	20		ELT	04/29/2024 07:17	SM 2540C-2015

Customer Sample ID: AD-31

Customer Description:

Lab Number: 241393-016

Preparation:

Date Collected: 04/22/2024 12:20 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.25	mg/L	2	0.10	0.02		CRJ	05/10/2024 13:57	EPA 300.1 -1997, Rev. 1.0
Chloride	16.8	mg/L	2	0.06	0.02		CRJ	05/10/2024 13:57	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.10	mg/L	2	0.06	0.02		CRJ	05/10/2024 13:57	EPA 300.1 -1997, Rev. 1.0
Sulfate	79.8	mg/L	2	0.6	0.1		CRJ	05/10/2024 13:57	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	250	mg/L	1	50	20		ELT	04/29/2024 07:17	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241393

Customer: Pirkey Power Station

Date Reported: 06/05/2024

Customer Sample ID: AD-32

Customer Description:

Lab Number: 241393-017

Preparation:

Date Collected: 04/22/2024 11:33 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.42	mg/L	2	0.10	0.02		CRJ	05/10/2024 15:03	EPA 300.1 -1997, Rev. 1.0
Chloride	10.6	mg/L	2	0.06	0.02		CRJ	05/10/2024 15:03	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.32	mg/L	2	0.06	0.02		CRJ	05/10/2024 15:03	EPA 300.1 -1997, Rev. 1.0
Sulfate	67.0	mg/L	2	0.6	0.1		CRJ	05/10/2024 15:03	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	190	mg/L	1	50	20		ELT	04/29/2024 07:17	SM 2540C-2015

Customer Sample ID: AD-33

Customer Description:

Lab Number: 241393-018

Preparation:

Date Collected: 04/22/2024 12:13 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.36	mg/L	2	0.10	0.02		CRJ	05/10/2024 19:26	EPA 300.1 -1997, Rev. 1.0
Chloride	9.97	mg/L	2	0.06	0.02		CRJ	05/10/2024 19:26	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.27	mg/L	2	0.06	0.02		CRJ	05/10/2024 19:26	EPA 300.1 -1997, Rev. 1.0
Sulfate	65.7	mg/L	2	0.6	0.1		CRJ	05/10/2024 19:26	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	180	mg/L	1	50	20		ELT	04/29/2024 07:24	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241393

Customer: Pirkey Power Station

Date Reported: 06/05/2024

Customer Sample ID: AD-34

Customer Description:

Lab Number: 241393-019

Preparation:

Date Collected: 04/24/2024 11:11 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.21	mg/L	5	0.25	0.05	J1	CRJ	05/10/2024 16:42	EPA 300.1 -1997, Rev. 1.0
Chloride	7.32	mg/L	5	0.15	0.05		CRJ	05/10/2024 16:42	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.69	mg/L	5	0.15	0.05		CRJ	05/10/2024 16:42	EPA 300.1 -1997, Rev. 1.0
Sulfate	1150	mg/L	50	15	3		CRJ	05/10/2024 16:09	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	1650	mg/L	1	50	20		ELT	04/29/2024 07:24	SM 2540C-2015

Customer Sample ID: AD-36

Customer Description:

Lab Number: 241393-020

Preparation:

Date Collected: 04/23/2024 10:20 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.59	mg/L	2	0.10	0.02		CRJ	05/10/2024 19:59	EPA 300.1 -1997, Rev. 1.0
Chloride	14.8	mg/L	2	0.06	0.02		CRJ	05/10/2024 19:59	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.08	mg/L	2	0.06	0.02		CRJ	05/10/2024 19:59	EPA 300.1 -1997, Rev. 1.0
Sulfate	2.9	mg/L	2	0.6	0.1		CRJ	05/10/2024 19:59	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	60	mg/L	1	50	20		ELT	04/29/2024 07:24	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241393

Customer: Pirkey Power Station

Date Reported: 06/05/2024

Customer Sample ID: Duplicate 1

Customer Description:

Lab Number: 241393-021

Preparation:

Date Collected: 04/22/2024 15:00 EDT

Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.61	mg/L	2	0.10	0.02		CRJ	05/10/2024 18:20	EPA 300.1 -1997, Rev. 1.0
Chloride	20.8	mg/L	2	0.06	0.02		CRJ	05/10/2024 18:20	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.15	mg/L	2	0.06	0.02		CRJ	05/10/2024 18:20	EPA 300.1 -1997, Rev. 1.0
Sulfate	76.5	mg/L	2	0.6	0.1		CRJ	05/10/2024 18:20	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	04/29/2024 15:40	SM 2320B-2011
TDS, Filterable Residue	230	mg/L	1	50	20		ELT	04/29/2024 07:37	SM 2540C-2015

Report Verification

This report and the above data have been confirmed by the following analyst.

Michael Ohlinger, Chemist

Email: msohlinger@aep.com

Phone: 614-836-4184

Audinet: 8-210-4184

THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED. ALL TIMES LISTED ARE IN THE EASTERN TIME ZONE.

Data Qualifer Legend

U1 - Not detected at or below method detection limit (MDL).

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
 4001 Bkby Road
 Groveport, Ohio 43125
 Michael Ohlinger (614-836-4184)
 Dave Conover (614-836-4219)

Site Contact:

Date:

COC/Order #:

For Lab Use Only:

Project Name: Pikey PP Semi-Annual CCR
 Contact Name: Leslie Fuerschbach
 Contact Phone: 318-673-2744

Analysis Turnaround Time (in Calendar Days)
 Routine (28 days for Monitoring Wells)

250 mL bottle, pH<2, HNO3	Field-filter 250 mL bottle, then pH<2, HNO3	1 L bottle, Cool, 0-6C	Three (six every 10th*) L bottles, pH<2, HNO3
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241393

Sampler(s): Matt Hamilton Kerry McDonald

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) initials	Mercury	Dissolved Mercury	F, Cl, SO4, Br, TDS, Alkalinity	Ra-226, Ra-228	Sample Specific Notes
AD-2	4/23/2024	821	G	GW	1				X		
AD-3	4/23/2024	1104	G	GW	1				X		
AD-4	4/24/2024	931	G	GW	1				X		
AD-7R	4/22/2024	925	G	GW	1				X		
AD-8	4/23/2024	1011	G	GW	1				X		
AD-12	4/22/2024	944	G	GW	1				X		
AD-13	4/22/2024	820	G	GW	1				X		
AD-16	4/24/2024	1104	G	GW	1				X		
AD-17	4/23/2024	1016	G	GW	1				X		
AD-18	4/23/2024	1058	G	GW	1				X		
AD-22	4/22/2024	1022	G	GW	1				X		
AD-23	4/24/2023	1105	G	GW	1				X		

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ; F= filter in field

* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

TG-32 needed

Relinquished by: <i>John Tomlinson</i>	Company: <i>ESK</i>	Date/Time: <i>4/25/24</i>	Received by: <i>Shirley</i>	Date/Time: <i>4/26/24</i>
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time:

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
 4001 Bixby Road
 Groveport, Ohio 43125
 Michael Chillingier (614-836-4184)
 Dave Conover (614-836-4219)

Project Name: Pirkey PP CCR
Contact Name: Leslie Fuerschbach
Contact Phone: 318-673-2744
Samplers(s): Matt Hamilton Kenny McDonald

Site Contact: _____ **Date:** _____

COC/Order #: _____ **For Lab Use Only:**

Analysis Turnaround Time (in Calendar Days)
 ☐ Routine (28 days for Monitoring Wells)

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	Mercury	Dissolved Mercury	F, Cl, SO4, Br, TDS, Alkalinity	Ra-226, Ra-228	Sample Specific Notes
AD-27	4/24/2024	830	G	GW	1		250 mL bottle, pH<2, HNO3	Field-filter 250 mL bottle, then pH<2, HNO3	1 L bottle, Cool, 0-8C	Three (six every 10th) L bottles, pH<2, HNO3	
AD-28	4/23/2024	928	G	GW	1				X		
AD-30	4/23/2024	843	G	GW	1				X		
AD-31	4/22/2024	1120	G	GW	1				X		
AD-32	4/22/2024	1033	G	GW	1				X		
AD-33	4/22/2024	1113	G	GW	1				X		
AD-34	4/24/2024	1011	G	GW	1				X		
AD-36	4/23/2024	920	G	GW	1				X		
Duplicate 1	4/22/2024	1400	G	GW	1				X		

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field

*** Six 1L Bottles must be collected for Radium for every 10th sample.**

Special Instructions/QC Requirements & Comments:

TG-32 needed

Relinquished by: <i>[Signature]</i>	Company: <i>Ex</i>	Date/Time: 4-25-24	Received by: <i>[Signature]</i>	Date/Time: 4/16/24
Relinquished by: <i>[Signature]</i>	Company: <i>Ex</i>	Date/Time: 4-25-24	Received by: <i>[Signature]</i>	Date/Time: 4/16/24
Relinquished by: _____	Company: _____	Date/Time: _____	Received in Laboratory by: <i>[Signature]</i>	Date/Time: 4/16/24

AEP WATER & WASTE SAMPLE RECEIPT FORM

<u>Package Type</u>		<u>Delivery Type</u>	
<input checked="" type="radio"/> Cooler	Box Bag Envelope	PONY UPS <input checked="" type="radio"/> FedEx	USPS
Other _____		Other _____	
Plant/Customer <u>Pittkey</u>	Number of Plastic Containers: <u>21</u>		
Opened By <u>MBK/MSO</u>	Number of Glass Containers: <u>-</u>		
Date/Time <u>4/26/24 1000</u>	Number of Mercury Containers: <u>-</u>		
Were all temperatures within 0-6°C? <input checked="" type="radio"/> Y / N or N/A Initial: <u>MBK</u> <input checked="" type="radio"/> on ice / no ice (IR Gun Ser# <u>240009843</u> , Expir. <u>01/03/2026</u>) - If No, specify each deviation: _____			
Was container in good condition? <input checked="" type="radio"/> Y / N Comments _____			
Was Chain of Custody received? <input checked="" type="radio"/> Y / N Comments _____			
Requested turnaround: <u>Routine</u> If RUSH, who was notified? _____			
pH (15 min)	Cr ⁺⁶ (pres) (24 hr)	NO ₂ or NO ₃ (48 hr)	ortho-PO ₄ (48 hr) Hg-diss (pres) (48 hr)

Was COC filled out properly? Y / N Comments _____

Were samples labeled properly? Y / N Comments _____

Were correct containers used? Y / N Comments _____

Was pH checked & Color Coding done? Y / N or N/A Initial & Date: MSO 4/26/24

pH paper (circle one): MQuant.PN1.09535.0001.LOT# _____ [OR] Lab Rat.PN4801 LOT# _____ X000RWDG21 Exp 11/15/2024

- Was Add'l Preservative needed? Y / N If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / N Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# 241393 Initial & Date & Time : _____

Logged by MSO Comments: _____

Reviewed by WCG _____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Ion Chromatography Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

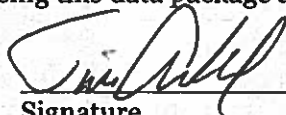
- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Tim Arnold

Name (printed)



Signature

Principle Chemist

Official Title

05/13/2024

Date

Ion Chromatography Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Wells
Reviewer Name: Tim Arnold
LRC Date: 05/13/2024
Laboratory Job Number: 241393
Prep Batch Number(s): QC2405096

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	Yes	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	Yes	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	Yes	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Ion Chromatography Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Ion Chromatography Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Wells
Reviewer Name: Tim Arnold
LRC Date: 05/13/2024
Laboratory Job Number: 241393
Prep Batch Number(s): QC2405096

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Ion Chromatography Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

TDS Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Sandra Williams	<i>Sandra D. Williams</i>	Chemist	06/04/2024
Name (printed)	Signature	Official Title	Date

TDS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Station
Reviewer Name: Sandra Williams
LRC Date: 06/04/2024
Laboratory Job Number: 241393
Prep Batch Number(s): QC2405010

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	NA	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

TDS Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

TDS Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Station
Reviewer Name: Sandra Williams
LRC Date: 05/06/2024
Laboratory Job Number: 241393
Prep Batch Number(s): QC2405010

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	NA	
	I	Was the number of standards recommended in the method used for all analytes?	NA	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	NA	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	NA	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

TDS Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Alkalinity Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

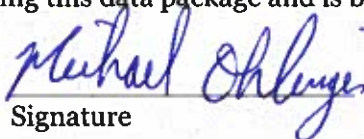
- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Michael Ohlinger

Name (printed)



Signature

Chemist

Official Title

06/05/2024

Date

Alkalinity Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey Plant Semi-Annual CCR

Reviewer Name: Michael Ohlinger

LRC Date: 06/05/2024

Laboratory Job Number: 241393

Prep Batch Number(s): QC2404238

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Alkalinity Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Alkalinity Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Plant Semi-Annual CCR
Reviewer Name: Michael Ohlinger
LRC Date: 06/05/2024
Laboratory Job Number: 241393
Prep Batch Number(s): QC2404238

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	NA	
	I	Was the number of standards recommended in the method used for all analytes?	NA	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	NA	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	NA	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Alkalinity Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-2

Customer Description:

Lab Number: 242840-001

Preparation:

Date Collected: 09/17/2024 08:58 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.04	µg/L	5	0.50	0.04	U1	ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4
Arsenic	0.9	µg/L	5	0.5	0.2		ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4
Barium	14.8	µg/L	5	1.0	0.3		ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4
Beryllium	1.03	µg/L	5	0.25	0.04		ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4
Boron	3.09	mg/L	5	0.25	0.04		ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4
Cadmium	0.12	µg/L	5	0.10	0.02		ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4
Calcium	3.9	mg/L	5	0.3	0.1		ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4
Chromium	0.9	µg/L	5	1.5	0.4	J1	ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4
Cobalt	29.6	µg/L	5	0.10	0.03		ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4
Lead	0.8	µg/L	5	1.0	0.3	J1	ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4
Lithium	0.0851	mg/L	5	0.0015	0.0003		ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4
Magnesium	7.87	mg/L	5	0.50	0.05		ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4
Mercury	41	ng/L	2	10	4		RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	2.0	µg/L	5	2.5	0.5	J1	ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4
Potassium	1.56	mg/L	5	0.50	0.05		ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4
Selenium	3.5	µg/L	5	2.5	0.2		ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4
Sodium	113	mg/L	5	1.0	0.1		ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4
Strontium	0.0557	mg/L	5	0.0100	0.0003		ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4
Thallium	0.1	µg/L	5	1.0	0.1	J1	ELT	09/26/2024 12:39	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.67	pCi/L	0.14	0.23		ST	10/09/2024 10:42	SW-846 9315-1986, Rev. 0
Carrier Recovery	81.6	%						
Radium-228	2.18	pCi/L	0.15	0.43	B1	TTP	10/02/2024 16:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	79.3	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-2

Customer Description:

Lab Number: 242840-001-01

Preparation: Dissolved

Date Collected: 09/17/2024 08:58 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.04	µg/L	5	0.50	0.04	U1	ELT	10/01/2024 22:59	EPA 200.8-1994, Rev. 5.4
Arsenic	1.2	µg/L	5	0.5	0.2		ELT	10/01/2024 22:59	EPA 200.8-1994, Rev. 5.4
Barium	15.7	µg/L	5	1.0	0.3		ELT	10/01/2024 22:59	EPA 200.8-1994, Rev. 5.4
Beryllium	0.87	µg/L	10	0.50	0.07		ELT	10/04/2024 20:55	EPA 200.8-1994, Rev. 5.4
Cadmium	0.16	µg/L	5	0.10	0.02		ELT	10/01/2024 22:59	EPA 200.8-1994, Rev. 5.4
Chromium	<0.4	µg/L	5	1.5	0.4	U1	ELT	10/01/2024 22:59	EPA 200.8-1994, Rev. 5.4
Cobalt	33.1	µg/L	5	0.10	0.03		ELT	10/01/2024 22:59	EPA 200.8-1994, Rev. 5.4
Iron	0.84	mg/L	5	0.10	0.02		ELT	10/01/2024 22:59	EPA 200.8-1994, Rev. 5.4
Lead	0.7	µg/L	5	1.0	0.3	J1	ELT	10/01/2024 22:59	EPA 200.8-1994, Rev. 5.4
Lithium	0.0772	mg/L	10	0.0030	0.0006		ELT	10/04/2024 20:55	EPA 200.8-1994, Rev. 5.4
Manganese	0.122	mg/L	5	0.0050	0.0004		ELT	10/01/2024 22:59	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RPL	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.5	µg/L	5	2.5	0.5	U1	ELT	10/01/2024 22:59	EPA 200.8-1994, Rev. 5.4
Selenium	4.3	µg/L	5	2.5	0.2		ELT	10/01/2024 22:59	EPA 200.8-1994, Rev. 5.4
Thallium	0.1	µg/L	5	1.0	0.1	J1	ELT	10/01/2024 22:59	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
 4001 Bixby Road
 Groveport, OH 43125
 Phone: 614-836-4221
 Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-3

Customer Description:

Lab Number: 242840-002

Preparation:

Date Collected: 09/17/2024 12:01 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/25/2024 18:26	EPA 200.8-1994, Rev. 5.4
Arsenic	0.57	µg/L	1	0.10	0.03		ELT	09/25/2024 18:26	EPA 200.8-1994, Rev. 5.4
Barium	60.5	µg/L	1	0.20	0.05		ELT	09/25/2024 18:26	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.4	µg/L	50	2.5	0.4	U1	ELT	09/26/2024 13:46	EPA 200.8-1994, Rev. 5.4
Boron	0.052	mg/L	1	0.050	0.007		ELT	09/25/2024 18:26	EPA 200.8-1994, Rev. 5.4
Cadmium	0.014	µg/L	1	0.020	0.004	J1	ELT	09/25/2024 18:26	EPA 200.8-1994, Rev. 5.4
Calcium	4.67	mg/L	1	0.05	0.02		ELT	09/25/2024 18:26	EPA 200.8-1994, Rev. 5.4
Chromium	0.40	µg/L	1	0.30	0.07		ELT	09/25/2024 18:26	EPA 200.8-1994, Rev. 5.4
Cobalt	4.77	µg/L	1	0.020	0.005		ELT	09/25/2024 18:26	EPA 200.8-1994, Rev. 5.4
Lead	0.10	µg/L	1	0.20	0.05	J1	ELT	09/25/2024 18:26	EPA 200.8-1994, Rev. 5.4
Lithium	0.082	mg/L	50	0.015	0.003		ELT	09/26/2024 13:46	EPA 200.8-1994, Rev. 5.4
Magnesium	2.42	mg/L	1	0.100	0.009		ELT	09/25/2024 18:26	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/25/2024 18:26	EPA 200.8-1994, Rev. 5.4
Potassium	2.52	mg/L	1	0.10	0.01		ELT	09/25/2024 18:26	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	ELT	09/25/2024 18:26	EPA 200.8-1994, Rev. 5.4
Sodium	9.68	mg/L	1	0.20	0.02		ELT	09/25/2024 18:26	EPA 200.8-1994, Rev. 5.4
Strontium	0.0304	mg/L	1	0.00200	0.00005		ELT	09/25/2024 18:26	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.02	J1	ELT	09/25/2024 18:26	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.49	pCi/L	0.10	0.14		ST	10/09/2024 10:42	SW-846 9315-1986, Rev. 0
Carrier Recovery	94.7	%						
Radium-228	2.14	pCi/L	0.17	0.52	B1	TTP	10/02/2024 16:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	71.7	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-3

Customer Description:

Lab Number: 242840-002-01

Preparation: Dissolved

Date Collected: 09/17/2024 12:01 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/25/2024 18:32	EPA 200.8-1994, Rev. 5.4
Arsenic	0.28	µg/L	1	0.10	0.03		ELT	09/25/2024 18:32	EPA 200.8-1994, Rev. 5.4
Barium	55.7	µg/L	1	0.20	0.05		ELT	09/25/2024 18:32	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.4	µg/L	50	2.5	0.4	U1	ELT	09/26/2024 13:51	EPA 200.8-1994, Rev. 5.4
Cadmium	0.015	µg/L	1	0.020	0.004	J1	ELT	09/25/2024 18:32	EPA 200.8-1994, Rev. 5.4
Chromium	0.29	µg/L	1	0.30	0.07	J1	ELT	09/25/2024 18:32	EPA 200.8-1994, Rev. 5.4
Cobalt	4.37	µg/L	1	0.020	0.005		ELT	09/25/2024 18:32	EPA 200.8-1994, Rev. 5.4
Iron	3.13	mg/L	1	0.020	0.003		ELT	09/25/2024 18:32	EPA 200.8-1994, Rev. 5.4
Lead	0.06	µg/L	1	0.20	0.05	J1	ELT	09/25/2024 18:32	EPA 200.8-1994, Rev. 5.4
Lithium	0.080	mg/L	50	0.015	0.003		ELT	09/26/2024 13:51	EPA 200.8-1994, Rev. 5.4
Manganese	0.0554	mg/L	1	0.00100	0.00007		ELT	09/25/2024 18:32	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/25/2024 18:32	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	ELT	09/25/2024 18:32	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	ELT	09/25/2024 18:32	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
 4001 Bixby Road
 Groveport, OH 43125
 Phone: 614-836-4221
 Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-4

Customer Description:

Lab Number: 242840-003

Preparation:

Date Collected: 09/17/2024 10:35 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/25/2024 18:37	EPA 200.8-1994, Rev. 5.4
Arsenic	0.46	µg/L	1	0.10	0.03		ELT	09/25/2024 18:37	EPA 200.8-1994, Rev. 5.4
Barium	120	µg/L	1	0.20	0.05		ELT	09/25/2024 18:37	EPA 200.8-1994, Rev. 5.4
Beryllium	0.4	µg/L	50	2.5	0.4	J1	ELT	09/26/2024 13:56	EPA 200.8-1994, Rev. 5.4
Boron	0.016	mg/L	1	0.050	0.007	J1	ELT	09/25/2024 18:37	EPA 200.8-1994, Rev. 5.4
Cadmium	0.022	µg/L	1	0.020	0.004		ELT	09/25/2024 18:37	EPA 200.8-1994, Rev. 5.4
Calcium	2.58	mg/L	1	0.05	0.02		ELT	09/25/2024 18:37	EPA 200.8-1994, Rev. 5.4
Chromium	0.57	µg/L	1	0.30	0.07		ELT	09/25/2024 18:37	EPA 200.8-1994, Rev. 5.4
Cobalt	3.52	µg/L	1	0.020	0.005		ELT	09/25/2024 18:37	EPA 200.8-1994, Rev. 5.4
Lead	0.07	µg/L	1	0.20	0.05	J1	ELT	09/25/2024 18:37	EPA 200.8-1994, Rev. 5.4
Lithium	0.030	mg/L	50	0.015	0.003		ELT	09/26/2024 13:56	EPA 200.8-1994, Rev. 5.4
Magnesium	0.635	mg/L	1	0.100	0.009		ELT	09/25/2024 18:37	EPA 200.8-1994, Rev. 5.4
Mercury	4	ng/L	1	5	2	J1	RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/25/2024 18:37	EPA 200.8-1994, Rev. 5.4
Potassium	2.22	mg/L	1	0.10	0.01		ELT	09/25/2024 18:37	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	ELT	09/25/2024 18:37	EPA 200.8-1994, Rev. 5.4
Sodium	6.50	mg/L	1	0.20	0.02		ELT	09/25/2024 18:37	EPA 200.8-1994, Rev. 5.4
Strontium	0.0190	mg/L	1	0.00200	0.00005		ELT	09/25/2024 18:37	EPA 200.8-1994, Rev. 5.4
Thallium	0.10	µg/L	1	0.20	0.02	J1	ELT	09/25/2024 18:37	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.68	pCi/L	0.12	0.16		ST	10/09/2024 10:42	SW-846 9315-1986, Rev. 0
Carrier Recovery	90.5	%						
Radium-228	2.78	pCi/L	0.16	0.46	B1	TTP	10/02/2024 16:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	76.9	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-4

Customer Description:

Lab Number: 242840-003-01

Preparation: Dissolved

Date Collected: 09/17/2024 10:35 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/25/2024 18:42	EPA 200.8-1994, Rev. 5.4
Arsenic	0.13	µg/L	1	0.10	0.03		ELT	09/25/2024 18:42	EPA 200.8-1994, Rev. 5.4
Barium	99.3	µg/L	1	0.20	0.05		ELT	09/25/2024 18:42	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.4	µg/L	50	2.5	0.4	U1	ELT	09/26/2024 14:01	EPA 200.8-1994, Rev. 5.4
Cadmium	0.016	µg/L	1	0.020	0.004	J1	ELT	09/25/2024 18:42	EPA 200.8-1994, Rev. 5.4
Chromium	0.41	µg/L	1	0.30	0.07		ELT	09/25/2024 18:42	EPA 200.8-1994, Rev. 5.4
Cobalt	2.63	µg/L	1	0.020	0.005		ELT	09/25/2024 18:42	EPA 200.8-1994, Rev. 5.4
Iron	1.77	mg/L	1	0.020	0.003		ELT	09/25/2024 18:42	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	ELT	09/25/2024 18:42	EPA 200.8-1994, Rev. 5.4
Lithium	0.029	mg/L	50	0.015	0.003		ELT	09/26/2024 14:01	EPA 200.8-1994, Rev. 5.4
Manganese	0.0222	mg/L	1	0.00100	0.00007		ELT	09/25/2024 18:42	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/25/2024 18:42	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	ELT	09/25/2024 18:42	EPA 200.8-1994, Rev. 5.4
Thallium	0.10	µg/L	1	0.20	0.02	J1	ELT	09/25/2024 18:42	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
 4001 Bixby Road
 Groveport, OH 43125
 Phone: 614-836-4221
 Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-7R

Customer Description:

Lab Number: 242840-004

Preparation:

Date Collected: 09/16/2024 10:05 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/25/2024 18:47	EPA 200.8-1994, Rev. 5.4
Arsenic	0.66	µg/L	1	0.10	0.03		ELT	09/25/2024 18:47	EPA 200.8-1994, Rev. 5.4
Barium	57.9	µg/L	1	0.20	0.05		ELT	09/25/2024 18:47	EPA 200.8-1994, Rev. 5.4
Beryllium	2.0	µg/L	50	2.5	0.4	J1	ELT	09/26/2024 14:06	EPA 200.8-1994, Rev. 5.4
Boron	0.241	mg/L	1	0.050	0.007		ELT	09/25/2024 18:47	EPA 200.8-1994, Rev. 5.4
Cadmium	0.336	µg/L	1	0.020	0.004		ELT	09/25/2024 18:47	EPA 200.8-1994, Rev. 5.4
Calcium	2.68	mg/L	1	0.05	0.02		ELT	09/25/2024 18:47	EPA 200.8-1994, Rev. 5.4
Chromium	0.30	µg/L	1	0.30	0.07		ELT	09/25/2024 18:47	EPA 200.8-1994, Rev. 5.4
Cobalt	16.0	µg/L	1	0.020	0.005		ELT	09/25/2024 18:47	EPA 200.8-1994, Rev. 5.4
Lead	0.08	µg/L	1	0.20	0.05	J1	ELT	09/25/2024 18:47	EPA 200.8-1994, Rev. 5.4
Lithium	0.053	mg/L	50	0.015	0.003		ELT	09/26/2024 14:06	EPA 200.8-1994, Rev. 5.4
Magnesium	4.42	mg/L	1	0.100	0.009		ELT	09/25/2024 18:47	EPA 200.8-1994, Rev. 5.4
Mercury	23	ng/L	1	5	2		RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/25/2024 18:47	EPA 200.8-1994, Rev. 5.4
Potassium	1.52	mg/L	1	0.10	0.01		ELT	09/25/2024 18:47	EPA 200.8-1994, Rev. 5.4
Selenium	0.64	µg/L	1	0.50	0.04		ELT	09/25/2024 18:47	EPA 200.8-1994, Rev. 5.4
Sodium	19.7	mg/L	1	0.20	0.02		ELT	09/25/2024 18:47	EPA 200.8-1994, Rev. 5.4
Strontium	0.0298	mg/L	1	0.00200	0.00005		ELT	09/25/2024 18:47	EPA 200.8-1994, Rev. 5.4
Thallium	0.11	µg/L	1	0.20	0.02	J1	ELT	09/25/2024 18:47	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.34	pCi/L	0.18	0.20		ST	10/09/2024 10:42	SW-846 9315-1986, Rev. 0
Carrier Recovery	87.8	%						
Radium-228	3.43	pCi/L	0.16	0.43	B1	TTP	10/02/2024 16:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	76.6	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-7R

Customer Description:

Lab Number: 242840-004-01

Preparation: Dissolved

Date Collected: 09/16/2024 10:05 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/25/2024 18:52	EPA 200.8-1994, Rev. 5.4
Arsenic	0.21	µg/L	1	0.10	0.03		ELT	09/25/2024 18:52	EPA 200.8-1994, Rev. 5.4
Barium	59.9	µg/L	1	0.20	0.05		ELT	09/25/2024 18:52	EPA 200.8-1994, Rev. 5.4
Beryllium	1.6	µg/L	50	2.5	0.4	J1	ELT	09/26/2024 14:11	EPA 200.8-1994, Rev. 5.4
Cadmium	0.312	µg/L	1	0.020	0.004		ELT	09/25/2024 18:52	EPA 200.8-1994, Rev. 5.4
Chromium	0.27	µg/L	1	0.30	0.07	J1	ELT	09/25/2024 18:52	EPA 200.8-1994, Rev. 5.4
Cobalt	16.4	µg/L	1	0.020	0.005		ELT	09/25/2024 18:52	EPA 200.8-1994, Rev. 5.4
Iron	3.31	mg/L	1	0.020	0.003		ELT	09/25/2024 18:52	EPA 200.8-1994, Rev. 5.4
Lead	0.09	µg/L	1	0.20	0.05	J1	ELT	09/25/2024 18:52	EPA 200.8-1994, Rev. 5.4
Lithium	0.053	mg/L	50	0.015	0.003		ELT	09/26/2024 14:11	EPA 200.8-1994, Rev. 5.4
Manganese	0.0483	mg/L	1	0.00100	0.00007		ELT	09/25/2024 18:52	EPA 200.8-1994, Rev. 5.4
Mercury	12	ng/L	1	5	2		RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/25/2024 18:52	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	ELT	09/25/2024 18:52	EPA 200.8-1994, Rev. 5.4
Thallium	0.10	µg/L	1	0.20	0.02	J1	ELT	09/25/2024 18:52	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-8

Customer Description:

Lab Number: 242840-005

Preparation:

Date Collected: 09/18/2024 11:07 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	1.61	mg/L	1	0.050	0.007		ELT	09/25/2024 18:57	EPA 200.8-1994, Rev. 5.4
Calcium	61.6	mg/L	1	0.05	0.02		ELT	09/25/2024 18:57	EPA 200.8-1994, Rev. 5.4
Magnesium	4.79	mg/L	1	0.100	0.009		ELT	09/25/2024 18:57	EPA 200.8-1994, Rev. 5.4
Potassium	1.34	mg/L	1	0.10	0.01		ELT	09/25/2024 18:57	EPA 200.8-1994, Rev. 5.4
Sodium	16.3	mg/L	1	0.20	0.02		ELT	09/25/2024 18:57	EPA 200.8-1994, Rev. 5.4
Strontium	0.366	mg/L	1	0.00200	0.00005		ELT	09/25/2024 18:57	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-12

Customer Description:

Lab Number: 242840-006

Preparation:

Date Collected: 09/16/2024 10:34 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.011	µg/L	1	0.100	0.008	J1	ELT	09/25/2024 20:04	EPA 200.8-1994, Rev. 5.4
Arsenic	0.09	µg/L	1	0.10	0.03	J1	ELT	09/25/2024 20:04	EPA 200.8-1994, Rev. 5.4
Barium	16.6	µg/L	1	0.20	0.05		ELT	09/25/2024 20:04	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.4	µg/L	50	2.5	0.4	U1	ELT	09/26/2024 14:16	EPA 200.8-1994, Rev. 5.4
Boron	0.018	mg/L	1	0.050	0.007	J1	ELT	09/25/2024 20:04	EPA 200.8-1994, Rev. 5.4
Cadmium	0.007	µg/L	1	0.020	0.004	J1	ELT	09/25/2024 20:04	EPA 200.8-1994, Rev. 5.4
Calcium	0.23	mg/L	1	0.05	0.02		ELT	09/25/2024 20:04	EPA 200.8-1994, Rev. 5.4
Chromium	0.43	µg/L	1	0.30	0.07		ELT	09/25/2024 20:04	EPA 200.8-1994, Rev. 5.4
Cobalt	1.06	µg/L	1	0.020	0.005		ELT	09/25/2024 20:04	EPA 200.8-1994, Rev. 5.4
Lead	0.08	µg/L	1	0.20	0.05	J1	ELT	09/25/2024 20:04	EPA 200.8-1994, Rev. 5.4
Lithium	0.006	mg/L	50	0.015	0.003	J1	ELT	09/26/2024 14:16	EPA 200.8-1994, Rev. 5.4
Magnesium	0.326	mg/L	1	0.100	0.009		ELT	09/25/2024 20:04	EPA 200.8-1994, Rev. 5.4
Mercury	2	ng/L	1	5	2	J1	RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/25/2024 20:04	EPA 200.8-1994, Rev. 5.4
Potassium	0.19	mg/L	1	0.10	0.01		ELT	09/25/2024 20:04	EPA 200.8-1994, Rev. 5.4
Selenium	0.19	µg/L	1	0.50	0.04	J1	ELT	09/25/2024 20:04	EPA 200.8-1994, Rev. 5.4
Sodium	3.66	mg/L	1	0.20	0.02		ELT	09/25/2024 20:04	EPA 200.8-1994, Rev. 5.4
Strontium	0.00189	mg/L	1	0.00200	0.00005	J1	ELT	09/25/2024 20:04	EPA 200.8-1994, Rev. 5.4
Thallium	0.02	µg/L	1	0.20	0.02	J1	ELT	09/25/2024 20:04	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.78	pCi/L	0.12	0.12		ST	10/09/2024 10:42	SW-846 9315-1986, Rev. 0
Carrier Recovery	102	%						
Radium-228	2.06	pCi/L	0.15	0.44	B1	TTP	10/02/2024 16:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	75.7	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-12

Customer Description:

Lab Number: 242840-006-01

Preparation: Dissolved

Date Collected: 09/16/2024 10:34 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.011	µg/L	1	0.100	0.008	J1	ELT	09/25/2024 20:09	EPA 200.8-1994, Rev. 5.4
Arsenic	0.05	µg/L	1	0.10	0.03	J1	ELT	09/25/2024 20:09	EPA 200.8-1994, Rev. 5.4
Barium	5.36	µg/L	1	0.20	0.05		ELT	09/25/2024 20:09	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.4	µg/L	50	2.5	0.4	U1	ELT	09/26/2024 14:21	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	ELT	09/25/2024 20:09	EPA 200.8-1994, Rev. 5.4
Chromium	0.34	µg/L	1	0.30	0.07		ELT	09/25/2024 20:09	EPA 200.8-1994, Rev. 5.4
Cobalt	0.279	µg/L	1	0.020	0.005		ELT	09/25/2024 20:09	EPA 200.8-1994, Rev. 5.4
Iron	0.018	mg/L	1	0.020	0.003	J1	ELT	09/25/2024 20:09	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	ELT	09/25/2024 20:09	EPA 200.8-1994, Rev. 5.4
Lithium	0.005	mg/L	50	0.015	0.003	J1	ELT	09/26/2024 14:21	EPA 200.8-1994, Rev. 5.4
Manganese	0.00064	mg/L	1	0.00100	0.00007	J1	ELT	09/25/2024 20:09	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/25/2024 20:09	EPA 200.8-1994, Rev. 5.4
Selenium	0.14	µg/L	1	0.50	0.04	J1	ELT	09/25/2024 20:09	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	ELT	09/25/2024 20:09	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-13

Customer Description:

Lab Number: 242840-007

Preparation:

Date Collected: 09/16/2024 09:13 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/25/2024 20:14	EPA 200.8-1994, Rev. 5.4
Arsenic	1.53	µg/L	1	0.10	0.03		ELT	09/25/2024 20:14	EPA 200.8-1994, Rev. 5.4
Barium	34.0	µg/L	1	0.20	0.05		ELT	09/25/2024 20:14	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.4	µg/L	50	2.5	0.4	U1	ELT	09/26/2024 14:26	EPA 200.8-1994, Rev. 5.4
Boron	0.052	mg/L	1	0.050	0.007		ELT	09/25/2024 20:14	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	ELT	09/25/2024 20:14	EPA 200.8-1994, Rev. 5.4
Calcium	8.21	mg/L	1	0.05	0.02		ELT	09/25/2024 20:14	EPA 200.8-1994, Rev. 5.4
Chromium	0.28	µg/L	1	0.30	0.07	J1	ELT	09/25/2024 20:14	EPA 200.8-1994, Rev. 5.4
Cobalt	35.6	µg/L	1	0.020	0.005		ELT	09/25/2024 20:14	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	ELT	09/25/2024 20:14	EPA 200.8-1994, Rev. 5.4
Lithium	0.155	mg/L	50	0.015	0.003		ELT	09/26/2024 14:26	EPA 200.8-1994, Rev. 5.4
Magnesium	9.26	mg/L	1	0.100	0.009		ELT	09/25/2024 20:14	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/25/2024 20:14	EPA 200.8-1994, Rev. 5.4
Potassium	4.36	mg/L	1	0.10	0.01		ELT	09/25/2024 20:14	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	ELT	09/25/2024 20:14	EPA 200.8-1994, Rev. 5.4
Sodium	14.5	mg/L	1	0.20	0.02		ELT	09/25/2024 20:14	EPA 200.8-1994, Rev. 5.4
Strontium	0.0794	mg/L	1	0.00200	0.00005		ELT	09/25/2024 20:14	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	ELT	09/25/2024 20:14	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.77	pCi/L	0.13	0.15		ST	10/09/2024 10:42	SW-846 9315-1986, Rev. 0
Carrier Recovery	91.1	%						
Radium-228	1.36	pCi/L	0.13	0.40	B1	TTP	10/02/2024 16:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	77.9	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-13

Customer Description:

Lab Number: 242840-007-01

Preparation: Dissolved

Date Collected: 09/16/2024 09:13 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/25/2024 20:19	EPA 200.8-1994, Rev. 5.4
Arsenic	1.41	µg/L	1	0.10	0.03		ELT	09/25/2024 20:19	EPA 200.8-1994, Rev. 5.4
Barium	35.6	µg/L	1	0.20	0.05		ELT	09/25/2024 20:19	EPA 200.8-1994, Rev. 5.4
Beryllium	0.117	µg/L	1	0.050	0.007		ELT	09/25/2024 20:19	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	ELT	09/25/2024 20:19	EPA 200.8-1994, Rev. 5.4
Chromium	0.25	µg/L	1	0.30	0.07	J1	ELT	09/25/2024 20:19	EPA 200.8-1994, Rev. 5.4
Cobalt	38.1	µg/L	1	0.020	0.005		ELT	09/25/2024 20:19	EPA 200.8-1994, Rev. 5.4
Iron	32.6	mg/L	1	0.020	0.003		ELT	09/25/2024 20:19	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	ELT	09/25/2024 20:19	EPA 200.8-1994, Rev. 5.4
Lithium	0.113	mg/L	1	0.00030	0.00006		ELT	09/25/2024 20:19	EPA 200.8-1994, Rev. 5.4
Manganese	0.319	mg/L	1	0.00100	0.00007		ELT	09/25/2024 20:19	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/25/2024 20:19	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	ELT	09/25/2024 20:19	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	ELT	09/25/2024 20:19	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-16

Customer Description:

Lab Number: 242840-008

Preparation:

Date Collected: 09/17/2024 12:19 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.015	mg/L	1	0.050	0.007	J1	ELT	09/25/2024 20:24	EPA 200.8-1994, Rev. 5.4
Calcium	0.95	mg/L	1	0.05	0.02		ELT	09/25/2024 20:24	EPA 200.8-1994, Rev. 5.4
Magnesium	1.88	mg/L	1	0.100	0.009		ELT	09/25/2024 20:24	EPA 200.8-1994, Rev. 5.4
Potassium	1.07	mg/L	1	0.10	0.01		ELT	09/25/2024 20:24	EPA 200.8-1994, Rev. 5.4
Sodium	17.9	mg/L	1	0.20	0.02		ELT	09/25/2024 20:24	EPA 200.8-1994, Rev. 5.4
Strontium	0.0121	mg/L	1	0.00200	0.00005		ELT	09/25/2024 20:24	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
 4001 Bixby Road
 Groveport, OH 43125
 Phone: 614-836-4221
 Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-17

Customer Description:

Lab Number: 242840-009

Preparation:

Date Collected: 09/17/2024 10:55 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4
Arsenic	0.22	µg/L	1	0.10	0.03		ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4
Barium	158	µg/L	1	0.20	0.05		ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4
Beryllium	0.501	µg/L	1	0.050	0.007		ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4
Boron	0.029	mg/L	1	0.050	0.007	J1	ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4
Cadmium	0.038	µg/L	1	0.020	0.004		ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4
Calcium	0.41	mg/L	1	0.05	0.02		ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4
Chromium	0.35	µg/L	1	0.30	0.07		ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4
Cobalt	7.63	µg/L	1	0.020	0.005		ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4
Lead	0.11	µg/L	1	0.20	0.05	J1	ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4
Lithium	0.0167	mg/L	1	0.00030	0.00006		ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4
Magnesium	2.65	mg/L	1	0.100	0.009		ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4
Mercury	135	ng/L	4	20	8		RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4
Potassium	0.56	mg/L	1	0.10	0.01		ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4
Selenium	0.20	µg/L	1	0.50	0.04	J1	ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4
Sodium	7.43	mg/L	1	0.20	0.02		ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4
Strontium	0.0102	mg/L	1	0.00200	0.00005		ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	ELT	09/25/2024 20:29	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.10	pCi/L	0.15	0.13		ST	10/09/2024 10:42	SW-846 9315-1986, Rev. 0
Carrier Recovery	99.3	%						
Radium-228	2.26	pCi/L	0.14	0.41	B1	TTP	10/02/2024 16:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	85.2	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-17

Customer Description:

Lab Number: 242840-009-01

Preparation: Dissolved

Date Collected: 09/17/2024 10:55 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/25/2024 20:35	EPA 200.8-1994, Rev. 5.4
Arsenic	0.04	µg/L	1	0.10	0.03	J1	ELT	09/25/2024 20:35	EPA 200.8-1994, Rev. 5.4
Barium	133	µg/L	1	0.20	0.05		ELT	09/25/2024 20:35	EPA 200.8-1994, Rev. 5.4
Beryllium	0.296	µg/L	1	0.050	0.007		ELT	09/25/2024 20:35	EPA 200.8-1994, Rev. 5.4
Cadmium	0.028	µg/L	1	0.020	0.004		ELT	09/25/2024 20:35	EPA 200.8-1994, Rev. 5.4
Chromium	0.44	µg/L	1	0.30	0.07		ELT	09/25/2024 20:35	EPA 200.8-1994, Rev. 5.4
Cobalt	6.22	µg/L	1	0.020	0.005		ELT	09/25/2024 20:35	EPA 200.8-1994, Rev. 5.4
Iron	0.008	mg/L	1	0.020	0.003	J1	ELT	09/25/2024 20:35	EPA 200.8-1994, Rev. 5.4
Lead	0.07	µg/L	1	0.20	0.05	J1	ELT	09/25/2024 20:35	EPA 200.8-1994, Rev. 5.4
Lithium	0.0160	mg/L	1	0.00030	0.00006		ELT	09/25/2024 20:35	EPA 200.8-1994, Rev. 5.4
Manganese	0.0147	mg/L	1	0.00100	0.00007		ELT	09/25/2024 20:35	EPA 200.8-1994, Rev. 5.4
Mercury	63	ng/L	1	5	2		RPL	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/25/2024 20:35	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	ELT	09/25/2024 20:35	EPA 200.8-1994, Rev. 5.4
Thallium	0.02	µg/L	1	0.20	0.02	J1	ELT	09/25/2024 20:35	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-18

Customer Description:

Lab Number: 242840-010

Preparation:

Date Collected: 09/18/2024 08:44 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.016	µg/L	1	0.100	0.008	J1	ELT	09/25/2024 20:40	EPA 200.8-1994, Rev. 5.4
Arsenic	1.58	µg/L	1	0.10	0.03		ELT	09/25/2024 20:40	EPA 200.8-1994, Rev. 5.4
Barium	78.2	µg/L	1	0.20	0.05		ELT	09/25/2024 20:40	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.4	µg/L	50	2.5	0.4	U1	ELT	09/26/2024 14:32	EPA 200.8-1994, Rev. 5.4
Boron	0.010	mg/L	1	0.050	0.007	J1	ELT	09/25/2024 20:40	EPA 200.8-1994, Rev. 5.4
Cadmium	0.013	µg/L	1	0.020	0.004	J1	ELT	09/25/2024 20:40	EPA 200.8-1994, Rev. 5.4
Calcium	0.32	mg/L	1	0.05	0.02		ELT	09/25/2024 20:40	EPA 200.8-1994, Rev. 5.4
Chromium	1.02	µg/L	1	0.30	0.07		ELT	09/25/2024 20:40	EPA 200.8-1994, Rev. 5.4
Cobalt	1.28	µg/L	1	0.020	0.005		ELT	09/25/2024 20:40	EPA 200.8-1994, Rev. 5.4
Lead	0.37	µg/L	1	0.20	0.05		ELT	09/25/2024 20:40	EPA 200.8-1994, Rev. 5.4
Lithium	0.021	mg/L	50	0.015	0.003		ELT	09/26/2024 14:32	EPA 200.8-1994, Rev. 5.4
Magnesium	0.401	mg/L	1	0.100	0.009		ELT	09/25/2024 20:40	EPA 200.8-1994, Rev. 5.4
Mercury	13	ng/L	1	5	2		RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/25/2024 20:40	EPA 200.8-1994, Rev. 5.4
Potassium	0.93	mg/L	1	0.10	0.01		ELT	09/25/2024 20:40	EPA 200.8-1994, Rev. 5.4
Selenium	0.19	µg/L	1	0.50	0.04	J1	ELT	09/25/2024 20:40	EPA 200.8-1994, Rev. 5.4
Sodium	5.74	mg/L	1	0.20	0.02		ELT	09/25/2024 20:40	EPA 200.8-1994, Rev. 5.4
Strontium	0.00557	mg/L	1	0.00200	0.00005		ELT	09/25/2024 20:40	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.02	J1	ELT	09/25/2024 20:40	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.54	pCi/L	0.10	0.17		ST	10/09/2024 10:42	SW-846 9315-1986, Rev. 0
Carrier Recovery	110	%						
Radium-228	1.46	pCi/L	0.15	0.47	B1	TTP	10/02/2024 16:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	77.4	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-18

Customer Description:

Lab Number: 242840-010-01

Preparation: Dissolved

Date Collected: 09/18/2024 08:44 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.008	µg/L	1	0.100	0.008	J1	ELT	09/25/2024 20:55	EPA 200.8-1994, Rev. 5.4
Arsenic	0.08	µg/L	1	0.10	0.03	J1	ELT	09/25/2024 20:55	EPA 200.8-1994, Rev. 5.4
Barium	20.4	µg/L	1	0.20	0.05		ELT	09/25/2024 20:55	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.4	µg/L	50	2.5	0.4	U1	ELT	09/26/2024 12:49	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	ELT	09/25/2024 20:55	EPA 200.8-1994, Rev. 5.4
Chromium	0.28	µg/L	1	0.30	0.07	J1	ELT	09/25/2024 20:55	EPA 200.8-1994, Rev. 5.4
Cobalt	0.281	µg/L	1	0.020	0.005		ELT	09/25/2024 20:55	EPA 200.8-1994, Rev. 5.4
Iron	0.043	mg/L	1	0.020	0.003		ELT	09/25/2024 20:55	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	ELT	09/25/2024 20:55	EPA 200.8-1994, Rev. 5.4
Lithium	<0.003	mg/L	50	0.015	0.003	U1	ELT	09/26/2024 12:49	EPA 200.8-1994, Rev. 5.4
Manganese	0.00124	mg/L	1	0.00100	0.00007		ELT	09/25/2024 20:55	EPA 200.8-1994, Rev. 5.4
Mercury	2	ng/L	1	5	2	J1	RPL	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/25/2024 20:55	EPA 200.8-1994, Rev. 5.4
Selenium	0.04	µg/L	1	0.50	0.04	J1	ELT	09/25/2024 20:55	EPA 200.8-1994, Rev. 5.4
Thallium	0.07	µg/L	1	0.20	0.02	J1	ELT	09/25/2024 20:55	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-22

Customer Description:

Lab Number: 242840-011

Preparation:

Date Collected: 09/16/2024 10:59 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4
Arsenic	1.11	µg/L	1	0.10	0.03		ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4
Barium	17.0	µg/L	1	0.20	0.05		ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4
Beryllium	2.56	µg/L	1	0.050	0.007		ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4
Boron	0.028	mg/L	1	0.050	0.007	J1	ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4
Cadmium	0.531	µg/L	1	0.020	0.004		ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4
Calcium	12.3	mg/L	1	0.05	0.02	M1	ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4
Chromium	0.40	µg/L	1	0.30	0.07		ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4
Cobalt	74.3	µg/L	1	0.020	0.005	M1	ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4
Lead	0.08	µg/L	1	0.20	0.05	J1	ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4
Lithium	0.125	mg/L	1	0.00030	0.00006	M1	ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4
Magnesium	16.7	mg/L	1	0.100	0.009	M1	ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4
Mercury	93	ng/L	4	20	8		RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4
Potassium	3.68	mg/L	1	0.10	0.01		ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4
Selenium	2.37	µg/L	1	0.50	0.04		ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4
Sodium	97.4	mg/L	1	0.20	0.02	M1	ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4
Strontium	0.0950	mg/L	1	0.00200	0.00005		ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4
Thallium	0.16	µg/L	1	0.20	0.02	J1	ELT	09/26/2024 16:20	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.57	pCi/L	0.11	0.12		ST	10/09/2024 10:42	SW-846 9315-1986, Rev. 0
Carrier Recovery	87.2	%						
Radium-228	2.19	pCi/L	0.17	0.52	B1	TTP	10/02/2024 16:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	65.3	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-22

Customer Description:

Lab Number: 242840-011-01

Preparation: Dissolved

Date Collected: 09/16/2024 10:59 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	ELT	09/26/2024 16:35	EPA 200.8-1994, Rev. 5.4
Arsenic	1.16	µg/L	1	0.10	0.03		ELT	09/26/2024 16:35	EPA 200.8-1994, Rev. 5.4
Barium	16.8	µg/L	1	0.20	0.05		ELT	09/26/2024 16:35	EPA 200.8-1994, Rev. 5.4
Beryllium	2.36	µg/L	1	0.050	0.007		ELT	09/26/2024 16:35	EPA 200.8-1994, Rev. 5.4
Cadmium	0.528	µg/L	1	0.020	0.004		ELT	09/26/2024 16:35	EPA 200.8-1994, Rev. 5.4
Chromium	0.39	µg/L	1	0.30	0.07		ELT	09/26/2024 16:35	EPA 200.8-1994, Rev. 5.4
Cobalt	75.7	µg/L	1	0.020	0.005		ELT	09/26/2024 16:35	EPA 200.8-1994, Rev. 5.4
Iron	42.5	mg/L	50	1.0	0.2		ELT	10/01/2024 23:10	EPA 200.8-1994, Rev. 5.4
Lead	0.10	µg/L	1	0.20	0.05	J1	ELT	09/26/2024 16:35	EPA 200.8-1994, Rev. 5.4
Lithium	0.124	mg/L	1	0.00030	0.00006		ELT	09/26/2024 16:35	EPA 200.8-1994, Rev. 5.4
Manganese	0.361	mg/L	1	0.00100	0.00007		ELT	09/26/2024 16:35	EPA 200.8-1994, Rev. 5.4
Mercury	58	ng/L	1	5	2		RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/26/2024 16:35	EPA 200.8-1994, Rev. 5.4
Selenium	2.24	µg/L	1	0.50	0.04		ELT	09/26/2024 16:35	EPA 200.8-1994, Rev. 5.4
Thallium	0.16	µg/L	1	0.20	0.02	J1	ELT	09/26/2024 16:35	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-23

Customer Description:

Lab Number: 242840-012

Preparation:

Date Collected: 09/18/2024 10:48 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.229	mg/L	1	0.050	0.007		ELT	09/26/2024 16:40	EPA 200.8-1994, Rev. 5.4
Calcium	0.20	mg/L	1	0.05	0.02		ELT	09/26/2024 16:40	EPA 200.8-1994, Rev. 5.4
Magnesium	0.195	mg/L	1	0.100	0.009		ELT	09/26/2024 16:40	EPA 200.8-1994, Rev. 5.4
Potassium	3.06	mg/L	1	0.10	0.01		ELT	09/26/2024 16:40	EPA 200.8-1994, Rev. 5.4
Sodium	3.76	mg/L	1	0.20	0.02		ELT	09/26/2024 16:40	EPA 200.8-1994, Rev. 5.4
Strontium	0.00221	mg/L	1	0.00200	0.00005		ELT	09/26/2024 16:40	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-27

Customer Description:

Lab Number: 242840-013

Preparation:

Date Collected: 09/18/2024 11:58 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.052	mg/L	1	0.050	0.007		ELT	09/26/2024 16:45	EPA 200.8-1994, Rev. 5.4
Calcium	3.80	mg/L	1	0.05	0.02		ELT	09/26/2024 16:45	EPA 200.8-1994, Rev. 5.4
Magnesium	5.04	mg/L	1	0.100	0.009		ELT	09/26/2024 16:45	EPA 200.8-1994, Rev. 5.4
Potassium	2.13	mg/L	1	0.10	0.01		ELT	09/26/2024 16:45	EPA 200.8-1994, Rev. 5.4
Sodium	9.63	mg/L	1	0.20	0.02		ELT	09/26/2024 16:45	EPA 200.8-1994, Rev. 5.4
Strontium	0.0580	mg/L	1	0.00200	0.00005		ELT	09/26/2024 16:45	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-28

Customer Description:

Lab Number: 242840-014

Preparation:

Date Collected: 09/17/2024 10:06 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.011	µg/L	1	0.100	0.008	J1	ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4
Arsenic	0.15	µg/L	1	0.10	0.03		ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4
Barium	124	µg/L	1	0.20	0.05		ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4
Beryllium	0.617	µg/L	1	0.050	0.007		ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4
Boron	0.375	mg/L	1	0.050	0.007		ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4
Cadmium	0.057	µg/L	1	0.020	0.004		ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4
Calcium	1.39	mg/L	1	0.05	0.02		ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4
Chromium	0.38	µg/L	1	0.30	0.07		ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4
Cobalt	13.8	µg/L	1	0.020	0.005		ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4
Lead	0.10	µg/L	1	0.20	0.05	J1	ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4
Lithium	0.0267	mg/L	1	0.00030	0.00006		ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4
Magnesium	3.01	mg/L	1	0.100	0.009		ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4
Mercury	16	ng/L	1	5	2		RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4
Potassium	0.82	mg/L	1	0.10	0.01		ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4
Selenium	0.22	µg/L	1	0.50	0.04	J1	ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4
Sodium	7.09	mg/L	1	0.20	0.02		ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4
Strontium	0.0204	mg/L	1	0.00200	0.00005		ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	ELT	09/26/2024 16:50	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.32	pCi/L	0.18	0.18		ST	10/04/2024 08:52	SW-846 9315-1986, Rev. 0
Carrier Recovery	92.9	%						
Radium-228	1.68	pCi/L	0.15	0.47	B1	TTP	10/02/2024 16:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	79.6	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-28

Customer Description:

Lab Number: 242840-014-01

Preparation: Dissolved

Date Collected: 09/17/2024 10:06 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.009	µg/L	1	0.100	0.008	J1	ELT	09/26/2024 16:55	EPA 200.8-1994, Rev. 5.4
Arsenic	0.03	µg/L	1	0.10	0.03	J1	ELT	09/26/2024 16:55	EPA 200.8-1994, Rev. 5.4
Barium	108	µg/L	1	0.20	0.05		ELT	09/26/2024 16:55	EPA 200.8-1994, Rev. 5.4
Beryllium	0.361	µg/L	1	0.050	0.007		ELT	09/26/2024 16:55	EPA 200.8-1994, Rev. 5.4
Cadmium	0.045	µg/L	1	0.020	0.004		ELT	09/26/2024 16:55	EPA 200.8-1994, Rev. 5.4
Chromium	0.36	µg/L	1	0.30	0.07		ELT	09/26/2024 16:55	EPA 200.8-1994, Rev. 5.4
Cobalt	11.5	µg/L	1	0.020	0.005		ELT	09/26/2024 16:55	EPA 200.8-1994, Rev. 5.4
Iron	0.039	mg/L	1	0.020	0.003		ELT	09/26/2024 16:55	EPA 200.8-1994, Rev. 5.4
Lead	0.08	µg/L	1	0.20	0.05	J1	ELT	09/26/2024 16:55	EPA 200.8-1994, Rev. 5.4
Lithium	0.0257	mg/L	1	0.00030	0.00006		ELT	09/26/2024 16:55	EPA 200.8-1994, Rev. 5.4
Manganese	0.0440	mg/L	1	0.00100	0.00007		ELT	09/26/2024 16:55	EPA 200.8-1994, Rev. 5.4
Mercury	8	ng/L	1	5	2		RPL	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/26/2024 16:55	EPA 200.8-1994, Rev. 5.4
Selenium	0.05	µg/L	1	0.50	0.04	J1	ELT	09/26/2024 16:55	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	ELT	09/26/2024 16:55	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-30

Customer Description:

Lab Number: 242840-015

Preparation:

Date Collected: 09/17/2024 10:25 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4
Arsenic	0.14	µg/L	1	0.10	0.03		ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4
Barium	57.8	µg/L	1	0.20	0.05		ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4
Beryllium	0.078	µg/L	1	0.050	0.007		ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4
Boron	1.35	mg/L	1	0.050	0.007		ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4
Cadmium	0.009	µg/L	1	0.020	0.004	J1	ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4
Calcium	0.49	mg/L	1	0.05	0.02		ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4
Chromium	0.50	µg/L	1	0.30	0.07		ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4
Cobalt	3.26	µg/L	1	0.020	0.005		ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4
Lead	0.08	µg/L	1	0.20	0.05	J1	ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4
Lithium	0.0103	mg/L	1	0.00030	0.00006		ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4
Magnesium	1.64	mg/L	1	0.100	0.009		ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4
Mercury	19	ng/L	1	5	2		RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4
Potassium	0.77	mg/L	1	0.10	0.01		ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4
Selenium	0.22	µg/L	1	0.50	0.04	J1	ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4
Sodium	59.7	mg/L	1	0.20	0.02		ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4
Strontium	0.00725	mg/L	1	0.00200	0.00005		ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4
Thallium	0.03	µg/L	1	0.20	0.02	J1	ELT	09/26/2024 17:00	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.51	pCi/L	0.12	0.23		ST	10/04/2024 08:52	SW-846 9315-1986, Rev. 0
Carrier Recovery	88.5	%						
Radium-228	0.60	pCi/L	0.15	0.50	B1	TTP	10/02/2024 16:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	76.7	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-30

Customer Description:

Lab Number: 242840-015-01

Preparation: Dissolved

Date Collected: 09/17/2024 09:25 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/26/2024 17:06	EPA 200.8-1994, Rev. 5.4
Arsenic	0.08	µg/L	1	0.10	0.03	J1	ELT	09/26/2024 17:06	EPA 200.8-1994, Rev. 5.4
Barium	39.6	µg/L	1	0.20	0.05		ELT	09/26/2024 17:06	EPA 200.8-1994, Rev. 5.4
Beryllium	0.038	µg/L	1	0.050	0.007	J1	ELT	09/26/2024 17:06	EPA 200.8-1994, Rev. 5.4
Cadmium	0.018	µg/L	1	0.020	0.004	J1	ELT	09/26/2024 17:06	EPA 200.8-1994, Rev. 5.4
Chromium	0.50	µg/L	1	0.30	0.07		ELT	09/26/2024 17:06	EPA 200.8-1994, Rev. 5.4
Cobalt	2.40	µg/L	1	0.020	0.005		ELT	09/26/2024 17:06	EPA 200.8-1994, Rev. 5.4
Iron	0.007	mg/L	1	0.020	0.003	J1	ELT	09/26/2024 17:06	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	ELT	09/26/2024 17:06	EPA 200.8-1994, Rev. 5.4
Lithium	0.0104	mg/L	1	0.00030	0.00006		ELT	09/26/2024 17:06	EPA 200.8-1994, Rev. 5.4
Manganese	0.00991	mg/L	1	0.00100	0.00007		ELT	09/26/2024 17:06	EPA 200.8-1994, Rev. 5.4
Mercury	10	ng/L	1	5	2		RPL	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/26/2024 17:06	EPA 200.8-1994, Rev. 5.4
Selenium	0.16	µg/L	1	0.50	0.04	J1	ELT	09/26/2024 17:06	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	ELT	09/26/2024 17:06	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-31

Customer Description:

Lab Number: 242840-016

Preparation:

Date Collected: 09/16/2024 12:36 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.010	µg/L	1	0.100	0.008	J1	ELT	09/26/2024 17:11	EPA 200.8-1994, Rev. 5.4
Arsenic	0.61	µg/L	1	0.10	0.03		ELT	09/26/2024 17:11	EPA 200.8-1994, Rev. 5.4
Barium	36.2	µg/L	1	0.20	0.05		ELT	09/26/2024 17:11	EPA 200.8-1994, Rev. 5.4
Beryllium	1.00	µg/L	10	0.50	0.07		ELT	10/04/2024 21:00	EPA 200.8-1994, Rev. 5.4
Boron	0.026	mg/L	1	0.050	0.007	J1	ELT	09/26/2024 17:11	EPA 200.8-1994, Rev. 5.4
Cadmium	0.065	µg/L	1	0.020	0.004		ELT	09/26/2024 17:11	EPA 200.8-1994, Rev. 5.4
Calcium	2.38	mg/L	1	0.05	0.02		ELT	09/26/2024 17:11	EPA 200.8-1994, Rev. 5.4
Chromium	1.18	µg/L	1	0.30	0.07		ELT	09/26/2024 17:11	EPA 200.8-1994, Rev. 5.4
Cobalt	9.20	µg/L	1	0.020	0.005		ELT	09/26/2024 17:11	EPA 200.8-1994, Rev. 5.4
Lead	0.54	µg/L	1	0.20	0.05		ELT	09/26/2024 17:11	EPA 200.8-1994, Rev. 5.4
Lithium	0.0857	mg/L	10	0.0030	0.0006		ELT	10/04/2024 21:00	EPA 200.8-1994, Rev. 5.4
Magnesium	3.43	mg/L	1	0.100	0.009		ELT	09/26/2024 17:11	EPA 200.8-1994, Rev. 5.4
Mercury	740	ng/L	10	50	20		RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/26/2024 17:11	EPA 200.8-1994, Rev. 5.4
Potassium	1.67	mg/L	1	0.10	0.01		ELT	09/26/2024 17:11	EPA 200.8-1994, Rev. 5.4
Selenium	0.37	µg/L	1	0.50	0.04	J1	ELT	09/26/2024 17:11	EPA 200.8-1994, Rev. 5.4
Sodium	28.6	mg/L	1	0.20	0.02		ELT	09/26/2024 17:11	EPA 200.8-1994, Rev. 5.4
Strontium	0.0344	mg/L	1	0.00200	0.00005		ELT	09/26/2024 17:11	EPA 200.8-1994, Rev. 5.4
Thallium	0.10	µg/L	1	0.20	0.02	J1	ELT	09/26/2024 17:11	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.81	pCi/L	0.13	0.14		ST	10/04/2024 08:52	SW-846 9315-1986, Rev. 0
Carrier Recovery	105	%						
Radium-228	3.14	pCi/L	0.19	0.52	B1, L1, O2	TTP	10/16/2024 16:22	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	87.5	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-31

Customer Description:

Lab Number: 242840-016-01

Preparation: Dissolved

Date Collected: 09/16/2024 12:36 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/26/2024 17:16	EPA 200.8-1994, Rev. 5.4
Arsenic	0.14	µg/L	1	0.10	0.03		ELT	09/26/2024 17:16	EPA 200.8-1994, Rev. 5.4
Barium	30.2	µg/L	1	0.20	0.05		ELT	09/26/2024 17:16	EPA 200.8-1994, Rev. 5.4
Beryllium	0.556	µg/L	1	0.050	0.007		ELT	09/26/2024 17:16	EPA 200.8-1994, Rev. 5.4
Cadmium	0.054	µg/L	1	0.020	0.004		ELT	09/26/2024 17:16	EPA 200.8-1994, Rev. 5.4
Chromium	0.30	µg/L	1	0.30	0.07		ELT	09/26/2024 17:16	EPA 200.8-1994, Rev. 5.4
Cobalt	8.17	µg/L	1	0.020	0.005		ELT	09/26/2024 17:16	EPA 200.8-1994, Rev. 5.4
Iron	0.207	mg/L	1	0.020	0.003		ELT	09/26/2024 17:16	EPA 200.8-1994, Rev. 5.4
Lead	0.24	µg/L	1	0.20	0.05		ELT	09/26/2024 17:16	EPA 200.8-1994, Rev. 5.4
Lithium	0.0700	mg/L	1	0.00030	0.00006		ELT	09/26/2024 17:16	EPA 200.8-1994, Rev. 5.4
Manganese	0.0221	mg/L	1	0.00100	0.00007		ELT	09/26/2024 17:16	EPA 200.8-1994, Rev. 5.4
Mercury	53	ng/L	1	5	2		RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/26/2024 17:16	EPA 200.8-1994, Rev. 5.4
Selenium	0.08	µg/L	1	0.50	0.04	J1	ELT	09/26/2024 17:16	EPA 200.8-1994, Rev. 5.4
Thallium	0.08	µg/L	1	0.20	0.02	J1	ELT	09/26/2024 17:16	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-32

Customer Description:

Lab Number: 242840-017

Preparation:

Date Collected: 09/16/2024 11:32 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.015	µg/L	1	0.100	0.008	J1	ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4
Arsenic	6.08	µg/L	1	0.10	0.03		ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4
Barium	35.5	µg/L	1	0.20	0.05		ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4
Beryllium	0.191	µg/L	1	0.050	0.007		ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4
Boron	0.175	mg/L	1	0.050	0.007		ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4
Cadmium	0.013	µg/L	1	0.020	0.004	J1	ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4
Calcium	6.10	mg/L	1	0.05	0.02		ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4
Chromium	0.40	µg/L	1	0.30	0.07		ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4
Cobalt	14.3	µg/L	1	0.020	0.005		ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4
Lead	0.08	µg/L	1	0.20	0.05	J1	ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4
Lithium	0.0693	mg/L	1	0.00030	0.00006		ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4
Magnesium	6.86	mg/L	1	0.100	0.009		ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4
Mercury	380	ng/L	20	100	40		RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4
Potassium	3.05	mg/L	1	0.10	0.01		ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4
Selenium	0.28	µg/L	1	0.50	0.04	J1	ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4
Sodium	17.9	mg/L	1	0.20	0.02		ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4
Strontium	0.0811	mg/L	1	0.00200	0.00005		ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4
Thallium	0.06	µg/L	1	0.20	0.02	J1	ELT	09/26/2024 18:12	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.02	pCi/L	0.17	0.20		ST	10/04/2024 08:52	SW-846 9315-1986, Rev. 0
Carrier Recovery	78.7	%						
Radium-228	0.16	pCi/L	0.14	0.48	B1	TTP	10/02/2024 16:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	77.8	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-32

Customer Description:

Lab Number: 242840-017-01

Preparation: Dissolved

Date Collected: 09/16/2024 11:32 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/26/2024 18:28	EPA 200.8-1994, Rev. 5.4
Arsenic	2.48	µg/L	1	0.10	0.03		ELT	09/26/2024 18:28	EPA 200.8-1994, Rev. 5.4
Barium	33.6	µg/L	1	0.20	0.05		ELT	09/26/2024 18:28	EPA 200.8-1994, Rev. 5.4
Beryllium	0.153	µg/L	1	0.050	0.007		ELT	09/26/2024 18:28	EPA 200.8-1994, Rev. 5.4
Cadmium	0.013	µg/L	1	0.020	0.004	J1	ELT	09/26/2024 18:28	EPA 200.8-1994, Rev. 5.4
Chromium	0.23	µg/L	1	0.30	0.07	J1	ELT	09/26/2024 18:28	EPA 200.8-1994, Rev. 5.4
Cobalt	13.2	µg/L	1	0.020	0.005		ELT	09/26/2024 18:28	EPA 200.8-1994, Rev. 5.4
Iron	13.5	mg/L	1	0.020	0.003		ELT	09/26/2024 18:28	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	ELT	09/26/2024 18:28	EPA 200.8-1994, Rev. 5.4
Lithium	0.0697	mg/L	1	0.00030	0.00006		ELT	09/26/2024 18:28	EPA 200.8-1994, Rev. 5.4
Manganese	0.108	mg/L	1	0.00100	0.00007		ELT	09/26/2024 18:28	EPA 200.8-1994, Rev. 5.4
Mercury	4	ng/L	1	5	2	J1	RPL	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/26/2024 18:28	EPA 200.8-1994, Rev. 5.4
Selenium	0.05	µg/L	1	0.50	0.04	J1	ELT	09/26/2024 18:28	EPA 200.8-1994, Rev. 5.4
Thallium	0.09	µg/L	1	0.20	0.02	J1	ELT	09/26/2024 18:28	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-33

Customer Description:

Lab Number: 242840-018

Preparation:

Date Collected: 09/16/2024 12:25 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4
Arsenic	0.54	µg/L	1	0.10	0.03		ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4
Barium	43.2	µg/L	1	0.20	0.05		ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4
Beryllium	1.30	µg/L	1	0.050	0.007		ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4
Boron	0.122	mg/L	1	0.050	0.007		ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4
Cadmium	0.049	µg/L	1	0.020	0.004		ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4
Calcium	1.54	mg/L	1	0.05	0.02		ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4
Chromium	0.39	µg/L	1	0.30	0.07		ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4
Cobalt	9.82	µg/L	1	0.020	0.005		ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4
Lead	0.28	µg/L	1	0.20	0.05		ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4
Lithium	0.0224	mg/L	1	0.00030	0.00006		ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4
Magnesium	3.75	mg/L	1	0.100	0.009		ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4
Mercury	6500	ng/L	100	500	200		RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4
Potassium	0.28	mg/L	1	0.10	0.01		ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4
Selenium	1.73	µg/L	1	0.50	0.04		ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4
Sodium	16.5	mg/L	1	0.20	0.02		ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4
Strontium	0.0288	mg/L	1	0.00200	0.00005		ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4
Thallium	0.06	µg/L	1	0.20	0.02	J1	ELT	09/26/2024 18:33	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.82	pCi/L	0.16	0.25		ST	10/04/2024 08:52	SW-846 9315-1986, Rev. 0
Carrier Recovery	81.2	%						
Radium-228	1.52	pCi/L	0.18	0.58	B1	TTP	10/02/2024 16:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	77.6	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-33

Customer Description:

Lab Number: 242840-018-01

Preparation: Dissolved

Date Collected: 09/16/2024 12:25 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.013	µg/L	1	0.100	0.008	J1	ELT	09/26/2024 18:38	EPA 200.8-1994, Rev. 5.4
Arsenic	0.26	µg/L	1	0.10	0.03		ELT	09/26/2024 18:38	EPA 200.8-1994, Rev. 5.4
Barium	47.3	µg/L	1	0.20	0.05		ELT	09/26/2024 18:38	EPA 200.8-1994, Rev. 5.4
Beryllium	1.19	µg/L	1	0.050	0.007		ELT	09/26/2024 18:38	EPA 200.8-1994, Rev. 5.4
Cadmium	0.055	µg/L	1	0.020	0.004		ELT	09/26/2024 18:38	EPA 200.8-1994, Rev. 5.4
Chromium	0.36	µg/L	1	0.30	0.07		ELT	09/26/2024 18:38	EPA 200.8-1994, Rev. 5.4
Cobalt	10.4	µg/L	1	0.020	0.005		ELT	09/26/2024 18:38	EPA 200.8-1994, Rev. 5.4
Iron	0.022	mg/L	1	0.020	0.003		ELT	09/26/2024 18:38	EPA 200.8-1994, Rev. 5.4
Lead	0.31	µg/L	1	0.20	0.05		ELT	09/26/2024 18:38	EPA 200.8-1994, Rev. 5.4
Lithium	0.0226	mg/L	1	0.00030	0.00006		ELT	09/26/2024 18:38	EPA 200.8-1994, Rev. 5.4
Manganese	0.00636	mg/L	1	0.00100	0.00007		ELT	09/26/2024 18:38	EPA 200.8-1994, Rev. 5.4
Mercury	760	ng/L	20	100	40		RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/26/2024 18:38	EPA 200.8-1994, Rev. 5.4
Selenium	0.81	µg/L	1	0.50	0.04		ELT	09/26/2024 18:38	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.02	J1	ELT	09/26/2024 18:38	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: AD-34

Customer Description:

Lab Number: 242840-019

Preparation:

Date Collected: 09/18/2024 10:15 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	<0.07	mg/L	10	0.50	0.07	U1	ELT	10/02/2024 00:32	EPA 200.8-1994, Rev. 5.4
Calcium	43.0	mg/L	10	0.5	0.2		ELT	10/02/2024 00:32	EPA 200.8-1994, Rev. 5.4
Magnesium	39.9	mg/L	10	1.00	0.09		ELT	10/02/2024 00:32	EPA 200.8-1994, Rev. 5.4
Potassium	7.9	mg/L	10	1.0	0.1		ELT	10/02/2024 00:32	EPA 200.8-1994, Rev. 5.4
Sodium	16.1	mg/L	10	2.0	0.2		ELT	10/02/2024 00:32	EPA 200.8-1994, Rev. 5.4
Strontium	0.441	mg/L	10	0.0200	0.0005		ELT	10/02/2024 00:32	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: AD-36

Customer Description:

Lab Number: 242840-020

Preparation:

Date Collected: 09/18/2024 10:10 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.082	mg/L	1	0.050	0.007		ELT	09/26/2024 18:48	EPA 200.8-1994, Rev. 5.4
Calcium	0.77	mg/L	1	0.05	0.02		ELT	09/26/2024 18:48	EPA 200.8-1994, Rev. 5.4
Magnesium	2.33	mg/L	1	0.100	0.009		ELT	09/26/2024 18:48	EPA 200.8-1994, Rev. 5.4
Potassium	1.87	mg/L	1	0.10	0.01		ELT	09/26/2024 18:48	EPA 200.8-1994, Rev. 5.4
Sodium	6.68	mg/L	1	0.20	0.02		ELT	09/26/2024 18:48	EPA 200.8-1994, Rev. 5.4
Strontium	0.0114	mg/L	1	0.00200	0.00005		ELT	09/26/2024 18:48	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: Duplicate 1

Customer Description:

Lab Number: 242840-021

Preparation:

Date Collected: 09/16/2024 12:00 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4
Arsenic	1.17	µg/L	1	0.10	0.03		ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4
Barium	17.3	µg/L	1	0.20	0.05		ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4
Beryllium	2.48	µg/L	1	0.050	0.007		ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4
Boron	0.028	mg/L	1	0.050	0.007	J1	ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4
Cadmium	0.552	µg/L	1	0.020	0.004		ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4
Calcium	12.5	mg/L	1	0.05	0.02		ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4
Chromium	0.32	µg/L	1	0.30	0.07		ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4
Cobalt	76.5	µg/L	1	0.020	0.005		ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4
Lead	0.11	µg/L	1	0.20	0.05	J1	ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4
Lithium	0.117	mg/L	1	0.00030	0.00006		ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4
Magnesium	17.0	mg/L	1	0.100	0.009		ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4
Mercury	84	ng/L	1	5	2		RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4
Potassium	3.78	mg/L	1	0.10	0.01		ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4
Selenium	2.63	µg/L	1	0.50	0.04		ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4
Sodium	101	mg/L	1	0.20	0.02		ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4
Strontium	0.0950	mg/L	1	0.00200	0.00005		ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4
Thallium	0.16	µg/L	1	0.20	0.02	J1	ELT	09/26/2024 18:53	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: Duplicate 1

Customer Description:

Lab Number: 242840-021-01

Preparation: Dissolved

Date Collected: 09/16/2024 12:00 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/26/2024 18:58	EPA 200.8-1994, Rev. 5.4
Arsenic	1.25	µg/L	1	0.10	0.03		ELT	09/26/2024 18:58	EPA 200.8-1994, Rev. 5.4
Barium	17.4	µg/L	1	0.20	0.05		ELT	09/26/2024 18:58	EPA 200.8-1994, Rev. 5.4
Beryllium	2.46	µg/L	1	0.050	0.007		ELT	09/26/2024 18:58	EPA 200.8-1994, Rev. 5.4
Cadmium	0.550	µg/L	1	0.020	0.004		ELT	09/26/2024 18:58	EPA 200.8-1994, Rev. 5.4
Chromium	0.33	µg/L	1	0.30	0.07		ELT	09/26/2024 18:58	EPA 200.8-1994, Rev. 5.4
Cobalt	80.2	µg/L	1	0.020	0.005		ELT	09/26/2024 18:58	EPA 200.8-1994, Rev. 5.4
Iron	41.1	mg/L	50	1.0	0.2		ELT	10/01/2024 23:20	EPA 200.8-1994, Rev. 5.4
Lead	0.08	µg/L	1	0.20	0.05	J1	ELT	09/26/2024 18:58	EPA 200.8-1994, Rev. 5.4
Lithium	0.126	mg/L	1	0.00030	0.00006		ELT	09/26/2024 18:58	EPA 200.8-1994, Rev. 5.4
Manganese	0.376	mg/L	1	0.00100	0.00007		ELT	09/26/2024 18:58	EPA 200.8-1994, Rev. 5.4
Mercury	61	ng/L	1	5	2		RPL	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/26/2024 18:58	EPA 200.8-1994, Rev. 5.4
Selenium	2.43	µg/L	1	0.50	0.04		ELT	09/26/2024 18:58	EPA 200.8-1994, Rev. 5.4
Thallium	0.16	µg/L	1	0.20	0.02	J1	ELT	09/26/2024 18:58	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: Equipment Blank

Customer Description:

Lab Number: 242840-022

Preparation:

Date Collected: 09/17/2024 09:50 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4
Calcium	<0.02	mg/L	1	0.05	0.02	U1	ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4
Chromium	0.22	µg/L	1	0.30	0.07	J1	ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4
Cobalt	<0.005	µg/L	1	0.020	0.005	U1	ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4
Lithium	0.00037	mg/L	1	0.00030	0.00006		ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.009	mg/L	1	0.100	0.009	U1	ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4
Potassium	<0.01	mg/L	1	0.10	0.01	U1	ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4
Sodium	<0.02	mg/L	1	0.20	0.02	U1	ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4
Strontium	<0.00005	mg/L	1	0.00200	0.00005	U1	ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	ELT	09/26/2024 19:03	EPA 200.8-1994, Rev. 5.4



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Customer Sample ID: Field Blank

Customer Description:

Lab Number: 242840-023

Preparation:

Date Collected: 09/17/2024 09:51 EDT

Date Received: 09/23/2024 15:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.008	µg/L	1	0.100	0.008	U1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4
Calcium	<0.02	mg/L	1	0.05	0.02	U1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4
Chromium	0.23	µg/L	1	0.30	0.07	J1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4
Cobalt	<0.005	µg/L	1	0.020	0.005	U1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4
Lithium	0.00011	mg/L	1	0.00030	0.00006	J1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.009	mg/L	1	0.100	0.009	U1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4
Potassium	<0.01	mg/L	1	0.10	0.01	U1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4
Sodium	<0.02	mg/L	1	0.20	0.02	U1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4
Strontium	<0.00005	mg/L	1	0.00200	0.00005	U1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	ELT	09/26/2024 19:09	EPA 200.8-1994, Rev. 5.4

242840-015

Comments:

Third Radium bottle, label wore off.



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840

Customer: Pirkey Power Station

Date Reported: 11/07/2024

Report Verification

This report and the above data have been confirmed by the following analyst.

Michael Ohlinger, Chemist

Email: msohlinger@aep.com

Phone: 614-836-4184

Audinet: 8-210-4184

THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED. ALL TIMES LISTED ARE IN THE EASTERN TIME ZONE.

Data Qualifier Legend

U1 - Not detected at or below method detection limit (MDL).

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

B1 - Analyte detected in method blank (MB) at or above the method criteria.

M1 - The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.

L1 - The associated laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) recovery was outside acceptance limits.

O2 - Insufficient sample was received to perform the MS and duplicate analyses with this sample batch.

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
 4001 Bixby Road
 Groveport, Ohio 43125
Contacts: Michael Ohlinger (614-836-4184)
 Dave Conover (614-836-4219)

Project Name: Pirkey PP CCR
 Contact Name: Leslie Fuerschbach
 Contact Phone: 318-673-2744

Sampler(s): Matt Hamilton Kenny McDonald

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Site Contact: 18						Sample Specific Notes
						250 mL bottle, pH<2, HNO ₃	Field-filter 250 mL bottle, then pH<2, HNO ₃	Three (six every 10th) 1 L bottles, pH<2, HNO ₃	250 mL Glass bottle, HCl ⁺⁺ , pH<2	250 mL Glass bottle, HCl ⁺⁺ , pH<2	250 mL bottle, pH<2, HNO ₃	
AD-2	9/17/2024	758	G	GW	7	Mo, Na, Pb, Se, Sr, Ti	Man, Mo, Pb, Se, Ti	Ra-226, Ra-228	250 mL Glass bottle, HCl ⁺⁺ , pH<2	250 mL Glass bottle, HCl ⁺⁺ , pH<2	250 mL bottle, pH<2, HNO ₃	2428010
AD-3	9/17/2024	1101	G	GW	7	Gd, Cr, Co, K, Li, Mg, Sr, As, B, Ba, Be, Ca	Dissolved Sb, As, Ba, Cd, Cr, Co, Fe, Li					
AD-4	9/17/2024	935	G	GW	7							
AD-7R	9/16/2024	905	G	GW	7							
AD-8	9/18/2024	1007	G	GW	1							
AD-12	9/16/2024	934	G	GW	7							
AD-13	9/16/2024	813	G	GW	7							
AD-16	9/17/2024	1119	G	GW	1							
AD-17	9/17/2024	955	G	GW	7							
AD-18	9/18/2024	744	G	GW	7							
AD-22	9/18/2024	959	G	GW	10							
AD-23	9/18/2024	948	G	GW	1							

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ; F= filter in field

* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

TG-32 needed

Relinquished by: *[Signature]* Date/Time: 9-18-24 Received by: Date/Time: 9-18-24

Relinquished by: *[Signature]* Date/Time: 9-13-24 Received by: Date/Time: 9-13-24

Relinquished by: *[Signature]* Date/Time: 9-13-24 Received by: Date/Time: 9-13-24

Form COC-04, AEP Chain of Custody (COC) Record for Coal Combustion Residual (CCR) Sampling - Shreveport, Rev. 1, 1/10/17

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Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
 4001 Bixby Road
 Groveport, Ohio 43125
Contacts: Michael Ohlinger (614-836-4184)
 Dave Conover (614-836-4219)

Project Name: Pirkey PP CCR
Contact Name: Leslie Fuerschbach
Contact Phone: 318-673-2744

Sampler(s): Matt Hamilton Kenny McDonald

Site Contact: 18 14 2 1 6
Date: 1 6
COC/Order #: 292840
For Lab Use Only:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Analysis Turnaround Time (in Calendar Days) <small>(C= Routine (28 days for Monitoring Wells))</small>						Sample Specific Notes
						250 mL bottle, pH<2, HNO ₃	Field-filter 250 mL bottle, then pH<2, HNO ₃	Three (six every 10th*) 1 L bottles, pH<2, HNO ₃	250 mL Glass bottle, HCL ^o , pH<2	250 mL Glass bottle, pH<2, HNO ₃	250 mL bottle, pH<2, HNO ₃	
AD-27	9/18/2024	1058	G	GW	1	Sb, As, B, Ba, Be, Ca, Cd, Cr, Co, K, Li, Mg, Mo, Na, Pb, Se, Sr, Ti	Dissolved Sb, As, Ba, Be, Cd, Cr, Co, K, Li, Mg, Mn, Mo, Pb, Se, Sr, Ti	Ra-226, Ra-228	Mercury	Dissolved Mercury	B, Ca, K, Mg, Na, Sr	
AD-28	9/17/2024	906	G	GW	7	X	X	X	X	X	X	
AD-30	9/17/2024	825	G	GW	7	X	X	X	X	X	X	
AD-31	9/16/2024	1136	G	GW	7	X	X	X	X	X	X	
AD-32	9/16/2024	1032	G	GW	7	X	X	X	X	X	X	
AD-33	9/16/2024	1125	G	GW	7	X	X	X	X	X	X	
AD-34	9/18/2024	915	G	GW	1						X	
AD-36	9/18/2024	910	G	GW	1						X	
Duplicate 1	9/18/2024	1100	G	GW	4	X	X		X	X		
Equipment Blank	9/17/2024	850	G	GW	2	X	X		X	X		
Field Blank	9/17/2024	851	G	GW	2	X	X		X	X		
						4	F4	4	2	F2	4	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ; F= filter in field
 * Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

TG-32 needed

Relinquished by: <i>John Tomules</i>	Company:	Date/Time: 9-15-24	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: <i>Matthew O'Leary</i>	Date/Time: 9/23/24 1500



WATER & WASTE SAMPLE RECEIPT FORM

Form SOP-7102

Sample Receipt Form Rev.8.08.23.24

<u>Package Type</u>			<u>Delivery Type</u>			
<input checked="" type="radio"/> Cooler	<input type="radio"/> Box	<input type="radio"/> Bag	<input type="radio"/> Envelope	UPS	<input checked="" type="radio"/> FedEX	<input type="radio"/> USPS
				Other _____		
Plant/Customer <u>PirKey PPCCR</u>			Total # of Containers RECEIVED in Job: <u>115</u>			
Opened By <u>BLB</u>						
Date/Time <u>9.23.24 3:30pm</u>						
Were all temperatures within 0-6°C? Y / N or <input checked="" type="radio"/> N/A (Temps) Initial: <u>BLB</u>			on ice / <input checked="" type="radio"/> no ice			
If No, specify each deviation(s) on back of form.			(IR Gun Ser# 240009843, Expir. 01-03-2026)			
Was container in good condition? Y / <input checked="" type="radio"/> N			Comments <u>Suspect AD-30 label is unreadable</u>			
Was Chain of Custody received? <input checked="" type="radio"/> Y / N			Comments _____			
Requested turnaround: <u>Routine</u>			If RUSH, who was notified?			
pH (15 min)	Cr ⁶ (pres) (24 hr)	NO ₂ or NO ₃ (48 hr)	ortho-PO ₄ (48 hr)	Hg-diss (pres) (48 hr)		

Was pH checked & Color Coding done? Y / N or N/A (pH) Initial & Date: JLD/MGK 9.23.24
TTP

****pH paper** mfr: LabRat, PN 4801, LOT#X000RWDG21 exp 11-30-25 **** Note changes to pH paper in comments below**

Was Add'l Preservative needed? Y / N If Yes: By whom & when: _____ (See Prep Book)

(Dissolved) Is sample filtration requested? Y / N Comments _____ (See Prep Book)

Was COC filled out properly?	<input checked="" type="radio"/> Y / N	Comments _____
Were samples labeled properly?	<input checked="" type="radio"/> Y / N	Comments _____
Were correct containers used?	<input checked="" type="radio"/> Y / N	Comments _____
Was the customer contacted?	If Yes: Person Contacted: _____	
	Initial & Date & Time : _____	
Lab ID# <u>242745</u>	Comments: _____	
Logged by <u>MSJ</u>	_____	
(Record Test Count on back of form)	_____	

Total # of Containers LISTED on COC: <u>115</u>	_____	

WATER & WASTE SAMPLE RECEIPT FORM (CONT)

Form SOP-7102

Sample Receipt Form Rev 8.08.23.24

REMINDER Document the pertinent sample integrity information and deviations in sample receipt

(as noted above) in the Sample or Job "Comments" field in the LIMS **Comments below**

i.e. Mark "LF" if needs Lab filtered, Temperature or Preservative deviation, Preserved upon arrival, etc

JOB #: 242840

Initial/ Date: MSD 9/23/24

Login Test Count from COC	LIMS Sample ID (or COC Sample Name)	Comments /Nonconformities	Peer Review Test Count from COC
21	242840 -001		21
15	-001-01		Ⓟ 15
21	-002		21
15	-002-01		15
21	-003		21
15	-003-01		15
21	-004		21
15	-004-01		15
6	-005		6
21	-006		21
15	-006-01		15
21	-007		21
15	-007-01		15
6	-008		6
21	-009		21
15	-009-01		15
21	-010		21
15	-010-01		15
21	-011		21
15	-011-01		15
6	-012		6
6	-013		6
21	-014		21
15	-014-01		15

Ⓟ 9/24/24

See previous page

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WATER & WASTE SAMPLE RECEIPT FORM

Form SOP-7102

Sample Receipt Form Rev.8.05.23.24

<u>Package Type</u>			<u>Delivery Type</u>			
Cooler	Box	Bag	Envelope	UPS	FedEX	USPS
			Other _____			
Plant/Customer _____			Total # of Containers RECEIVED in Job: _____			
Opened By _____						
Date/Time _____						
Were all temperatures within 0-6°C? Y / N or N/A (Temps) Initial: _____ on ice / no ice						
If No, specify each deviation(s) on back of form. (IR Gun Ser# 240009843, Expir. 01-03-2026)						
Was container in good condition? Y / N Comments _____						
Was Chain of Custody received? Y / N Comments _____						
Requested turnaround: _____ If RUSH, who was notified?						
pH (15 min)	Cr ⁶ (pres) (24 hr)	NO ₂ or NO ₃ (48 hr)	ortho-PO ₄ (48 hr)	Hg-diss (pres) (48 hr)		

Was pH checked & Color Coding done? Y / N or N/A (pH) Initial & Date: _____

****pH paper** mfr: LabRat,PN 4801,LOT#X000RWDG21 exp 11-30-25 **** Note changes to pH paper in comments below**

Was Add'l Preservative needed? Y / N If Yes: By whom & when: _____ (See Prep Book)

(Dissolved) Is sample filtration requested? Y / N Comments _____ (See Prep Book)

Was COC filled out properly?	Y / N	Comments _____
Were samples labeled properly?	Y / N	Comments _____
Were correct containers used?	Y / N	Comments _____
Was the customer contacted?	If Yes: Person Contacted: _____	Initial & Date & Time : _____
Lab ID# _____	Comments: _____	
Logged by _____	_____	
(Record Test Count on back of form)	_____	
Total # of Containers	_____	
LISTED on COC: _____	_____	

Radium Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Tamisha T. Palmer  Chemical Tech. Principal 10/16/2024
Name (printed) Signature Official Title Date

Radium Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: ~~Welsh Power~~ (P) 10/17/24 ~~Perkey Power~~
Reviewer Name: Tamisha Palmer
LRC Date: 10/16/2024
Laboratory Job Number: 242840
Prep Batch Number(s): PB24092408, PB24092409

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Radium Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes, No	ER1
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Radium Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: ~~Welsh Power~~ B10117/24 Pirkey Power
Reviewer Name: Tamisha Palmer
LRC Date: 10/16/2024
Laboratory Job Number: 242840
Prep Batch Number(s): PB24092408, PB24092409

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Radium Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Radium Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Sunita Timsina
Name (printed)


Signature

Chemist Associate
Official Title

10/16/2024
Date

Radium Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Station
Reviewer Name: Sunita Timsina
LRC Date: 10/16/2024
Laboratory Job Number: 242840
Prep Batch Number(s): PB24092407

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Radium Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	No	ER1
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	NA	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Radium Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Station
Reviewer Name: Sunita Timsina
LRC Date: 10/16/2024
Laboratory Job Number: 242840
Prep Batch Number(s): PB24092407

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Radium Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Radium Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

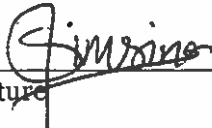
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- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
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 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

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Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Sunita Timsina

Name (printed)


Signature

Chemist Associate

Official Title

10/23/2024

Date

Radium Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Station
Reviewer Name: Sunita Timsina
LRC Date: 10/23/2024
Laboratory Job Number: 242840-016
Prep Batch Number(s): PB24100412

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Radium Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	No	ER1
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	NA	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Radium Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Station
Reviewer Name: Sunita Timsina
LRC Date: 10/23/2024
Laboratory Job Number: 242840-016
Prep Batch Number(s): PB24100412

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Radium Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

ICP-MS Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
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- R2 Sample identification cross-reference
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Elizabeth L. Tinapple	Elizabeth L. Tinapple	<small>Digitally signed by Elizabeth L. Tinapple Date: 2024.10.14 09:02:09 -0400</small>	Chemist	10/14/2024
Name (printed)	Signature		Official Title	Date

ICP-MS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey CCR
Reviewer Name: Elizabeth L. Tinapple
LRC Date: 10/14/2024
Laboratory Job Number: 242840
Prep Batch Number(s): PB24092405 PB24092502 QC2409160 QC2409174 QC2410020 QC2410051

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	No	ER1
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

ICP-MS Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	No	ER3
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

ICP-MS Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey CCR
Reviewer Name: Elizabeth L. Tinapple
LRC Date: 10/14/2024
Laboratory Job Number: 242840
Prep Batch Number(s): PB24092405 PB24092502 QC2409160 QC2409174 QC2410020 QC2410051

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER2
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	Yes	
	I	Were ion abundance data within the method-required QC limits?	Yes	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	Yes	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

ICP-MS Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

ICP-MS Laboratory Review Checklist

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey CCR
Reviewer Name: Elizabeth L. Tinapple
LRC Date: 10/14/2024
Laboratory Job Number: 242840
Prep Batch Number(s): PB24092405 PB24092502 QC2409160 QC2409174 QC2410020 QC2410051

Exception Report No.	Description
ER1	Linear Dynamic Range (LDR) study used to determine upper limit of analyte calibration.
ER2	CCB acceptance criteria is $CCB < 2.2 * MDL$.
ER3	Matrix Spike failed for Ca, Co, Li, Mg, and Na on sample 242840-011

¹ Items identified by the letter "R" must be available as a hard copy or as a .pdf file. Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
² O - organic analyses; I - inorganic analyses (including general chemistry constituents, when applicable).
³ NA - Not applicable; NR - Not reviewed.
⁴ Exception Report identification number; an Exception Report should be completed for an item if the result is "No" or "NR."

Mercury Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Susann Sulzmann S. Sulzmann Senior Chemist 10-14-24
Name (printed) Signature Official Title Date

Mercury Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Station
Reviewer Name: Susann Sulzmann
LRC Date: 10-14-2024
Laboratory Job Number: 242840
Prep Batch Number(s): PB24093003,-004,-005,-102

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	yes	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Mercury Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	yes	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	yes	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Mercury Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Power Station
Reviewer Name: Susann Sulzmann
LRC Date: 10-14-2024
Laboratory Job Number: 242840
Prep Batch Number(s): PB24093003,-004,-005,-102

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?		
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Mercury Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242807

Customer: Pirkey Power Station

Date Reported: 10/23/2024

Customer Sample ID: AD-2

Customer Description:

Lab Number: 242807-001

Preparation:

Date Collected: 09/17/2024 08:58 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.38	mg/L	2	0.10	0.02		CRJ	09/24/2024 19:28	EPA 300.1 -1997, Rev. 1.0
Chloride	29.4	mg/L	2	0.06	0.02		CRJ	09/24/2024 19:28	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.18	mg/L	2	0.06	0.02		CRJ	09/24/2024 19:28	EPA 300.1 -1997, Rev. 1.0
Sulfate	281	mg/L	10	3.0	0.6		CRJ	09/24/2024 18:55	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	510	mg/L	1	50	20		BHB	09/20/2024 12:17	SM 2540C-2015

Customer Sample ID: AD-3

Customer Description:

Lab Number: 242807-002

Preparation:

Date Collected: 09/17/2024 12:01 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.08	mg/L	2	0.10	0.02	J1	CRJ	09/24/2024 18:22	EPA 300.1 -1997, Rev. 1.0
Chloride	6.36	mg/L	2	0.06	0.02		CRJ	09/24/2024 18:22	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.07	mg/L	2	0.06	0.02		CRJ	09/24/2024 18:22	EPA 300.1 -1997, Rev. 1.0
Sulfate	30.2	mg/L	2	0.6	0.1		CRJ	09/24/2024 18:22	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	6	mg/L	1	20	5	J1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	140	mg/L	1	50	20		BHB	09/20/2024 12:24	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242807

Customer: Pirkey Power Station

Date Reported: 10/23/2024

Customer Sample ID: AD-4

Customer Description:

Lab Number: 242807-003

Preparation:

Date Collected: 09/17/2024 10:35 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.19	mg/L	2	0.10	0.02		CRJ	09/24/2024 22:46	EPA 300.1 -1997, Rev. 1.0
Chloride	3.95	mg/L	2	0.06	0.02		CRJ	09/24/2024 22:46	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.02	mg/L	2	0.06	0.02	J1	CRJ	09/24/2024 22:46	EPA 300.1 -1997, Rev. 1.0
Sulfate	18.4	mg/L	2	0.6	0.1		CRJ	09/24/2024 22:46	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	130	mg/L	1	50	20		BHB	09/20/2024 12:30	SM 2540C-2015

Customer Sample ID: AD-7R

Customer Description:

Lab Number: 242807-004

Preparation:

Date Collected: 09/16/2024 10:05 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	1.21	mg/L	2	0.10	0.02		CRJ	09/24/2024 20:34	EPA 300.1 -1997, Rev. 1.0
Chloride	24.5	mg/L	2	0.06	0.02		CRJ	09/24/2024 20:34	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.12	mg/L	2	0.06	0.02		CRJ	09/24/2024 20:34	EPA 300.1 -1997, Rev. 1.0
Sulfate	43.3	mg/L	2	0.6	0.1		CRJ	09/24/2024 20:34	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	190	mg/L	1	50	20		BHB	09/20/2024 12:37	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242807

Customer: Pirkey Power Station

Date Reported: 10/23/2024

Customer Sample ID: AD-8

Customer Description:

Lab Number: 242807-005

Preparation:

Date Collected: 09/18/2024 11:07 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	1.01	mg/L	2	0.10	0.02		CRJ	09/24/2024 21:40	EPA 300.1 -1997, Rev. 1.0
Chloride	17.5	mg/L	2	0.06	0.02		CRJ	09/24/2024 21:40	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.40	mg/L	2	0.06	0.02		CRJ	09/24/2024 21:40	EPA 300.1 -1997, Rev. 1.0
Sulfate	116	mg/L	10	3.0	0.6		CRJ	09/24/2024 21:07	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	63	mg/L	1	20	5		MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	290	mg/L	1	50	20		BHB	09/20/2024 12:37	SM 2540C-2015

Customer Sample ID: AD-12

Customer Description:

Lab Number: 242807-006

Preparation:

Date Collected: 09/16/2024 10:34 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.08	mg/L	2	0.10	0.02	J1	CRJ	09/25/2024 00:57	EPA 300.1 -1997, Rev. 1.0
Chloride	4.45	mg/L	2	0.06	0.02		CRJ	09/25/2024 00:57	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.07	mg/L	2	0.06	0.02		CRJ	09/25/2024 00:57	EPA 300.1 -1997, Rev. 1.0
Sulfate	3.1	mg/L	2	0.6	0.1		CRJ	09/25/2024 00:57	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	60	mg/L	1	50	20		BHB	09/20/2024 12:43	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242807

Customer: Pirkey Power Station

Date Reported: 10/23/2024

Customer Sample ID: AD-13

Customer Description:

Lab Number: 242807-007

Preparation:

Date Collected: 09/16/2024 09:13 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.21	mg/L	2	0.10	0.02		CRJ	09/24/2024 23:52	EPA 300.1 -1997, Rev. 1.0
Chloride	29.0	mg/L	2	0.06	0.02		CRJ	09/24/2024 23:52	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.35	mg/L	2	0.06	0.02		CRJ	09/24/2024 23:52	EPA 300.1 -1997, Rev. 1.0
Sulfate	54.1	mg/L	2	0.6	0.1		CRJ	09/24/2024 23:52	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	38	mg/L	1	20	5		MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	210	mg/L	1	50	20		BHB	09/20/2024 12:43	SM 2540C-2015

Customer Sample ID: AD-16

Customer Description:

Lab Number: 242807-008

Preparation:

Date Collected: 09/17/2024 12:19 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.28	mg/L	2	0.10	0.02		CRJ	09/25/2024 04:15	EPA 300.1 -1997, Rev. 1.0
Chloride	32.5	mg/L	2	0.06	0.02		CRJ	09/25/2024 04:15	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.08	mg/L	2	0.06	0.02		CRJ	09/25/2024 04:15	EPA 300.1 -1997, Rev. 1.0
Sulfate	11.0	mg/L	2	0.6	0.1		CRJ	09/25/2024 04:15	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	120	mg/L	1	50	20		BHB	09/20/2024 12:50	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242807

Customer: Pirkey Power Station

Date Reported: 10/23/2024

Customer Sample ID: AD-17

Customer Description:

Lab Number: 242807-009

Preparation:

Date Collected: 09/17/2024 10:55 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.23	mg/L	2	0.10	0.02		CRJ	09/25/2024 04:48	EPA 300.1 -1997, Rev. 1.0
Chloride	22.2	mg/L	2	0.06	0.02		CRJ	09/25/2024 04:48	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.20	mg/L	2	0.06	0.02		CRJ	09/25/2024 04:48	EPA 300.1 -1997, Rev. 1.0
Sulfate	3.4	mg/L	2	0.6	0.1		CRJ	09/25/2024 04:48	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	60	mg/L	1	50	20		BHB	09/20/2024 12:50	SM 2540C-2015

Customer Sample ID: AD-18

Customer Description:

Lab Number: 242807-010

Preparation:

Date Collected: 09/18/2024 08:44 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.07	mg/L	2	0.10	0.02	J1	CRJ	09/25/2024 05:21	EPA 300.1 -1997, Rev. 1.0
Chloride	5.92	mg/L	2	0.06	0.02		CRJ	09/25/2024 05:21	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.02	mg/L	2	0.06	0.02	J1	CRJ	09/25/2024 05:21	EPA 300.1 -1997, Rev. 1.0
Sulfate	10.2	mg/L	2	0.6	0.1		CRJ	09/25/2024 05:21	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	130	mg/L	1	50	20		BHB	09/20/2024 12:50	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242807

Customer: Pirkey Power Station

Date Reported: 10/23/2024

Customer Sample ID: AD-22

Customer Description:

Lab Number: 242807-011

Preparation:

Date Collected: 09/16/2024 10:59 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.72	mg/L	2	0.10	0.02		CRJ	09/25/2024 07:32	EPA 300.1 -1997, Rev. 1.0
Chloride	108	mg/L	25	0.8	0.3		CRJ	09/25/2024 07:00	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.22	mg/L	2	0.06	0.02		CRJ	09/25/2024 07:32	EPA 300.1 -1997, Rev. 1.0
Sulfate	276	mg/L	25	8	2		CRJ	09/25/2024 07:00	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	620	mg/L	1	50	20		BHB	09/20/2024 12:56	SM 2540C-2015

Customer Sample ID: AD-23

Customer Description:

Lab Number: 242807-012

Preparation:

Date Collected: 09/18/2024 10:48 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.24	mg/L	2	0.10	0.02		CRJ	09/25/2024 05:54	EPA 300.1 -1997, Rev. 1.0
Chloride	9.03	mg/L	2	0.06	0.02		CRJ	09/25/2024 05:54	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.05	mg/L	2	0.06	0.02	J1	CRJ	09/25/2024 05:54	EPA 300.1 -1997, Rev. 1.0
Sulfate	7.1	mg/L	2	0.6	0.1		CRJ	09/25/2024 05:54	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	60	mg/L	1	50	20		BHB	09/20/2024 12:56	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242807

Customer: Pirkey Power Station

Date Reported: 10/23/2024

Customer Sample ID: AD-27

Customer Description:

Lab Number: 242807-013

Preparation:

Date Collected: 09/18/2024 11:58 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.33	mg/L	2	0.10	0.02		CRJ	09/25/2024 08:38	EPA 300.1 -1997, Rev. 1.0
Chloride	12.7	mg/L	2	0.06	0.02		CRJ	09/25/2024 08:38	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.15	mg/L	2	0.06	0.02		CRJ	09/25/2024 08:38	EPA 300.1 -1997, Rev. 1.0
Sulfate	60.6	mg/L	2	0.6	0.1		CRJ	09/25/2024 08:38	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	200	mg/L	1	50	20		BHB	09/20/2024 12:56	SM 2540C-2015

Customer Sample ID: AD-28

Customer Description:

Lab Number: 242807-014

Preparation:

Date Collected: 09/17/2024 10:06 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.10	mg/L	2	0.10	0.02		CRJ	09/25/2024 10:50	EPA 300.1 -1997, Rev. 1.0
Chloride	5.15	mg/L	2	0.06	0.02		CRJ	09/25/2024 10:50	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.54	mg/L	2	0.06	0.02		CRJ	09/25/2024 10:50	EPA 300.1 -1997, Rev. 1.0
Sulfate	26.8	mg/L	2	0.6	0.1		CRJ	09/25/2024 10:50	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	120	mg/L	1	50	20		BHB	09/20/2024 13:04	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242807

Customer: Pirkey Power Station

Date Reported: 10/23/2024

Customer Sample ID: AD-30

Customer Description:

Lab Number: 242807-015

Preparation:

Date Collected: 09/17/2024 09:25 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.20	mg/L	2	0.10	0.02		CRJ	09/25/2024 09:44	EPA 300.1 -1997, Rev. 1.0
Chloride	16.8	mg/L	2	0.06	0.02		CRJ	09/25/2024 09:44	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.04	mg/L	2	0.06	0.02	J1	CRJ	09/25/2024 09:44	EPA 300.1 -1997, Rev. 1.0
Sulfate	110	mg/L	10	3.0	0.6		CRJ	09/25/2024 09:11	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	250	mg/L	1	50	20		BHB	09/20/2024 13:04	SM 2540C-2015

Customer Sample ID: AD-31

Customer Description:

Lab Number: 242807-016

Preparation:

Date Collected: 09/16/2024 12:36 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.24	mg/L	2	0.10	0.02		CRJ	09/25/2024 16:56	EPA 300.1 -1997, Rev. 1.0
Chloride	17.7	mg/L	2	0.06	0.02		CRJ	09/25/2024 16:56	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.09	mg/L	2	0.06	0.02		CRJ	09/25/2024 16:56	EPA 300.1 -1997, Rev. 1.0
Sulfate	73.2	mg/L	2	0.6	0.1		CRJ	09/25/2024 16:56	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	260	mg/L	1	50	20		BHB	09/20/2024 13:04	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242807

Customer: Pirkey Power Station

Date Reported: 10/23/2024

Customer Sample ID: AD-32

Customer Description:

Lab Number: 242807-017

Preparation:

Date Collected: 09/16/2024 11:32 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.33	mg/L	2	0.10	0.02		CRJ	09/25/2024 18:02	EPA 300.1 -1997, Rev. 1.0
Chloride	11.6	mg/L	2	0.06	0.02		CRJ	09/25/2024 18:02	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.30	mg/L	2	0.06	0.02		CRJ	09/25/2024 18:02	EPA 300.1 -1997, Rev. 1.0
Sulfate	59.7	mg/L	2	0.6	0.1		CRJ	09/25/2024 18:02	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	9	mg/L	1	20	5	J1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	190	mg/L	1	50	20		BHB	09/20/2024 13:10	SM 2540C-2015

Customer Sample ID: AD-33

Customer Description:

Lab Number: 242807-018

Preparation:

Date Collected: 09/16/2024 12:25 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.37	mg/L	2	0.10	0.02		CRJ	09/25/2024 22:25	EPA 300.1 -1997, Rev. 1.0
Chloride	10.1	mg/L	2	0.06	0.02		CRJ	09/25/2024 22:25	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.20	mg/L	2	0.06	0.02		CRJ	09/25/2024 22:25	EPA 300.1 -1997, Rev. 1.0
Sulfate	54.4	mg/L	2	0.6	0.1		CRJ	09/25/2024 22:25	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	170	mg/L	1	50	20		BHB	09/20/2024 13:10	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242807

Customer: Pirkey Power Station

Date Reported: 10/23/2024

Customer Sample ID: AD-34

Customer Description:

Lab Number: 242807-019

Preparation:

Date Collected: 09/18/2024 10:15 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.20	mg/L	5	0.25	0.05	J1	CRJ	09/25/2024 19:41	EPA 300.1 -1997, Rev. 1.0
Chloride	7.20	mg/L	5	0.15	0.05		CRJ	09/25/2024 19:41	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.54	mg/L	5	0.15	0.05		CRJ	09/25/2024 19:41	EPA 300.1 -1997, Rev. 1.0
Sulfate	1160	mg/L	50	15	3		CRJ	09/25/2024 19:08	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	1620	mg/L	1	50	20		BHB	09/20/2024 13:10	SM 2540C-2015

Customer Sample ID: AD-36

Customer Description:

Lab Number: 242807-020

Preparation:

Date Collected: 09/18/2024 10:10 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.64	mg/L	2	0.10	0.02		CRJ	09/25/2024 22:58	EPA 300.1 -1997, Rev. 1.0
Chloride	15.7	mg/L	2	0.06	0.02		CRJ	09/25/2024 22:58	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.08	mg/L	2	0.06	0.02		CRJ	09/25/2024 22:58	EPA 300.1 -1997, Rev. 1.0
Sulfate	2.8	mg/L	2	0.6	0.1		CRJ	09/25/2024 22:58	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	50	mg/L	1	50	20		BHB	09/20/2024 13:16	SM 2540C-2015



Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242807

Customer: Pirkey Power Station

Date Reported: 10/23/2024

Customer Sample ID: Duplicate 1

Customer Description:

Lab Number: 242807-021

Preparation:

Date Collected: 09/16/2024 12:00 EDT

Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.72	mg/L	2	0.10	0.02		CRJ	09/25/2024 21:19	EPA 300.1 -1997, Rev. 1.0
Chloride	106	mg/L	25	0.8	0.3		CRJ	09/25/2024 20:46	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.21	mg/L	2	0.06	0.02		CRJ	09/25/2024 21:19	EPA 300.1 -1997, Rev. 1.0
Sulfate	273	mg/L	25	8	2		CRJ	09/25/2024 20:46	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	09/23/2024 19:17	SM 2320B-2011
TDS, Filterable Residue	630	mg/L	1	50	20		BHB	09/20/2024 13:35	SM 2540C-2015

Report Verification

This report and the above data have been confirmed by the following analyst.

Michael Ohlinger, Chemist

Email: msohlinger@aep.com

Phone: 614-836-4184

Audinet: 8-210-4184

THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED. ALL TIMES LISTED ARE IN THE EASTERN TIME ZONE.

Data Qualifier Legend

U1 - Not detected at or below method detection limit (MDL).

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

Chain of Custody Record

Dolan Chemical Laboratory (DCL)
 4001 Bixby Road
 Groveport, Ohio 43125
 Michael Ohlinger (614-836-4184)
 Contacts: Dave Conover (614-836-4219)

Program : Coal Combustion Residuals (CCR)

Site Contact:

Date:

For Lab Use Only:

COC/Order #:

Project Name: Pitkey PP CCR
 Contact Name: Leslie Fuerschbach
 Contact Phone: 318-673-2744

Analysis Turnaround Time (in Calendar Days)
 ☞ Routine (28 days for Monitoring Wells)

250 mL bottle, pH<2, HNO3
 Field-filter 250 mL bottle, then pH<2, HNO3
 1 L bottle, Cool, 0-6C
 Three (six every 10th*) L bottles, pH<2, HNO3

Sampler(s): Matt Hamilton Kerry McDonald

Analysis Turnaround Time (in Calendar Days)
 ☞ Routine (28 days for Monitoring Wells)

Mercury
 Dissolved Mercury
 F, Cl, SO4, Br, TDS, Alkalinity
 Ra-226, Ra-228

Sample Specific Notes:

Sample Identification	Sample Date	Sample Time	Sample Type (C-Comp, G-Grab)	Matrix	# of Cnt.	Sampler(s) Initials	Mercury	Dissolved Mercury	F, Cl, SO4, Br, TDS, Alkalinity	Ra-226, Ra-228	COC/Order #	Sample Specific Notes
AD-27	9/18/2024	1058	G	GW	1				X			
AD-28	9/17/2024	906	G	GW	1				X			
AD-30	9/17/2024	825	G	GW	1				X			
AD-31	9/18/2024	1136	G	GW	1				X			
AD-32	9/18/2024	1032	G	GW	1				X			
AD-33	9/18/2024	1125	G	GW	1				X			
AD-34	9/18/2024	915	G	GW	1				X			
AD-36	9/18/2024	910	G	GW	1				X			
Duplicate 1	9/18/2024	1100	G	GW	1				X			
Preservation Used: 1= Ice, 2= HCl, 3= H2SO4, 4=HNO3, 5=NaOH, 6= Other ; F= filter in field						4	F4	1	4			
* Six 1L Bottles must be collected for Radium for every 10th sample.												
Special Instructions/QC Requirements & Comments:												
TG-32 needed												
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:	Received by:	Date/Time:	Received by:	Date/Time:	Received by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:	Received by:	Date/Time:	Received by:	Date/Time:	Received by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:	Received by:	Date/Time:	Received by:	Date/Time:	Received by:	Date/Time:	Received by:	Date/Time:

Alkalinity Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

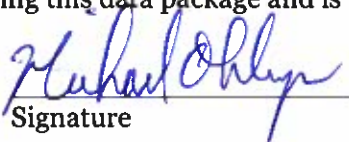
This data package consists of:

- This signature page, and the laboratory review checklist consisting of Table 1, Reportable Data (which includes the reportable data identified on this page), Table 2, Supporting Data, and Table 3, Exception Reports.
- R1 Field chain-of-custody documentation
- R2 Sample identification cross-reference
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
 - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

Release Statement: I am responsible for the release of this laboratory data package. This data package as been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld that would affect the quality of the data.

Check, if applicable: This laboratory is an in-house laboratory controlled by the person responding to rule. The official signing the cover page of the rule-required report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Michael Ohlinger
Name (printed)


Signature

Chemist
Official Title

10/23/2024
Date

Alkalinity Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Plant
Reviewer Name: Michael Ohlinger
LRC Date: 10/23/2024
Laboratory Job Number: 242807
Prep Batch Number(s): QC2409144

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Alkalinity Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Alkalinity Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey Plant
Reviewer Name: Michael Ohlinger
LRC Date: 10/23/2024
Laboratory Job Number: 242807
Prep Batch Number(s): QC2409144

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	NA	
	I	Was the number of standards recommended in the method used for all analytes?	NA	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	NA	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	NA	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Alkalinity Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Ion Chromatography Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

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 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

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Tim Arnold

Name (printed)



Signature

Prin. Chemist

Official Title

10/23/2024

Date

Ion Chromatography Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP Semi-annual CCR

Reviewer Name: Tim Arnold

LRC Date: 10/23/2024

Laboratory Job Number: 242807

Prep Batch Number(s): QC2409161

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	Yes	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	Yes	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	Yes	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Ion Chromatography Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Ion Chromatography Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey PP Semi-annual CCR
Reviewer Name: Tim Arnold
LRC Date: 10/23/2024
Laboratory Job Number: 242807
Prep Batch Number(s): QC2409161

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Ion Chromatography Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

TDS Laboratory Review Checklist

Municipal Solid Waste Laboratory Review Checklist

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 - (b) Dilution factors
 - (c) Preparation methods
 - (d) Cleanup methods
 - (e) If required for the project, tentatively identified compounds (TICs)
- NA R4 Surrogate recovery data including:
 - (a) Calculated recovery (%R)
 - (b) The laboratory's surrogate QC limits
- R5 Test reports/summary forms for blank samples
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
 - (a) LCS spiking amounts
 - (b) Calculated %R for each analyte
 - (c) The laboratory's LCS QC limits
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - (a) Samples associated with the MS/MSD clearly identified
 - (b) MS/MSD spiking amounts
 - (c) Concentration of each MS/MSD analyte measured in the parent and spiked samples
 - (d) Calculated %Rs and relative percent differences (RPDs)
 - (e) The laboratory's MS/MSD QC limits
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
 - (a) The amount of analyte measured in the duplicate
 - (b) The calculated RPD
 - (c) The laboratory's QC limits for analytical duplicates
- R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- R10 Other problems or anomalies
- The Exception Report for every item for which the result is "No" or "NR" (Not Reviewed)

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Sandra Williams	<i>Sandra D. Williams</i>	Chemist	10-23-2024
Name (printed)	Signature	Official Title	Date

TDS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey PS
Reviewer Name: Sandra Williams
LRC Date: 10-23-2024
Laboratory Job Number: 242807
Prep Batch Number(s): QC2409152

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
R1	O, I	Chain-of-custody (COC)		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	NA	
R2	O, I	Sample and quality control (QC) identification		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	Test reports		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	NA	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	Surrogate recovery data		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	Test reports/summary forms for blank samples		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

TDS Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	Laboratory control samples (LCS):		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	Matrix spike (MS) and matrix spike duplicate (MSD) data		
	I	Were the project/method specified analytes included in the MS and MSD?	NA	
	I	Were MS/MSD analyzed at the appropriate frequency?	NA	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	NA	
	I	Were MS/MSD RPDs within laboratory QC limits?	NA	
R8	O, I	Analytical duplicate data		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	Method quantitation limits (MQLs):		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	Other problems/anomalies		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

TDS Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory
Project Name: Pirkey PS
Reviewer Name: Sandra Williams
LRC Date: 10-23-20204
Laboratory Job Number: 242807
Prep Batch Number(s): QC2409152

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S1	O, I	Initial calibration (ICAL)		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	NA	
	I	Was the number of standards recommended in the method used for all analytes?	NA	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	NA	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	NA	
S2	O, I	Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	Mass spectral tuning:		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	Internal standards (IS):		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	Raw data (NELAC section 1 appendix A glossary, and section 5.)		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

TDS Laboratory Review Checklist

Item ¹	Analytes ²	Description	Result (Yes, No, NA, NR) ³	Exception Report No. ⁴
S6	O	Dual column confirmation		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	Tentatively identified compounds (TICs):		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	Interference Check Sample (ICS) results:		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	Serial dilutions, post digestion spikes, and method of standard additions		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	Method detection limit (MDL) studies		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	Proficiency test reports:		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	Standards documentation		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	Compound/analyte identification procedures		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	Demonstration of analyst competency (DOC)		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	Verification/validation documentation for methods (NELAC Chap 5n 5)		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	Laboratory standard operating procedures (SOPs):		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

