Annual Groundwater Monitoring Report

Southwestern Electric Power Company

H. W. Pirkey Power Plant

West Bottom Ash Pond CCR Unit

CN600126767; RN100214287

Registration No: CCR104

Hallsville, Texas

January 31, 2025

Prepared by:
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SOUTHWESTERN ELECTRIC POWER COMPANY℠

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Page

Table of Contents

Abbreviations:

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

I. Overview

This *Annual Groundwater Monitoring Report* (Report) has been prepared to report the status of activities for the preceding year at the West Bottom Ash Pond (WBAP) 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 rule requires 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 WBAP was operating under the Assessment monitoring program.
- At the end of the current annual reporting period, the WBAP was operating under the Assessment monitoring program.
- The WBAP initiated an assessment monitoring program on April 3, 2018.
- Groundwater samples were collected for AD-3, AD-12, AD-17, AD-18, AD-28, and AD-30 in February, April and September 2024 and analyzed for Appendix III and Appendix IV constituents, as specified in 30 TAC §352.941 or §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.
- Data and statistical analysis not available for the previous reporting period indicates that during the 2nd semi-annual 2023 sampling event (October 2023):

  The following Appendix IV parameters exceeded established groundwater protection standards (GWPS):

  - Cobalt at AD-28

  The following Appendix III parameters exceeded background:

  - Boron at AD-28 and AD-30
  - Chloride at AD-17 and AD-30
  - Fluoride at AD-17 and AD-28
  - pH at AD-17
  - Sulfate at AD-30
  - TDS at AD-30

- A successful ASDs for the Appendix IV parameter that exceeded the GWPS for the 2nd semi-annual 2023 was certified on June 4, 2024, and submitted to TCEQ June 4, 2024, for approval.
- The 1st semi-annual sampling event held in April 2024:

  The following Appendix IV parameters exceeded established GWPS:

  - Cobalt at AD-28

  The following Appendix III parameters exceeded background:

  - Boron at AD-28 and AD-30
  - Chloride at AD-30
  - Fluoride at AD-28
  - Sulfate at AD-30
  - TDS at AD-30
- A successful ASD for the Appendix IV parameter that exceeded the GWPS semi-annual 2024 was certified December 6, 2024, and submitted to TCEQ December 6, 2024, for approval.
- The 2nd semi-annual sampling event held in September 2024:

  The following Appendix IV parameters exceeded established GWPS:

  - Cobalt at AD-28

  The following Appendix III parameters exceeded background:

  - Boron at AD-28 and AD-30
  - Chloride at AD-17 and AD-30
  - Fluoride at AD-28
  - pH at AD-17 and AD-28
  - Sulfate at AD-30
  - TDS at AD-30
- Pirkey Power Plant submitted a Notice of SSLs above the Groundwater Protection Standard (GWPS) to TCEQ (December 31, 2025) 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, WBAP 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 March 30, 2022, WBAP ceased receipt of CCR and non-CCR waste streams and commenced closure by removal in accordance with the certified closure plan.
- The CCR material was removed from April to June of 2022 from the WBAP. An additional 12 inches of soil was then removed, finishing in July of 2022. The last inspection for the removal was completed on July 26, 2022.
- On May 5, 2023, the WBAP was closed by removal in accordance with 30 TAC §352.1221 (40 CFR 257.102) and the most recent Written Closure Plan. A Closure Completion Notification certified by a Professional engineer was submitted to TCEQ. Groundwater monitoring will continue until TCEQ's Executive Director issues a closure certification.

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

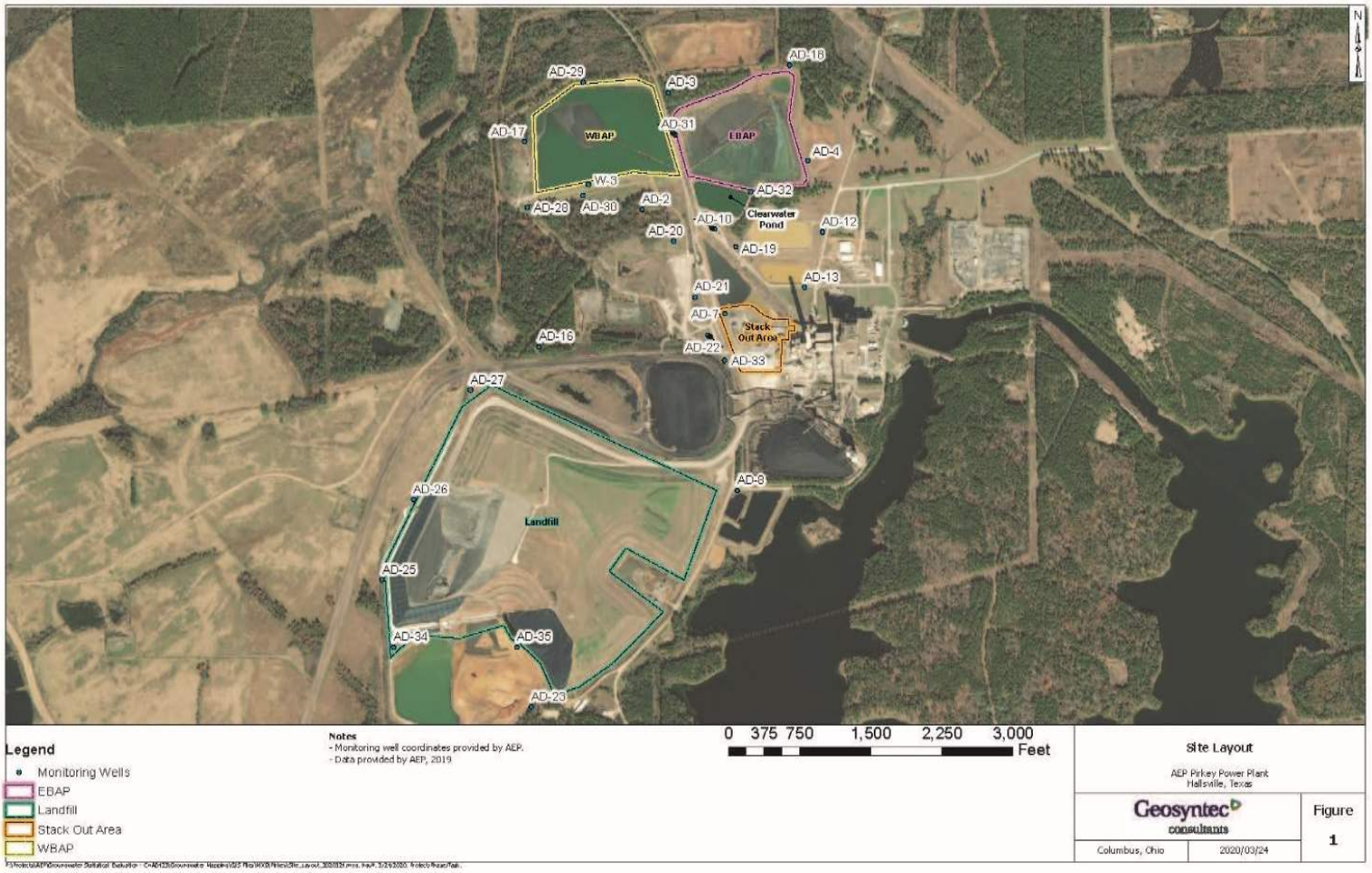
- A map, aerial photograph or a drawing showing the CCR unit(s), all groundwater monitoring wells and monitoring well identification numbers;
- All of the monitoring data collected, including the rate and direction of groundwater flow, plus a summary showing the number of samples collected per monitoring 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.

WBAP Monitoring Wells	
Upgradient	Downgradient
AD-3	AD-17
AD-12	AD-28
AD-18	AD-30



III. Monitoring Wells Installed or Decommissioned

There were no new groundwater monitoring wells installed during 2024. The network design, as summarized in the *Groundwater Monitoring Network Design Report* (May 25, 2016) and as posted at the CCR website for Pirkey Power Plant's WBAP, did not change. 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.

V. Groundwater Quality Data Statistical Analysis

Appendix 2 contains the statistical analysis report(s).

Data and statistical analysis not available for the previous reporting period indicates that during the 2nd semi-annual 2023 sampling event (October 2023):

The following Appendix IV parameters exceeded established groundwater protection standards (GWPS):

- Cobalt at AD-28

The following Appendix III parameters exceeded background:

- Boron at AD-28 and AD-30
- Chloride at AD-17 and AD-30
- Fluoride at AD-17 and AD-28
- pH at AD-17
- Sulfate at AD-30
- TDS at AD-30

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

The following Appendix IV parameters exceeded established GWPS:

- Cobalt at AD-28

The following Appendix III parameters exceeded background:

- Boron at AD-28 and AD-30
- Chloride at AD-30
- Fluoride at AD-28
- Sulfate at AD-30
- TDS at AD-30

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

The following Appendix IV parameters exceeded established GWPS:

- Cobalt at AD-28

The following Appendix III parameters exceeded background:

- Boron at AD-28 and AD-30
- Chloride at AD-17 and AD-30
- Fluoride at AD-28
- pH at AD-17 and AD-28
- Sulfate at AD-30
- TDS at AD-30

VI. Alternate Source Demonstration

A successful ASDs for the Appendix IV parameter that exceeded the GWPS for the 2nd semi-annual 2023 was certified on June 4, 2024, and submitted to TCEQ June 4, 2024, for approval.

A successful ASD for the Appendix IV parameter that exceeded the GWPS 1st semi-annual 2024 was certified December 6, 2024, and submitted to TCEQ December 6, 2024, for approval.

Pirkey Power Plant submitted a Notice of SSLs above the Groundwater Protection Standard (GWPS) to TCEQ (December 31, 2025) 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.

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, WBAP remained in Assessment Monitoring.

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

The WBAP 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 WBAP, 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.

On March 30, 2022, WBAP ceased receipt of CCR and non-CCR waste streams and commenced closure by removal for this CCR Unit in accordance with the certified closure plan.

The CCR material was removed from April to June of 2022 from the WBAP. An additional 12 inches of soil was then removed, finishing in July of 2022. The last inspection for the removal was completed on July 26, 2022.

On May 5, 2023, the WBAP was closed by removal in accordance with 30 TAC §352.1221 (40 CFR 257.102) and the most recent Written Closure Plan. A Closure Completion Notification certified by a Professional engineer was submitted to TCEQ. Groundwater monitoring will continue until TCEQ's Executive Director issues a closure certification.

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:

- If any SSLs are identified, then an alternate source demonstration will be completed.
- Responding to any new data received in light of 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-3
Pirkey - WBAP
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	0.04	2.9	6	< 0.083 U1	4.9	18	136
7/14/2016	Background	0.06	4.67	6	< 0.083 U1	4.7	30	161
9/8/2016	Background	0.06	4.28	7	< 0.083 U1	4.5	28	145
10/13/2016	Background	0.05	4.93	8	< 0.083 U1	5.5	31	168
11/14/2016	Background	0.07	4.61	7	< 0.083 U1	5.4	29	170
1/12/2017	Background	0.05	3.81	7	< 0.083 U1	5.3	27	152
3/1/2017	Background	0.05	2.55	5	< 0.083 U1	5.1	16	124
4/10/2017	Background	0.06	2.6	10	< 0.083 U1	4.9	19	140
8/24/2017	Detection	0.08625	2.37	6	< 0.083 U1	5.6	17	68
3/22/2018	Assessment	0.05508	3.41	5	< 0.083 U1	5.3	26	140
8/21/2018	Assessment	0.055	4.79	9	< 0.083 U1	5.6	34	166
2/27/2019	Assessment	0.034	3.46	6.16	0.04 J1	5.3	21.8	50
5/23/2019	Assessment	0.045	6.19	5.99	0.09	4.9	29.5	154
8/13/2019	Assessment	0.05 J1	5.08	6.83	0.19	5.1	32.5	168
3/11/2020	Assessment	0.04 J1	2.84	5.76	0.04 J1	4.8	19.5	124
6/3/2020	Assessment	0.04 J1	4.56	6.44	0.09	5.3	29.2	171
11/3/2020	Assessment	0.054	4.58	6.32	0.08	5.0	30.1	167
3/9/2021	Assessment	0.03 J1	4.22	5.98	0.06	5.0	27.1	158
5/25/2021	Assessment	0.051	4.7	6.06	0.08	4.6	28.8	150
11/16/2021	Assessment	0.054	4.92	6.42	0.12	5.3	31.3	150
3/29/2022	Assessment	0.059	6.09	6.84	0.21	4.8	34.0	170 L1
6/21/2022	Assessment	0.08 J1	3.1	5.65	0.04 J1	4.4	21.2	--
8/30/2022	Assessment	--	--	--	--	4.7	--	170
11/16/2022	Assessment	0.063	5.05	7.40	0.18	5.9	34.4	160
6/27/2023	Assessment	0.037 J1	2.95	5.67	0.03 J1	5.8	22.4	150
10/18/2023	Assessment	0.036 J1	4.04	6.17	0.06	4.8	28.6	140
2/20/2024	Assessment	0.037 J1	3.55	5.55	0.03 J1	4.8	22.3	140
4/23/2024	Assessment	0.038 J1	4.32	5.83	0.05 J1	4.6	28.5	160
9/17/2024	Assessment	0.052	4.67	6.36	0.07	4.3	30.2	140

Table 1. Groundwater Data Summary: AD-3
Pirkey - WBAP
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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
5/11/2016	Background	< 0.93 U1	< 1.05 U1	59	0.412956 J1	0.0947139 J1	0.724945 J1	3.12937 J1	1.059	< 0.083 U1	< 0.68 U1	0.025	0.00992 J1	0.774997 J1	3.29747 J1	< 0.86 U1
7/14/2016	Background	< 0.93 U1	2.10876 J1	70	0.583927 J1	< 0.07 U1	1	7	1.69	< 0.083 U1	< 0.68 U1	0.095	0.025	1.16077 J1	2.50173 J1	< 0.86 U1
9/8/2016	Background	< 0.93 U1	< 1.05 U1	70	0.502486 J1	< 0.07 U1	0.974129 J1	7	1.491	< 0.083 U1	< 0.68 U1	0.087	0.00618 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
10/13/2016	Background	< 0.93 U1	4.22879 J1	82	0.591063 J1	0.159178 J1	2	9	3.42	< 0.083 U1	< 0.68 U1	0.991	0.0073 J1	< 0.29 U1	1.92667 J1	< 0.86 U1
11/14/2016	Background	< 0.93 U1	1.98138 J1	64	0.310985 J1	< 0.07 U1	0.42234 J1	8	1.532	< 0.083 U1	< 0.68 U1	0.092	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/12/2017	Background	< 0.93 U1	< 1.05 U1	62	0.281878 J1	< 0.07 U1	0.551806 J1	4.96138 J1	2.01	< 0.083 U1	< 0.68 U1	0.079	0.0057 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/1/2017	Background	< 0.93 U1	< 1.05 U1	62	0.279961 J1	< 0.07 U1	< 0.23 U1	2.54266 J1	0.862	< 0.083 U1	< 0.68 U1	0.046	< 0.005 U1	< 0.29 U1	1.78128 J1	1.13014 J1
4/10/2017	Background	< 0.93 U1	< 1.05 U1	61	0.284613 J1	< 0.07 U1	0.250858 J1	2.40319 J1	0.991	< 0.083 U1	< 0.68 U1	0.046	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/22/2018	Assessment	< 0.93 U1	< 1.05 U1	57.94	0.22 J1	< 0.07 U1	0.86 J1	3.74 J1	0.739	< 0.083 U1	< 0.68 U1	0.06189	< 0.005 U1	< 0.29 U1	1.13 J1	< 0.86 U1
8/21/2018	Assessment	< 0.01 U1	1.01	63.3	0.240	0.02 J1	0.496	7.18	1.837	< 0.083 U1	0.355	0.0876	< 0.005 U1	0.1 J1	0.1	0.057
2/27/2019	Assessment	0.04 J1	0.13	54.2	< 0.4 U1	0.03 J1	0.04 J1	2.31	0.3144	0.04 J1	0.05 J1	0.0525	< 0.005 U1	< 0.4 U1	0.05 J1	< 0.1 U1
5/23/2019	Assessment	< 0.4 U1	< 0.6 U1	61.8	< 0.4 U1	< 0.2 U1	< 0.8 U1	4.94	0.988	0.09	< 0.4 U1	0.0734	< 0.005 U1	< 8 U1	< 0.6 U1	< 0.1 U1
8/13/2019	Assessment	< 0.02 U1	2.41	58.3	0.196	0.02 J1	0.206	6.55	1.378	0.19	0.417	0.108	< 0.005 U1	< 0.4 U1	0.1 J1	< 0.1 U1
3/11/2020	Assessment	< 0.02 U1	0.81	62.4	0.312	0.02 J1	0.1 J1	2.62	1.504	0.04 J1	0.396	0.0353	0.003 J1	< 0.4 U1	0.09 J1	< 0.1 U1
6/3/2020	Assessment	< 0.02 U1	0.66	57.4	0.228	0.09	0.226	4.36	1.352	0.09	0.372	0.0561	0.003 J1	< 0.4 U1	0.06 J1	< 0.1 U1
11/3/2020	Assessment	< 0.02 U1	1.22	64.8	0.257	0.02 J1	0.220	5.27	1.594	0.08	0.364	0.0714	< 0.002 U1	< 0.4 U1	0.08 J1	< 0.1 U1
3/9/2021	Assessment	< 0.02 U1	0.53	60.7	0.185	0.02 J1	0.207	3.63	0.709	0.06	0.1 J1	0.0445	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1
5/25/2021	Assessment	< 0.02 U1	0.49	66.4	0.169	0.097	0.32	3.98	1.30	0.08	0.20	0.0452	< 0.002 U1	< 0.1 U1	0.09 J1	0.05 J1
11/16/2021	Assessment	< 0.02 U1	1.90	64.1	0.200	0.016 J1	0.63	5.87	1.32	0.12	0.43	0.0722	0.006	< 0.1 U1	< 0.09 U1	< 0.04 U1
3/29/2022	Assessment	< 0.02 U1	1.51	68.3	0.163	0.012 J1	0.40	7.88	1.91	0.21	0.28	0.0934	< 0.002 U1	< 0.1 U1	< 0.09 U1	0.04 J1
6/21/2022	Assessment	< 0.1 U1	0.2 J1	55.6	0.22 J1	< 0.02 U1	0.3 J1	2.70	1.68	0.04 J1	< 0.3 U1	0.0457	0.004 J1	< 0.5 U1	< 0.5 U1	< 0.2 U1
11/16/2022	Assessment	< 0.02 U1	1.22	63.7	0.186	0.012 J1	0.63	7.40	1.51	0.18	0.31	0.0837	< 0.002 U1	< 0.1 U1	0.09 J1	0.05 J1
6/27/2023	Assessment	0.011 J1	0.80	52.2	0.200	0.020	0.31	2.79	0.91	0.03 J1	0.25	0.0414	< 0.002 U1	< 0.1 U1	0.04 J1	0.05 J1
10/18/2023	Assessment	< 0.008 U1	0.57	57.7	0.174	0.016 J1	0.33	3.70	1.19	0.06	0.12 J1	0.0587	< 0.002 U1	< 0.1 U1	0.04 J1	0.05 J1
2/20/2024	Assessment	0.008 J1	0.10	57.7	0.21 J1	0.024	0.49	3.07	1.25	0.03 J1	< 0.05 U1	0.0511	< 0.002 U1	< 0.1 U1	0.07 J1	0.05 J1
4/23/2024	Assessment	< 0.008 U1	0.25	65.2	0.24 J1	0.017 J1	0.24 J1	3.57	1.81	0.05 J1	0.05 J1	0.0599	< 0.002 U1	< 0.1 U1	0.06 J1	0.05 J1
9/17/2024	Assessment	< 0.008 U1	0.57	60.5	< 0.4 U1	0.014 J1	0.40	4.77	2.63	0.07	0.10 J1	0.082	< 0.002 U1	< 0.1 U1	< 0.04 U1	0.05 J1

Table 1. Groundwater Data Summary: AD-12
Pirkey - WBAP
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 - WBAP
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	pCi/L	mg/L	µg/L	mg/L	µg/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-17
Pirkey - WBAP
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	0.02	0.648	12	< 0.083 U1	4.3	4	68
7/14/2016	Background	0.03	1.28	34	< 0.083 U1	3.3	4	96
9/8/2016	Background	0.03	1.19	29	< 0.083 U1	3.9	6	88
10/13/2016	Background	0.03	1.34	32	0.393 J1	3.6	6	96
11/15/2016	Background	0.03	1.3	30	0.3446 J1	3.7	6	88
1/12/2017	Background	0.03	1.08	26	< 0.083 U1	4.4	6	90
3/1/2017	Background	0.04	0.57	19	< 0.083 U1	4.0	5	80
4/10/2017	Background	0.03	0.395	20	< 0.083 U1	4.2	9	88
8/24/2017	Detection	0.04495	1.06	25	0.245 J1	4.6	6	98
12/21/2017	Detection	--	--	26	< 0.083 U1	--	8	76
3/22/2018	Assessment	0.03113	0.0981	13	< 0.083 U1	4.4	5	44
8/21/2018	Assessment	0.044	0.997	35	< 0.083 U1	3.9	7	98
2/28/2019	Assessment	0.03 J1	0.2 J1	10.2	0.12	3.7	2.4	68
5/23/2019	Assessment	0.019	0.2 J1	10.3	0.13	4.0	2.4	58
8/13/2019	Assessment	0.03 J1	0.777	26.3	0.24	4.8	1.8	88
3/11/2020	Assessment	< 0.02 U1	0.1 J1	10.1	0.13	4.4	2.4	60 J1
6/3/2020	Assessment	0.02 J1	0.312	22.7	0.26	4.2	2.7	77
11/3/2020	Assessment	0.03 J1	1.06	32.4	0.24	3.7	1.8	86
3/9/2021	Assessment	0.02 J1	< 0.1 U1	10.2	0.17	4.3	2.3	83
5/25/2021	Assessment	0.031 J1	< 0.1 U1	9.30	0.17	3.9	2.66	60
11/16/2021	Assessment	0.022 J1	0.98	31.3	0.29	4.0	2.58	90
3/29/2022	Assessment	0.031 J1	0.24	16.2	0.26	4.1	6.77	60 L1
6/21/2022	Assessment	0.021 J1	1.10	30.2	0.30	3.3	5.78	90
11/16/2022	Assessment	0.026 J1	1.23	35.0	0.26	4.5	2.91	80
6/26/2023	Assessment	0.032 J1	0.23	15.4	0.19	4.5	2.4	60
10/17/2023	Assessment	0.023 J1	0.94	29.7	0.27	3.1	1.6	77
2/20/2024	Assessment	0.034 J1	0.14	12.0	0.15	4.9	3.4	50
4/23/2024	Assessment	0.020 J1	0.04 J1	6.44	0.09	3.6	2.1	40 J1
9/17/2024	Assessment	0.029 J1	0.41	22.2	0.20	3.1	3.4	60

Table 1. Groundwater Data Summary: AD-17
Pirkey - WBAP
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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
5/11/2016	Background	< 0.93 U1	1.21333 J1	143	0.507354 J1	0.0868344 J1	1	5	2.082	< 0.083 U1	< 0.68 U1	< 0.00013 U1	0.06	< 0.29 U1	2.55378 J1	< 0.86 U1
7/14/2016	Background	< 0.93 U1	1.3096 J1	334	0.85295 J1	0.0833036 J1	2	14	3.12	< 0.083 U1	< 0.68 U1	0.027	0.138	0.485824 J1	< 0.99 U1	< 0.86 U1
9/8/2016	Background	< 0.93 U1	1.76675 J1	327	0.948023 J1	< 0.07 U1	5	14	4.473	< 0.083 U1	< 0.68 U1	0.028	0.142	< 0.29 U1	< 0.99 U1	1.0754 J1
10/13/2016	Background	< 0.93 U1	< 1.05 U1	324	0.753919 J1	< 0.07 U1	0.542006 J1	14	6.64	0.393 J1	< 0.68 U1	0.026	0.05	< 0.29 U1	< 0.99 U1	< 0.86 U1
11/15/2016	Background	< 0.93 U1	< 1.05 U1	290	0.708598 J1	< 0.07 U1	0.448238 J1	13	7.94	0.3446 J1	< 0.68 U1	0.026	0.078	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/12/2017	Background	< 0.93 U1	< 1.05 U1	234	0.541302 J1	< 0.07 U1	0.723126 J1	10	9.60	< 0.083 U1	< 0.68 U1	0.023	0.055	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/1/2017	Background	< 0.93 U1	< 1.05 U1	176	0.499114 J1	< 0.07 U1	0.359001 J1	8	2.31	< 0.083 U1	< 0.68 U1	0.019	0.084	< 0.29 U1	< 0.99 U1	< 0.86 U1
4/10/2017	Background	< 0.93 U1	< 1.05 U1	140	0.511666 J1	< 0.07 U1	0.689417 J1	7	3.67	< 0.083 U1	< 0.68 U1	0.016	0.069	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/22/2018	Assessment	< 0.93 U1	< 1.05 U1	94.77	0.38 J1	< 0.07 U1	1.21	4.57 J1	1.669	< 0.083 U1	< 0.68 U1	0.01186	0.125	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/21/2018	Assessment	< 0.01 U1	0.41	223	0.588	0.04	0.367	10.9	2.505	< 0.083 U1	0.181	0.0234	0.216	< 0.02 U1	0.5	0.051
2/28/2019	Assessment	< 0.4 U1	< 0.6 U1	71.4	< 0.4 U1	< 0.2 U1	< 0.8 U1	2.93	0.772	0.12	< 0.4 U1	0.00912	0.107	< 8 U1	< 0.6 U1	< 2 U1
5/23/2019	Assessment	< 0.4 U1	< 0.6 U1	82.9	< 0.4 U1	< 0.2 U1	0.9 J1	3.15	1.62	0.13	< 0.4 U1	0.00911	0.103	< 8 U1	< 0.6 U1	< 0.1 U1
8/13/2019	Assessment	< 0.02 U1	0.40	216	0.554	0.04 J1	0.732	9.03	6.40	0.24	0.2 J1	0.0193	0.447	< 0.4 U1	0.3	< 0.1 U1
3/11/2020	Assessment	< 0.02 U1	0.46	73.5	0.285	0.02 J1	0.700	3.04	3.986	0.13	0.2 J1	0.00822	0.175	< 0.4 U1	0.2 J1	< 0.1 U1
6/3/2020	Assessment	< 0.02 U1	0.17	176	0.553	0.03 J1	0.208	7.02	2.44	0.26	0.09 J1	0.0147	0.346	< 0.4 U1	0.4	< 0.1 U1
11/3/2020	Assessment	< 0.02 U1	0.44	263	0.610	0.05	0.518	12.1	8.21	0.24	0.209	0.0237	0.476	< 0.4 U1	0.4	< 0.1 U1
3/9/2021	Assessment	< 0.02 U1	0.13	76.7	0.321	0.02 J1	0.222	3.05	0.816	0.17	0.06 J1	0.00924	0.123	< 0.1 U1	0.1 J1	< 0.04 U1
5/25/2021	Assessment	< 0.02 U1	0.14	74.5	0.262	0.012 J1	0.36	2.85	1.41	0.17	0.07 J1	0.00759	0.127	< 0.1 U1	0.12 J1	< 0.04 U1
11/16/2021	Assessment	< 0.02 U1	0.21	266	0.686	0.058	0.33	11.8	6.42	0.29	0.13 J1	0.0236	0.350	< 0.1 U1	0.35 J1	0.04 J1
3/29/2022	Assessment	< 0.02 U1	0.30	112	0.481	0.028	0.70	6.48	3.01	0.26	0.1 J1	0.0126	0.300 J1	< 0.1 U1	0.26 J1	< 0.04 U1
6/21/2022	Assessment	< 0.02 U1	0.39	250	0.650	0.063	0.51	12.2	11.96	0.30	0.13 J1	0.0206	0.200 J1	< 0.1 U1	0.44 J1	0.05 J1
11/16/2022	Assessment	< 0.02 U1	0.13	276	0.662	0.061	0.37	12.7	6.75	0.26	0.16 J1	0.0267	0.400 J1	< 0.1 U1	0.36 J1	0.07 J1
6/26/2023	Assessment	0.008 J1	0.16	112	0.354	0.022	0.49	5.15	2.90	0.19	0.13 J1	0.0106	0.297	< 0.1 U1	0.17 J1	< 0.02 U1
10/17/2023	Assessment	< 0.008 U1	0.22	249	0.667	0.054	0.31	11.0	5.39	0.27	0.12 J1	0.0244	0.196	< 0.1 U1	0.58	0.04 J1
2/20/2024	Assessment	0.009 J1	0.23	85.2	0.310	0.020	0.57	4.40	3.15	0.15	0.08 J1	0.00998	0.131	< 0.1 U1	0.16 J1	< 0.02 U1
4/23/2024	Assessment	< 0.008 U1	0.09 J1	47.6	0.221	0.011 J1	0.37	1.99	1.80	0.09	< 0.05 U1	0.00705	0.051	< 0.1 U1	0.11 J1	< 0.02 U1
9/17/2024	Assessment	0.009 J1	0.22	158	0.501	0.038	0.35	7.63	3.36	0.20	0.11 J1	0.0167	0.135	< 0.1 U1	0.20 J1	0.03 J1

Table 1. Groundwater Data Summary: AD-18
Pirkey - WBAP
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
5/10/2016	Background	0.01	0.548	8	< 0.083 U1	4.5	7	108
7/14/2016	Background	0.01	0.409	8	< 0.083 U1	4.7	7	116
9/8/2016	Background	0.01	0.343	8	< 0.083 U1	4.7	8	110
10/13/2016	Background	0.02	0.56	7	< 0.083 U1	4.1	10	124
11/15/2016	Background	0.02	0.59	7	< 0.083 U1	4.4	7	134
1/12/2017	Background	0.01	0.415	7	< 0.083 U1	4.7	10	128
3/1/2017	Background	0.01	0.224	6	< 0.083 U1	4.1	7	108
4/10/2017	Background	0.01	0.304	7	< 0.083 U1	4.1	8	102
8/24/2017	Detection	0.0278	0.435	8	< 0.083 U1	4.9	8	68
3/22/2018	Assessment	0.01642	0.292	6	< 0.083 U1	5.4	6	100
8/21/2018	Assessment	0.012	0.321	10	< 0.083 U1	5.1	8	118
2/28/2019	Assessment	< 0.02 U1	0.490	8.19	0.02 J1	5.0	6.1	84
5/23/2019	Assessment	0.013	0.684	8.82	0.02 J1	5.2	10.6	104
8/13/2019	Assessment	< 0.02 U1	0.647	8.49	0.01 J1	5.2	6.6	90
3/11/2020	Assessment	< 0.02 U1	0.3 J1	7.34	0.02 J1	4.4	6.1	90 J1
6/3/2020	Assessment	< 0.02 U1	0.2 J1	8.30	0.03 J1	4.5	6.3	119
11/3/2020	Assessment	--	--	--	--	4.4	--	--
11/4/2020	Assessment	< 0.02 U1	0.2 J1	6.30	0.02 J1	--	6.3	100
3/9/2021	Assessment	0.009 J1	0.2 J1	6.61	0.02 J1	4.5	6.6	113
5/25/2021	Assessment	0.021 J1	0.3	7.16	0.02 J1	4.4	7.46	100 P1
11/16/2021	Assessment	--	--	--	--	3.9	--	--
11/17/2021	Assessment	0.01 J1	0.20	5.99	< 0.02 U1	--	6.23	100
3/29/2022	Assessment	0.009 J1	0.24	5.26	< 0.02 U1	4.4	7.31	140 L1
6/21/2022	Assessment	--	--	--	--	4.6	--	--
6/22/2022	Assessment	< 0.009 U1	1.49	5.20	< 0.02 U1	--	6.47	110
11/15/2022	Assessment	--	--	--	--	4.5	--	--
11/16/2022	Assessment	0.011 J1	0.19	4.94	< 0.02 U1	--	6.55	90
2/28/2023	Assessment	< 0.009 U1	0.18	5.49	< 0.02 U1	4.4	7.52	100
6/27/2023	Assessment	0.009 J1	0.23	5.28	< 0.02 U1	4.4	8.2	110
8/23/2023	Assessment	0.012 J1	3.17	5.02	0.02 J1	4.4	6.9	88
10/18/2023	Assessment	0.011 J1	0.35	5.05	< 0.02 U1	3.9	10	98
2/19/2024	Assessment	--	--	--	--	4.5	--	--
2/20/2024	Assessment	0.013 J1	0.27	4.67	< 0.02 U1	--	8.1	110
4/23/2024	Assessment	0.008 J1	0.19	5.39	0.02 J1	4.7	7.2	90
9/17/2024	Assessment	--	--	--	--	4.2	--	--
9/18/2024	Assessment	0.010 J1	0.32	5.92	0.02 J1	--	10.2	130

Table 1. Groundwater Data Summary: AD-18
Pirkey - WBAP
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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
5/10/2016	Background	< 0.93 U1	< 1.05 U1	157	0.262755 J1	0.109247 J1	1	1.82932 J1	0.847	< 0.083 U1	< 0.68 U1	0.004	0.01536 J1	< 0.29 U1	1.71074 J1	< 0.86 U1
7/14/2016	Background	< 0.93 U1	3.77261 J1	139	0.243326 J1	< 0.07 U1	3	2.16037 J1	3.264	< 0.083 U1	< 0.68 U1	0.02	0.064	0.41347 J1	2.45009 J1	< 0.86 U1
9/8/2016	Background	< 0.93 U1	< 1.05 U1	115	0.226343 J1	< 0.07 U1	0.779959 J1	1.09947 J1	1.105	< 0.083 U1	< 0.68 U1	0.019	0.03	< 0.29 U1	< 0.99 U1	< 0.86 U1
10/13/2016	Background	< 0.93 U1	< 1.05 U1	112	0.192611 J1	< 0.07 U1	0.631027 J1	2.24885 J1	1.161	< 0.083 U1	< 0.68 U1	0.026	0.01416 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
11/15/2016	Background	< 0.93 U1	< 1.05 U1	94	0.107171 J1	< 0.07 U1	0.724569 J1	1.66054 J1	1.486	< 0.083 U1	< 0.68 U1	0.017	0.029	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/12/2017	Background	< 0.93 U1	< 1.05 U1	99	0.169196 J1	< 0.07 U1	0.411433 J1	1.62881 J1	0.976	< 0.083 U1	< 0.68 U1	0.026	0.01887 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/1/2017	Background	< 0.93 U1	< 1.05 U1	99	0.105337 J1	< 0.07 U1	0.572874 J1	0.976724 J1	0.468	< 0.083 U1	< 0.68 U1	0.017	0.01086 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
4/10/2017	Background	< 0.93 U1	< 1.05 U1	105	0.130316 J1	< 0.07 U1	0.967681 J1	0.98157 J1	0.648	< 0.083 U1	< 0.68 U1	0.019	0.0096 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/22/2018	Assessment	< 0.93 U1	< 1.05 U1	97.75	0.09 J1	< 0.07 U1	< 0.23 U1	0.97 J1	0.942	< 0.083 U1	< 0.68 U1	0.01647	0.006 J1	< 0.29 U1	1.53 J1	< 0.86 U1
8/21/2018	Assessment	0.02 J1	1.01	99.8	0.129	0.02 J1	0.809	1.18	1.108	< 0.083 U1	0.280	0.0175	0.014 J1	0.08 J1	0.2	0.060
2/28/2019	Assessment	< 0.4 U1	< 0.6 U1	106	< 0.4 U1	< 0.2 U1	< 0.8 U1	1.11	0.615	0.02 J1	0.7 J1	0.0177	0.009 J1	< 8 U1	< 0.6 U1	< 2 U1
5/23/2019	Assessment	< 0.4 U1	< 0.6 U1	131	< 0.4 U1	< 0.2 U1	< 0.8 U1	1.47	0.492	0.02 J1	< 0.4 U1	0.0209	0.009 J1	< 8 U1	< 0.6 U1	< 0.1 U1
8/13/2019	Assessment	< 0.02 U1	0.45	100	0.118	0.02 J1	0.212	1.25	0.473	0.01 J1	0.2 J1	0.0183	0.023 J1	< 0.4 U1	0.09 J1	< 0.1 U1
3/11/2020	Assessment	< 0.02 U1	0.09 J1	97.1	0.09 J1	0.01 J1	0.1 J1	0.948	4.813	0.02 J1	< 0.05 U1	0.0134	0.003 J1	< 0.4 U1	0.05 J1	< 0.1 U1
6/3/2020	Assessment	< 0.02 U1	0.22	100	0.1 J1	0.01 J1	0.2 J1	0.950	0.728	0.03 J1	0.06 J1	0.0132	0.007	< 0.4 U1	0.09 J1	< 0.1 U1
11/4/2020	Assessment	< 0.02 U1	0.29	89.3	0.08 J1	0.01 J1	0.1 J1	0.917	1.169	0.02 J1	0.06 J1	0.0128	0.028	< 0.4 U1	0.2 J1	< 0.1 U1
3/9/2021	Assessment	< 0.02 U1	0.28	88.7	0.09 J1	0.01 J1	0.271	0.827	0.331	0.02 J1	0.08 J1	0.0131	0.006	< 0.1 U1	0.1 J1	< 0.04 U1
5/25/2021	Assessment	< 0.02 U1	0.42	103	0.088	0.014 J1	0.55	0.964	0.77	0.02 J1	0.15 J1	0.0127	0.014	< 0.1 U1	0.13 J1	0.05 J1
11/17/2021	Assessment	< 0.02 U1	0.19	82.2	0.078	0.011 J1	0.31	0.801	1.91	< 0.02 U1	< 0.05 U1	0.0124	0.030	< 0.1 U1	0.11 J1	< 0.04 U1
3/29/2022	Assessment	0.02 J1	1.55	90.1	0.106	0.01 J1	1.40	0.842	2.01	< 0.02 U1	0.53	0.0137	0.021	< 0.1 U1	0.38 J1	0.05 J1
6/22/2022	Assessment	< 0.02 U1	0.30	79.3	0.073	0.012 J1	0.47	0.790	0.73	< 0.02 U1	0.11 J1	0.0108	< 0.007 U1	< 0.1 U1	0.14 J1	< 0.04 U1
11/16/2022	Assessment	< 0.02 U1	0.25	77.4	0.071	0.009 J1	0.54	0.723	1.61	< 0.02 U1	0.08 J1	0.0125	0.018	< 0.1 U1	0.12 J1	< 0.04 U1
2/28/2023	Assessment	< 0.02 U1	0.26	77.9	0.085	0.01 J1	0.38	0.750	1.10	< 0.02 U1	0.18 J1	0.0123	0.006	< 0.1 U1	< 0.09 U1	< 0.04 U1
6/27/2023	Assessment	0.009 J1	0.55	89.0	0.132	0.013 J1	0.57	0.933	2.53	< 0.02 U1	0.13 J1	0.0138	0.010	< 0.1 U1	0.15 J1	0.04 J1
8/23/2023	Assessment	0.056 J1	0.54	70.6	0.115	0.015 J1	1.15	0.731	1.27	0.02 J1	0.43	0.0119	0.005	0.1 J1	0.18 J1	0.03 J1
10/18/2023	Assessment	0.023 J1	0.43	84.0	0.127	0.018 J1	0.52	1.26	1.27	< 0.02 U1	0.12 J1	0.0186	0.084	< 0.1 U1	0.17 J1	0.05 J1
2/20/2024	Assessment	0.019 J1	1.17	83.1	0.100	0.013 J1	0.95	1.05	1.42	< 0.02 U1	0.30	0.0151	0.014	< 0.1 U1	0.23 J1	0.05 J1
4/23/2024	Assessment	< 0.008 U1	0.19	76.6	0.083	0.010 J1	0.32	0.851	0.99	0.02 J1	0.06 J1	0.0130	0.008	< 0.1 U1	0.11 J1	0.03 J1
9/18/2024	Assessment	0.016 J1	1.58	78.2	< 0.4 U1	0.013 J1	1.02	1.28	2.00	0.02 J1	0.37	0.021	0.013	< 0.1 U1	0.19 J1	0.05 J1

Table 1. Groundwater Data Summary: AD-28
Pirkey - WBAP
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	0.277	2.16	6	0.9005 J1	4.7	18	106
7/14/2016	Background	0.301	1.69	6	0.4478 J1	5.1	17	96
9/7/2016	Background	0.332	1.25	6	0.3966 J1	4.1	19	94
10/13/2016	Background	0.23	3.21	6	0.532 J1	5.3	19	124
11/15/2016	Background	0.32	1.64	8	0.9199 J1	4.2	16	112
1/12/2017	Background	0.285	1.22	7	0.7158 J1	4.1	17	84
3/1/2017	Background	0.293	1.25	5	< 0.083 U1	3.4	18	96
4/10/2017	Background	0.293	1.2	7	0.6732 J1	4.1	20	104
8/24/2017	Detection	0.281	1.22	6	0.557 J1	5.1	18	96
12/21/2017	Detection	0.277	1.14	--	--	--	--	--
3/22/2018	Assessment	0.254	1.4	5	0.6327 J1	5.2	23	100
8/21/2018	Assessment	0.330	1.39	9	0.4982 J1	5.0	22	96
2/27/2019	Assessment	0.458	1.65	6.29	0.81	5.0	19.6	32
5/22/2019	Assessment	0.313	1.24	4.48	0.69	4.6	20.1	100
8/12/2019	Assessment	0.366	1.72	6.04	0.65	4.7	22.5	128
3/11/2020	Assessment	0.370	1.14	5.48	1.04	4.2	29.1	112
6/2/2020	Assessment	0.351	1.18	5.33	0.87	4.5	26.2	125
11/2/2020	Assessment	0.395	1.38	5.51	0.55	4.4	21.9	104
3/9/2021	Assessment	0.358	1.26	5.16	1.03	4.2	28.3	117
5/25/2021	Assessment	0.391	1.3	4.92	1.0	3.9	27.6	110
11/16/2021	Assessment	0.363	1.22	4.79	0.58	4.3	24.2	100
3/29/2022	Assessment	0.356	1.31	5.07	0.68	3.7	28.9	100 L1
6/21/2022	Assessment	0.311	1.40	4.36	0.61	4.0	28.0	110
11/16/2022	Assessment	0.334	1.34	4.96	0.48	4.3	23.3	80
6/26/2023	Assessment	0.299	1.48	4.14	0.54	4.2	25.9	120
10/17/2023	Assessment	0.294	1.23	4.64	0.50	3.5	22.1	94
2/20/2024	Assessment	0.333	1.34	4.54	0.97	4.8	26.9	90
4/23/2024	Assessment	0.290	1.19	3.90	0.79	3.4	24.7	100
9/17/2024	Assessment	0.375	1.39	5.15	0.54	3.1	26.8	120

Table 1. Groundwater Data Summary: AD-28
Pirkey - WBAP
Appendix IV Constituents

Geosyntec Consultants, Inc.

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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
5/11/2016	Background	1.58838 J1	2.49885 J1	223	0.968775 J1	< 0.07 U1	1	18	1.212	0.9005 J1	< 0.68 U1	0.004	0.146	< 0.29 U1	1.10335 J1	< 0.86 U1
7/14/2016	Background	< 0.93 U1	1.52986 J1	170	0.663081 J1	< 0.07 U1	0.982579 J1	15	2.29	0.4478 J1	< 0.68 U1	0.034	0.162	< 0.29 U1	< 0.99 U1	< 0.86 U1
9/7/2016	Background	< 0.93 U1	< 1.05 U1	168	0.728735 J1	< 0.07 U1	0.605543 J1	14	1.44	0.3966 J1	< 0.68 U1	0.03	0.069	< 0.29 U1	< 0.99 U1	1.24745 J1
10/13/2016	Background	< 0.93 U1	6	152	0.42032 J1	< 0.07 U1	6	18	2.547	0.532 J1	< 0.68 U1	0.066	0.085	< 0.29 U1	< 0.99 U1	< 0.86 U1
11/15/2016	Background	< 0.93 U1	1.40867 J1	148	0.520895 J1	< 0.07 U1	0.638766 J1	13	3.35	0.9199 J1	< 0.68 U1	0.032	0.029	0.294156 J1	< 0.99 U1	< 0.86 U1
1/12/2017	Background	< 0.93 U1	< 1.05 U1	154	0.475597 J1	< 0.07 U1	< 0.23 U1	12	2.67	0.7158 J1	< 0.68 U1	0.031	0.025	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/1/2017	Background	< 0.93 U1	< 1.05 U1	163	0.576508 J1	< 0.07 U1	0.968975 J1	14	2.082	< 0.083 U1	< 0.68 U1	0.031	0.025	< 0.29 U1	< 0.99 U1	< 0.86 U1
4/10/2017	Background	< 0.93 U1	< 1.05 U1	162	0.654819 J1	< 0.07 U1	0.324151 J1	15	2.331	0.6732 J1	< 0.68 U1	0.03	0.026	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/22/2018	Assessment	< 0.93 U1	< 1.05 U1	166	0.95 J1	< 0.07 U1	< 0.23 U1	14.36	1.288	0.6327 J1	< 0.68 U1	0.02561	0.046	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/21/2018	Assessment	0.03 J1	0.64	143	0.598	0.05	0.688	14.4	2.028	0.4982 J1	0.266	0.0307	0.028	0.05 J1	0.3	0.03 J1
2/27/2019	Assessment	< 0.4 U1	< 0.6 U1	154	0.9 J1	< 0.2 U1	< 0.8 U1	14.3	2.318	0.81	< 0.4 U1	0.0266	0.061	< 8 U1	< 0.6 U1	< 2 U1
5/22/2019	Assessment	< 0.4 U1	< 0.6 U1	148	0.5 J1	< 0.2 U1	< 0.8 U1	13.8	1.948	0.69	< 0.4 U1	0.0227	0.028	< 8 U1	< 0.6 U1	< 0.1 U1
8/12/2019	Assessment	0.02 J1	0.64	113	0.473	0.04 J1	0.416	12.8	2.381	0.65	0.1 J1	0.0380	0.092	< 0.4 U1	0.2 J1	< 0.1 U1
3/11/2020	Assessment	< 0.02 U1	0.21	172	0.959	0.07	0.235	17.1	2.265	1.04	0.1 J1	0.0226	0.028	< 0.4 U1	0.4	< 0.1 U1
6/2/2020	Assessment	< 0.02 U1	0.16	146	0.801	0.05	0.230	13.6	1.667	0.87	0.06 J1	0.0223	0.026	< 0.4 U1	0.3	< 0.1 U1
11/2/2020	Assessment	< 0.02 U1	0.18	131	0.466	0.04 J1	0.2 J1	13.4	2.33	0.55	0.06 J1	0.0279	0.064	< 0.4 U1	0.2	< 0.1 U1
3/9/2021	Assessment	< 0.02 U1	0.16	153	0.958	0.07	0.292	15.3	1.214	1.03	0.08 J1	0.0223	0.019	< 0.1 U1	0.3	< 0.04 U1
5/25/2021	Assessment	0.02 J1	0.18	153	0.771	0.062	0.47	15.0	1.18	1.0	0.11 J1	0.0190	0.019	< 0.1 U1	0.21 J1	< 0.04 U1
11/16/2021	Assessment	< 0.02 U1	0.27	120	0.501	0.049	0.59	11.8	2.17	0.58	0.10 J1	0.0240	0.024	< 0.1 U1	0.17 J1	< 0.04 U1
3/29/2022	Assessment	< 0.02 U1	0.09 J1	120	0.605	0.057	0.35	12.5	2.98	0.68	0.05 J1	0.0242	0.012	< 0.1 U1	0.26 J1	< 0.04 U1
6/21/2022	Assessment	< 0.02 U1	0.14	130	0.463	0.047	0.40	13.3	5.96	0.61	0.08 J1	0.0213	0.007	< 0.1 U1	0.15 J1	< 0.04 U1
11/16/2022	Assessment	< 0.02 U1	0.10	125	0.459	0.046	0.54	11.8	5.15	0.48	0.15 J1	0.0270	0.008	< 0.1 U1	0.16 J1	< 0.04 U1
6/26/2023	Assessment	0.015 J1	0.22	119	0.562	0.054	0.47	13.1	4.00	0.54	0.11 J1	0.0235	0.013	< 0.1 U1	0.21 J1	0.03 J1
10/17/2023	Assessment	0.009 J1	0.16	114	0.469	0.043	0.42	10.9	2.31	0.50	0.09 J1	0.0262	0.009	< 0.1 U1	0.22 J1	0.03 J1
2/20/2024	Assessment	0.008 J1	0.10	124	0.917	0.063	0.38	14.4	5.84	0.97	< 0.05 U1	0.0207	0.017	< 0.1 U1	0.32 J1	0.02 J1
4/23/2024	Assessment	< 0.008 U1	0.12	121	0.770	0.055	0.38	13.0	1.55	0.79	0.07 J1	0.0179	0.013	< 0.1 U1	0.33 J1	0.03 J1
9/17/2024	Assessment	0.011 J1	0.15	124	0.617	0.057	0.38	13.8	3.00	0.54	0.10 J1	0.0267	0.016	< 0.1 U1	0.22 J1	0.04 J1

Table 1. Groundwater Data Summary: AD-30
Pirkey - WBAP
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	0.258	0.591	18	< 0.083 U1	4.7	14	112
7/14/2016	Background	0.384	0.499	22	< 0.083 U1	4.8	14	118
9/7/2016	Background	0.515	0.27	24	< 0.083 U1	4.4	15	110
10/13/2016	Background	0.625	0.373	24	< 0.083 U1	4.2	18	140
11/15/2016	Background	0.701	0.326	25	< 0.083 U1	4.3	19	132
1/12/2017	Background	0.697	0.286	26	< 0.083 U1	5.2	22	136
3/1/2017	Background	0.824	0.273	22	< 0.083 U1	4.8	25	136
4/11/2017	Background	0.837	0.242	24	< 0.083 U1	4.2	27	124
8/24/2017	Detection	1.39	0.294	25	< 0.083 U1	5.2	46	176
12/21/2017	Detection	1.27	0.363	26	< 0.083 U1	--	48	152
3/22/2018	Assessment	0.937	0.345	17	< 0.083 U1	5.2	44	140
8/21/2018	Assessment	1.57	0.716	29	< 0.083 U1	4.8	66	188
2/28/2019	Assessment	0.491	0.3 J1	14.6	< 0.04 U1	4.2	31.5	--
4/3/2019	Assessment	--	--	--	--	--	--	135
5/23/2019	Assessment	0.520	1.74	18.8	0.04 J1	4.9	29.2	112
8/12/2019	Assessment	1.25	0.302	28.1	0.03 J1	4.9	39.8	160
3/11/2020	Assessment	1.63	0.351	22.8	0.05 J1	4.6	76.4	188
6/2/2020	Assessment	1.58	0.341	23.2	0.05 J1	4.9	77.2	219
11/2/2020	Assessment	2.55	0.523	30.6	0.05 J1	4.4	109	252
3/9/2021	Assessment	1.91	0.478	23.5	0.07	4.5	122	264
5/25/2021	Assessment	1.84	0.6	22.8	0.08	4.1	113	240
11/15/2021	Assessment	2.78	0.67	30.9	0.05 J1	3.7	149	330
3/28/2022	Assessment	2.45	0.66	29.5	0.07	4.0	170	330 L1
6/20/2022	Assessment	2.49	0.75	26.0	0.06	4.2	177	340
11/16/2022	Assessment	2.86	0.71	27.4	0.07	5.1	177	340
6/26/2023	Assessment	1.80	0.54	18.2	0.04 J1	5.0	147	300
10/17/2023	Assessment	2.07	0.79	26.7	0.05 J1	4.2	148	290
2/19/2024	Assessment	1.50	0.44	15.6	0.03 J1	4.3	118	250
4/23/2024	Assessment	1.13	0.38	12.2	0.05 J1	3.8	104	220
9/17/2024	Assessment	1.35	0.49	16.8	0.04 J1	3.7	110	250

Table 1. Groundwater Data Summary: AD-30
Pirkey - WBAP
Appendix IV Constituents

Geosyntec Consultants, Inc.

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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
5/11/2016	Background	1.71137 J1	1.92931 J1	54	0.155441 J1	< 0.07 U1	3	2.21375 J1	1.057	< 0.083 U1	< 0.68 U1	< 0.00013 U1	0.278	< 0.29 U1	< 0.99 U1	< 0.86 U1
7/14/2016	Background	< 0.93 U1	< 1.05 U1	54	0.126875 J1	< 0.07 U1	0.994219 J1	2.13856 J1	4.701	< 0.083 U1	< 0.68 U1	0.01	0.649	1.14165 J1	< 0.99 U1	< 0.86 U1
9/7/2016	Background	< 0.93 U1	< 1.05 U1	52	0.153878 J1	< 0.07 U1	0.769517 J1	1.83325 J1	0.312	< 0.083 U1	< 0.68 U1	0.009	0.214	< 0.29 U1	< 0.99 U1	1.34697 J1
10/13/2016	Background	< 0.93 U1	< 1.05 U1	56	0.0606961 J1	< 0.07 U1	0.543859 J1	2.26228 J1	2.27	< 0.083 U1	< 0.68 U1	0.01	0.709	< 0.29 U1	< 0.99 U1	< 0.86 U1
11/15/2016	Background	< 0.93 U1	< 1.05 U1	52	0.0603858 J1	< 0.07 U1	< 0.23 U1	1.91681 J1	4.07	< 0.083 U1	< 0.68 U1	0.009	0.584	< 0.29 U1	1.2068 J1	0.959001 J1
1/12/2017	Background	< 0.93 U1	< 1.05 U1	51	0.0580655 J1	< 0.07 U1	0.504125 J1	1.76108 J1	0.355	< 0.083 U1	< 0.68 U1	0.009	1.588	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/1/2017	Background	0.997045 J1	< 1.05 U1	55	0.0632093 J1	< 0.07 U1	0.740184 J1	1.69598 J1	0.354	< 0.083 U1	< 0.68 U1	0.008	2.59	< 0.29 U1	< 0.99 U1	< 0.86 U1
4/11/2017	Background	< 0.93 U1	< 1.05 U1	55	0.0611 J1	< 0.07 U1	0.535696 J1	1.80383 J1	1.861	< 0.083 U1	< 0.68 U1	0.008	1.207	< 0.29 U1	< 0.99 U1	< 0.86 U1
3/22/2018	Assessment	< 0.93 U1	< 1.05 U1	56.42	0.09 J1	< 0.07 U1	1.47	2.6 J1	1.108	< 0.083 U1	< 0.68 U1	0.00837	0.104	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/21/2018	Assessment	< 100 U1	0.77	62.9	0.07 J1	< 0.05 U1	1.22	2.93	0.987	< 0.083 U1	0.2 J1	0.0118	1.123	< 200 U1	0.4 J1	0.1 J1
2/28/2019	Assessment	< 0.4 U1	< 0.6 U1	43.3	< 0.4 U1	< 0.2 U1	4 J1	1.67	1.144	< 0.04 U1	< 0.4 U1	0.00707	0.461	< 8 U1	< 0.6 U1	< 2 U1
5/23/2019	Assessment	< 0.4 U1	0.6 J1	59.2	< 0.4 U1	< 0.2 U1	1 J1	3.26	1.089	0.04 J1	< 0.4 U1	0.00841	0.165	< 8 U1	< 0.6 U1	< 0.1 U1
8/12/2019	Assessment	< 0.02 U1	0.21	58.0	0.07 J1	< 0.01 U1	0.374	2.10	1.217	0.03 J1	0.06 J1	0.00804	0.345	< 0.4 U1	0.2 J1	< 0.1 U1
3/11/2020	Assessment	< 0.02 U1	0.23	82.6	0.08 J1	< 0.01 U1	0.300	2.82	3.41	0.05 J1	0.09 J1	0.00788	0.010	0.8 J1	0.2 J1	< 0.1 U1
6/2/2020	Assessment	< 0.02 U1	0.19	77.3	0.08 J1	< 0.01 U1	0.531	2.64	0.983	0.05 J1	0.09 J1	0.00779	0.021	< 0.4 U1	0.2	< 0.1 U1
11/2/2020	Assessment	< 0.02 U1	0.15	104	0.09 J1	0.01 J1	0.328	4.10	1.311	0.05 J1	< 0.05 U1	0.0104	0.085	< 0.4 U1	0.2 J1	< 0.1 U1
3/9/2021	Assessment	< 0.02 U1	0.15	115	0.107	0.01 J1	0.301	3.87	1.144	0.07	< 0.05 U1	0.00939	0.018	< 0.1 U1	0.3	< 0.04 U1
5/25/2021	Assessment	< 0.02 U1	0.17	104	0.158	0.019 J1	0.42	4.95	1.83	0.08	0.07 J1	0.00858	0.015	< 0.1 U1	0.30 J1	< 0.04 U1
11/15/2021	Assessment	< 0.02 U1	0.21	113	0.107	0.008 J1	0.51	4.55	1.48	0.05 J1	0.06 J1	0.0113	0.060	< 0.1 U1	0.33 J1	< 0.04 U1
3/28/2022	Assessment	< 0.02 U1	0.19	129	0.125	0.012 J1	0.45	4.76	2.30	0.07	< 0.05 U1	0.0101	0.035	< 0.1 U1	0.44 J1	0.04 J1
6/20/2022	Assessment	< 0.02 U1	0.23	106	0.089	0.014 J1	0.42	4.90	3.71	0.06	< 0.05 U1	0.0100	0.014	< 0.1 U1	0.34 J1	0.04 J1
11/16/2022	Assessment	< 0.02 U1	0.16	89.4	0.108	0.013 J1	0.55	4.86	1.52	0.07	< 0.05 U1	0.0119	0.017	< 0.1 U1	0.35 J1	0.05 J1
6/26/2023	Assessment	0.010 J1	0.21	76.7	0.086	0.008 J1	0.57	3.81	1.68	0.04 J1	0.08 J1	0.00896	0.130	< 0.1 U1	0.45 J1	0.04 J1
10/17/2023	Assessment	< 0.008 U1	0.17	63.8	0.090	0.01 J1	0.44	4.11	0.99	0.05 J1	< 0.05 U1	0.0124	0.005	< 0.1 U1	0.42 J1	0.04 J1
2/19/2024	Assessment	0.009 J1	0.25	61.3	0.097	0.012 J1	0.53	3.33	2.26	0.03 J1	< 0.05 U1	0.00870	0.022	< 0.1 U1	0.31 J1	0.03 J1
4/23/2024	Assessment	< 0.008 U1	0.15	49.9	0.122	0.012 J1	0.42	3.30	0.89	0.05 J1	< 0.05 U1	0.00736	0.023	< 0.1 U1	0.30 J1	0.03 J1
9/17/2024	Assessment	< 0.008 U1	0.14	57.8	0.078	0.009 J1	0.50	3.26	1.11	0.04 J1	0.08 J1	0.0103	0.019	< 0.1 U1	0.22 J1	0.03 J1

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.
mg/L: milligrams per liter
P1: The precision between duplicate results was above acceptance limits.
pCi/L: picocuries per liter
SU: standard unit
µg/L: micrograms per liter

Table 1. Groundwater Elevation Data Summary
Pirkey Power Plant

Geosyntec Consultants

Unit	All Units	East Bottom Ash Pond					West Bottom Ash Pond				
Gradient	Upgradient	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

Geosyntec Consultants

Unit	FGD Stackout Area					Landfill					
Gradient	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

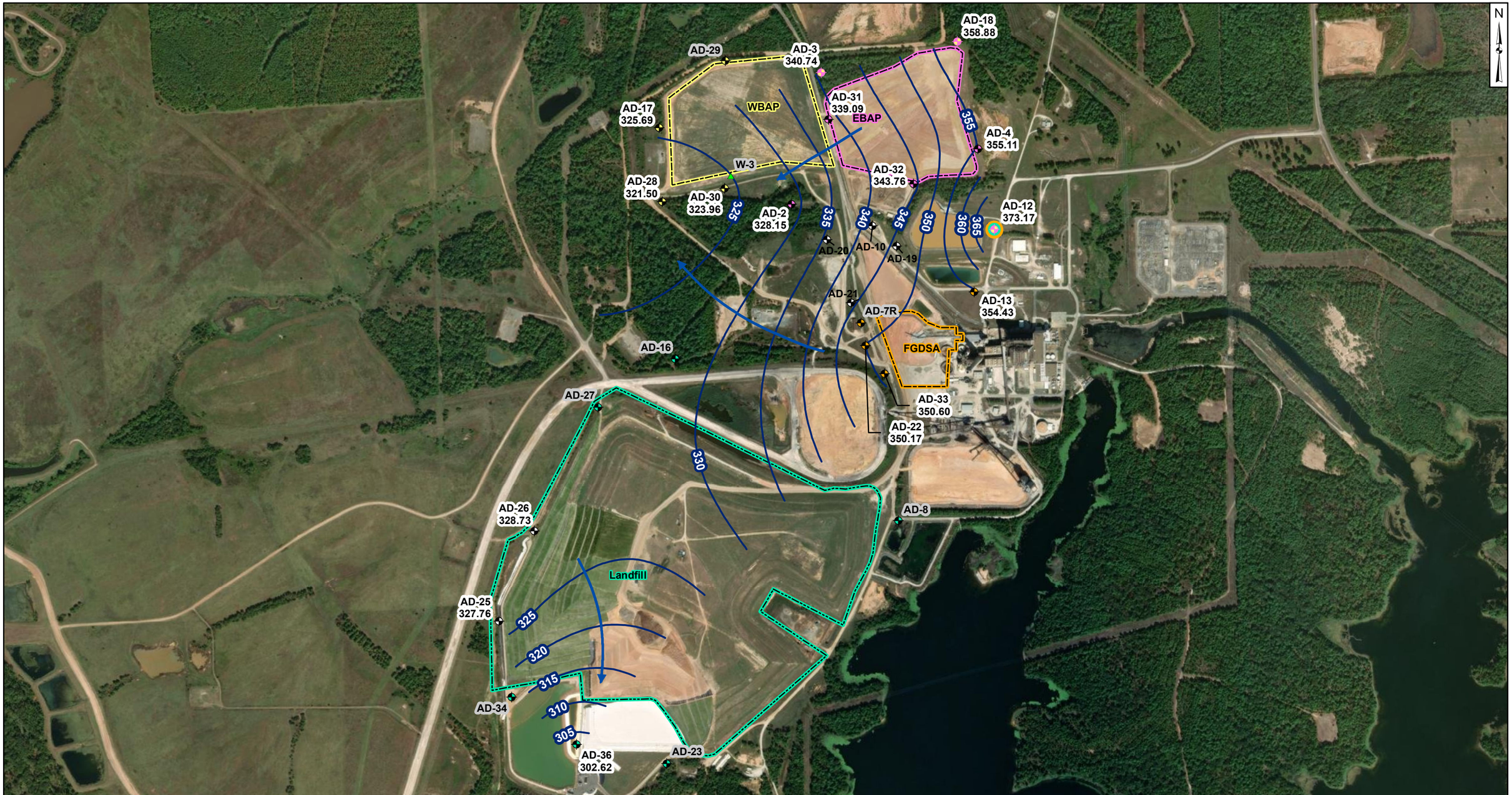
Notes:
1. Groundwater elevation measured in feet above mean sea level.
2. AD-7R added to the FGD Stackout Area certified monitoring network in December 2023.

Table 1: Residence Time Calculation Summary
Pirkey West Bottom Ash Pond

Geosyntec Consultants, Inc.

			2024-02		2024-04		2024-09	
CCR Management Unit	Monitoring Well	Well Diameter (inches)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
West Bottom Ash Pond	AD-3 [1]	4.0	13.7	8.9	14.1	8.6	10.6	11.5
	AD-12 [1]	4.0	46.3	2.6	47.3	2.6	37.5	3.2
	AD-17 [2]	2.0	7.5	8.1	11.2	5.4	7.4	8.2
	AD-18 [1]	2.0	17.3	3.5	17.4	3.5	15.4	3.9
	AD-28 [2]	2.0	6.4	9.5	14.2	4.3	12.4	4.9
	AD-30 [2]	2.0	9.4	6.5	10.8	5.6	11.0	5.5

Notes:
[1] - Background Well
[2] - Downgradient Well



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, 2
12. Map is updated to incorporate Landfill survey data collected on May 1, 2024.
13. Aerial imagery provided by ESRI, dated September 19, 2023.

500 250 0 500
Feet

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

Beth Ann Gross

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED
PROFESSIONAL ENGINEER

Potentiometric Contours: Uppermost Aquifer February 2024

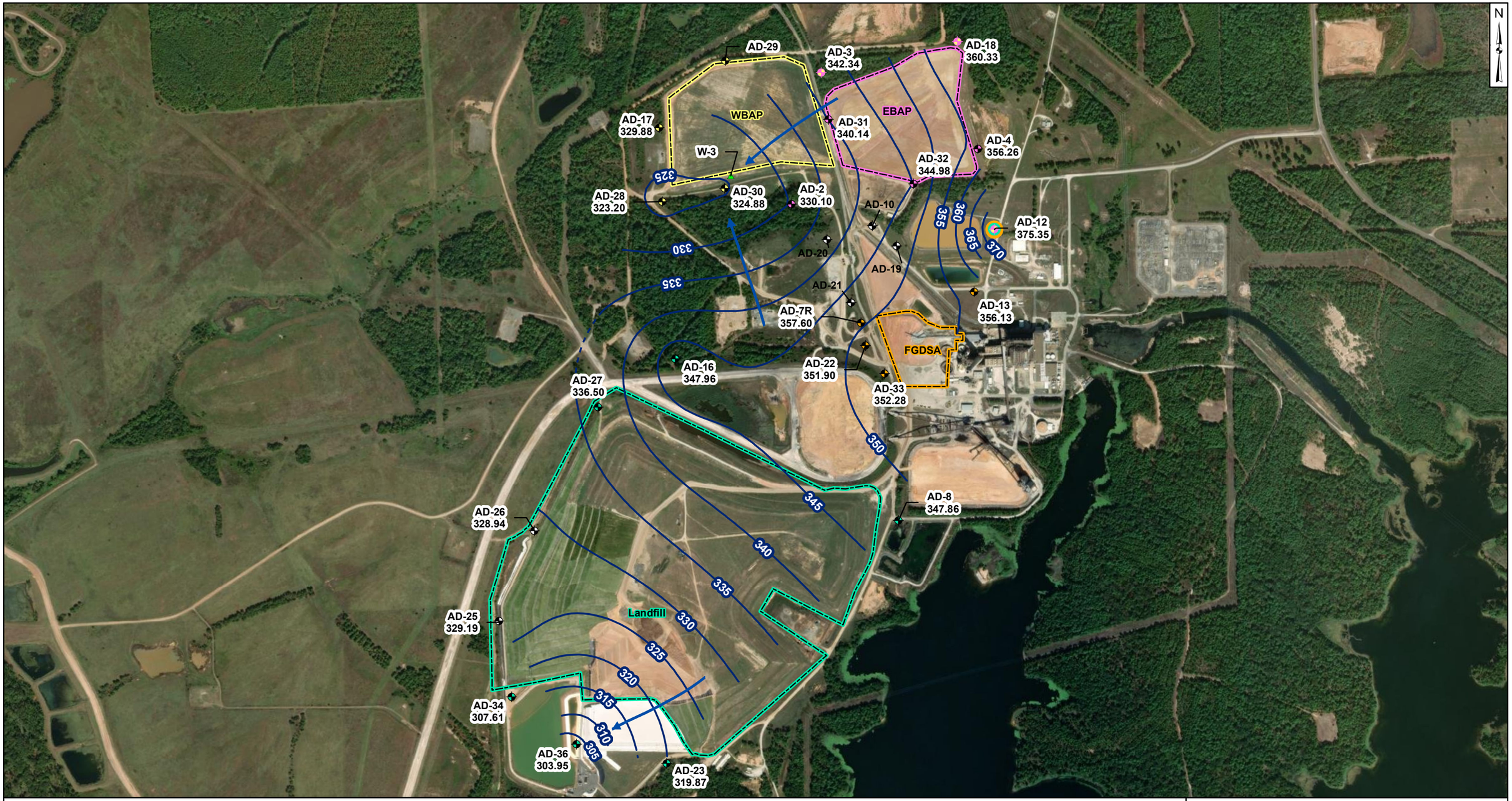
AEP Pirkey Power Plant
Hallsville, Texas

Geosyntec consultants

Columbus, Ohio | 2024/12/02

Figure 1

\\annarbor-01\Data\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Pirkey\2024\AEP-Pirkey_GW_2024-02Pirkey.mxd. ASoltero. 12/2/2024. Project/Phase/Task.



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.

1,000 500 0 1,000 Feet

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

Beth Ann Gross

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED
PROFESSIONAL ENGINEER

Potentiometric Contours: Uppermost Aquifer April 2024

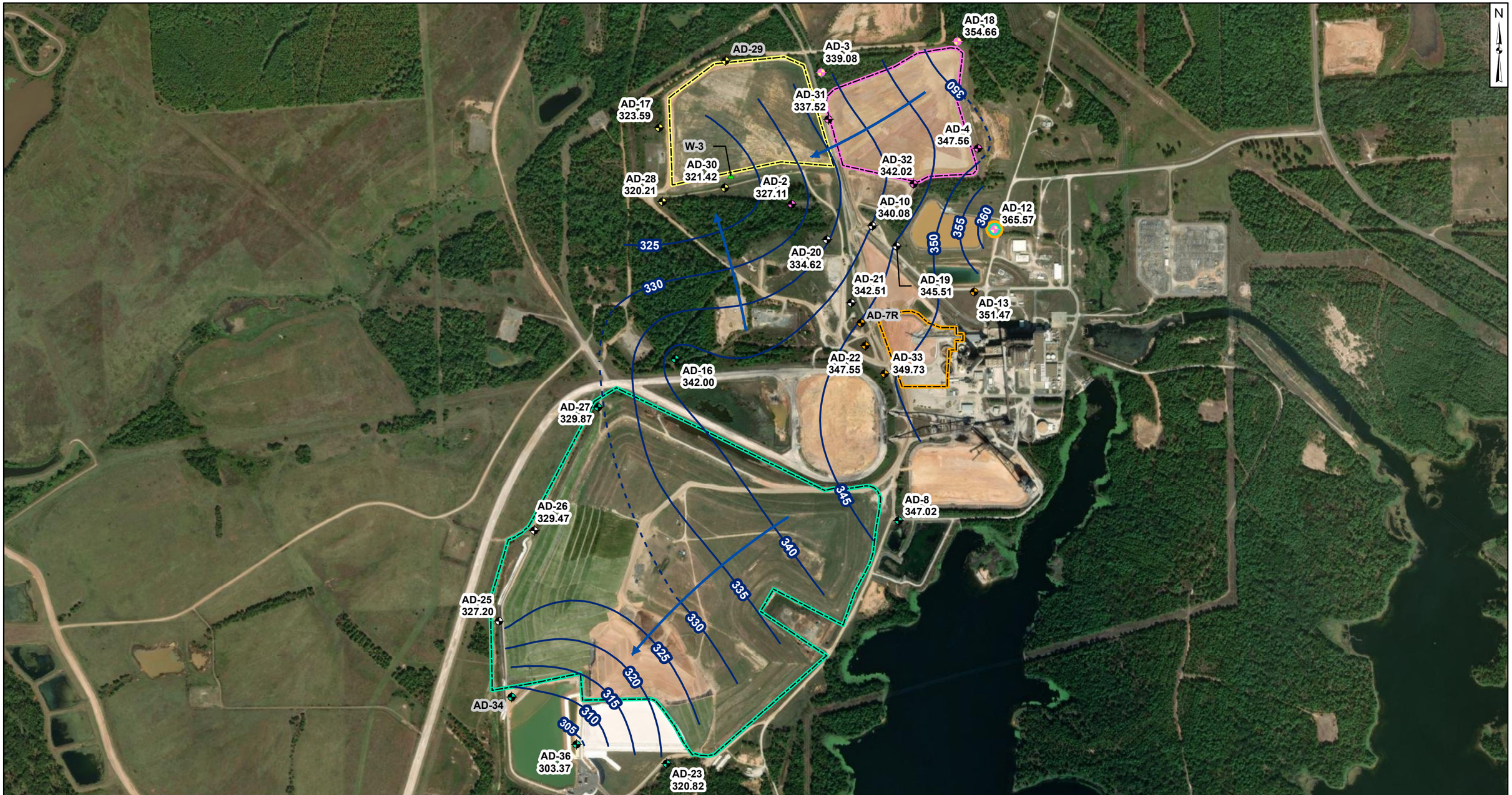
AEP Pirkey Power Plant
Hallsville, Texas

Geosyntec consultants

Columbus, Ohio | 2024/12/02

Figure 2

\\annarbor-01\Data\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Pirkey\2024\AEP-Pirkey_GW_2024-04Pirkey.mxd. ASoltero. 12/2/2024. Project/Phase/Task.



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.

1,000 500 0 1,000 Feet

Beth Ann Gross

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

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED
PROFESSIONAL ENGINEER

Potentiometric Contours: Uppermost Aquifer
September 2024

AEP Pirkey Power Plant
Hallsville, Texas

Geosyntec consultants

Columbus, Ohio | 2024/12/24

Figure 3

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Pirkey\2024\AEP-Pirkey_GW_2024-09Pirkey.mxd. Okiemute.Commander. 12/24/2024. Project/Phase/Task.

APPENDIX 2- Statistical Analyses

The reports summarizing the statistical evaluation follow.

Geosyntec consultants

engineers | scientists | innovators

STATISTICAL ANALYSIS SUMMARY, WEST BOTTOM ASH POND SECOND SEMIANNUAL EVENT 2023

H.W. Pirkey Power Plant
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 Number: CHA8500B

March 6, 2024

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

ASD	alternative source demonstration
CCR	coal combustion residuals
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
SU	standard units
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TDS	total dissolved solids
UPL	upper prediction limit
WBAP	West Bottom Ash Pond

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 West Bottom Ash Pond (WBAP), 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 at the WBAP. An alternative source was not identified at the time, so assessment monitoring was initiated and GWPSs were set in accordance with 30 TAC § 352.951(b). A sampling event for both Appendix III parameters and Appendix IV parameters, as required by § 352.951(a), was completed in June 2023. A statistically significant level (SSL) was observed for cobalt (Geosyntec 2023a). In accordance with § 352.951(e), an alternative source demonstration (ASD) was successfully completed (Geosyntec 2024). Therefore, the unit remained in assessment monitoring. An assessment monitoring event was conducted at the WBAP in October 2023 in accordance with § 352.951(a). The results of the October 2023 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 SSLs of Appendix IV parameters were present above the GWPS. An SSL was identified for cobalt. Therefore, either the unit will move to an assessment of corrective measures, or an 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. WEST BOTTOM ASH POND EVALUATION

2.1 Data Validation and QA/QC

During the October 2023 assessment monitoring event, one set of samples was collected for analysis from each background and compliance well to meet the requirements of § 352.951(a). Samples from the October 2023 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.10.0.15 statistics software. The export file was checked against the analytical data for transcription errors and completeness.

2.2 Statistical Analysis

Statistical analyses for the WBAP 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 October 2023 were screened for potential outliers. An outlier was identified at background well MW-18 for mercury. The identified value was below the maximum contaminant level (MCL); therefore, no outliers were flagged 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 chromium and combined radium. Nonparametric tolerance limits were calculated for arsenic, barium, beryllium, cadmium, cobalt, fluoride, lead, lithium, and selenium due to apparent nonnormal distributions, and for antimony, mercury, molybdenum, 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).

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 WBAP:

- The LCL for cobalt exceeded the GWPS of 0.00900 milligrams per liter (mg/L) at AD-28 (0.0131 mg/L).

As a result, the Pirkey WBAP 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. Intrawell tests were used to evaluate potential SSIs for calcium, pH, sulfate, and total dissolved solids (TDS), and interwell tests were used to evaluate potential SSIs for boron, chloride, and fluoride. Interwell and intrawell prediction limits are updated periodically during the assessment monitoring period as sufficient data become available.

For intrawell tests, insufficient data was available to compare against the existing background dataset, and so the prediction limits were not updated for the intrawell tests at this time. The intrawell prediction limits were previously calculated using historical data through June 2022 (Geosyntec 2023b).

Prediction limits for the interwell tests were recalculated using data collected during the 2023 assessment monitoring events. 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.

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-Francía 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, and fluoride using historical data through October 2023. Intrawell UPLs for calcium, pH, sulfate, and TDS and intrawell lower prediction limits (LPLs) for pH were previously updated using data through June 2022 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 an SSL was identified, a review of the Appendix III results was also completed to assess whether concentrations of Appendix III parameters at the compliance wells were above background concentrations. Data collected during the October 2023 assessment monitoring event from each compliance well were compared to calculated interwell and previously established 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 0.0668 mg/L at AD-28 (0.294 mg/L) and AD-30 (2.07 mg/L).
- Chloride concentrations were above the interwell UPL of 8.79 mg/L at AD-17 (29.7 mg/L) and AD-30 (26.7 mg/L).
- Fluoride concentrations were above the interwell UPL of 0.257 mg/L at AD-17 (0.27 mg/L) and AD-28 (0.50 mg/L).
- pH values were below the intrawell LPL of 3.3 standard units (SU) at AD-17 (3.1 SU).
- Sulfate concentrations were above the intrawell UPL of 31.6 mg/L at AD-30 (148 mg/L).
- TDS concentrations were above the intrawell UPL of 206 mg/L at AD-30 (290 mg/L).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the October 2023 sample was above the UPL or below the LPL in the case of pH. Based on these results, concentrations of Appendix III constituents appear to be above background concentrations.

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. While a potential outlier for mercury was identified in the

October 2023 data, it was not removed from the dataset because the concentration was below the MCL for mercury. 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. An SSL was identified for cobalt. Appendix III parameters were compared to calculated prediction limits; concentrations of boron, chloride, fluoride, sulfate, and TDS were identified above the prediction limits and pH values were identified below the LPLs.

Based on this evaluation, the Pirkey WBAP 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. 2023a. Statistical Analysis Summary – West Bottom Ash Pond, Pirkey, Hallsville, Texas. Geosyntec Consultants, Inc. October.

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Geosyntec. 2024. Alternative Source Demonstration Report – Texas State CCR Rule. H.W. Pirkey Power Plant, West Bottom Ash Pond, Hallsville, Texas. Geosyntec Consultants, Inc. January.

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 – West Bottom Ash Pond

Parameter	Unit	AD-3	AD-12	AD-17	AD-18	AD-28	AD-30
		10/18/2023	10/17/2023	10/17/2023	10/18/2023	10/17/2023	10/17/2023
Antimony	µg/L	0.1 U1	0.01 J1	0.1 U1	0.023 J1	0.009 J1	0.1 U1
Arsenic	µg/L	0.57	0.06 J1	0.22	0.43	0.16	0.17
Barium	µg/L	57.7	23.6	249	84.0	114	63.8
Beryllium	µg/L	0.174	0.142	0.667	0.127	0.469	0.090
Boron	mg/L	0.036 J1	0.015 J1	0.023 J1	0.011 J1	0.294	2.07
Cadmium	µg/L	0.016 J1	0.006 J1	0.054	0.018 J1	0.043	0.01 J1
Calcium	mg/L	4.04	0.27	0.94	0.35	1.23	0.79
Chloride	mg/L	6.17	6.74	29.7	5.05	4.64	26.7
Chromium	µg/L	0.33	0.31	0.31	0.52	0.42	0.44
Cobalt	µg/L	3.70	1.19	11.0	1.26	10.9	4.11
Combined Radium	pCi/L	1.19	1.08	5.39	1.27	2.31	0.99
Fluoride	mg/L	0.06	0.07	0.27	0.06 U1	0.50	0.05 J1
Lead	µg/L	0.12 J1	0.07 J1	0.12 J1	0.12 J1	0.09 J1	0.2 U1
Lithium	mg/L	0.0587	0.00891	0.0244	0.0186	0.0262	0.0124
Mercury	µg/L	0.005 U1	0.005 U1	0.196	0.084	0.009	0.005
Molybdenum	µg/L	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1
Selenium	µg/L	0.04 J1	0.21 J1	0.58	0.17 J1	0.22 J1	0.42 J1
Sulfate	mg/L	28.6	2.7	1.6	10	22.1	148
Thallium	µg/L	0.05 J1	0.2 U1	0.04 J1	0.05 J1	0.03 J1	0.04 J1
Total Dissolved Solids	mg/L	140	58	77	98	94	290
pH	SU	4.8	3.8	3.1	3.9	3.5	4.2

Notes:
J1: Estimated value. Parameter was detected in concentrations below the reporting limit.
mg/L: milligrams per liter
pCi/L: picocuries per liter
SU: standard unit
U1: Nondetect 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 - West Bottom Ash Pond

Constituent Name	MCL	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600	0.000100	0.00600
Arsenic, Total (mg/L)	0.0100	0.00423	0.0100
Barium, Total (mg/L)	2.00	0.157	2.00
Beryllium, Total (mg/L)	0.00400	0.00100	0.00400
Cadmium, Total (mg/L)	0.00500	0.000159	0.00500
Chromium, Total (mg/L)	0.100	0.00244	0.100
Cobalt, Total (mg/L)	n/a	0.00900	0.00900
Combined Radium, Total (pCi/L)	5.00	2.98	5.00
Fluoride, Total (mg/L)	4.00	0.257	4.00
Lead, Total (mg/L)	n/a	0.00100	0.00100
Lithium, Total (mg/L)	n/a	0.108	0.108
Mercury, Total (mg/L)	0.00200	0.0000840	0.00200
Molybdenum, Total (mg/L)	n/a	0.00116	0.00116
Selenium, Total (mg/L)	0.0500	0.00330	0.0500
Thallium, Total (mg/L)	0.00200	0.00113	0.00200

Notes:
1. Calculated UTL (upper tolerance limit) represents site-specific background values.
2. Grey cells indicate the GWPS is based on the calculated UTL because an MCL does not exist.
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 – West Bottom Ash Pond

Analyte	Unit	Description	AD-17	AD-28	AD-30
			10/17/2023	10/17/2023	10/17/2023
Boron	mg/L	Interwell Background Value (UPL)	0.0668		
		Analytical Result	0.023	**0.294**	**2.07**
Calcium	mg/L	Intrawell Background Value (UPL)	1.34	3.21	1.03
		Analytical Result	0.94	1.23	0.79
Chloride	mg/L	Interwell Background Value (UPL)	8.79		
		Analytical Result	**29.7**	4.64	**26.7**
Fluoride	mg/L	Interwell Background Value (UPL)	0.257		
		Analytical Result	**0.27**	**0.50**	0.05
pH	SU	Intrawell Background Value (UPL)	4.7	5.4	5.3
		Intrawell Background Value (LPL)	3.3	3.4	3.8
		Analytical Result	**3.1**	3.5	4.2
Sulfate	mg/L	Intrawell Background Value (UPL)	8.56	30.1	31.6
		Analytical Result	1.6	22.1	**148**
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	108	130	206
		Analytical Result	77	94	**290**

Notes:
1. Bold values exceed the background value.
2. Background values are shaded gray.
mg/L: milligrams per liter
LPL: lower prediction limit
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 West Bottom Ash Pond 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	Texas	03.07.2024
License Number	Licensing State	Date

ATTACHMENT B
Data Quality Review Memorandum

Geosyntec consultants

500 W. Wilson Bridge Road, Suite 250
Worthington, Ohio 43085
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Memorandum

Date:	January 9, 2024
To:	David Miller (AEP)
Copies to:	Leslie Fuerschbach (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Data Quality Review – Pirkey Power Plant October 2023 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 October 2023. 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") for the West Bottom Ash Pond (EBAP) and Flue Gas Desulfurization (FGD) Stackout Area regulated units. 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 August 2023 sampling event and are reviewed in this memorandum:

- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 233267
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 233279

The data included in these SDGs were reviewed to assess if they met the objectives outlined in TCEQ Draft Technical Guideline No. 32[1] prior to submittal of this data to TCEQ.

The following data quality issues were identified:

- As reported in SDG 233267, chloride and sulfate were detected in the field blank sample "FIELD BLANK" collected on 10/17/2023. The estimated sulfate concentration in the

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

field blank (0.2 mg/L) was more than 10% of the detected value for sulfate in the AD-17 groundwater sample, which could result in high bias for the AD-17 groundwater sulfate results.

- As reported in SDG 233267, chloride and sulfate were detected in the equipment blank sample "EQUIPMENT BLANK" collected on 10/17/2023. The estimated sulfate concentration in the equipment blank (0.2 mg/L) was more than 10% of the detected value for sulfate in the AD-17 groundwater sample, which could result in high bias for the AD-17 groundwater sulfate results.

- As reported in SDG 233279, chromium and cobalt were detected in the field blank sample "FIELD BLANK" collected on 10/17/2023. The detected chromium concentration in the field blank (0.51 µg/L) was more than 10% of the detected value for chromium in all groundwater samples, which could result in high bias for all groundwater chromium results.

- As reported in SDG 233279, chromium and cobalt were detected in the equipment blank sample "EQUIPMENT BLANK" collected on 10/17/2023. The detected chromium concentration in the equipment blank (0.38 µg/L) was more than 10% of the detected value for chromium in all groundwater samples, which could result in high bias for all groundwater chromium results.

- The quality control data provided with SDG 233279 noted that the recovery on the matrix spikes for barium, beryllium, calcium, and lithium and the matrix spike duplicates for boron, barium, beryllium, calcium, cobalt, and lithium associated with sample "DUPLICATE A" (parent sample = AD-7R) had low recoveries. The barium, beryllium, calcium, cobalt, and lithium results for sample "DUPLICATE A" were qualified with "M1: the associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits".

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, the data are considered usable for supporting project objectives.

ATTACHMENT C
Statistical Analysis Output

GROUNDWATER STATS CONSULTING

February 26, 2024

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

Re: Pirkey WBAP - Assessment Monitoring Event & Background Update 2023

Dear Ms. Kreinberg,

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the background update and assessment of 2023 groundwater data for American Electric Power Inc.'s Pirkey West Bottom Ash Pond. 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 Residuals (CCR) program in 2016. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** AD-3, AD-12, and AD-18
- **Downgradient wells:** AD-17, AD-28, and AD-30

Data were sent electronically, and the statistical analysis was reviewed by Andrew Collins, Project Manager of Groundwater Stats Consulting. The analysis was conducted according to the Statistical Analysis Plan and initial screening evaluation prepared in November 2017 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 CCR program consists of the following constituents listed below. The terms "constituent" and "parameter" are interchangeable.

- **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 and box plots for Appendix III and IV parameters are provided for all wells and constituents, and are used to evaluate concentrations over the entire record (Figures A & B, respectively). A summary of the values identified as outliers in this report and through previous screenings follows this letter. These values are deselected prior to the statistical analysis. 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 calculation of intrawell prediction limits, 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. 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.

In earlier analyses, 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 during the initial background screening and demonstrated that the selected statistical methods for Appendix III parameters comply with the USEPA Unified Guidance recommendations as discussed below.

Summary of Statistical Methods – Appendix III Parameters

Based on the original background screening described in the 2017 screening report, the following statistical methods were selected for Appendix III parameters:

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

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. While the annual false positive rate associated with parametric limits is fixed at 10% as recommended by the EPA Unified Guidance (2009), the false positive rate associated with nonparametric limits is not fixed and depends upon the available background sample size, number of future comparisons, and verification resample plan. 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 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 is necessary to accommodate these types of changes. In the intrawell case, data for all wells and constituents may be 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 the interwell case, prediction limits are updated with upgradient well data following each sampling event after screening for any new outliers. In some cases, deselecting the earlier portion of data may be necessary prior to construction of limits so that resulting statistical limits are conservative (lower) from a regulatory perspective and capable of rapidly detecting 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.

Appendix III Background Update Summary – Conducted in January 2024

Prior to updating background data sets during this analysis, Tukey's outlier test and visual screening were used to evaluate data through October 2023 at upgradient wells for boron, chloride, and fluoride, which are tested using interwell prediction limits. (Figure C).

Outlier Analysis

Tukey's outlier test on pooled upgradient well data for boron, chloride, and fluoride identified both high and low values for both fluoride; however, no additional values were flagged since concentrations identified by Tukey's test appeared to be representative of spatial variation or were similar to other measurements among pooled upgradient well data. 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.

For parameters which use intrawell prediction limits (calcium, pH, sulfate, and TDS), values were not re-evaluated for new outliers as these records had insufficient samples for updating background at this time.

Intrawell – Prediction Limits

Intrawell prediction limits, combined with a 1-of-2 resample plan, were constructed using historical data through June 2022 for calcium, pH, sulfate, and TDS (Figure D). A summary of the limits follows this letter. No comparisons of the October 2023 observations were performed 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, and fluoride to identify statistically significant increasing or decreasing trends (Figure E). The results of the trend analyses showed a decreasing trend for chloride in upgradient wells AD-18. Since concentrations for this well are similar to those among all other upgradient wells, no adjustments were required at this time. All available data were used to construct statistical limits for boron, chloride, and fluoride.

Interwell – Prediction Limits

Interwell prediction limits, combined with a 1-of-2 resample plan, were constructed using all available data from upgradient wells through October 2023 for boron, chloride, and fluoride (Figure F). 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. Interwell prediction limits pool upgradient well data to establish a background limit for an individual constituent. A summary table of the updated limits may be found following this letter.

Evaluation of Appendix IV Parameters – October 2023

Prior to evaluating Appendix IV parameters, upgradient well data are screened through both 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 through October 2023 identified outliers for fluoride and mercury. However, no new values were flagged as outliers as the measurements were similar to concentrations at neighboring upgradient wells or were below the MCL. No changes to previously flagged outliers were made among upgradient wells for Appendix IV parameters as these measurements were confirmed by visual screening.

During previous screenings, the highest value for lithium at upgradient well AD-3 was flagged to construct statistical limits that are conservative (i.e., lower) from a regulatory perspective. The reporting limit for thallium for the February 2019 event was 0.01 mg/L, which is higher than the historical reporting limit of 0.002 mg/L. Therefore, this value was flagged as an outlier at wells with reported non-detects for the February 2019 event. Similarly, the high non-detects for molybdenum of 0.04 mg/L for February and May of 2019 are flagged since they are censored at a much higher level than the other non-detects.

Additionally, downgradient well data through October 2023 were screened through visual screening using time series graphs. Since the downgradient well data are used to construct confidence intervals, a regulatory conservative approach is taken in that values that are marginally high relative to the rest of the data are retained unless there is particular justification for excluding them. 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).

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 H). 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

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 I).

Confidence Intervals

Confidence intervals were then constructed using data through October 2023 on downgradient wells 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, which use the highest and lowest order statistic, 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. Complete graphical results of the confidence intervals follow this letter (Figure I). An exceedance was identified for the following well/constituent pair:

- Cobalt: AD-28

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. 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:
- None

Decreasing:
- Cobalt: AD-18 (upgradient) and AD-28

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

For Groundwater Stats Consulting,

Abdul Diane
Groundwater Analyst

Andrew Collins
Project Manager

Date Ranges

Date: 1/2/2024 5:20 PM

Pirkey WBAP Data: Pirkey WBAP

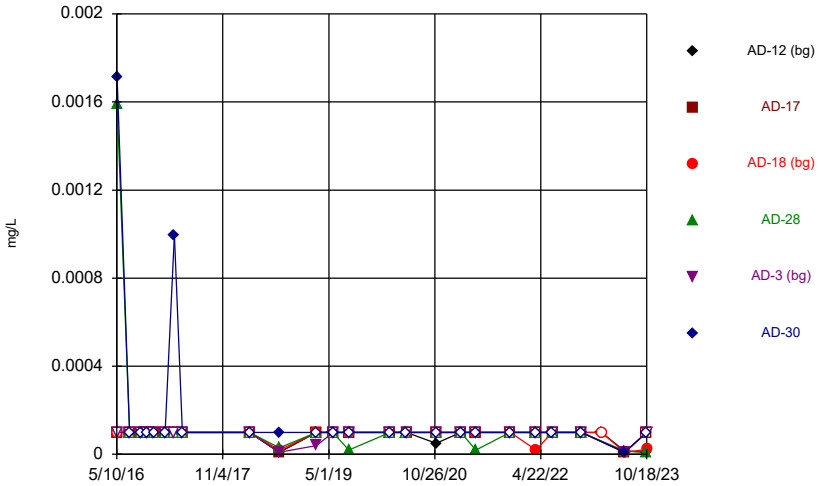
Sulfate, total (mg/L)
    AD-30 overall:5/11/2016-4/11/2017
Total Dissolved Solids [TDS] (mg/L)
    AD-30 overall:5/11/2016-6/3/2020

FIGURE A

Time Series

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

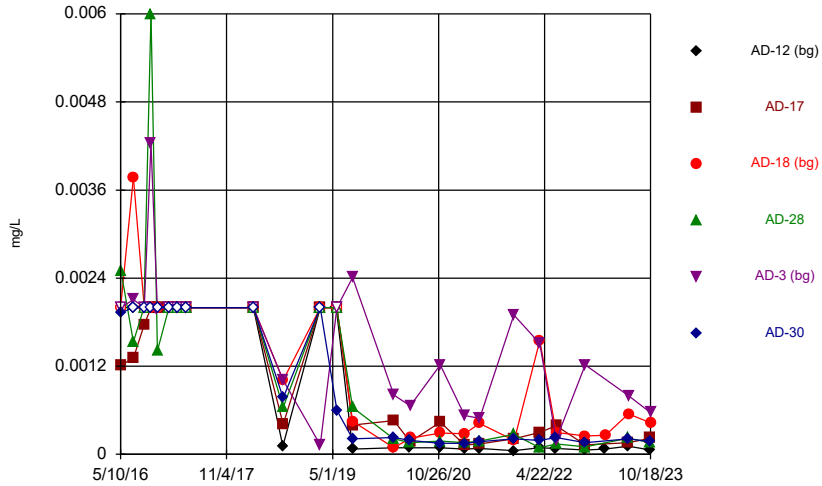
Time Series



Constituent: Antimony, total Analysis Run 1/4/2024 1:10 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

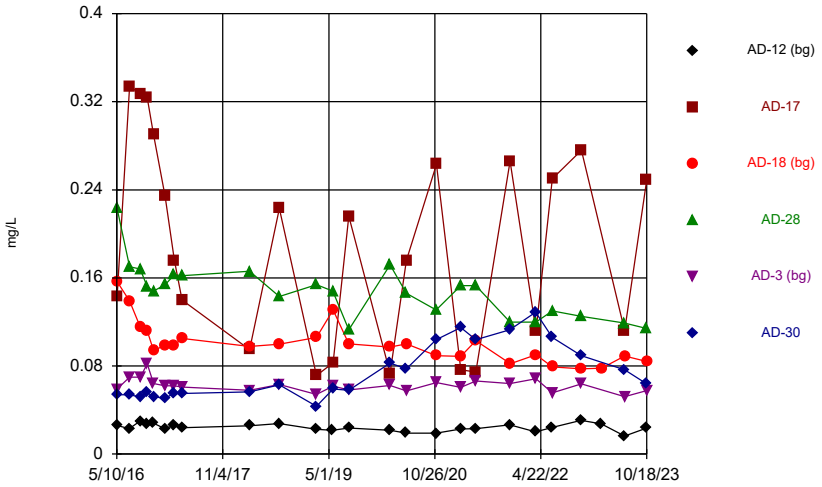
Time Series



Constituent: Arsenic, total Analysis Run 1/4/2024 1:10 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

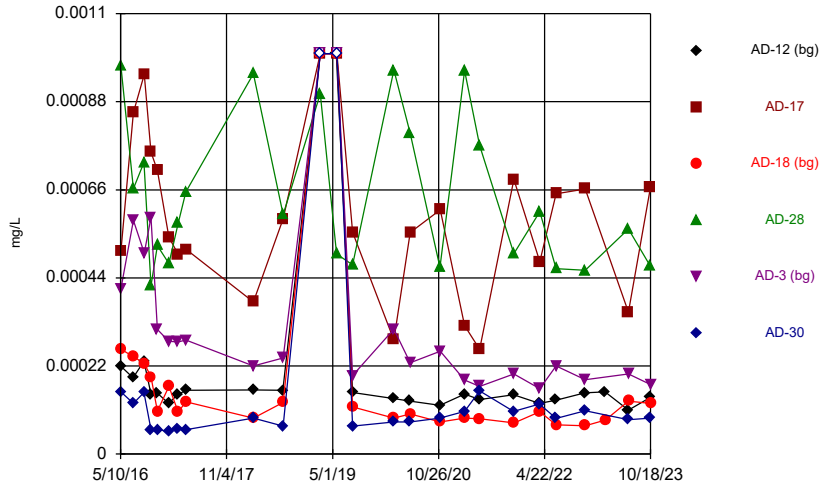
Time Series



Constituent: Barium, total Analysis Run 1/4/2024 1:10 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

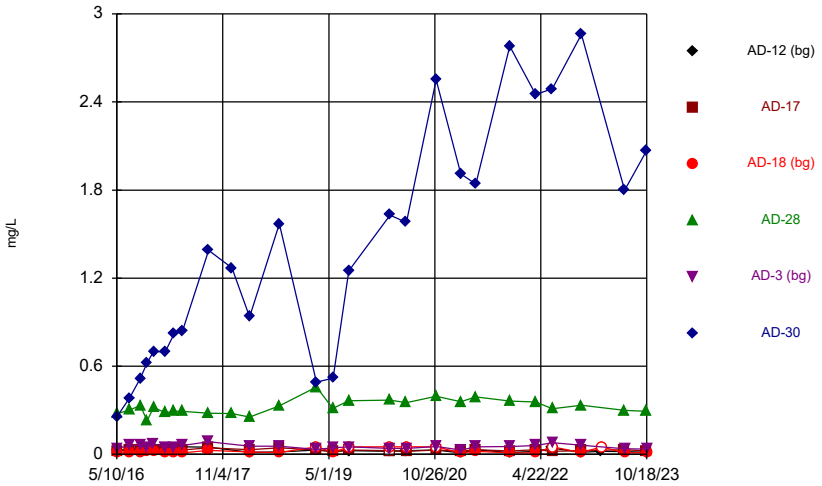
Time Series



Constituent: Beryllium, total Analysis Run 1/4/2024 1:11 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

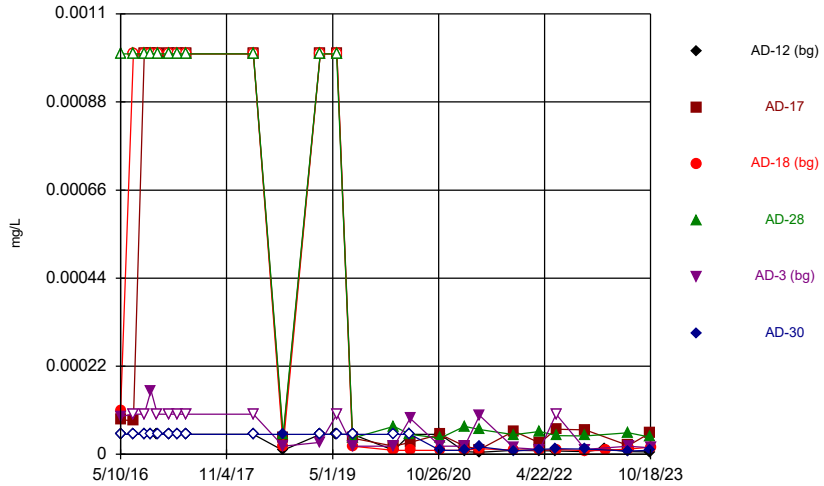
Time Series



Constituent: Boron, total Analysis Run 1/4/2024 1:11 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

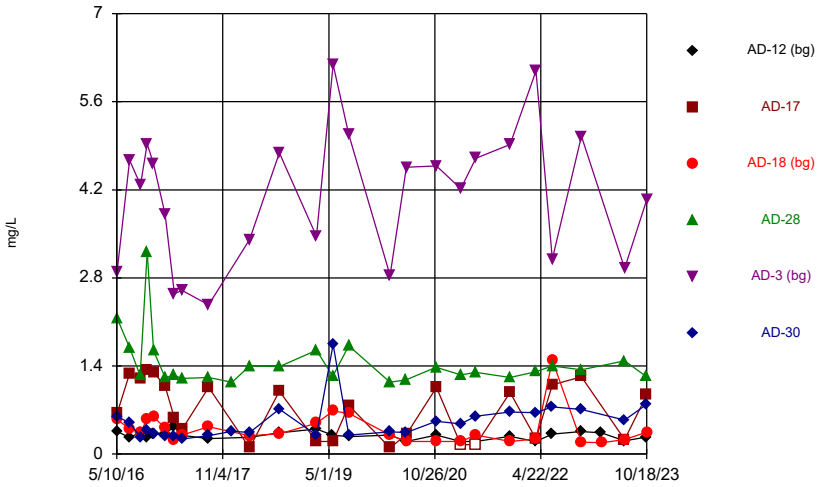
Time Series



Constituent: Cadmium, total Analysis Run 1/4/2024 1:11 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

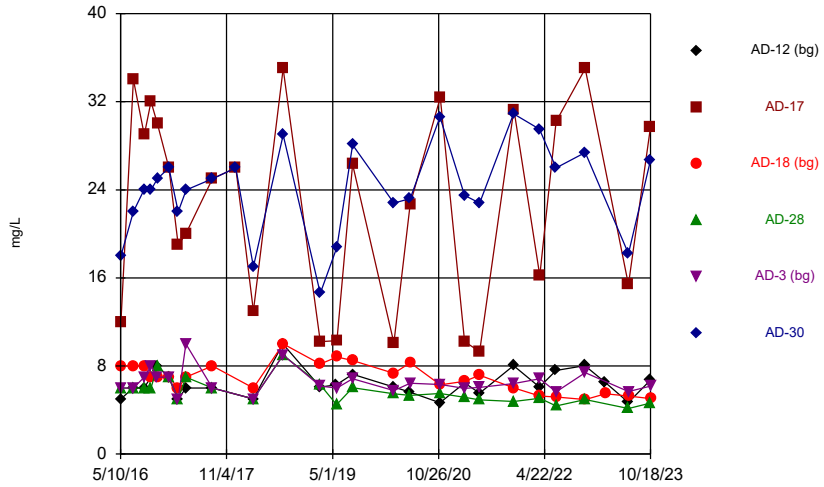
Time Series



Constituent: Calcium, total Analysis Run 1/4/2024 1:11 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

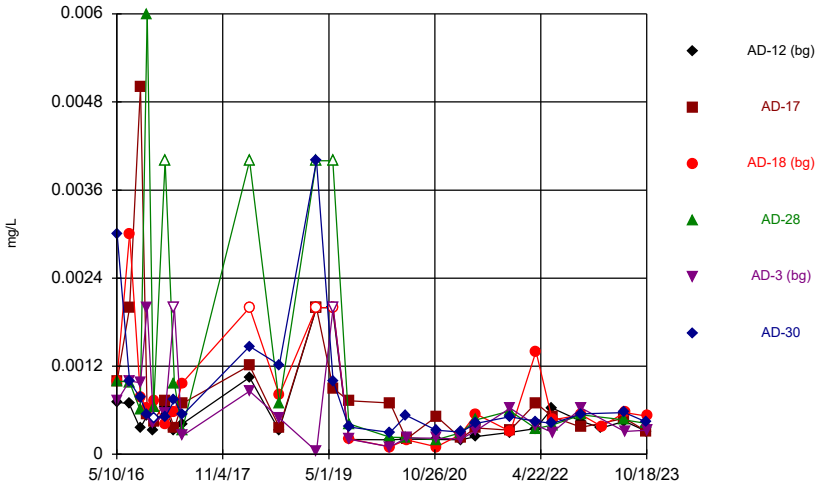
Time Series



Constituent: Chloride, total Analysis Run 1/4/2024 1:11 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

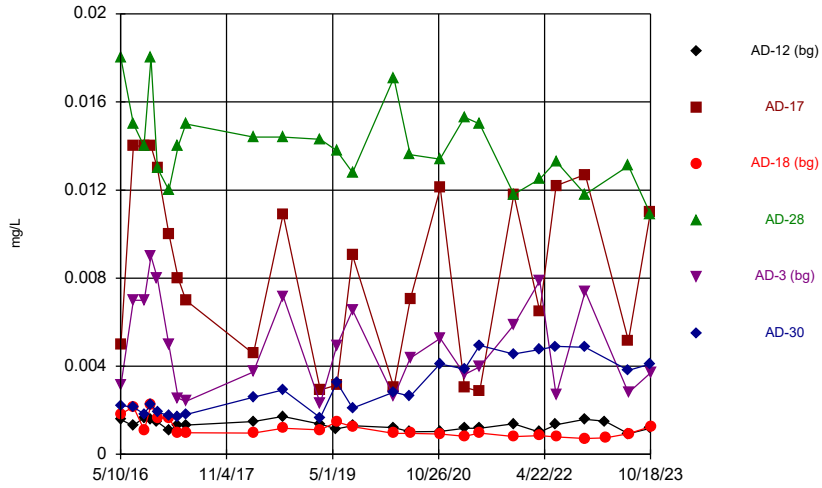
Time Series



Constituent: Chromium, total Analysis Run 1/4/2024 1:11 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

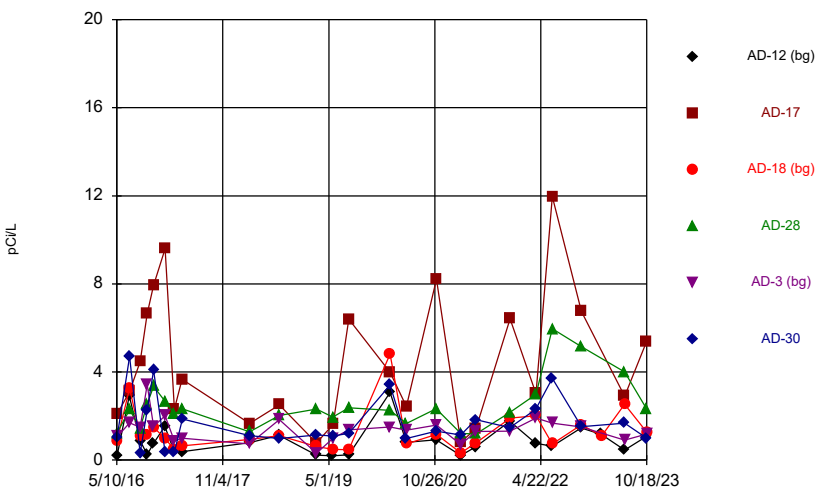
Time Series



Constituent: Cobalt, total Analysis Run 1/4/2024 1:11 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

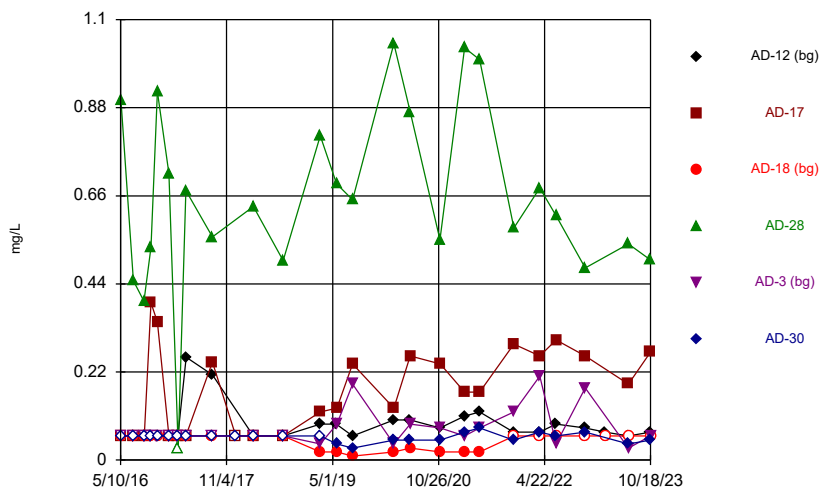
Time Series



Constituent: Combined Radium 226 + 228 Analysis Run 1/4/2024 1:11 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

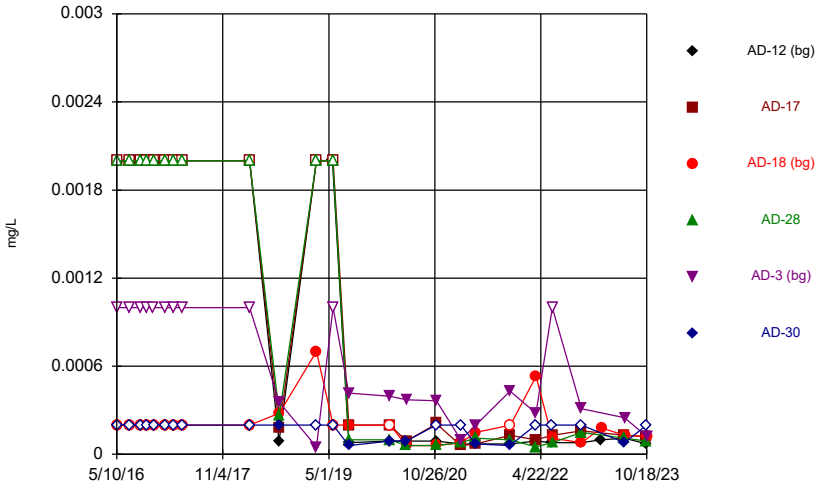
Time Series



Constituent: Fluoride, total Analysis Run 1/4/2024 1:11 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

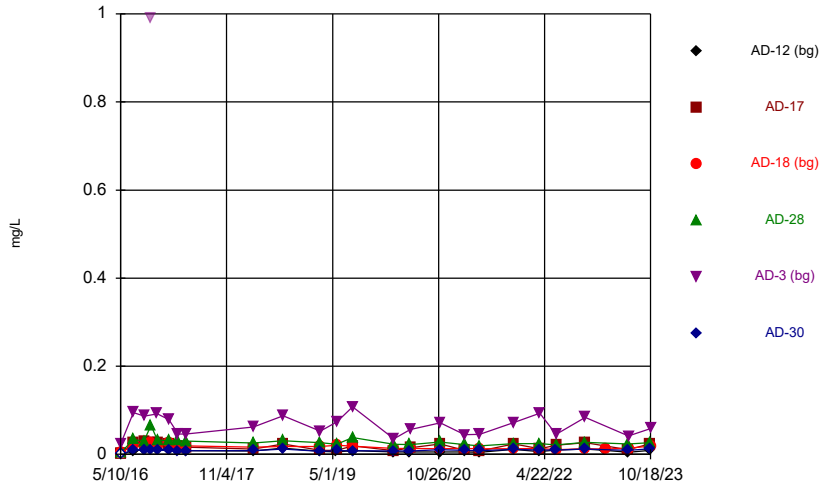
Time Series



Constituent: Lead, total Analysis Run 1/4/2024 1:11 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

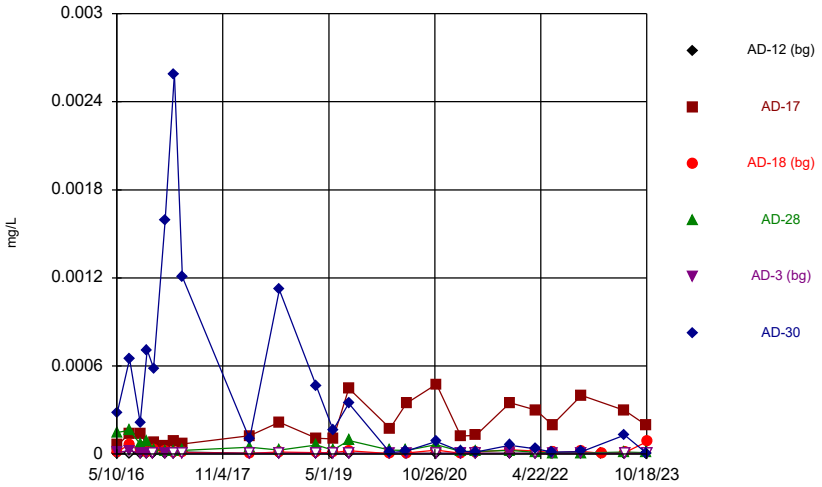
Time Series



Constituent: Lithium, total Analysis Run 1/4/2024 1:11 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

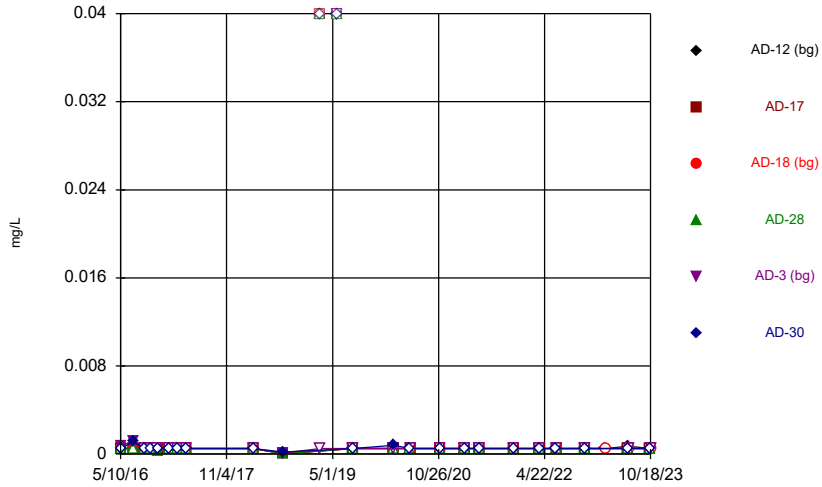
Time Series



Constituent: Mercury, total Analysis Run 1/4/2024 1:11 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

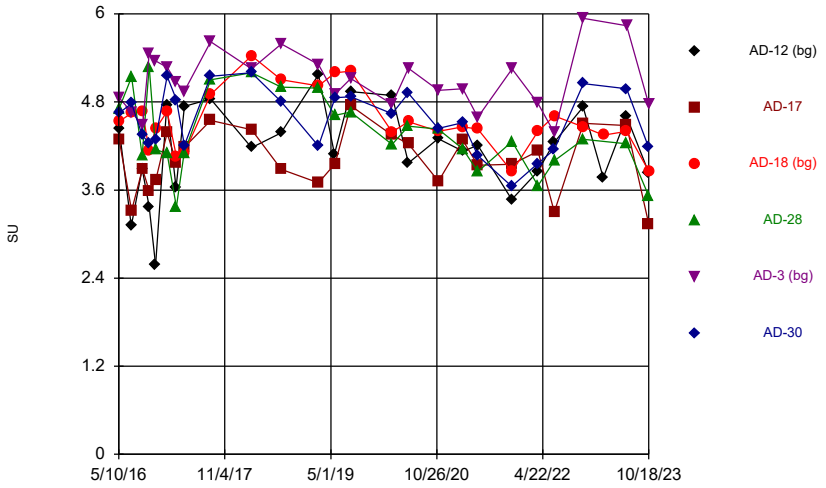
Time Series



Constituent: Molybdenum, total Analysis Run 1/4/2024 1:11 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Time Series



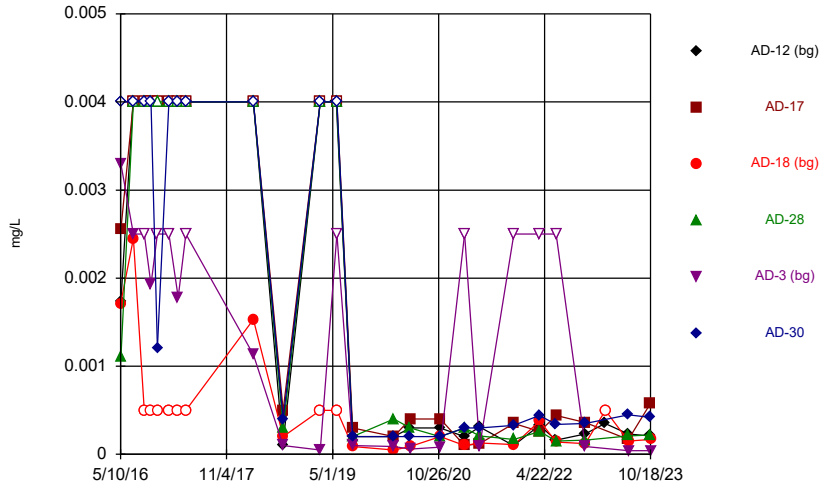
Constituent: pH, field Analysis Run 1/4/2024 1:11 PM

Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Hollow symbols indicate censored values.

Time Series

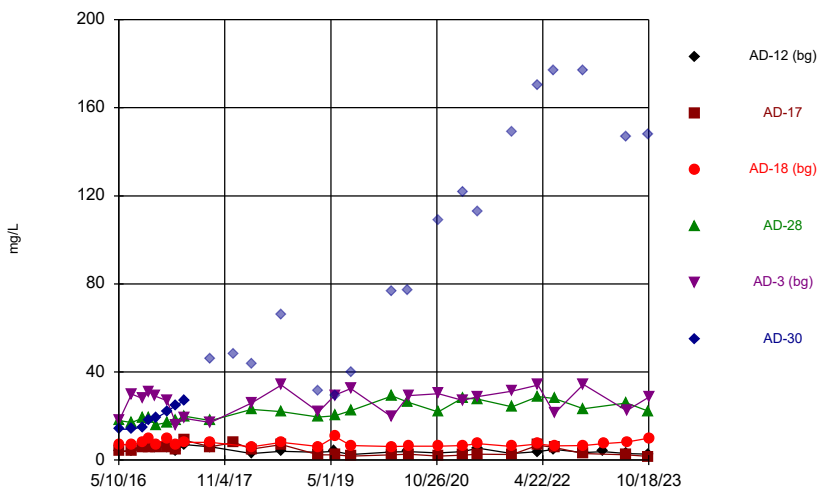


Constituent: Selenium, total Analysis Run 1/4/2024 1:11 PM

Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Time Series



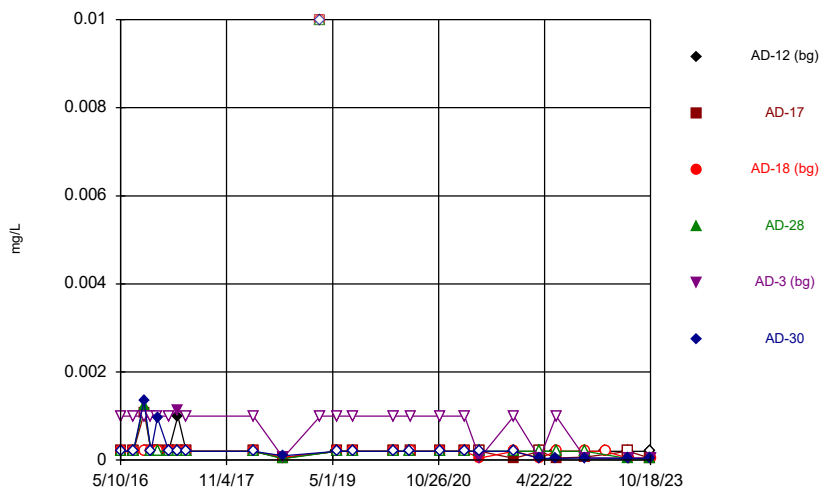
Constituent: Sulfate, total Analysis Run 1/4/2024 1:11 PM

Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Hollow symbols indicate censored values.

Time Series

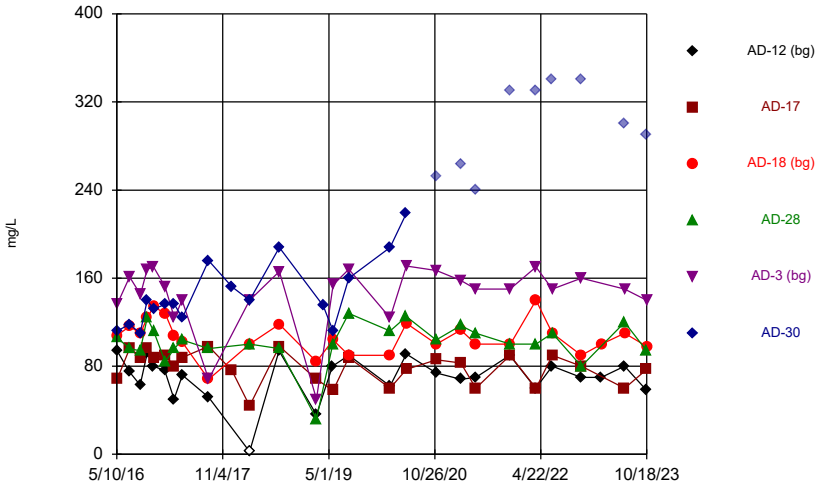


Constituent: Thallium, total Analysis Run 1/4/2024 1:11 PM

Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

Time Series



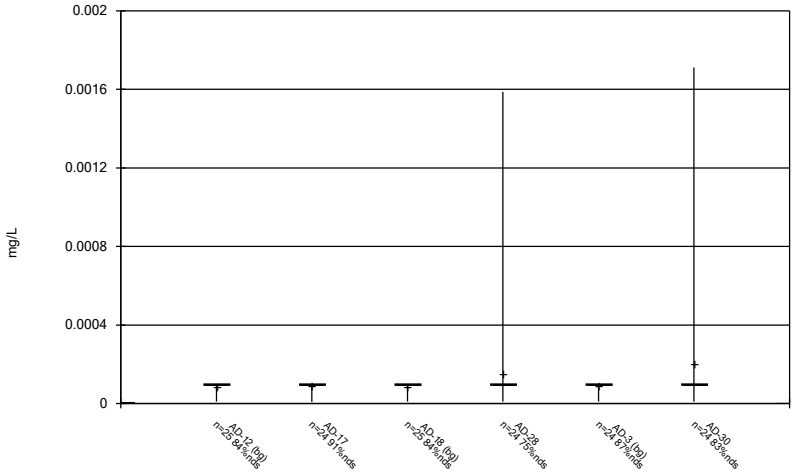
Constituent: Total Dissolved Solids [TDS] Analysis Run 1/4/2024 1:11 PM
Pirkey WBAP Data: Pirkey WBAP

FIGURE B

Box Plots

Sanitas™ v.10.0.15 . UG

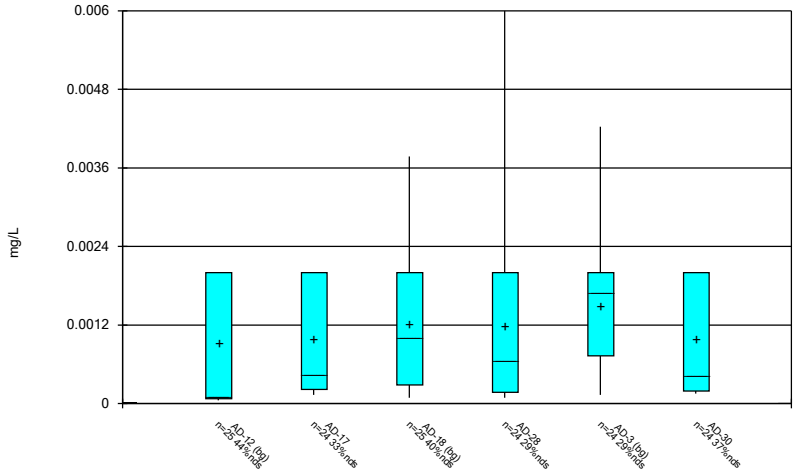
Box & Whiskers Plot



Constituent: Antimony, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

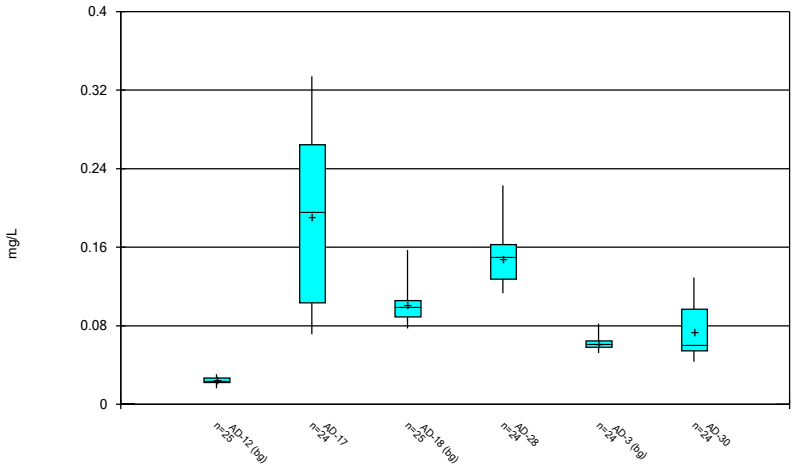
Box & Whiskers Plot



Constituent: Arsenic, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

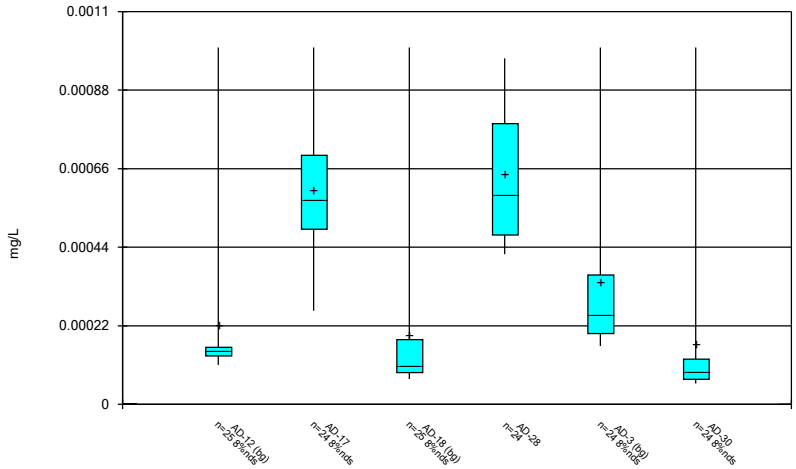
Box & Whiskers Plot



Constituent: Barium, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

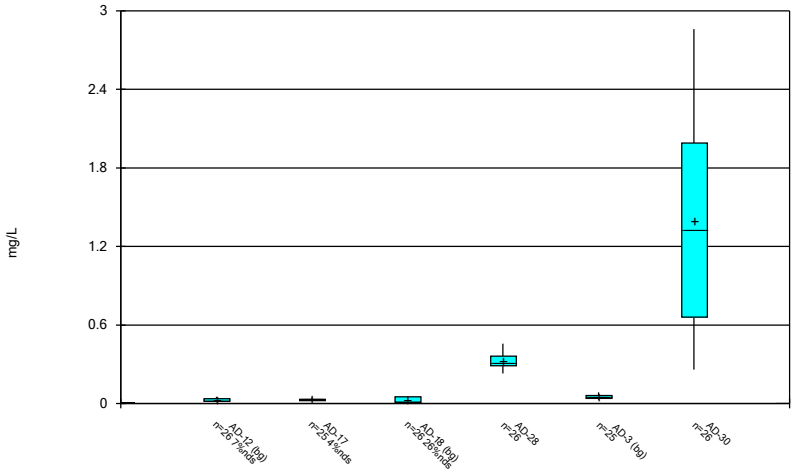
Sanitas™ v.10.0.15 . UG

Box & Whiskers Plot



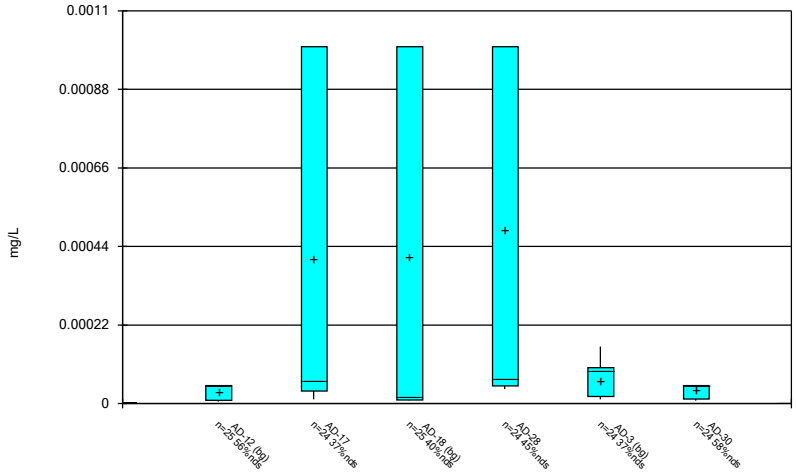
Constituent: Beryllium, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

Box & Whiskers Plot



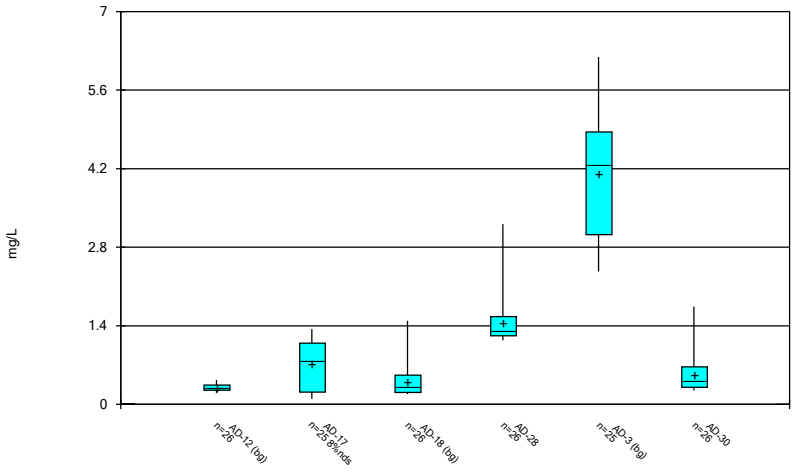
Constituent: Boron, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

Box & Whiskers Plot



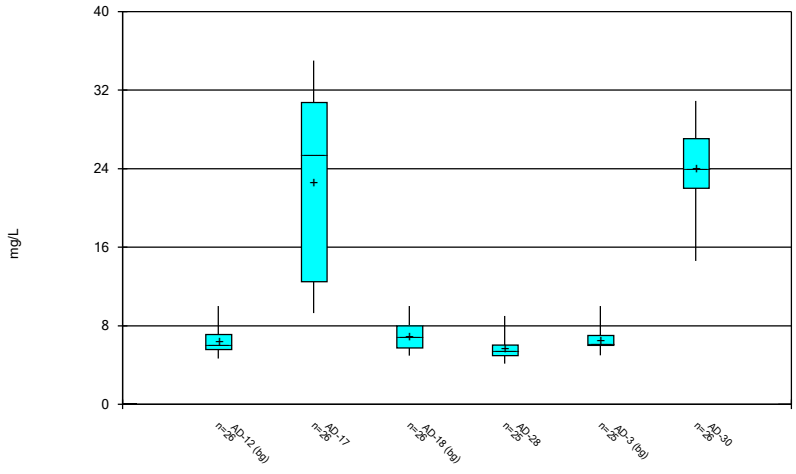
Constituent: Cadmium, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

Box & Whiskers Plot



Constituent: Calcium, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

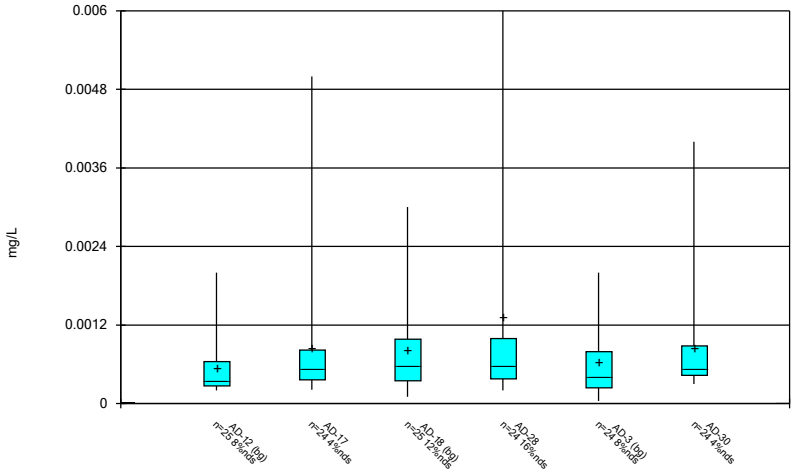
Box & Whiskers Plot



Constituent: Chloride, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

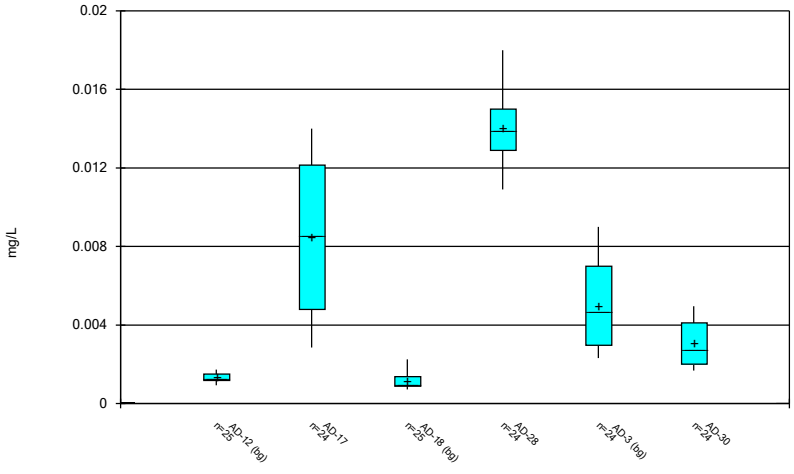
Box & Whiskers Plot



Constituent: Chromium, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

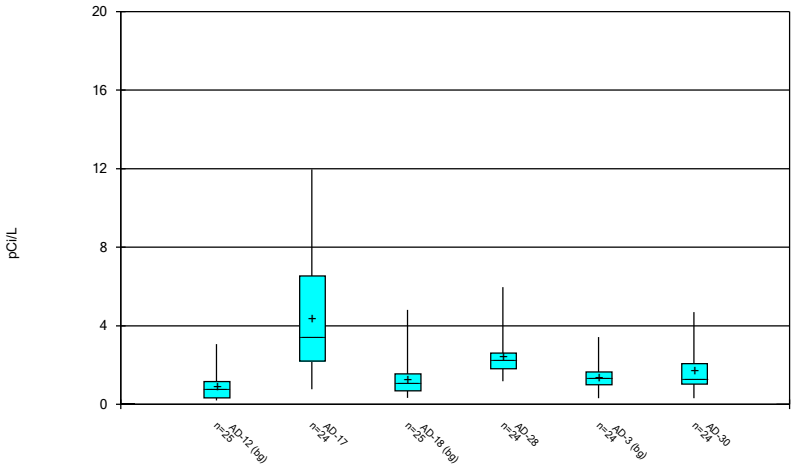
Box & Whiskers Plot



Constituent: Cobalt, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

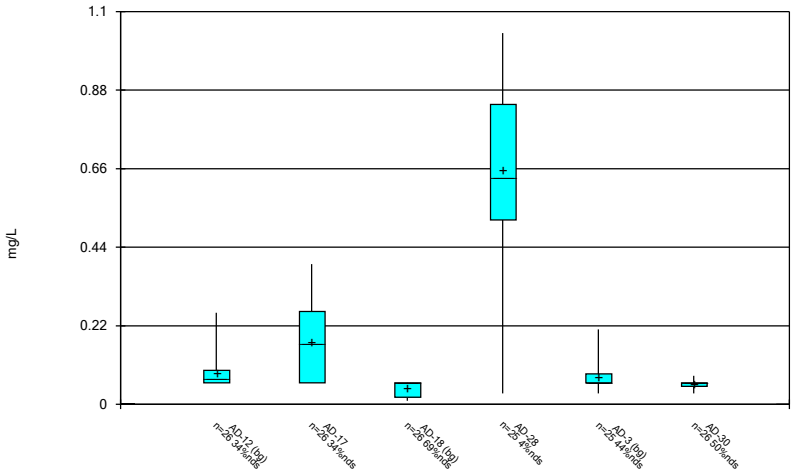
Box & Whiskers Plot



Constituent: Combined Radium 226 + 228 Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

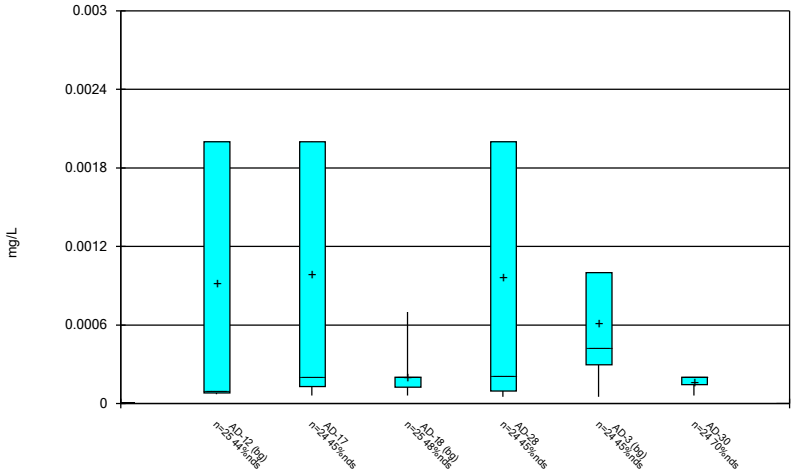
Box & Whiskers Plot



Constituent: Fluoride, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

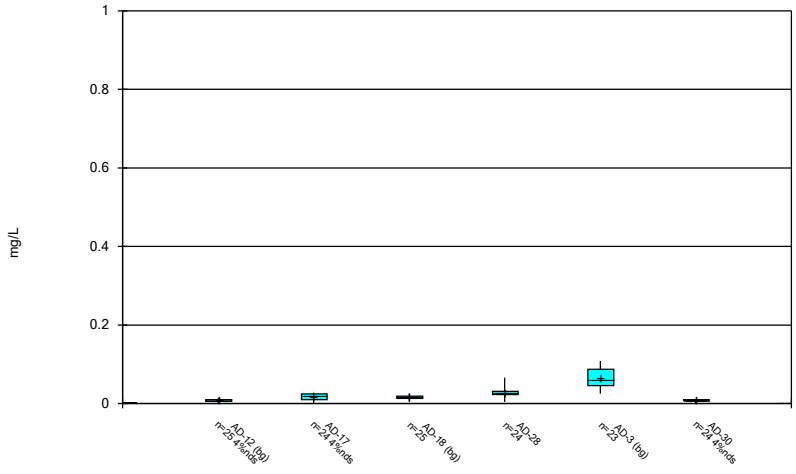
Box & Whiskers Plot



Constituent: Lead, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

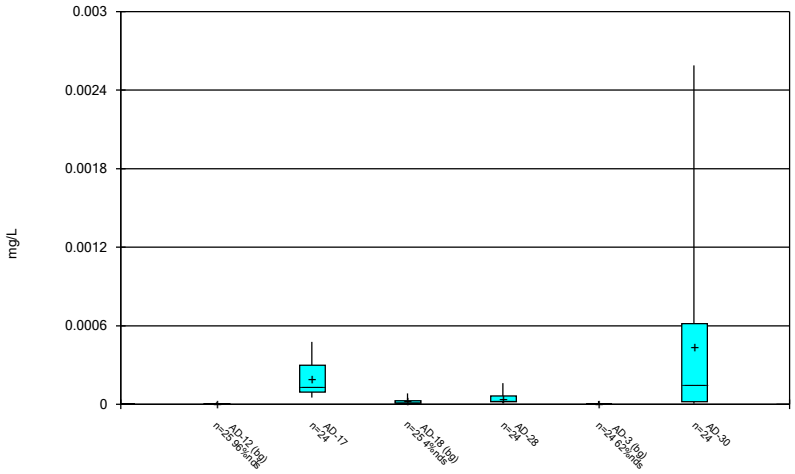
Box & Whiskers Plot



Constituent: Lithium, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

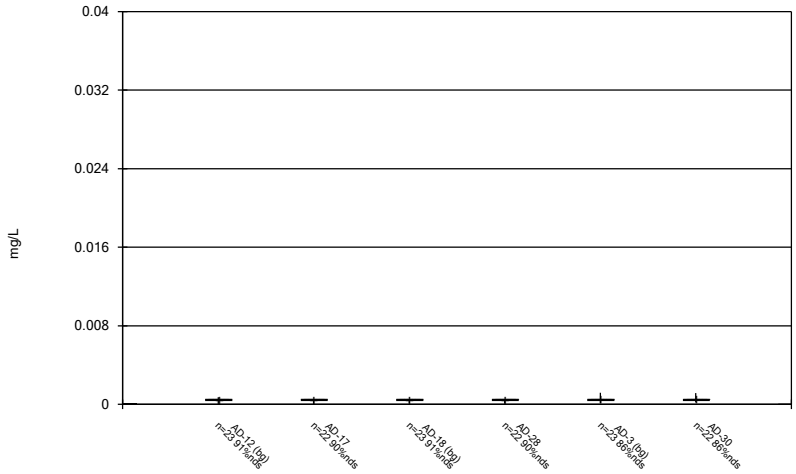
Box & Whiskers Plot



Constituent: Mercury, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

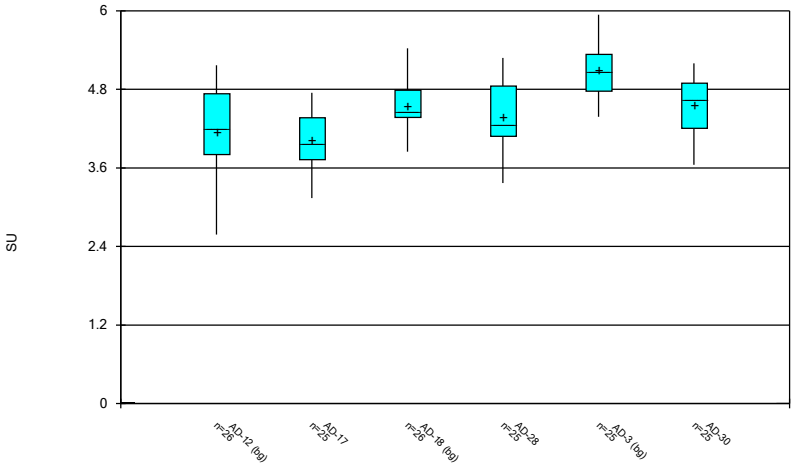
Box & Whiskers Plot



Constituent: Molybdenum, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

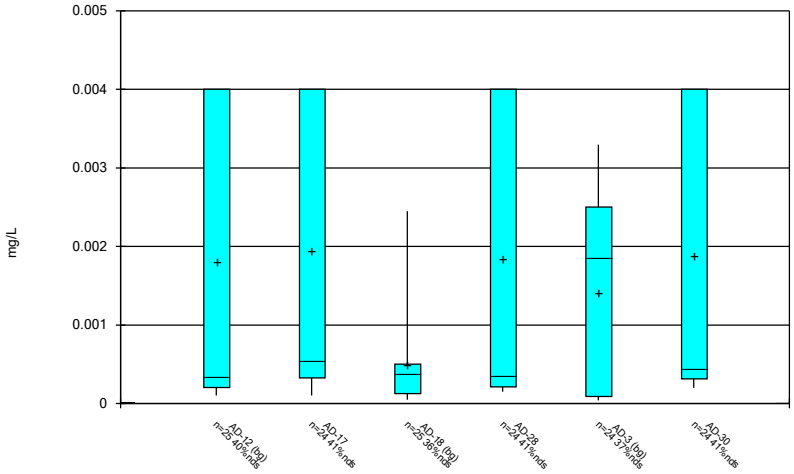
Box & Whiskers Plot



Constituent: pH, field Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

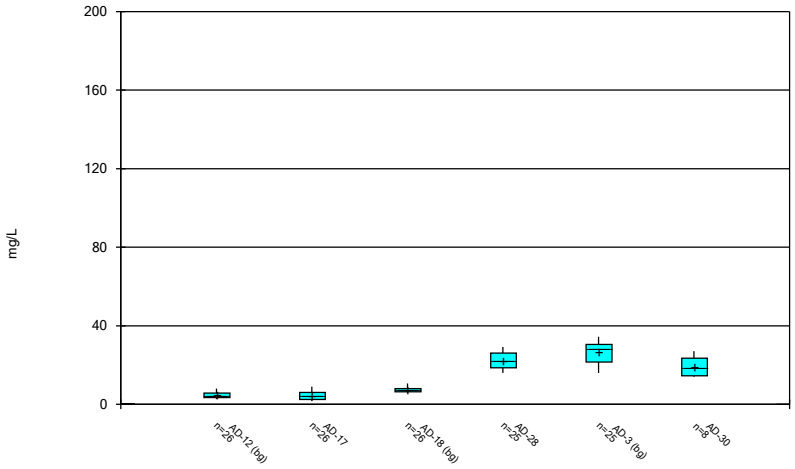
Box & Whiskers Plot



Constituent: Selenium, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

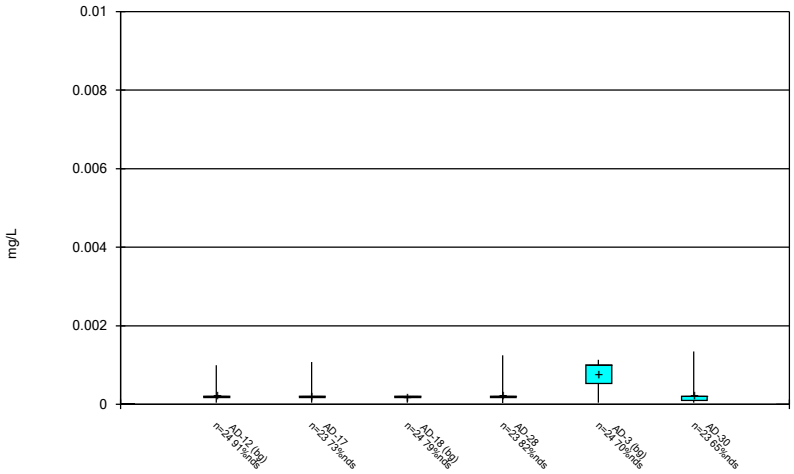
Box & Whiskers Plot



Constituent: Sulfate, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

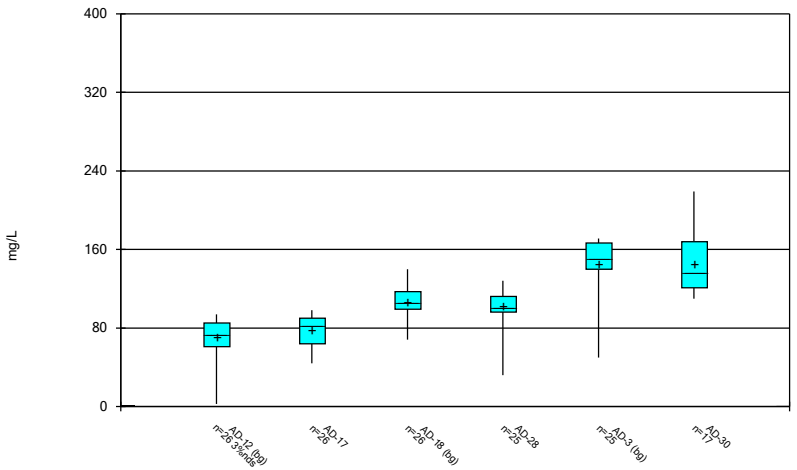
Sanitas™ v.10.0.15 . UG

Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 1/4/2024 1:12 PM
Pirkey WBAP Data: Pirkey WBAP

Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 1/4/2024 1:12 PM

Pirkey WBAP Data: Pirkey WBAP

FIGURE C

Outlier Summary and Tukey's Outlier Test

Outlier Summary

Pirkey WBAP Data: Pirkey WBAP Printed 1/4/2024, 12:04 PM

	AD-3 Lithium, total (mg/L)	AD-12 Molybdenum, total (mg/L)	AD-17 Molybdenum, total (mg/L)	AD-18 Molybdenum, total (mg/L)	AD-28 Molybdenum, total (mg/L)	AD-3 Molybdenum, total (mg/L)	AD-30 Molybdenum, total (mg/L)	AD-12 Thallium, total (mg/L)	AD-17 Thallium, total (mg/L)	AD-18 Thallium, total (mg/L)
10/13/2016	0.991 (o)									
2/27/2019		<0.04 (o)			<0.04 (o)			<0.01 (o)		
2/28/2019			<0.04 (o)	<0.04 (o)			<0.04 (o)		<0.01 (o)	<0.01 (o)
5/21/2019		<0.04 (o)								
5/22/2019					<0.04 (o)					
5/23/2019			<0.04 (o)	<0.04 (o)		<0.04 (o)	<0.04 (o)			

	AD-28 Thallium, total (mg/L)	AD-30 Thallium, total (mg/L)
10/13/2016		
2/27/2019	<0.01 (o)	
2/28/2019		<0.01 (o)
5/21/2019		
5/22/2019		
5/23/2019		

Tukey's Outlier Test - Upgradient Wells - Significant Results

Pirkey WBAP Data: Pirkey WBAP Printed 1/4/2024, 12:01 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Fluoride, total (mg/L)	**AD-12,AD-18,AD-3**	**Yes**	**0.2565,0.213,0.02,0.02,0.02,0.02,0.02,0.02,0.01,0**	**NP**	**NaN**	**77**	**0.07116**	**0.04303**	**ln(x)**	**ShapiroFrancia**
Mercury, total (mg/L)	**AD-12,AD-18,AD-3**	**Yes**	**0.000084**	**NP**	**NaN**	**74**	**0.00001032**	**0.00001278**	**ln(x)**	**ShapiroFrancia**

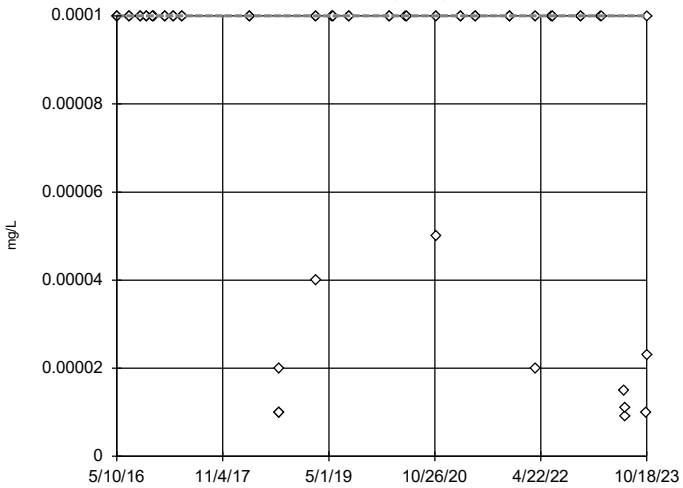
Tukey's Outlier Test - Upgradient Wells - All Results

Pirkey WBAP Data: Pirkey WBAP Printed 1/4/2024, 12:01 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony, total (mg/L)	AD-12,AD-18,AD-3	n/a	n/a	NP	NaN	74	0.00008808	0.00002915	unknown	ShapiroFrancia
Arsenic, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	74	0.001202	0.0009703	x^(1/3)	ShapiroFrancia
Barium, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	74	0.06236	0.03367	sqrt(x)	ShapiroFrancia
Beryllium, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	74	0.0002513	0.0002456	ln(x)	ShapiroFrancia
Boron, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	77	0.03168	0.0186	x^(1/3)	ShapiroFrancia
Cadmium, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	74	0.00005845	0.00004507	ln(x)	ShapiroFrancia
Chloride, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	77	6.633	1.243	ln(x)	ShapiroFrancia
Chromium, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	74	0.000665	0.0006099	ln(x)	ShapiroFrancia
Cobalt, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	74	0.002448	0.002127	ln(x)	ShapiroFrancia
Combined Radium 226 + 228 (pCi/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	74	1.199	0.824	x^(1/3)	ShapiroFrancia
Fluoride, total (mg/L)	**AD-12,AD-18,AD-3**	**Yes**	**0.2565,0.213,0.02,0.02,0.02,0.02,0.02,0.02,0.01,0**	**NP**	**NaN**	**77**	**0.07116**	**0.04303**	**ln(x)**	**ShapiroFrancia**
Lead, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	74	0.0005609	0.0004228	ln(x)	ShapiroFrancia
Lithium, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	74	0.04176	0.1153	ln(x)	ShapiroFrancia
Mercury, total (mg/L)	**AD-12,AD-18,AD-3**	**Yes**	**0.000084**	**NP**	**NaN**	**74**	**0.00001032**	**0.00001278**	**ln(x)**	**ShapiroFrancia**
Molybdenum, total (mg/L)	AD-12,AD-18,AD-3	n/a	n/a	NP	NaN	74	0.0004969	0.0001231	unknown	ShapiroFrancia
Selenium, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	74	0.0005129	0.0006234	ln(x)	ShapiroFrancia
Thallium, total (mg/L)	AD-12,AD-18,AD-3	n/a	n/a	NP	NaN	74	0.0001988	0.0001558	unknown	ShapiroFrancia

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 74

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

Ladder of Powers transformations did not improve normality; analysis run on raw data.

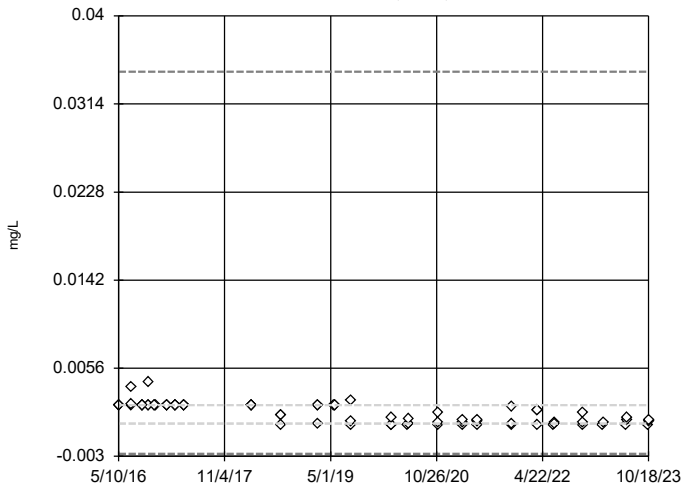
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Antimony, total Analysis Run 1/4/2024 12:00 PM View: Tukey's Outlier Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 74

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

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

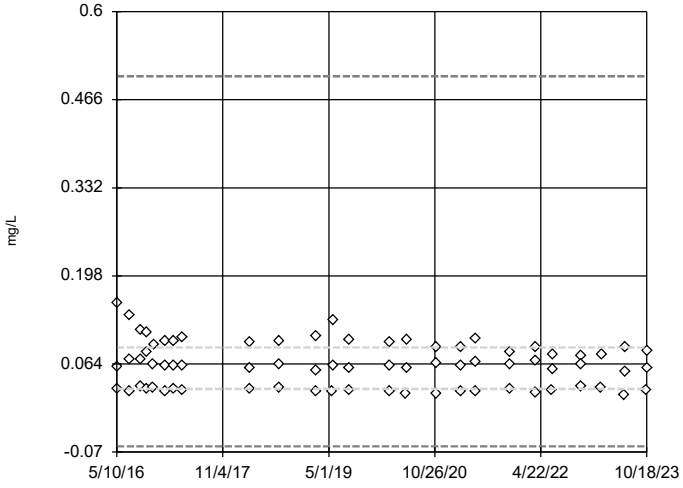
High cutoff = 0.03455, low cutoff = -0.00276, based on IQR multiplier of 3.

Constituent: Arsenic, total Analysis Run 1/4/2024 12:00 PM View: Tukey's Outlier Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 74

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

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

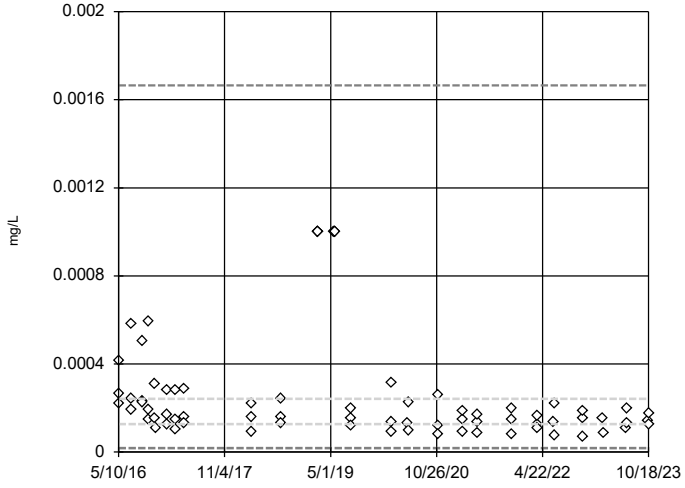
High cutoff = 0.5016, low cutoff = -0.06134, based on IQR multiplier of 3.

Constituent: Barium, total Analysis Run 1/4/2024 12:00 PM View: Tukey's Outlier Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 74

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

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

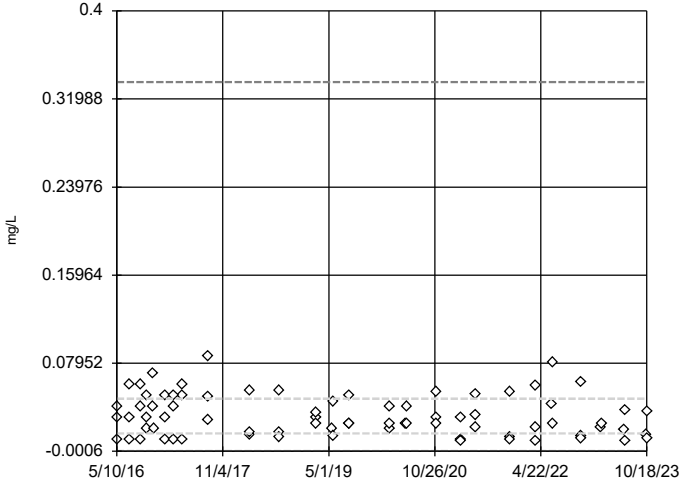
High cutoff = 0.001665, low cutoff = 0.00001843, based on IQR multiplier of 3.

Constituent: Beryllium, total Analysis Run 1/4/2024 12:00 PM View: Tukey's Outlier Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 77

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

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

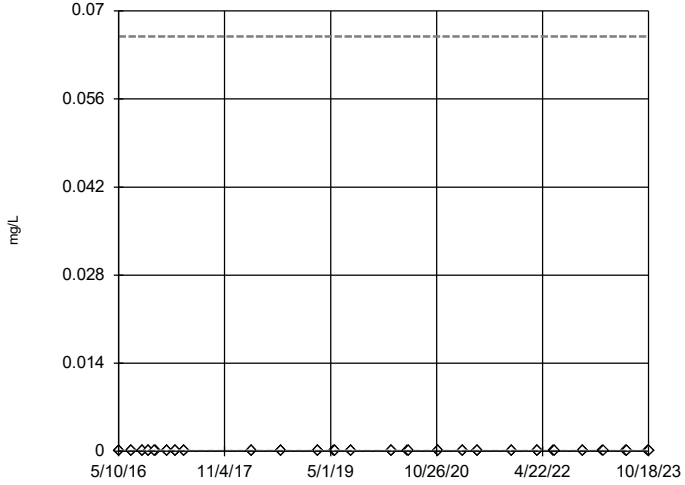
High cutoff = 0.3353, low cutoff = -0.00057, based on IQR multiplier of 3.

Constituent: Boron, total Analysis Run 1/4/2024 12:00 PM View: Tukey's Outlier Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 74

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

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

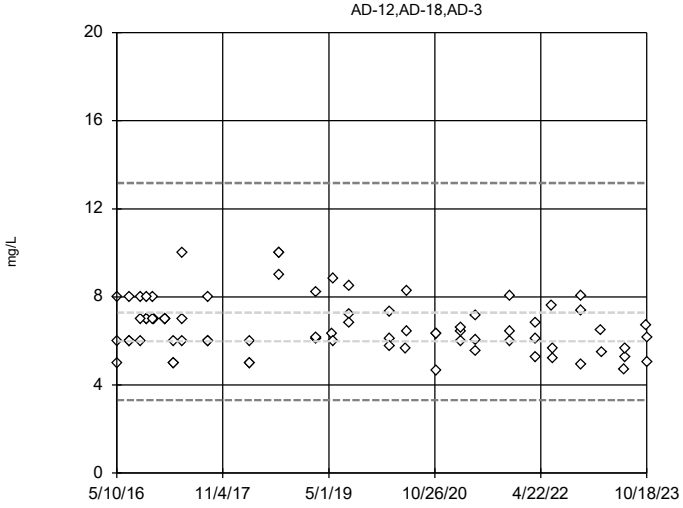
High cutoff = 0.06594, low cutoff = 1.7e-8, based on IQR multiplier of 3.

Constituent: Cadmium, total Analysis Run 1/4/2024 12:00 PM View: Tukey's Outlier Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 77

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

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

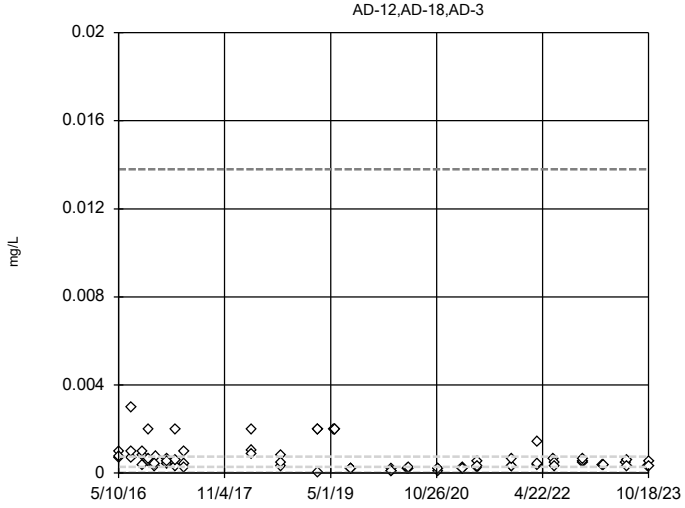
High cutoff = 13.17, low cutoff = 3.312, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 1/4/2024 12:00 PM View: Tukey's Outlier Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 74

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

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

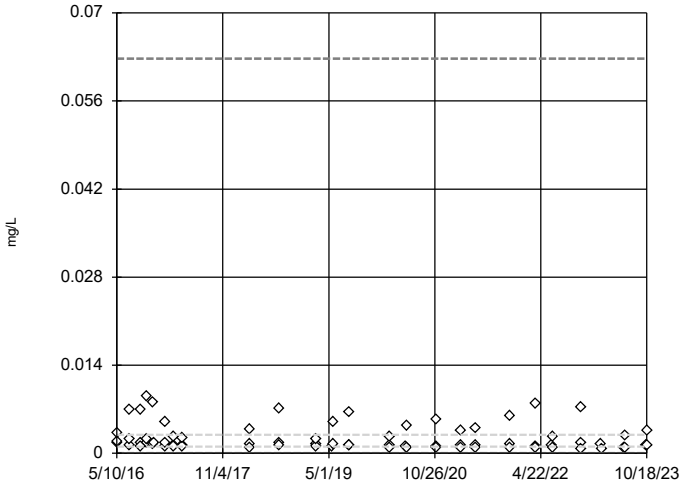
High cutoff = 0.01379, low cutoff = 0.00001555, based on IQR multiplier of 3.

Constituent: Chromium, total Analysis Run 1/4/2024 12:00 PM View: Tukey's Outlier Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 74

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

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

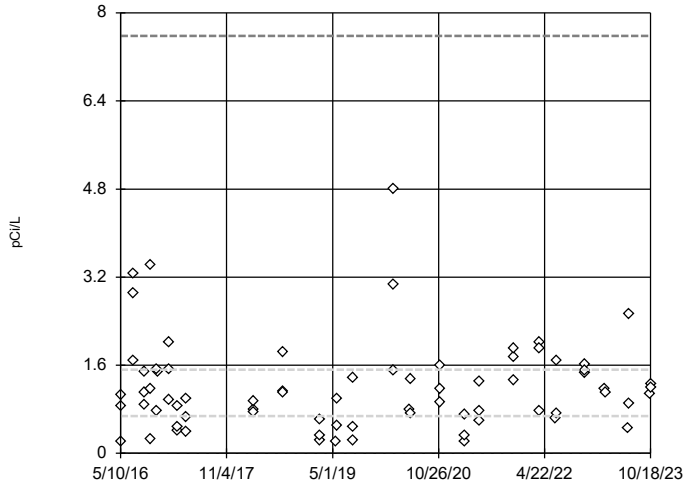
High cutoff = 0.06273, low cutoff = 0.00005026, based on IQR multiplier of 3.

Constituent: Cobalt, total Analysis Run 1/4/2024 12:00 PM View: Tukey's Outlier Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 74

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

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

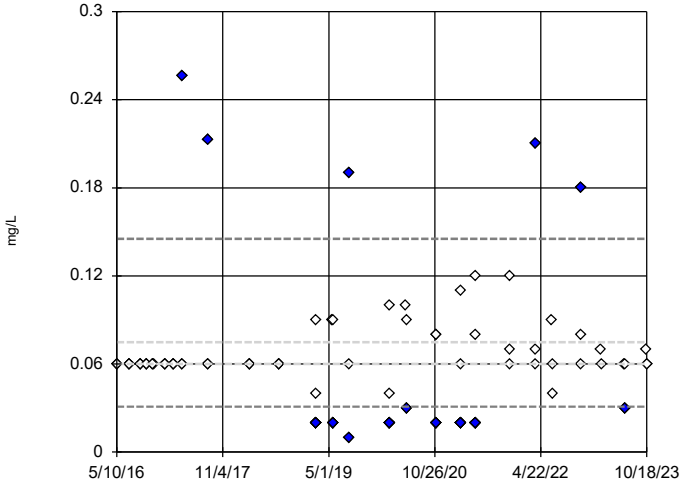
High cutoff = 7.582, low cutoff = 0.0002623, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 1/4/2024 12:00 PM View: Tukey's Outlier Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 77

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).

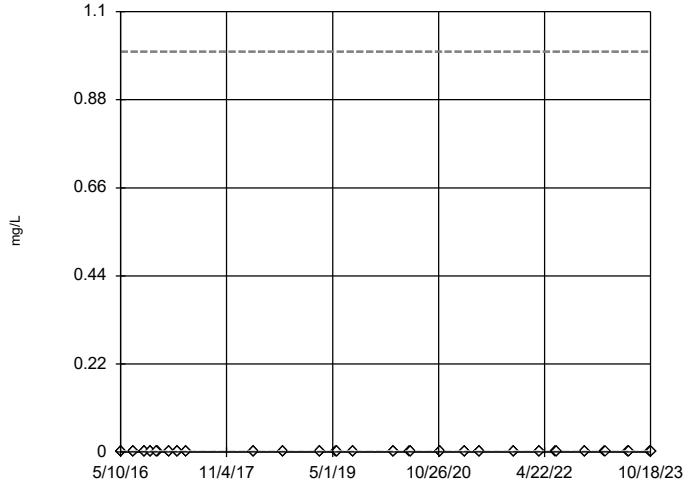
High cutoff = 0.1452, low cutoff = 0.03093, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 1/4/2024 12:00 PM View: Tukey's Outlier Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 74

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

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

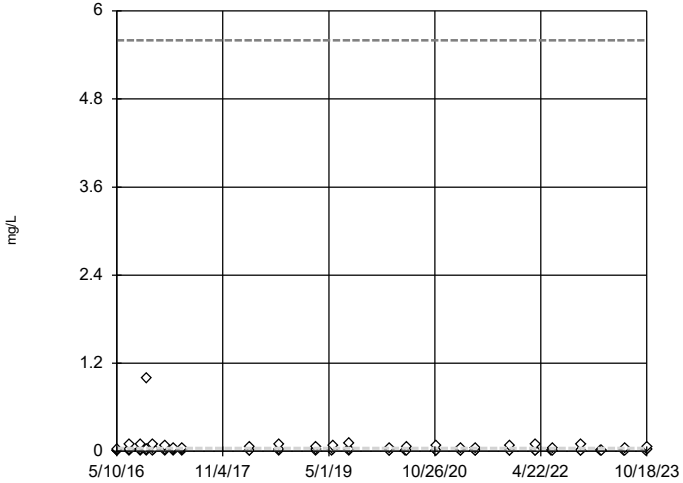
High cutoff = 1, low cutoff = 1.0e-7, based on IQR multiplier of 3.

Constituent: Lead, total Analysis Run 1/4/2024 12:00 PM View: Tukey's Outlier Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 74

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

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

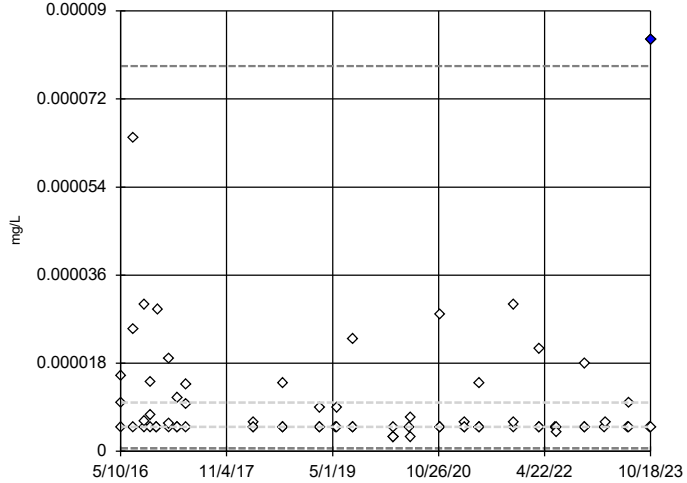
High cutoff = 5.599, low cutoff = 0.00007568, based on IQR multiplier of 3.

Constituent: Lithium, total Analysis Run 1/4/2024 12:00 PM View: Tukey's Outlier Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 74

Outlier is drawn as solid. Tukey's method selected by user.

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

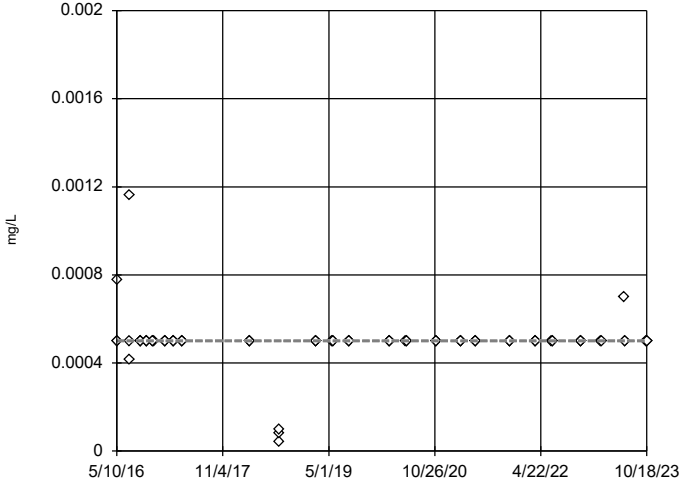
High cutoff = 0.00007873, low cutoff = 6.3e-7, based on IQR multiplier of 3.

Constituent: Mercury, total Analysis Run 1/4/2024 12:00 PM View: Tukey's Outlier Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 74

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

Ladder of Powers transformations did not improve normality; analysis run on raw data.

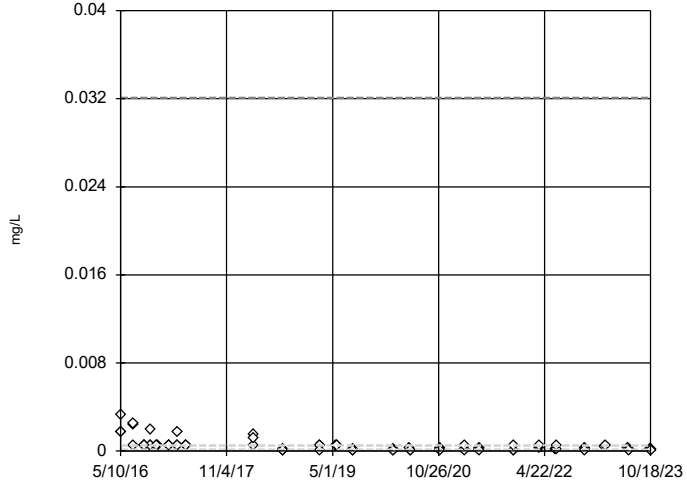
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Molybdenum, total Analysis Run 1/4/2024 12:00 PM View: Tukey's Outlier Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 74

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

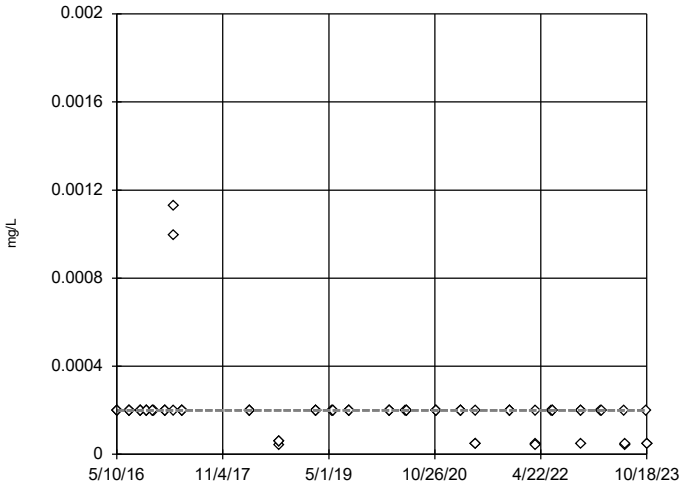
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.03208, low cutoff = 0.000001947, based on IQR multiplier of 3.

Constituent: Selenium, total Analysis Run 1/4/2024 12:00 PM View: Tukey's Outlier Test
Pirkey WBAP Data: Pirkey WBAP

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 74

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 1/4/2024 12:00 PM View: Tukey's Outlier Test

Pirkey WBAP Data: Pirkey WBAP

FIGURE D

Intrawell PLs

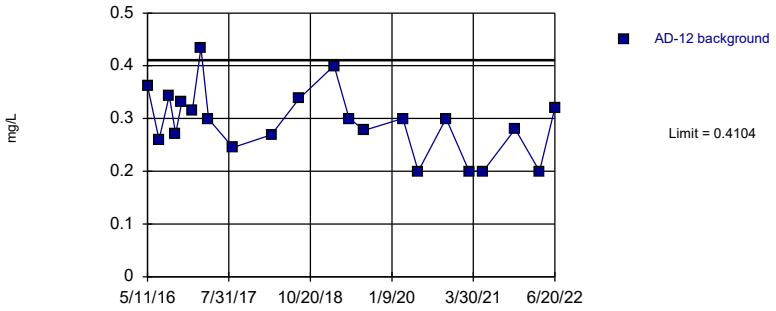
Appendix III - Intrawell Prediction Limits - All Results

Pirkey WBAP Data: Pirkey WBAP Printed 1/2/2024, 4:06 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Calcium, total (mg/L)	AD-12	0.4104	n/a	n/a	1 future	n/a	22	0.293	0.06283	0	None	No	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-17	1.34	n/a	n/a	1 future	n/a	22	n/a	n/a	9.091	n/a	n/a	0.003707	NP Intra (normality) 1 of 2
Calcium, total (mg/L)	AD-18	0.9612	n/a	n/a	1 future	n/a	22	-0.9928	0.5101	0	None	ln(x)	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-28	3.21	n/a	n/a	1 future	n/a	23	n/a	n/a	0	n/a	n/a	0.003415	NP Intra (normality) 1 of 2
Calcium, total (mg/L)	AD-3	6.168	n/a	n/a	1 future	n/a	22	4.121	1.095	0	None	No	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-30	1.03	n/a	n/a	1 future	n/a	23	-0.8354	0.4658	0	None	ln(x)	0.002505	Param Intra 1 of 2
pH, field (SU)	AD-12	5.345	2.945	n/a	1 future	n/a	22	4.145	0.6423	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-17	4.725	3.322	n/a	1 future	n/a	22	4.023	0.3753	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-18	5.361	3.838	n/a	1 future	n/a	22	4.6	0.4076	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-28	5.423	3.444	n/a	1 future	n/a	22	4.434	0.5294	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-3	5.683	4.395	n/a	1 future	n/a	22	5.039	0.3448	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-30	5.326	3.759	n/a	1 future	n/a	22	4.542	0.4193	0	None	No	0.001253	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-12	7.359	n/a	n/a	1 future	n/a	22	4.585	1.484	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-17	8.562	n/a	n/a	1 future	n/a	23	4.591	2.138	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-18	10.6	n/a	n/a	1 future	n/a	22	n/a	n/a	0	n/a	n/a	0.003707	NP Intra (normality) 1 of 2
Sulfate, total (mg/L)	AD-28	30.07	n/a	n/a	1 future	n/a	22	21.97	4.332	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-3	36.96	n/a	n/a	1 future	n/a	22	26.36	5.672	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-30	31.56	n/a	n/a	1 future	n/a	8	19.25	5.007	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	AD-12	100.3	n/a	n/a	1 future	n/a	22	5424	2481	4.545	None	x^2	0.002505	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	AD-17	107.7	n/a	n/a	1 future	n/a	23	79.57	15.15	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	AD-18	138.6	n/a	n/a	1 future	n/a	22	107.5	16.62	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	AD-28	129.7	n/a	n/a	1 future	n/a	22	10773	3232	0	None	x^2	0.002505	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	AD-3	181.6	n/a	n/a	1 future	n/a	22	3375121	1399507	0	None	x^3	0.002505	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	AD-30	206.4	n/a	n/a	1 future	n/a	17	145.8	31.08	0	None	No	0.002505	Param Intra 1 of 2

Prediction Limit

Intrawell Parametric, AD-12 (bg)



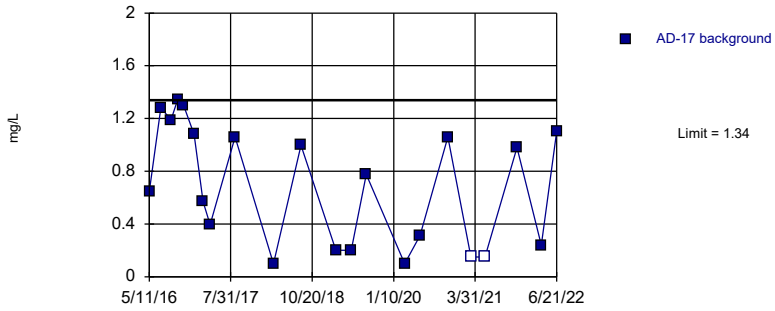
Background Data Summary: Mean=0.293, Std. Dev.=0.06283, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9534, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Hollow symbols indicate censored values.

Prediction Limit

Intrawell Non-parametric, AD-17

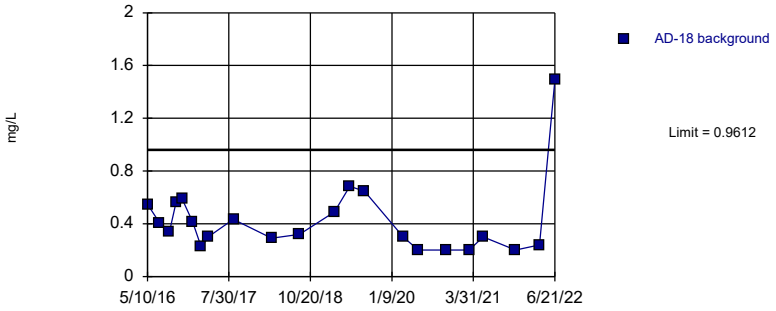


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 22 background values. 9.091% NDs. Well-constituent pair annual alpha = 0.007401. Individual comparison alpha = 0.003707 (1 of 2). Assumes 1 future value.

Constituent: Calcium, total Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Prediction Limit

Intrawell Parametric, AD-18 (bg)

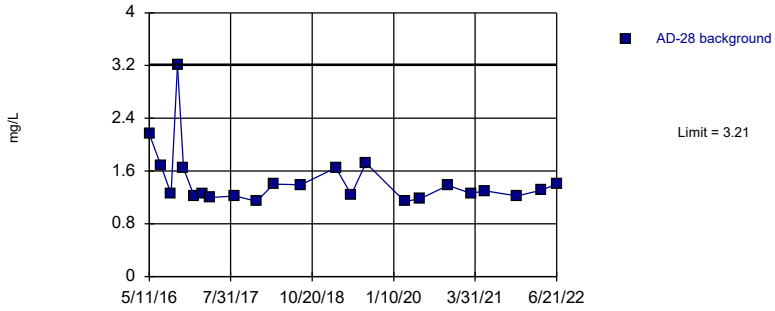


Background Data Summary (based on natural log transformation): Mean=-0.9928, Std. Dev.=0.5101, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.924, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Prediction Limit

Intrawell Non-parametric, AD-28



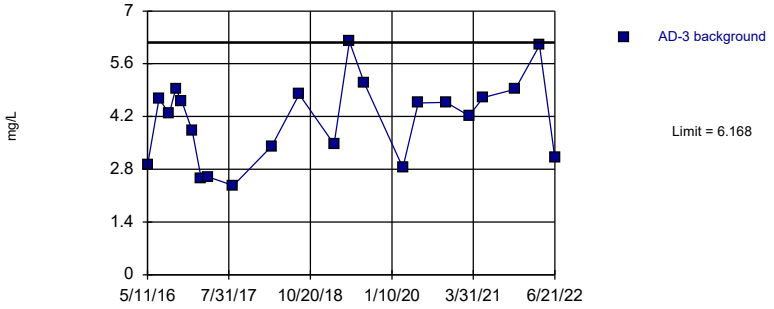
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 23 background values. Well-constituent pair annual alpha = 0.006819. Individual comparison alpha = 0.003415 (1 of 2). Assumes 1 future value.

Constituent: Calcium, total Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Intrawell Parametric, AD-3 (bg)



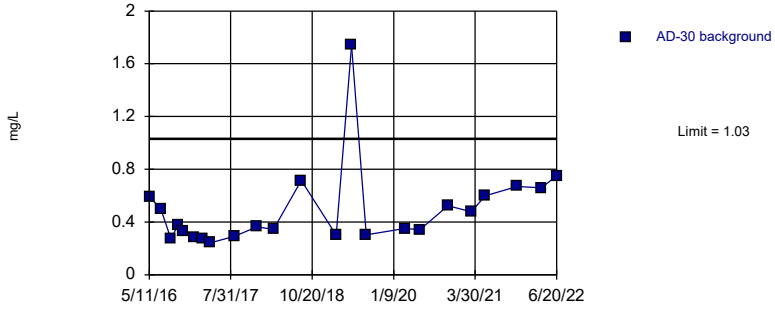
Background Data Summary: Mean=4.121, Std. Dev.=1.095, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9431, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Intrawell Parametric, AD-30



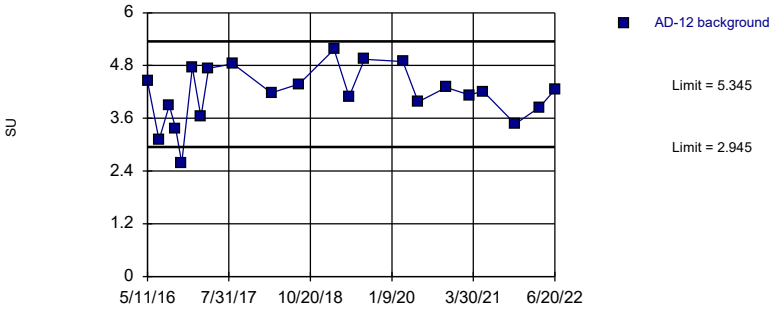
Background Data Summary (based on natural log transformation): Mean=-0.8354, Std. Dev.=0.4658, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8887, critical = 0.881. Kappa = 1.857 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Intrawell Parametric, AD-12 (bg)



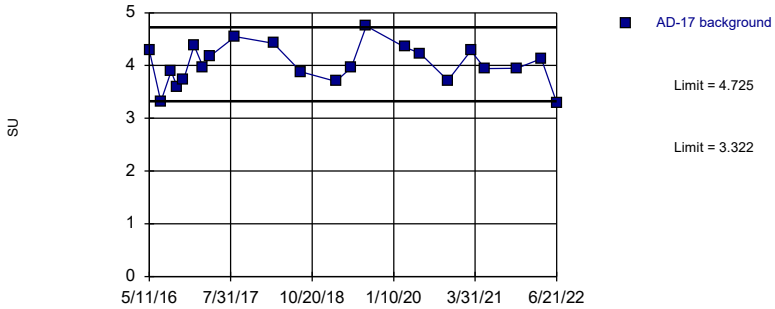
Background Data Summary: Mean=4.145, Std. Dev.=0.6423, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9666, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Intrawell Parametric, AD-17

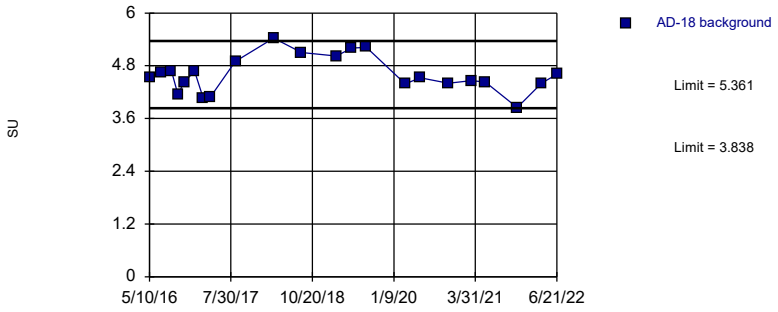


Background Data Summary: Mean=4.023, Std. Dev.=0.3753, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9786, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Prediction Limit

Intrawell Parametric, AD-18 (bg)



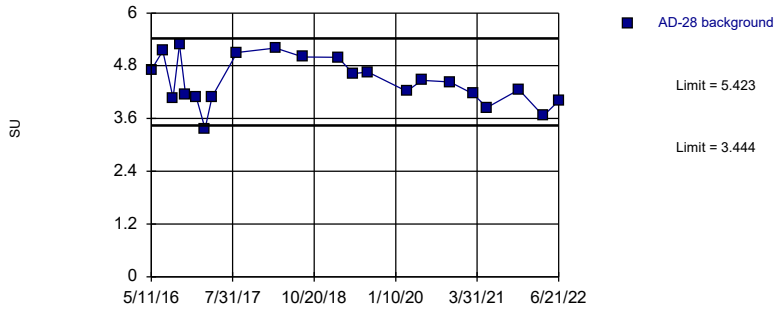
Background Data Summary: Mean=4.6, Std. Dev.=0.4076, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9632, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Intrawell Parametric, AD-28



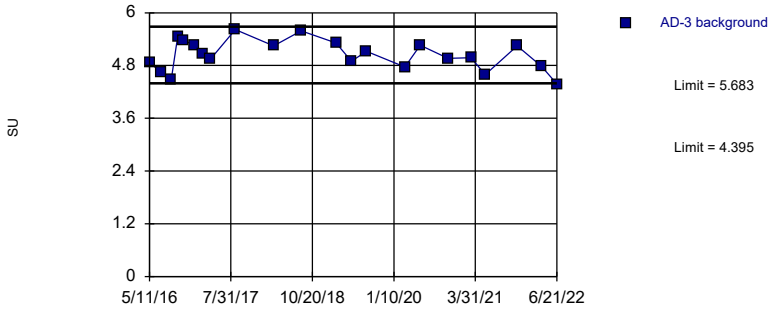
Background Data Summary: Mean=4.434, Std. Dev.=0.5294, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9592, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Intrawell Parametric, AD-3 (bg)



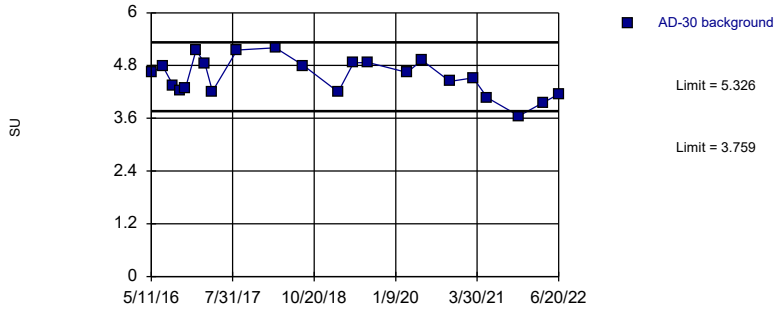
Background Data Summary: Mean=5.039, Std. Dev.=0.3448, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9765, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Intrawell Parametric, AD-30

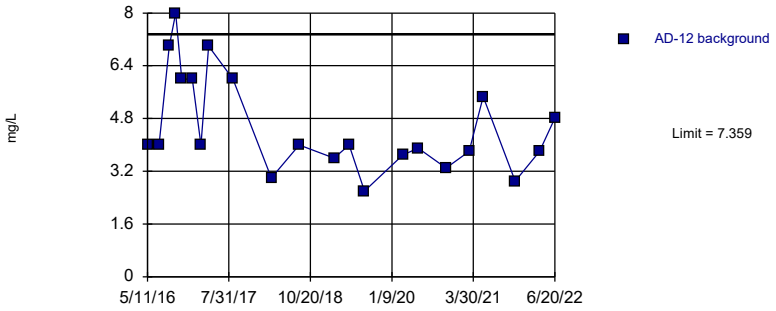


Background Data Summary: Mean=4.542, Std. Dev.=0.4193, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9667, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Prediction Limit

Intrawell Parametric, AD-12 (bg)



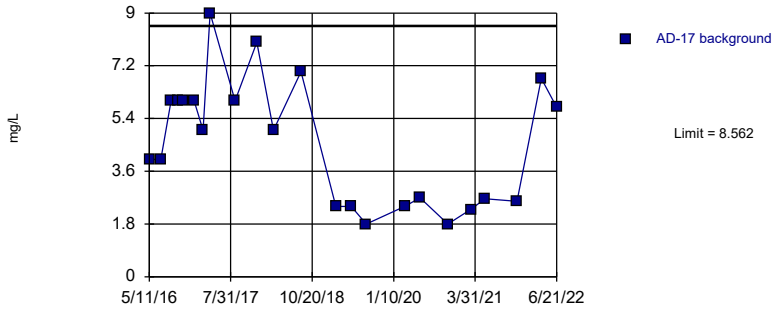
Background Data Summary: Mean=4.585, Std. Dev.=1.484, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8903, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Intrawell Parametric, AD-17



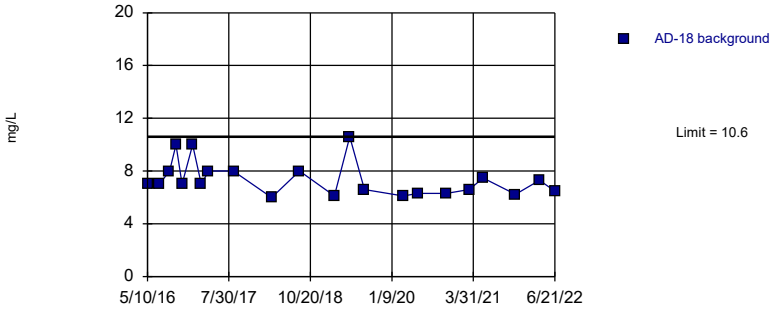
Background Data Summary: Mean=4.591, Std. Dev.=2.138, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9132, critical = 0.881. Kappa = 1.857 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Intrawell Non-parametric, AD-18 (bg)



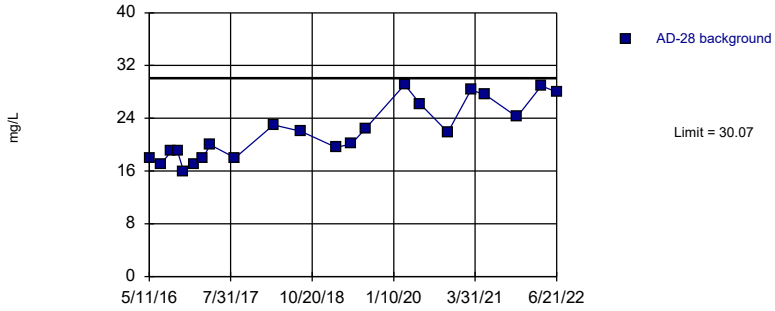
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 22 background values. Well-constituent pair annual alpha = 0.007401. Individual comparison alpha = 0.003707 (1 of 2). Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Intrawell Parametric, AD-28



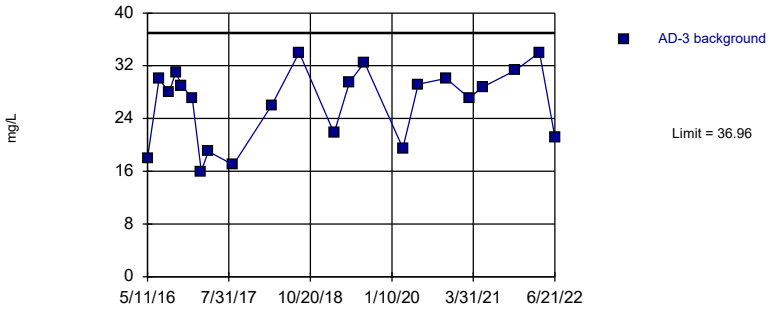
Background Data Summary: Mean=21.97, Std. Dev.=4.332, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9068, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Intrawell Parametric, AD-3 (bg)



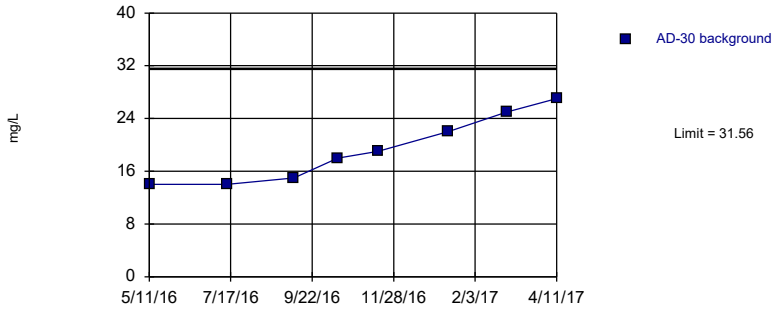
Background Data Summary: Mean=26.36, Std. Dev.=5.672, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9069, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Intrawell Parametric, AD-30



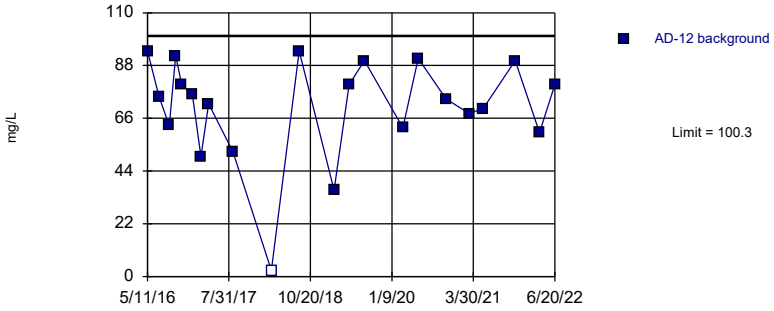
Background Data Summary: Mean=19.25, Std. Dev.=5.007, n=8. Normality test: Shapiro Wilk @alpha = 0.1, calculated = 0.9081, critical = 0.851. Kappa = 2.458 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

Prediction Limit

Intrawell Parametric, AD-12 (bg)



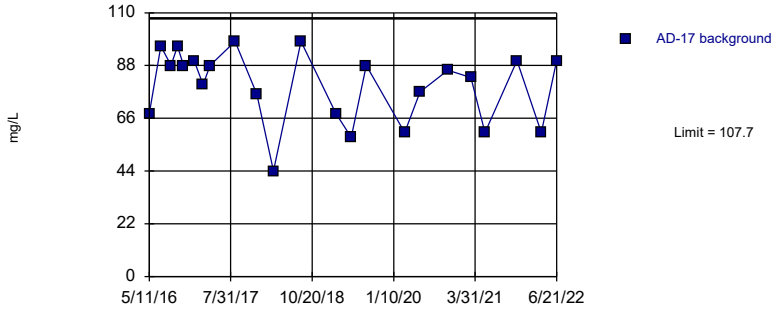
Background Data Summary (based on square transformation): Mean=5424, Std. Dev.=2481, n=22, 4.545% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9554, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Intrawell Parametric, AD-17



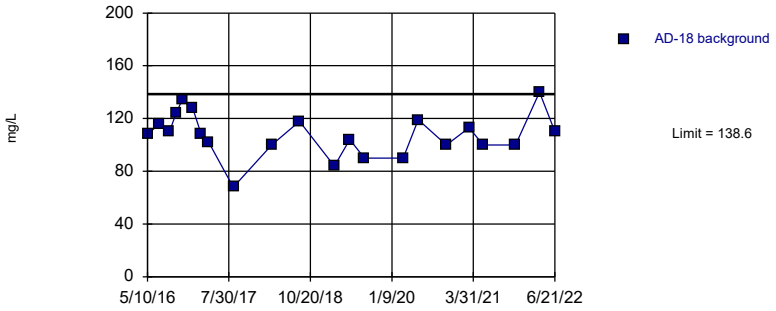
Background Data Summary: Mean=79.57, Std. Dev.=15.15, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9048, critical = 0.881. Kappa = 1.857 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Intrawell Parametric, AD-18 (bg)



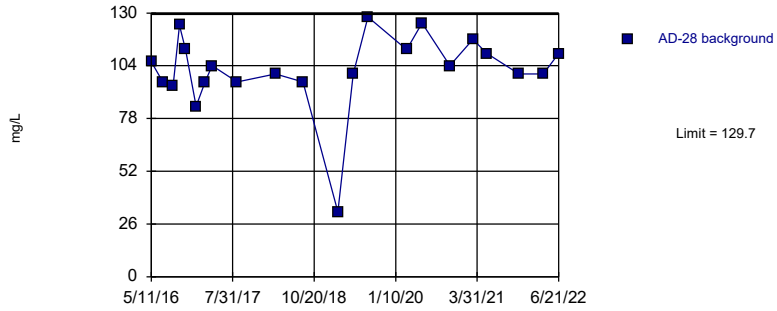
Background Data Summary: Mean=107.5, Std. Dev.=16.62, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9823, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Intrawell Parametric, AD-28



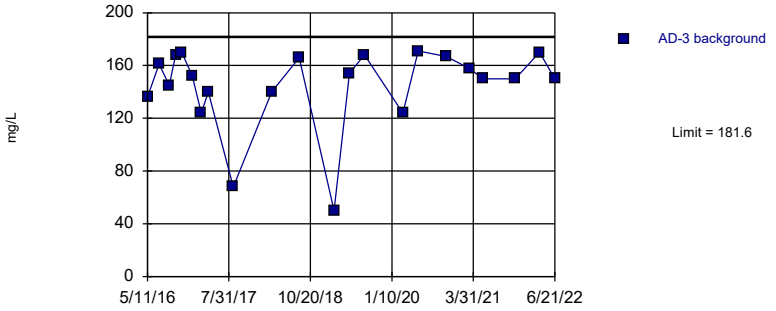
Background Data Summary (based on square transformation): Mean=10773, Std. Dev.=3232, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9046, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Intrawell Parametric, AD-3 (bg)



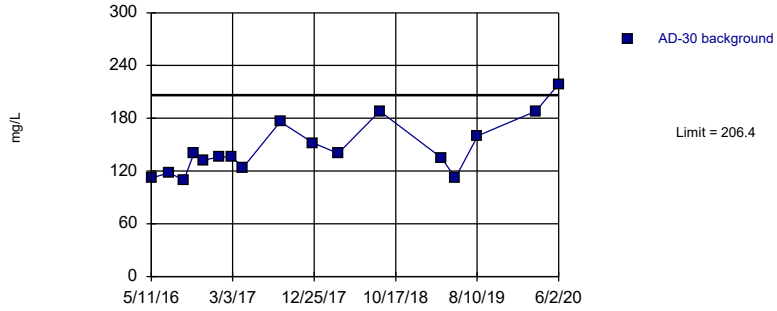
Background Data Summary (based on cube transformation): Mean=3375121, Std. Dev.=1399507, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9021, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Intrawell Parametric, AD-30



Background Data Summary: Mean=145.8, Std. Dev.=31.08, n=17. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9021, critical = 0.892. Kappa = 1.951 (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 1/2/2024 4:04 PM View: Intrawell
Pirkey WBAP Data: Pirkey WBAP

FIGURE E
Upgradient Trend Tests

Trend Tests - Upgradient Wells - Significant Result

Pirkey WBAP Data: Pirkey WBAP Printed 1/4/2024, 12:25 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Chloride, total (mg/L)	**AD-18 (bg)**	**-0.3462**	**-140**	**-118**	**Yes**	**26**	**0**	**n/a**	**n/a**	**0.01**	**NP**

Trend Tests - Upgradient Wells - All Results

Pirkey WBAP Data: Pirkey WBAP Printed 1/4/2024, 12:25 PM

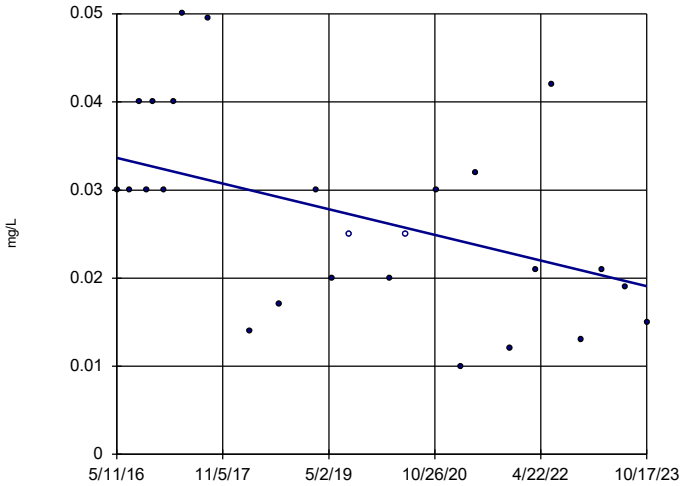
Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron, total (mg/L)	AD-12 (bg)	-0.001957	-104	-118	No	26	7.692	n/a	n/a	0.01	NP
Boron, total (mg/L)	AD-18 (bg)	0	36	118	No	26	26.92	n/a	n/a	0.01	NP
Boron, total (mg/L)	AD-3 (bg)	-0.001116	-39	-111	No	25	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	AD-12 (bg)	0.0425	45	118	No	26	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	**AD-18 (bg)**	**-0.3462**	**-140**	**-118**	**Yes**	**26**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Chloride, total (mg/L)	AD-3 (bg)	-0.04545	-33	-111	No	25	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	AD-12 (bg)	0.001344	67	118	No	26	34.62	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	AD-18 (bg)	0	-29	-118	No	26	69.23	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	AD-3 (bg)	1.8e-10	41	111	No	25	44	n/a	n/a	0.01	NP

Sanitas™ v.10.0.15 . UG

Hollow symbols indicate censored values.

Sen's Slope Estimator

AD-12 (bg)



n = 26

Slope = -0.001957 units per year.

Mann-Kendall statistic = -104
critical = -118

Trend not significant at 99% confidence level (α = 0.005 per tail).

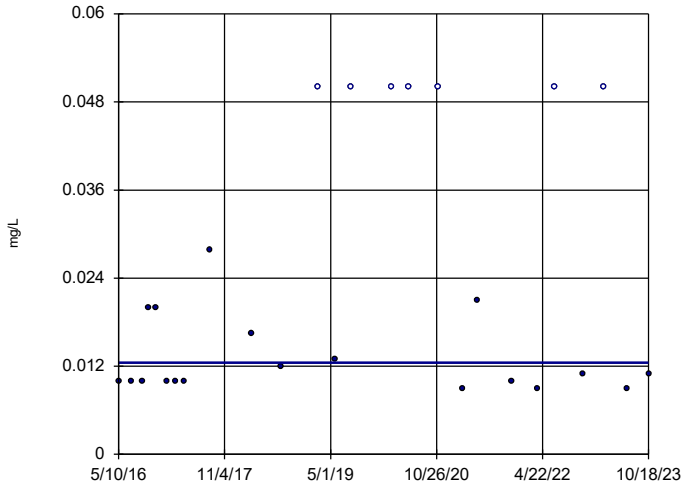
Constituent: Boron, total Analysis Run 1/4/2024 12:24 PM View: Interwell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Hollow symbols indicate censored values.

Sen's Slope Estimator

AD-18 (bg)



n = 26

Slope = 0 units per year.

Mann-Kendall statistic = 36
critical = 118

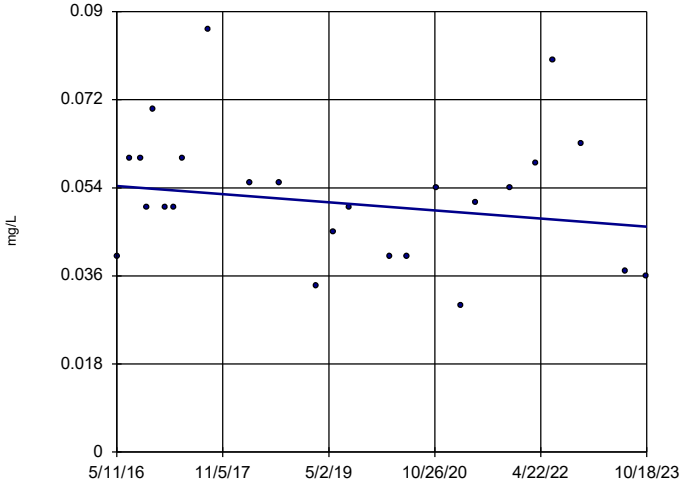
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 1/4/2024 12:24 PM View: Interwell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Sen's Slope Estimator

AD-3 (bg)



n = 25

Slope = -0.001116 units per year.

Mann-Kendall statistic = -39
critical = -111

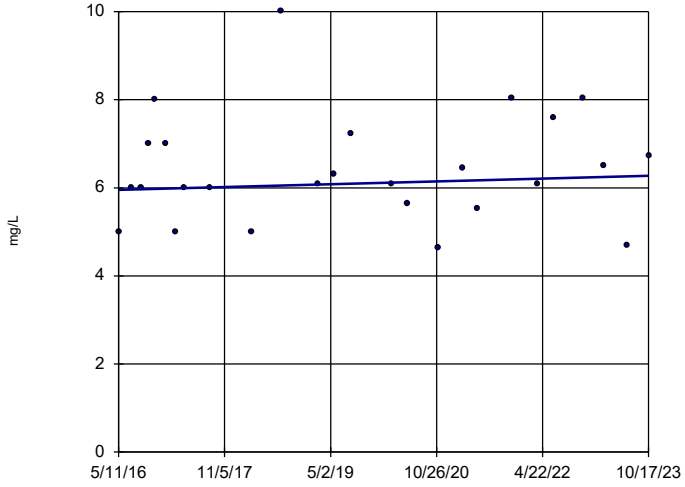
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 1/4/2024 12:24 PM View: Interwell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Sen's Slope Estimator

AD-12 (bg)



n = 26

Slope = 0.0425 units per year.

Mann-Kendall statistic = 45
critical = 118

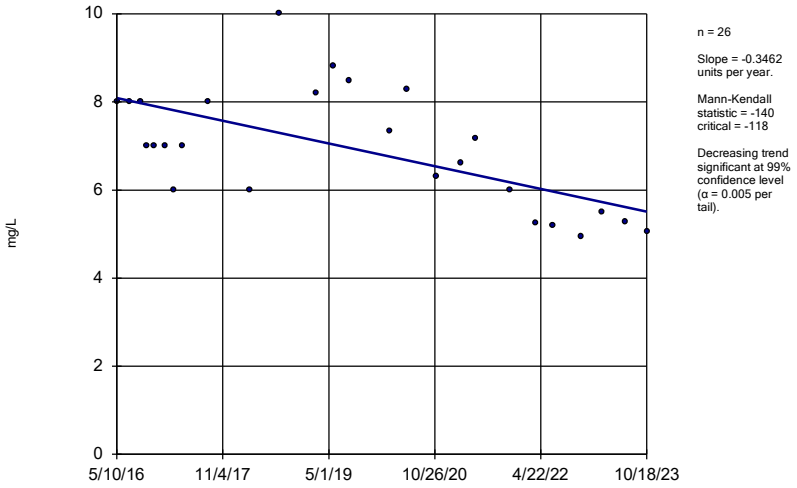
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride, total Analysis Run 1/4/2024 12:24 PM View: Interwell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Sen's Slope Estimator

AD-18 (bg)



n = 26

Slope = -0.3462 units per year.

Mann-Kendall statistic = -140 critical = -118

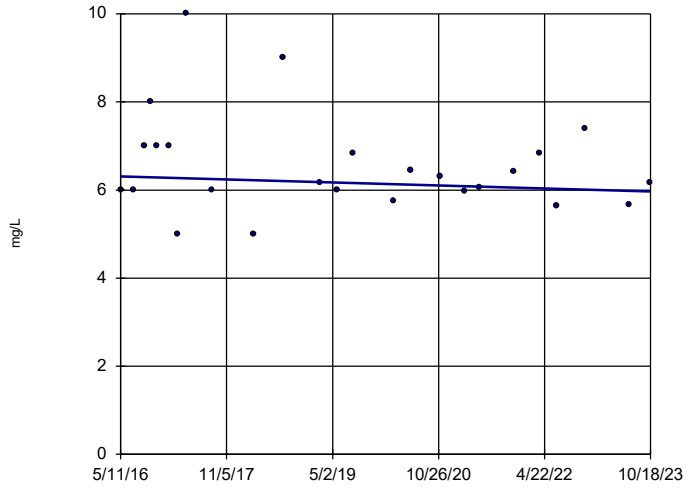
Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride, total Analysis Run 1/4/2024 12:24 PM View: Interwell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Sen's Slope Estimator

AD-3 (bg)



n = 25

Slope = -0.04545 units per year.

Mann-Kendall statistic = -33 critical = -111

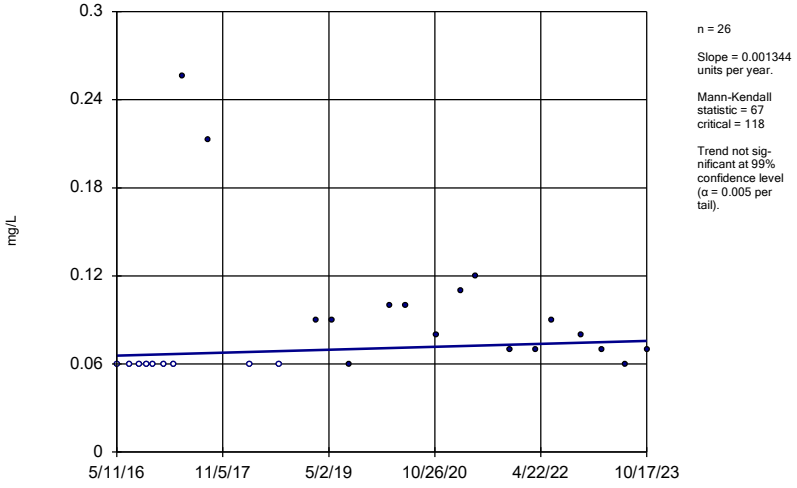
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride, total Analysis Run 1/4/2024 12:24 PM View: Interwell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

AD-12 (bg)



n = 26

Slope = 0.001344 units per year.

Mann-Kendall statistic = 67 critical = 118

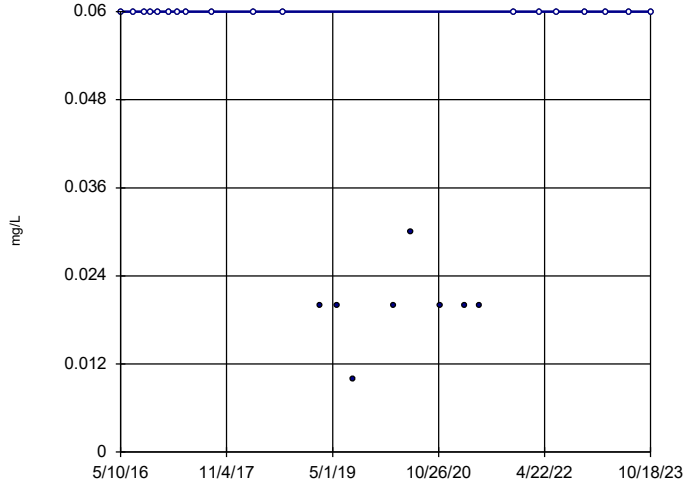
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Fluoride, total Analysis Run 1/4/2024 12:24 PM View: Interwell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

AD-18 (bg)



n = 26

Slope = 0 units per year.

Mann-Kendall statistic = -29 critical = -118

Trend not significant at 99% confidence level (α = 0.005 per tail).

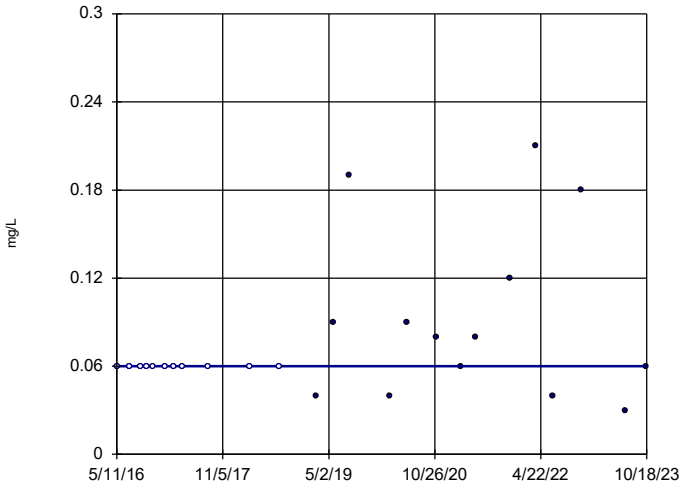
Constituent: Fluoride, total Analysis Run 1/4/2024 12:24 PM View: Interwell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Hollow symbols indicate censored values.

Sen's Slope Estimator

AD-3 (bg)



n = 25

Slope = 1.8e-10 units per year.

Mann-Kendall statistic = 41
critical = 111

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Fluoride, total Analysis Run 1/4/2024 12:24 PM View: Interwell

Pirkey WBAP Data: Pirkey WBAP

FIGURE F

Interwell PLs

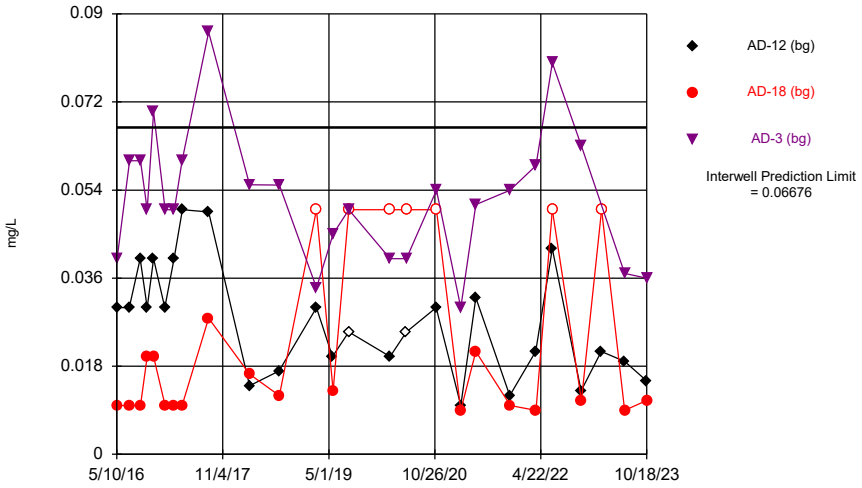
Appendix III - Interwell Prediction Limits - All Results

Pirkey WBAP Data: Pirkey WBAP Printed 1/4/2024, 12:28 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron, total (mg/L)	n/a	0.06676	n/a	n/a	3 future	n/a	77	0.1703	0.05202	11.69	None	sqrt(x)	0.002505	Param Inter 1 of 2
Chloride, total (mg/L)	n/a	8.788	n/a	n/a	3 future	n/a	77	2.565	0.236	0	None	sqrt(x)	0.002505	Param Inter 1 of 2
Fluoride, total (mg/L)	n/a	0.2565	n/a	n/a	3 future	n/a	77	n/a	n/a	49.35	n/a	n/a	0.0003268	NP Inter (normality) 1 of 2

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

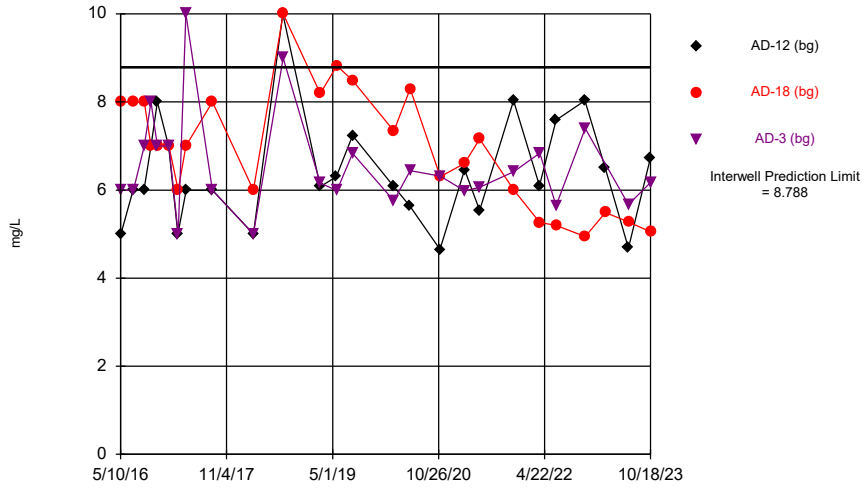
Time Series



Constituent: Boron, total Analysis Run 1/4/2024 12:27 PM View: Interwell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

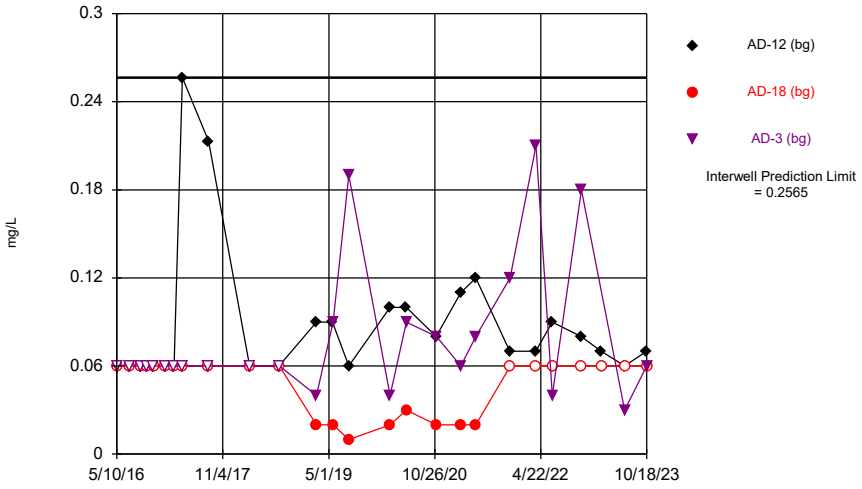
Time Series



Constituent: Chloride, total Analysis Run 1/4/2024 12:27 PM View: Interwell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG
Hollow symbols indicate censored values.

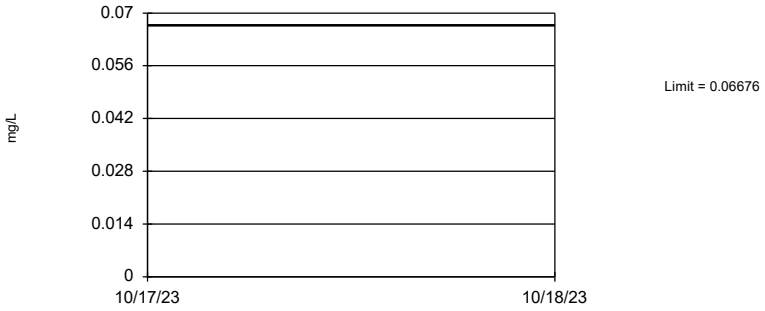
Time Series



Constituent: Fluoride, total Analysis Run 1/4/2024 12:27 PM View: Interwell
Pirkey WBAP Data: Pirkey WBAP

Prediction Limit

Interwell Parametric



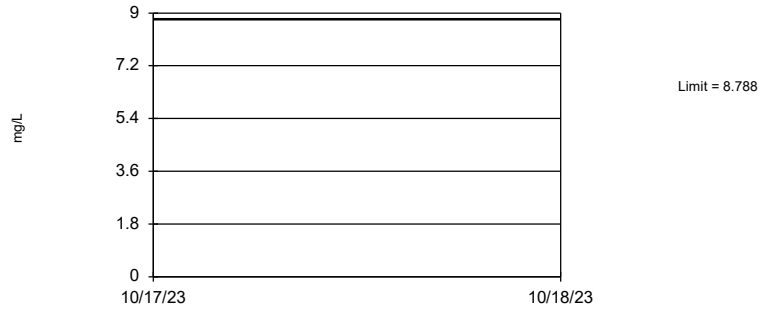
Background Data Summary (based on square root transformation): Mean=0.1703, Std. Dev.=0.05202, n=77, 11.69% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9645, critical = 0.957. Kappa = 1.693 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Assumes 3 future values.

Constituent: Boron, total Analysis Run 1/4/2024 12:26 PM View: Interwell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Prediction Limit

Interwell Parametric



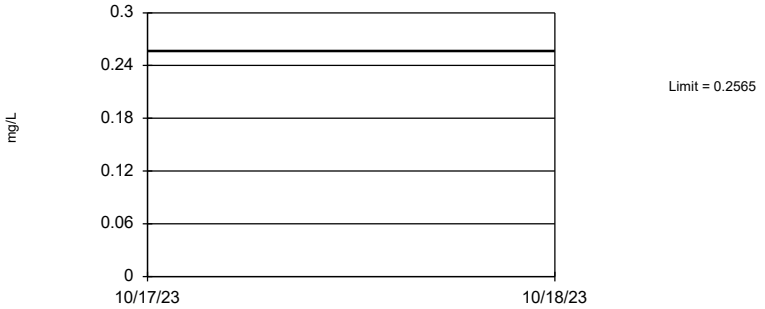
Background Data Summary (based on square root transformation): Mean=2.565, Std. Dev.=0.236, n=77. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9635, critical = 0.957. Kappa = 1.693 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Assumes 3 future values.

Constituent: Chloride, total Analysis Run 1/4/2024 12:26 PM View: Interwell
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

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 77 background values. 49.35% NDs. Annual per-constituent alpha = 0.001959. Individual comparison alpha = 0.0003268 (1 of 2). Assumes 3 future values.

Constituent: Fluoride, total Analysis Run 1/4/2024 12:26 PM View: Interwell
Pirkey WBAP Data: Pirkey WBAP

FIGURE G

UTLs

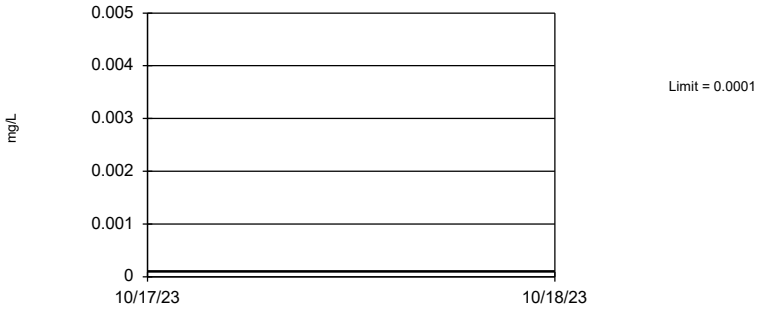
Upper Tolerance Limits Summary Table

Pirkey WBAP Data: Pirkey WBAP Printed 1/4/2024, 12:39 PM

Constituent	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Antimony, total (mg/L)	0.0001	n/a	n/a	n/a	n/a	74	85.14	n/a	0.02247	NP Inter(NDs)
Arsenic, total (mg/L)	0.004229	n/a	n/a	n/a	n/a	74	37.84	n/a	0.02247	NP Inter(normality)
Barium, total (mg/L)	0.157	n/a	n/a	n/a	n/a	74	0	n/a	0.02247	NP Inter(normality)
Beryllium, total (mg/L)	0.001	n/a	n/a	n/a	n/a	74	8.108	n/a	0.02247	NP Inter(normality)
Cadmium, total (mg/L)	0.0001592	n/a	n/a	n/a	n/a	74	44.59	n/a	0.02247	NP Inter(normality)
Chromium, total (mg/L)	0.002437	n/a	n/a	n/a	n/a	74	9.459	ln(x)	0.05	Inter
Cobalt, total (mg/L)	0.009	n/a	n/a	n/a	n/a	74	0	n/a	0.02247	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	2.983	n/a	n/a	n/a	n/a	74	0	sqrt(x)	0.05	Inter
Fluoride, total (mg/L)	0.2565	n/a	n/a	n/a	n/a	77	49.35	n/a	0.01926	NP Inter(normality)
Lead, total (mg/L)	0.001	n/a	n/a	n/a	n/a	74	45.95	n/a	0.02247	NP Inter(normality)
Lithium, total (mg/L)	0.108	n/a	n/a	n/a	n/a	73	1.37	n/a	0.02365	NP Inter(normality)
Mercury, total (mg/L)	0.000084	n/a	n/a	n/a	n/a	74	54.05	n/a	0.02247	NP Inter(NDs)
Molybdenum, total (mg/L)	0.001161	n/a	n/a	n/a	n/a	69	89.86	n/a	0.02904	NP Inter(NDs)
Selenium, total (mg/L)	0.003297	n/a	n/a	n/a	n/a	74	37.84	n/a	0.02247	NP Inter(normality)
Thallium, total (mg/L)	0.00113	n/a	n/a	n/a	n/a	72	80.56	n/a	0.02489	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 74 background values. 85.14% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

Constituent: Antimony, total Analysis Run 1/4/2024 12:38 PM View: UTLs
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

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 74 background values. 37.84% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

Constituent: Arsenic, total Analysis Run 1/4/2024 12:38 PM View: UTLs
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Non-parametric

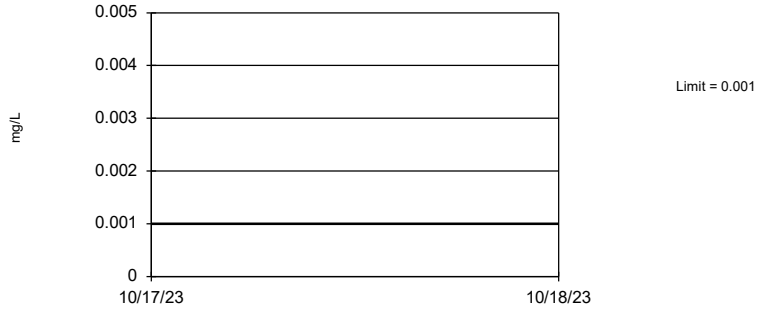
Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 74 background values. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

Constituent: Barium, total Analysis Run 1/4/2024 12:38 PM View: UTLs
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Non-parametric



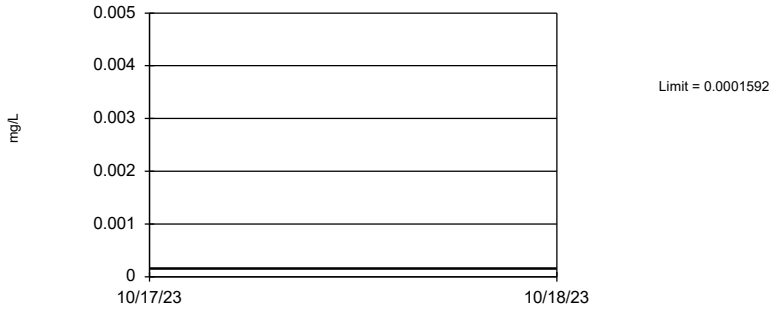
Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 74 background values. 8.108% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

Constituent: Beryllium, total Analysis Run 1/4/2024 12:38 PM View: UTLs
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Non-parametric



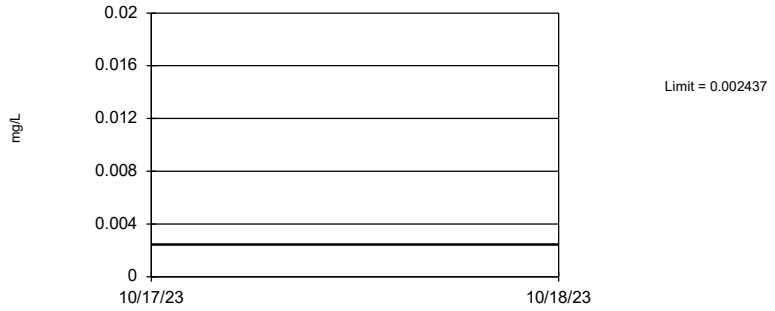
Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 74 background values. 44.59% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

Constituent: Cadmium, total Analysis Run 1/4/2024 12:38 PM View: UTLs
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Parametric



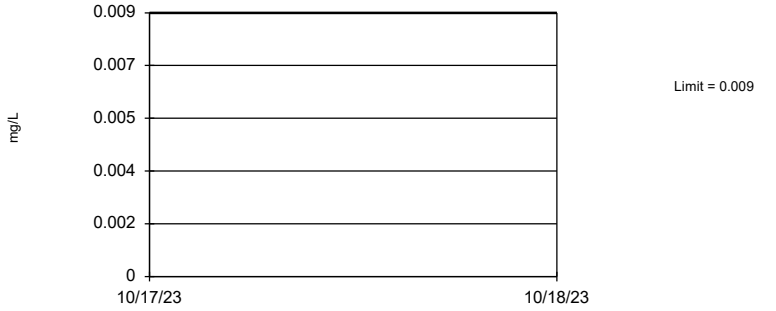
95% coverage. Background Data Summary (based on natural log transformation): Mean=-7.654, Std. Dev.=0.8289, n=74, 9.459% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9673, critical = 0.956. Report alpha = 0.05.

Constituent: Chromium, total Analysis Run 1/4/2024 12:38 PM View: UTLs
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Non-parametric



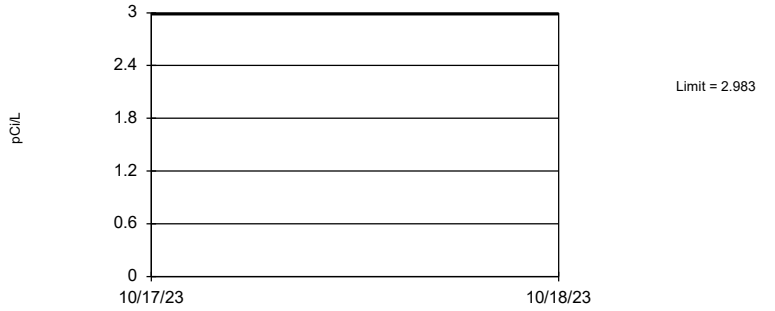
Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 74 background values. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

Constituent: Cobalt, total Analysis Run 1/4/2024 12:38 PM View: UTLs
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Parametric



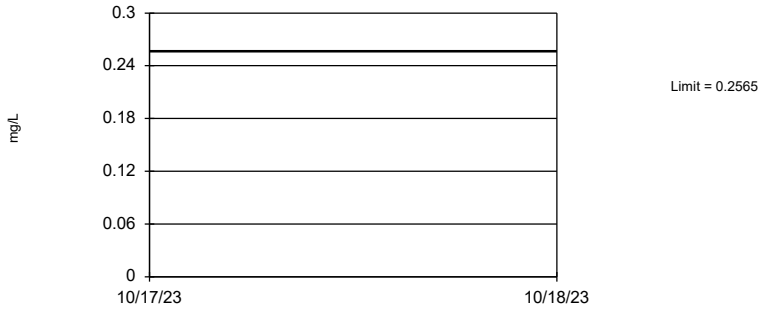
95% coverage. Background Data Summary (based on square root transformation): Mean=1.039, Std. Dev.=0.3486, n=74. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9616, critical = 0.956. Report alpha = 0.05.

Constituent: Combined Radium 226 + 228 Analysis Run 1/4/2024 12:38 PM View: UTLs
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

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 77 background values. 49.35% NDs. 94.34% coverage at alpha=0.01; 96.29% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.01926.

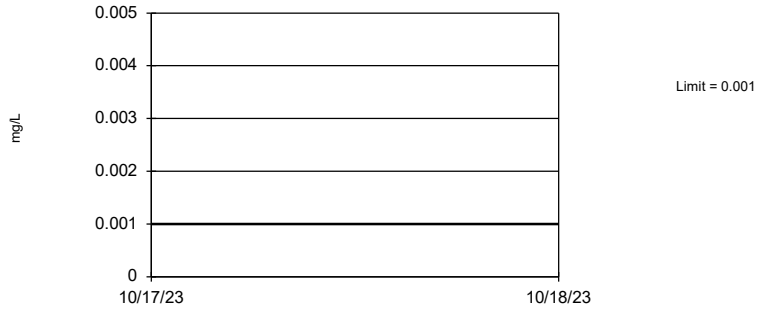
Constituent: Fluoride, total Analysis Run 1/4/2024 12:38 PM View: UTLs

Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

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 74 background values. 45.95% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

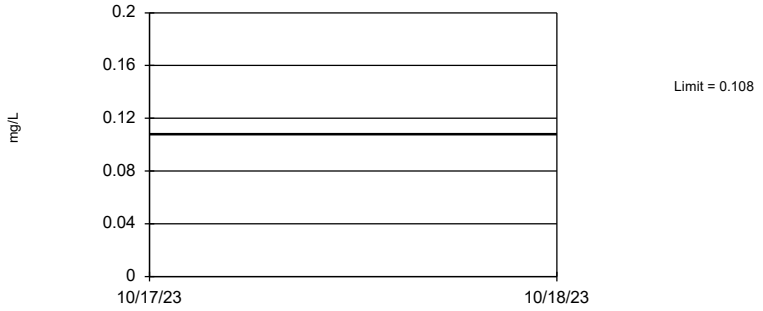
Constituent: Lead, total Analysis Run 1/4/2024 12:38 PM View: UTLs

Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

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 73 background values. 1.37% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02365.

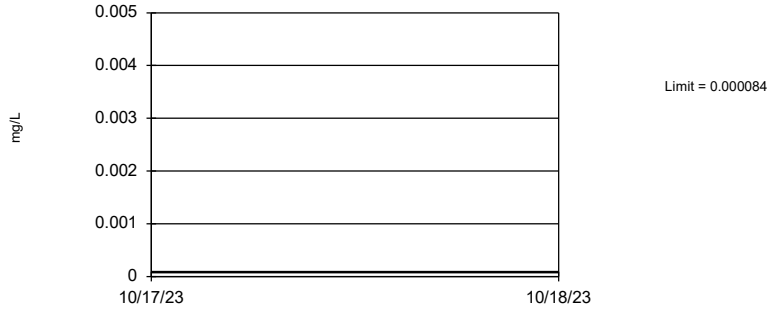
Constituent: Lithium, total Analysis Run 1/4/2024 12:38 PM View: UTLs

Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 74 background values. 54.05% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

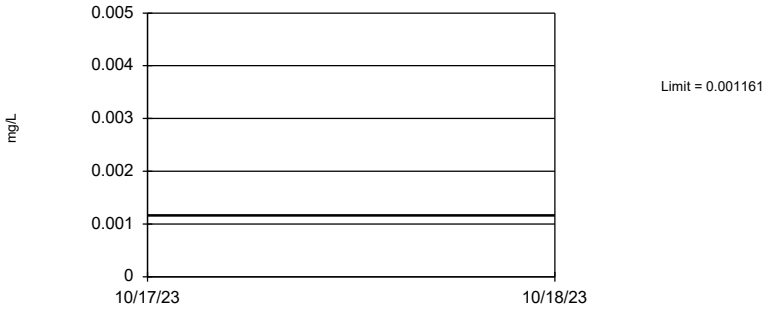
Constituent: Mercury, total Analysis Run 1/4/2024 12:38 PM View: UTLs

Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 69 background values. 89.86% NDs. 93.55% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02904.

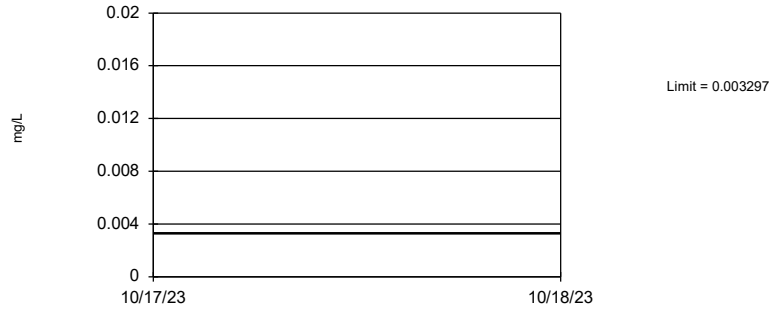
Constituent: Molybdenum, total Analysis Run 1/4/2024 12:38 PM View: UTLs

Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

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 74 background values. 37.84% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

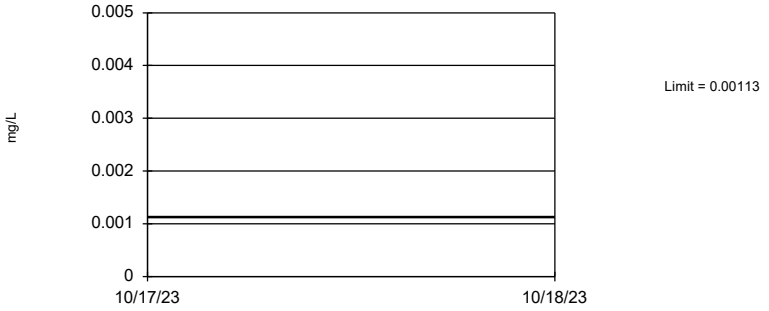
Constituent: Selenium, total Analysis Run 1/4/2024 12:38 PM View: UTLs

Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 72 background values. 80.56% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02489.

Constituent: Thallium, total Analysis Run 1/4/2024 12:38 PM View: UTLs

Pirkey WBAP Data: Pirkey WBAP

FIGURE H

GWPS

PIRKEY WBAP GWPS			
Constituent Name	**MCL**	**Background Limit**	**GWPS**
Antimony, Total (mg/L)	0.006	0.0001	0.006
Arsenic, Total (mg/L)	0.01	0.0042	0.01
Barium, Total (mg/L)	2	0.16	2
Beryllium, Total (mg/L)	0.004	0.001	0.004
Cadmium, Total (mg/L)	0.005	0.00016	0.005
Chromium, Total (mg/L)	0.1	0.0024	0.1
Cobalt, Total (mg/L)	n/a	0.009	0.009
Combined Radium, Total (pCi/L)	5	2.98	5
Fluoride, Total (mg/L)	4	0.26	4
Lead, Total (mg/L)	n/a	0.001	0.001
Lithium, Total (mg/L)	n/a	0.108	0.108
Mercury, Total (mg/L)	0.002	0.000084	0.002
Molybdenum, Total (mg/L)	n/a	0.0012	0.0012
Selenium, Total (mg/L)	0.05	0.0033	0.05
Thallium, Total (mg/L)	0.002	0.0011	0.002

**MCL = Maximum Contaminant Level*

**GWPS = Groundwater Protection Standard*

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FIGURE I

Confidence Intervals

Confidence Intervals Summary Table - Significant Results

Pirkey WBAP Data: Pirkey WBAP Printed 2/26/2024, 11:45 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Cobalt, total (mg/L)	**AD-28**	**0.01495**	**0.01309**	**0.009**	**Yes**	**24**	**0.01402**	**0.001824**	**0**	**None**	**No**	**0.01**	**Param.**

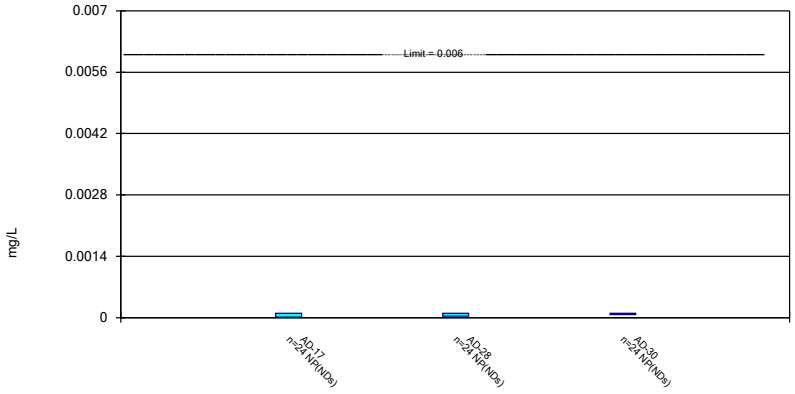
Confidence Intervals Summary Table - All Results

Pirkey WBAP Data: Pirkey WBAP Printed 2/26/2024, 11:45 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	AD-17	0.0001	0.00001	0.006	No	24	0.00009242	0.00002569	91.67	None	No	0.01	NP (NDs)
Antimony, total (mg/L)	AD-28	0.0001	0.00003	0.006	No	24	0.0001451	0.0003093	75	None	No	0.01	NP (NDs)
Antimony, total (mg/L)	AD-30	0.0001	0.0001	0.006	No	24	0.0002008	0.000371	83.33	None	No	0.01	NP (NDs)
Arsenic, total (mg/L)	AD-17	0.002	0.00021	0.01	No	24	0.0009937	0.0008284	33.33	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	AD-28	0.002	0.00018	0.01	No	24	0.001191	0.001346	29.17	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	AD-30	0.002	0.00019	0.01	No	24	0.0009821	0.0008839	37.5	None	No	0.01	NP (normality)
Barium, total (mg/L)	AD-17	0.2372	0.1449	2	No	24	0.191	0.09049	0	None	No	0.01	Param.
Barium, total (mg/L)	AD-28	0.1603	0.1352	2	No	24	0.1478	0.02461	0	None	No	0.01	Param.
Barium, total (mg/L)	AD-30	0.08251	0.05942	2	No	24	0.07373	0.02526	0	None	ln(x)	0.01	Param.
Beryllium, total (mg/L)	AD-17	0.0007058	0.0004922	0.004	No	24	0.000599	0.0002093	8.333	None	No	0.01	Param.
Beryllium, total (mg/L)	AD-28	0.0007228	0.0005398	0.004	No	24	0.0006435	0.0001887	0	None	x^(1/3)	0.01	Param.
Beryllium, total (mg/L)	AD-30	0.0001269	0.00007	0.004	No	24	0.0001704	0.0002573	8.333	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	AD-17	0.001	0.00003	0.005	No	24	0.0004028	0.0004729	37.5	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	AD-28	0.001	0.000049	0.005	No	24	0.0004866	0.0004825	45.83	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	AD-30	0.00005	0.000012	0.005	No	24	0.00003558	0.00001912	58.33	None	No	0.01	NP (NDs)
Chromium, total (mg/L)	AD-17	0.0009025	0.0004251	0.1	No	24	0.000862	0.001001	4.167	None	ln(x)	0.01	Param.
Chromium, total (mg/L)	AD-28	0.001	0.00035	0.1	No	24	0.001326	0.001668	16.67	None	No	0.01	NP (normality)
Chromium, total (mg/L)	AD-30	0.0009942	0.00044	0.1	No	24	0.000853	0.0008785	4.167	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	AD-17	0.01053	0.006384	0.009	No	24	0.008457	0.004062	0	None	No	0.01	Param.
Cobalt, total (mg/L)	**AD-28**	**0.01495**	**0.01309**	**0.009**	**Yes**	**24**	**0.01402**	**0.001824**	**0**	**None**	**No**	**0.01**	**Param.**
Cobalt, total (mg/L)	AD-30	0.003575	0.002397	0.009	No	24	0.003065	0.001183	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-17	5.943	2.899	5	No	24	4.421	2.983	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-28	2.915	1.849	5	No	24	2.463	1.172	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-30	2.114	1.04	5	No	24	1.703	1.172	0	None	sqrt(x)	0.01	Param.
Fluoride, total (mg/L)	AD-17	0.26	0.06	4	No	26	0.1751	0.105	34.62	None	No	0.01	NP (normality)
Fluoride, total (mg/L)	AD-28	0.7672	0.5395	4	No	25	0.6534	0.2283	4	None	No	0.01	Param.
Fluoride, total (mg/L)	AD-30	0.06	0.05	4	No	26	0.05731	0.01041	50	None	No	0.01	NP (normality)
Lead, total (mg/L)	AD-17	0.002	0.00013	0.001	No	24	0.0009908	0.000949	45.83	None	No	0.01	NP (normality)
Lead, total (mg/L)	AD-28	0.002	0.00009	0.001	No	24	0.0009732	0.0009657	45.83	None	No	0.01	NP (normality)
Lead, total (mg/L)	AD-30	0.0002	0.00009	0.001	No	24	0.0001687	0.00005566	70.83	None	No	0.01	NP (NDs)
Lithium, total (mg/L)	AD-17	0.02153	0.01349	0.108	No	24	0.01751	0.00788	4.167	None	No	0.01	Param.
Lithium, total (mg/L)	AD-28	0.0307	0.0226	0.108	No	24	0.02758	0.01045	0	None	No	0.01	NP (normality)
Lithium, total (mg/L)	AD-30	0.01015	0.008304	0.108	No	24	0.008995	0.002303	4.167	None	x^2	0.01	Param.
Mercury, total (mg/L)	AD-17	0.0002412	0.0001188	0.002	No	24	0.0001943	0.0001304	0	None	sqrt(x)	0.01	Param.
Mercury, total (mg/L)	AD-28	0.00005547	0.00002159	0.002	No	24	0.00004379	0.00004145	0	None	sqrt(x)	0.01	Param.
Mercury, total (mg/L)	AD-30	0.0005313	0.00008908	0.002	No	24	0.0004343	0.0006325	0	None	sqrt(x)	0.01	Param.
Molybdenum, total (mg/L)	AD-17	0.0005	0.0004858	0.0012	No	22	0.0004775	0.0001022	90.91	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	AD-28	0.0005	0.0002942	0.0012	No	22	0.0004702	0.0001036	90.91	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	AD-30	0.0008	0.0002	0.0012	No	22	0.0005292	0.0001652	86.36	None	No	0.01	NP (NDs)
Selenium, total (mg/L)	AD-17	0.004	0.0003	0.05	No	24	0.001947	0.001831	41.67	None	No	0.01	NP (normality)
Selenium, total (mg/L)	AD-28	0.004	0.00021	0.05	No	24	0.001841	0.001873	41.67	None	No	0.01	NP (normality)
Selenium, total (mg/L)	AD-30	0.004	0.00033	0.05	No	24	0.001889	0.001832	41.67	None	No	0.01	NP (normality)
Thallium, total (mg/L)	AD-17	0.0002	0.00007	0.002	No	23	0.0002055	0.0001998	73.91	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	AD-28	0.001247	0.00003	0.002	No	23	0.0002234	0.0002307	82.61	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	AD-30	0.000959	0.0001	0.002	No	23	0.0002442	0.0003001	65.22	None	No	0.01	NP (NDs)

Non-Parametric Confidence Interval

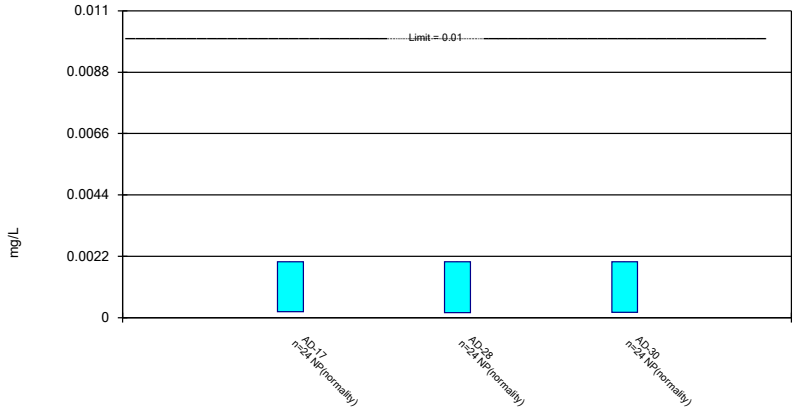
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Antimony, total Analysis Run 2/26/2024 11:44 AM View: Appendix IV
Pirkey WBAP Data: Pirkey WBAP

Non-Parametric Confidence Interval

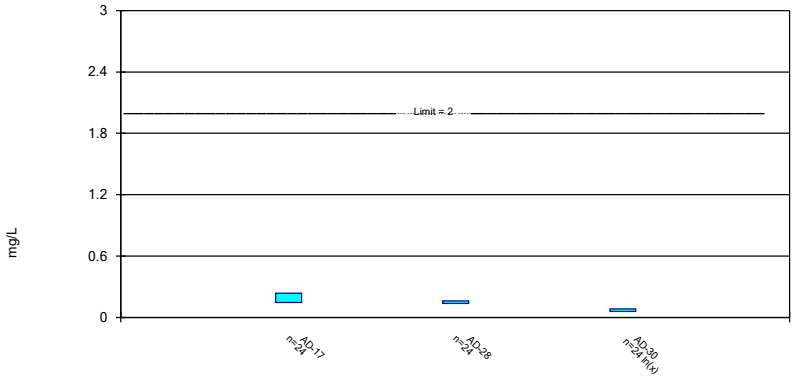
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Arsenic, total Analysis Run 2/26/2024 11:44 AM View: Appendix IV
Pirkey WBAP Data: Pirkey WBAP

Parametric 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 2/26/2024 11:44 AM View: Appendix IV
Pirkey WBAP Data: Pirkey WBAP

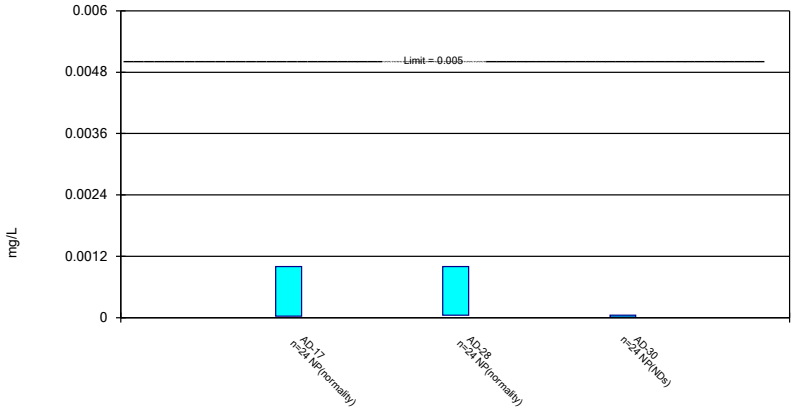
Parametric and Non-Parametric (NP) Confidence Interval

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

Constituent: Beryllium, total Analysis Run 2/26/2024 11:44 AM View: Appendix IV
Pirkey WBAP Data: Pirkey WBAP

Non-Parametric Confidence Interval

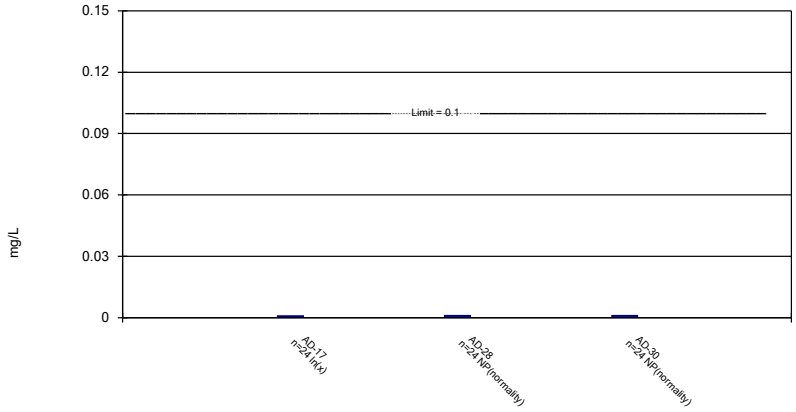
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Cadmium, total Analysis Run 2/26/2024 11:44 AM View: Appendix IV
Pirkey WBAP Data: Pirkey WBAP

Parametric and Non-Parametric (NP) Confidence Interval

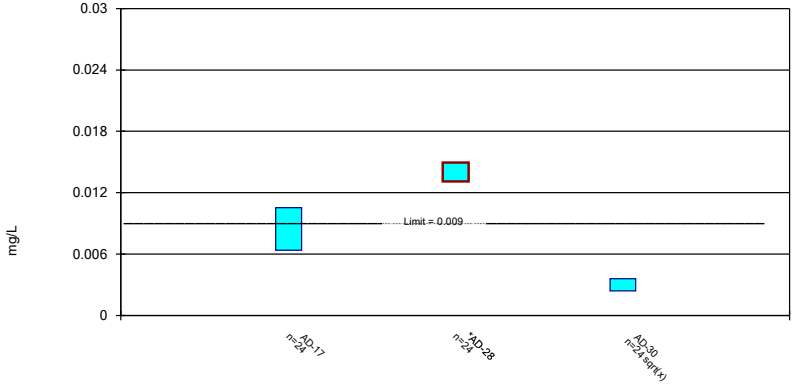
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 2/26/2024 11:44 AM View: Appendix IV
Pirkey WBAP Data: Pirkey WBAP

Parametric Confidence Interval

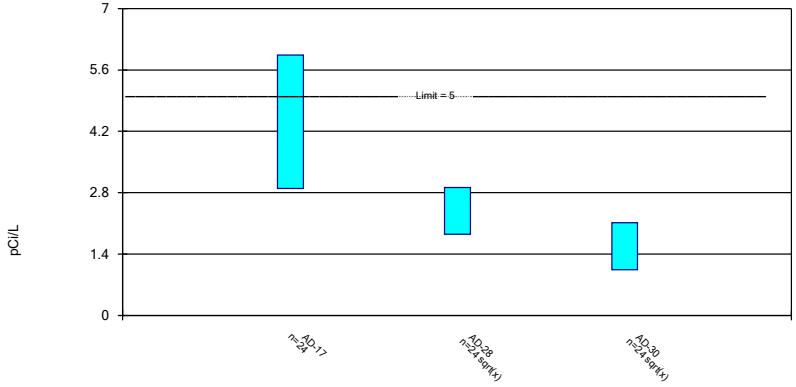
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 2/26/2024 11:44 AM View: Appendix IV
Pirkey WBAP Data: Pirkey WBAP

Parametric Confidence Interval

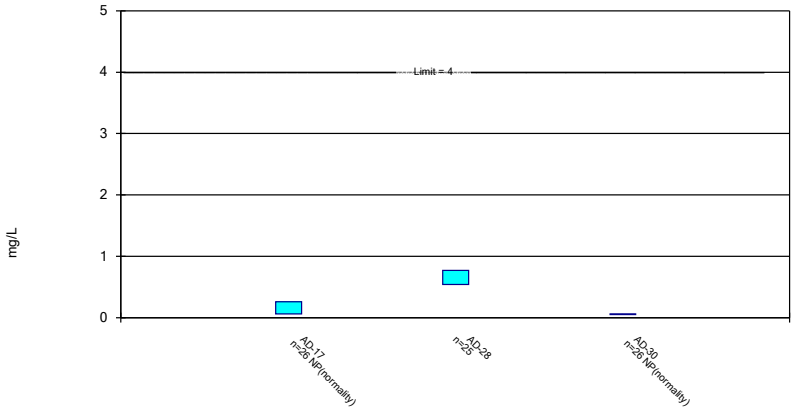
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 2/26/2024 11:44 AM View: Appendix IV
Pirkey WBAP Data: Pirkey WBAP

Parametric and Non-Parametric (NP) Confidence Interval

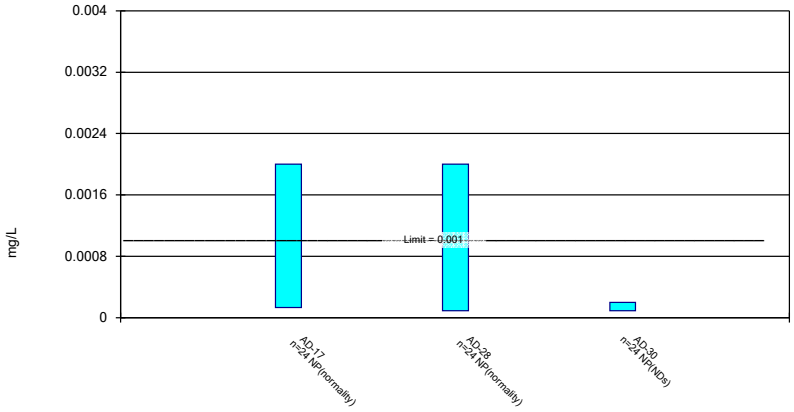
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 2/26/2024 11:44 AM View: Appendix IV
Pirkey WBAP Data: Pirkey WBAP

Non-Parametric Confidence Interval

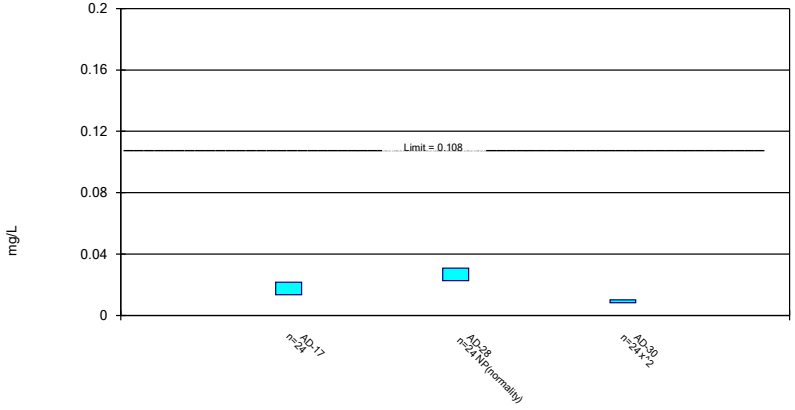
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Lead, total Analysis Run 2/26/2024 11:44 AM View: Appendix IV
Pirkey WBAP Data: Pirkey WBAP

Parametric and Non-Parametric (NP) Confidence Interval

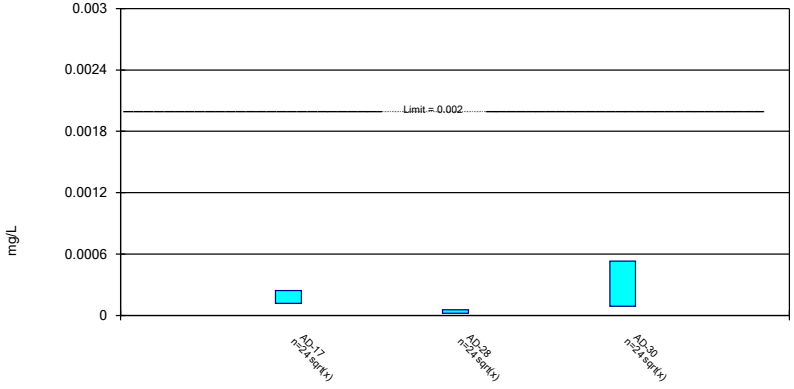
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 2/26/2024 11:44 AM View: Appendix IV
Pirkey WBAP Data: Pirkey WBAP

Parametric Confidence Interval

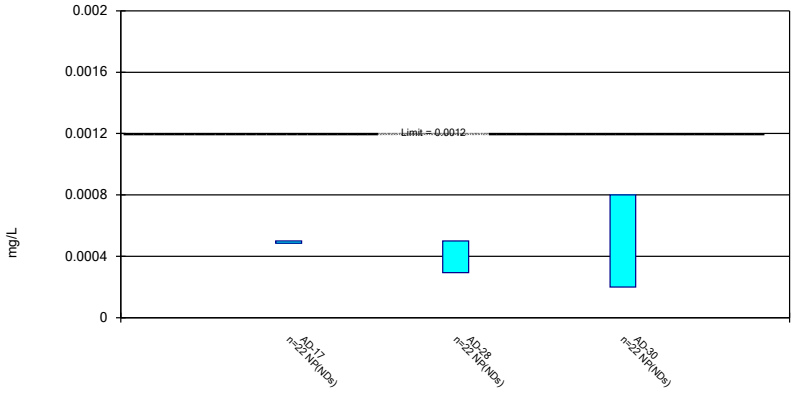
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Mercury, total Analysis Run 2/26/2024 11:44 AM View: Appendix IV
Pirkey WBAP Data: Pirkey WBAP

Non-Parametric Confidence Interval

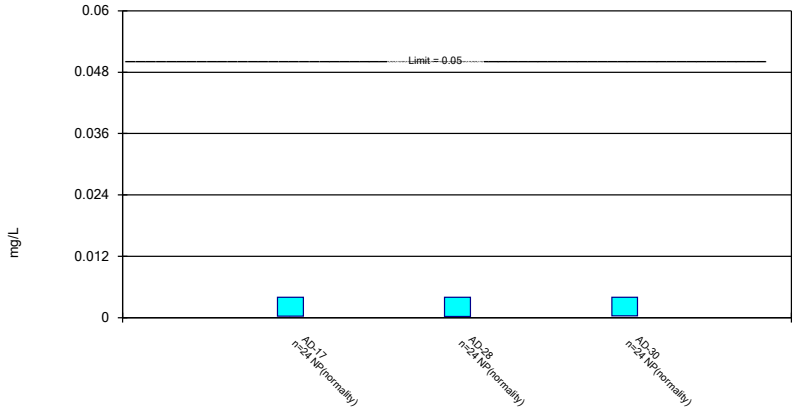
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Molybdenum, total Analysis Run 2/26/2024 11:44 AM View: Appendix IV
Pirkey WBAP Data: Pirkey WBAP

Non-Parametric Confidence Interval

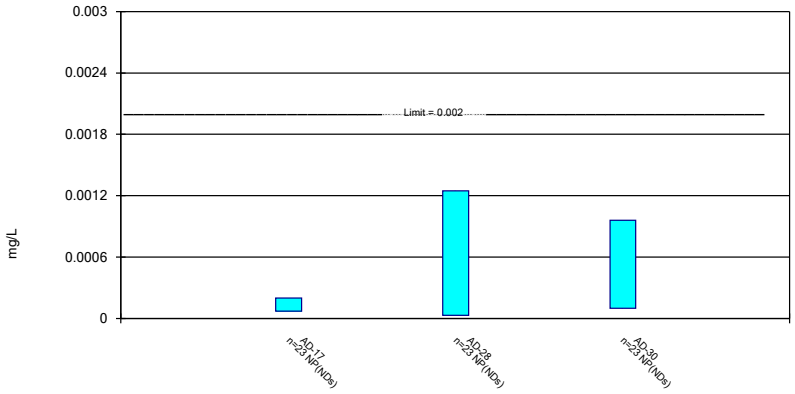
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Selenium, total Analysis Run 2/26/2024 11:44 AM View: Appendix IV
Pirkey WBAP Data: Pirkey WBAP

Non-Parametric Confidence Interval

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



Constituent: Thallium, total Analysis Run 2/26/2024 11:44 AM View: Appendix IV
Pirkey WBAP Data: Pirkey WBAP

FIGURE J

Confidence Intervals – Trend Tests

Trend Tests - Confidence Interval Exceedances - Significant Results

Pirkey WBAP Data: Pirkey WBAP Printed 1/2/2024, 5:16 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Cobalt, total (mg/L)	**AD-18 (bg)**	**-0.0001008**	**-180**	**-85**	**Yes**	**25**	**0**	**n/a**	**n/a**	**0.05**	**NP**
Cobalt, total (mg/L)	**AD-28**	**-0.0003834**	**-115**	**-81**	**Yes**	**24**	**0**	**n/a**	**n/a**	**0.05**	**NP**

Trend Tests - Confidence Interval Exceedances - All Results

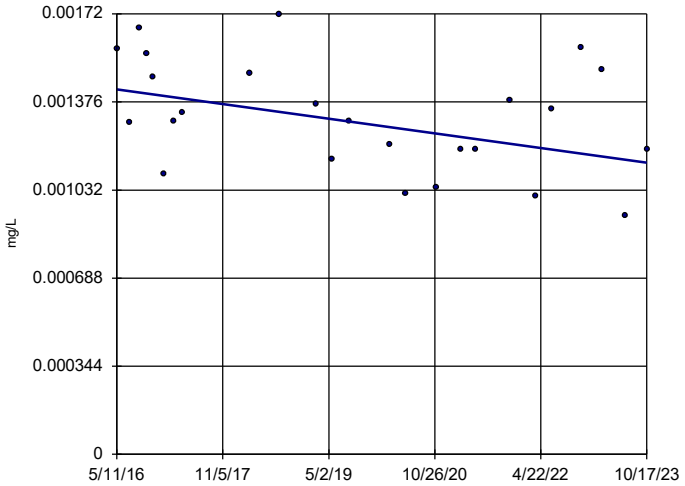
Pirkey WBAP Data: Pirkey WBAP Printed 1/2/2024, 5:16 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Cobalt, total (mg/L)	AD-12 (bg)	-0.00003841	-79	-85	No	25	0	n/a	n/a	0.05	NP
Cobalt, total (mg/L)	**AD-18 (bg)**	**-0.0001008**	**-180**	**-85**	**Yes**	**25**	**0**	**n/a**	**n/a**	**0.05**	**NP**
Cobalt, total (mg/L)	**AD-28**	**-0.0003834**	**-115**	**-81**	**Yes**	**24**	**0**	**n/a**	**n/a**	**0.05**	**NP**
Cobalt, total (mg/L)	AD-3 (bg)	-0.0001498	-25	-81	No	24	0	n/a	n/a	0.05	NP

Sanitas™ v.10.0.15 . UG

Sen's Slope Estimator

AD-12 (bg)



n = 25

Slope = -0.00003841 units per year.

Mann-Kendall statistic = -79
critical = -85

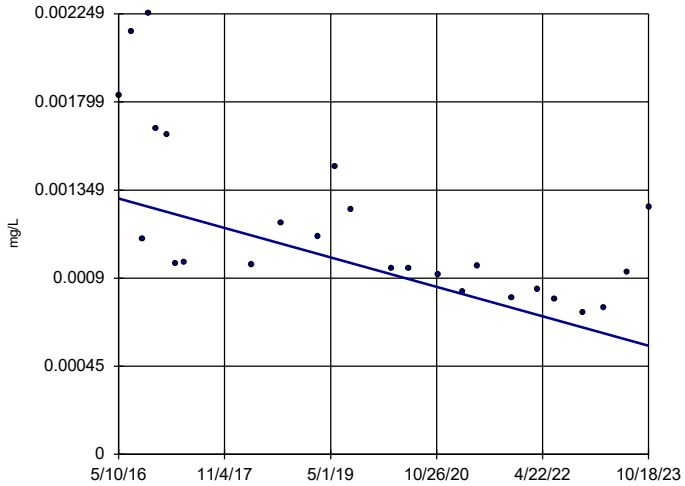
Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Cobalt, total Analysis Run 1/2/2024 5:12 PM View: Confidence Intervals - Trend Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Sen's Slope Estimator

AD-18 (bg)



n = 25

Slope = -0.0001008 units per year.

Mann-Kendall statistic = -180
critical = -85

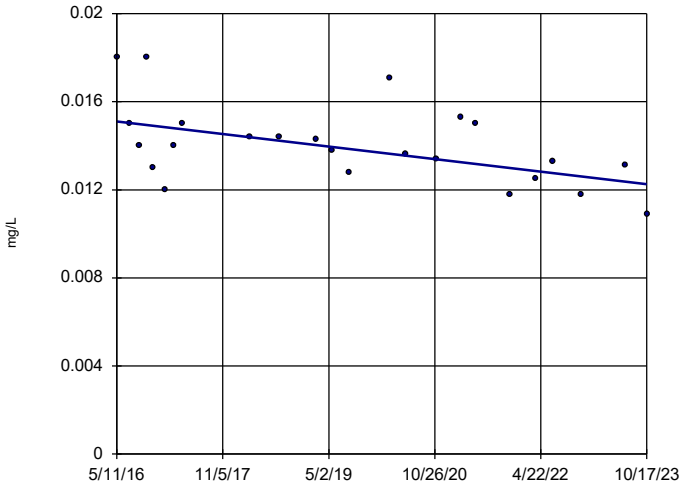
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Cobalt, total Analysis Run 1/2/2024 5:12 PM View: Confidence Intervals - Trend Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Sen's Slope Estimator

AD-28



n = 24

Slope = -0.0003834 units per year.

Mann-Kendall statistic = -115
critical = -81

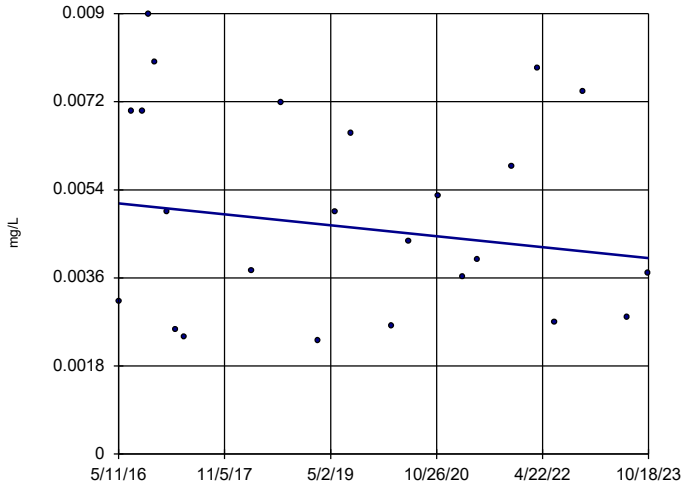
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Cobalt, total Analysis Run 1/2/2024 5:12 PM View: Confidence Intervals - Trend Test
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Sen's Slope Estimator

AD-3 (bg)



n = 24

Slope = -0.0001498 units per year.

Mann-Kendall statistic = -25
critical = -81

Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Cobalt, total Analysis Run 1/2/2024 5:12 PM View: Confidence Intervals - Trend Test
Pirkey WBAP Data: Pirkey WBAP

Geosyntec consultants

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STATISTICAL ANALYSIS SUMMARY 2024 1ST SEMIANNUAL EVENT WEST BOTTOM ASH POND

H.W. Pirkey Power Plant

Hallsville, Texas

Prepared for

American Electric Power
1 Riverside Plaza
Columbus, Ohio 43215-2372

Prepared by

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Project Number: CHA8500B

September 5, 2024

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

ASD	alternative source demonstration
CCR	coal combustion residuals
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
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TDS	total dissolved solids
UPL	upper prediction limit
WBAP	West Bottom Ash Pond

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 West Bottom Ash Pond (WBAP), 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 at the WBAP. An alternative source was not identified at the time, so assessment monitoring was initiated and GWPSs were set in accordance with 30 TAC § 352.951(b). Two assessment monitoring events were conducted at the WBAP in February and April 2024 in accordance with § 352.951(a). The results of these 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 a statistically significant level (SSL) above previously established GWPS. An SSL was identified for cobalt. 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. WEST BOTTOM ASH POND EVALUATION

2.1 Data Validation and QA/QC

Samples were collected for analysis from each upgradient and downgradient 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.10.0.19h statistics software. The export file was checked against the analytical data for transcription errors and completeness.

2.2 Statistical Analysis

Statistical analyses for the WBAP 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).

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 SSL was identified at the Pirkey WBAP:

- The LCL for cobalt was above the GWPS of 0.00900 milligrams per liter (mg/L) at AD-28 (0.0131 mg/L).

As a result, the Pirkey WBAP 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 an SSL was identified, a review of the Appendix III results was 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):

- Boron concentrations were above the interwell UPL of 0.0668 mg/L at AD-28 (0.290 mg/L) and AD-30 (1.13 mg/L).
- The chloride concentration was above the interwell UPL of 8.79 mg/L at AD-30 (12.2 mg/L).
- The fluoride concentration was above the interwell UPL of 0.257 mg/L at AD-28 (0.79 mg/L).
- The sulfate concentration was above the intrawell UPL of 31.6 mg/L at AD-30 (104 mg/L).
- The total dissolved solids (TDS) concentration was above the intrawell UPL of 206 mg/L at AD-30 (220 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, in the case of pH, below the lower prediction limit. 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, with no QA/QC issues identified that prevented data usage. 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. An SSL was identified for cobalt. Appendix III parameters were compared to previously calculated prediction limits, with exceedances identified for boron, chloride, fluoride, sulfate, and TDS.

Based on this evaluation, the Pirkey WBAP 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 – West Bottom Ash Pond, Pirkey, Hallsville, Texas. Geosyntec Consultants, Inc. March.

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

TABLES

Table 1. Groundwater Data Summary
Statistical Analysis Summary
Pirkey Plant – West Bottom Ash Pond

Parameter	Unit	AD-3		AD-12		AD-17		AD-18		AD-28		AD-30	
		2/20/2024	4/23/2024	2/19/2024	4/22/2024	2/20/2024	4/23/2024	2/20/2024*	4/23/2024	2/20/2024	4/23/2024	2/19/2024	4/23/2024
Antimony	µg/L	0.008 J1	0.1 U1	0.010 J1	0.009 J1	0.009 J1	0.1 U1	0.019 J1	0.1 U1	0.008 J1	0.1 U1	0.009 J1	0.1 U1
Arsenic	µg/L	0.10	0.25	0.07 J1	0.09 J1	0.23	0.09 J1	1.17	0.19	0.10	0.12	0.25	0.15
Barium	µg/L	57.7	65.2	21.7	19.3	85.2	47.6	83.1	76.6	124	121	61.3	49.9
Beryllium	µg/L	0.21 J1	0.24 J1	0.127	0.121	0.310	0.221	0.100	0.083	0.917	0.770	0.097	0.122
Boron	mg/L	0.037 J1	0.038 J1	0.016 J1	0.015 J1	0.034 J1	0.020 J1	0.013 J1	0.008 J1	0.333	0.290	1.50	1.13
Cadmium	µg/L	0.024	0.017 J1	0.009 J1	0.007 J1	0.020	0.011 J1	0.013 J1	0.010 J1	0.063	0.055	0.012 J1	0.012 J1
Calcium	mg/L	3.55	4.32	0.27	0.18	0.14	0.04 J1	0.27	0.19	1.34	1.19	0.44	0.38
Chloride	mg/L	5.55	5.83	5.87	4.86	12.0	6.44	4.67	5.39	4.54	3.90	15.6	12.2
Chromium	µg/L	0.49	0.24 J1	0.50	0.34	0.57	0.37	0.95	0.32	0.38	0.38	0.53	0.42
Cobalt	µg/L	3.07	3.57	1.13	1.08	4.40	1.99	1.05	0.851	14.4	13.0	3.33	3.30
Combined Radium	pCi/L	1.25	1.81	1.00	2.62	3.15	1.80	1.42	0.99	5.84	1.55	2.26	0.89
Fluoride	mg/L	0.03 J1	0.05 J1	0.11	0.08	0.15	0.09	0.06 U1	0.02 J1	0.97	0.79	0.03 J1	0.05 J1
Lead	µg/L	0.2 U1	0.05 J1	0.06 J1	0.08 J1	0.08 J1	0.2 U1	0.30	0.06 J1	0.2 U1	0.07 J1	0.2 U1	0.2 U1
Lithium	mg/L	0.0511	0.0599	0.00547	0.00462	0.00998	0.00705	0.0151	0.0130	0.0207	0.0179	0.00870	0.00736
Mercury	µg/L	0.005 U1	0.005 U1	0.002 J1	0.005 U1	0.131	0.051	0.014	0.008	0.017	0.013	0.022	0.023
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	0.5 U1	0.5 U1
Selenium	µg/L	0.07 J1	0.06 J1	0.19 J1	0.31 J1	0.16 J1	0.11 J1	0.23 J1	0.11 J1	0.32 J1	0.33 J1	0.31 J1	0.30 J1
Sulfate	mg/L	22.3	28.5	3.1	4.2	3.4	2.1	8.1	7.2	26.9	24.7	118	104
Thallium	µg/L	0.05 J1	0.05 J1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.05 J1	0.03 J1	0.02 J1	0.03 J1	0.03 J1	0.03 J1
Total Dissolved Solids	mg/L	140	160	60	60	50	40 J1	110	90	90	100	250	220
pH	SU	4.8	4.6	3.2	3.4	4.9	3.6	4.5	4.7	4.8	3.4	4.3	3.8

Notes:
*: pH value collected on 2/19/2024. Well purged dry and sampled the following day.
J1: Estimated value. Parameter was detected in concentrations below the reporting limit.
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 – West Bottom Ash Pond

Constituent Name	MCL	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600	0.000100	0.00600
Arsenic, Total (mg/L)	0.0100	0.00423	0.0100
Barium, Total (mg/L)	2.00	0.157	2.00
Beryllium, Total (mg/L)	0.00400	0.00100	0.00400
Cadmium, Total (mg/L)	0.00500	0.000159	0.00500
Chromium, Total (mg/L)	0.100	0.00244	0.100
Cobalt, Total (mg/L)	n/a	0.00900	0.00900
Combined Radium, Total (pCi/L)	5.00	2.98	5.00
Fluoride, Total (mg/L)	4.00	0.257	4.00
Lead, Total (mg/L)	n/a	0.00100	0.00100
Lithium, Total (mg/L)	n/a	0.108	0.108
Mercury, Total (mg/L)	0.00200	0.0000840	0.00200
Molybdenum, Total (mg/L)	n/a	0.00116	0.00116
Selenium, Total (mg/L)	0.0500	0.00330	0.0500
Thallium, Total (mg/L)	0.00200	0.00113	0.00200

Notes:
1. Calculated UTL (upper tolerance limit) represents site-specific background values.
2. Grey cells indicate the GWPS is based on the calculated UTL because an MCL does not exist.
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 – West Bottom Ash Pond

Analyte	Unit	Description	AD-17	AD-28	AD-30
			4/23/2024	4/23/2024	4/23/2024
Boron	mg/L	Interwell Background Value (UPL)	0.0668		
		Analytical Result	0.020	**0.290**	**1.13**
Calcium	mg/L	Intrawell Background Value (UPL)	1.34	3.21	1.03
		Analytical Result	0.04	1.19	0.38
Chloride	mg/L	Interwell Background Value (UPL)	8.79		
		Analytical Result	6.44	3.90	**12.2**
Fluoride	mg/L	Interwell Background Value (UPL)	0.257		
		Analytical Result	0.09	**0.79**	0.05
pH	SU	Intrawell Background Value (UPL)	4.7	5.4	5.3
		Intrawell Background Value (LPL)	3.3	3.4	3.8
		Analytical Result	3.6	3.4	3.8
Sulfate	mg/L	Intrawell Background Value (UPL)	8.56	30.1	31.6
		Analytical Result	2.1	24.7	**104**
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	108	130	206
		Analytical Result	40	100	**220**

Notes:
1. Bold values exceed the background value.
2. Background values are shaded gray.
mg/L: milligrams per liter
LPL: lower prediction limit
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 West Bottom Ash Pond 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	Texas	09.09.2024
License Number	Licensing State	Date

ATTACHMENT B
Data Quality Review Memoranda

Geosyntec consultants

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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. 32[1] 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 (180 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.

Geosyntec consultants

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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 April 2024 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. 32[1] 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

September 6, 2024

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

Re: Pirkey West Bottom Ash Pond
Assessment Monitoring Event – February and 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 West Bottom Ash Pond (WBAP). 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-3, AD-12, and AD-18
- **Downgradient wells:** AD-17, AD-28, and AD-30

Data were sent electronically to GSC, and the statistical analysis report was prepared according to the background screening conducted in December 2017 that was approved by Dr. Kirk Cameron, PhD Statistician with MacStat Consulting, primary author of the USEPA Unified Guidance, and Senior Advisor to GSC. The statistical analysis was reviewed by Andrew Collins, Project Manager for 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 and box plots for Appendix IV parameters are provided for all wells and constituents; and are used to evaluate concentrations over the entire record (Figures A and B, respectively). The time series plots are used to evaluate concentrations over time and between wells, and to initially screen for suspected outliers and trends while the box plots provide visual representation of variation within individual wells and between 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.

Summary of Statistical Methods

Assessment monitoring for Appendix IV parameters involves the comparison of a confidence interval for each parameter 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 constructed from tolerance limits using all pooled upgradient well data.

Prior to computing tolerance limits on upgradient well data or 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 (USEPA, 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 are used on data containing greater than 50% non-detects.

Summary of Background Update – Conducted in October 2023

Outlier Analysis

Prior to evaluating Appendix IV parameters, upgradient well data are screened through both 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 through October 2023 identified outliers for fluoride and mercury. However, no new values were flagged as outliers as the measurements were similar to concentrations at neighboring upgradient wells or were below the MCL. No changes to previously flagged outliers were made among upgradient wells for Appendix IV parameters as these measurements were confirmed by visual screening.

During previous screenings, the highest value for lithium at upgradient well AD-3 was flagged to construct statistical limits that are conservative (i.e., lower) from a regulatory perspective. The reporting limit for thallium for the February 2019 event was 0.01 mg/L, which is higher than the historical reporting limit of 0.002 mg/L. Therefore, this value was flagged as an outlier at wells with reported non-detects for the February 2019 event. Similarly, the high non-detects for molybdenum of 0.04 mg/L for February and May of 2019 are flagged since they are censored at a much higher level than the other non-detects. All flagged values may be seen on the Outlier Summary following this letter (Figure C).

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 D). 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 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 E).

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. 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. A summary of all flagged measurements follows this letter (Figure C).

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 F). 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 with the corresponding GWPS from Figure E. Only when the entire confidence interval is above the GWPS is the well/constituent pair considered to exceed its respective standard. Both a tabular summary and graphical presentation of the confidence interval results follow this letter. An exceedance was noted for the following well/constituent pair:

- Cobalt: AD-28

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 G). 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 prediction limit 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
- None

Decreasing
- Cobalt: AD-12, AD-18 (both upgradient), and AD-28

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

For Groundwater Stats Consulting,

Kristina Rayner
Senior Statistician

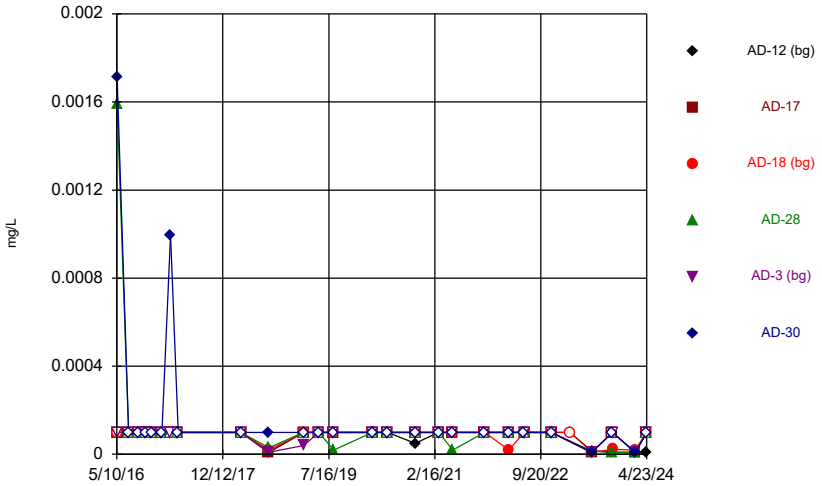
Andrew T. Collins
Project Manager

FIGURE A

Time Series

Sanitas™ v.10.0.19h Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

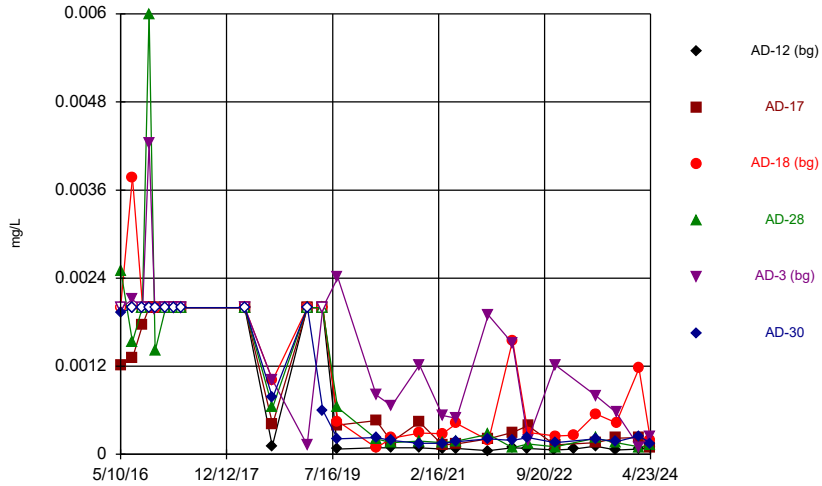
Time Series



Constituent: Antimony, total Analysis Run 7/3/2024 11:06 AM View: Descriptive
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.19h Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Arsenic, total Analysis Run 7/3/2024 11:06 AM View: Descriptive
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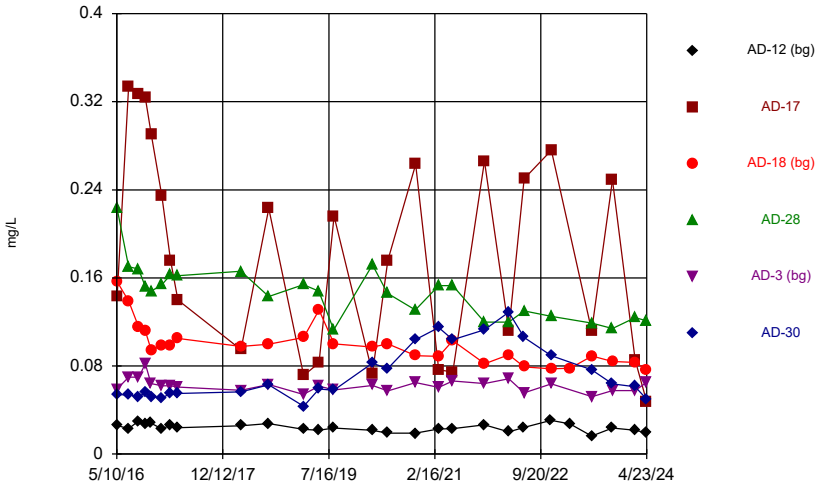
Sanitas™ v.10.0.19h Software licensed to Groundwater Stats Consulting. UG

Time Series



Constituent: Barium, total Analysis Run 7/3/2024 11:06 AM View: Descriptive
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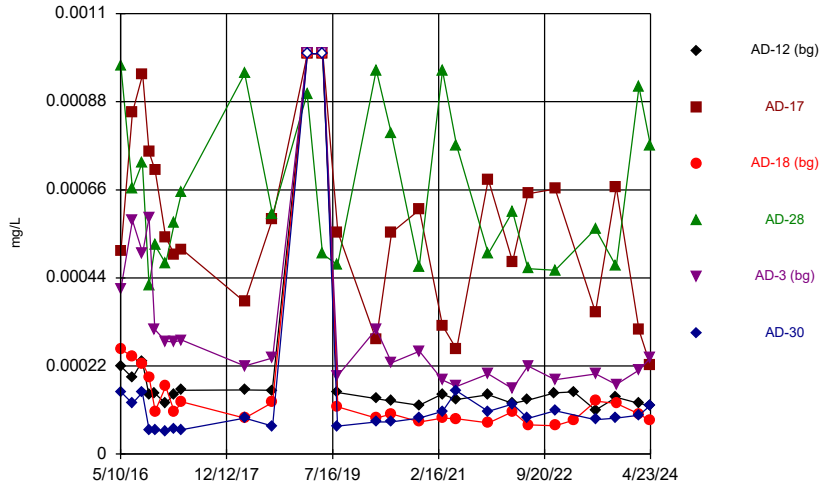
Sanitas™ v.10.0.19h Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Beryllium, total Analysis Run 7/3/2024 11:06 AM View: Descriptive
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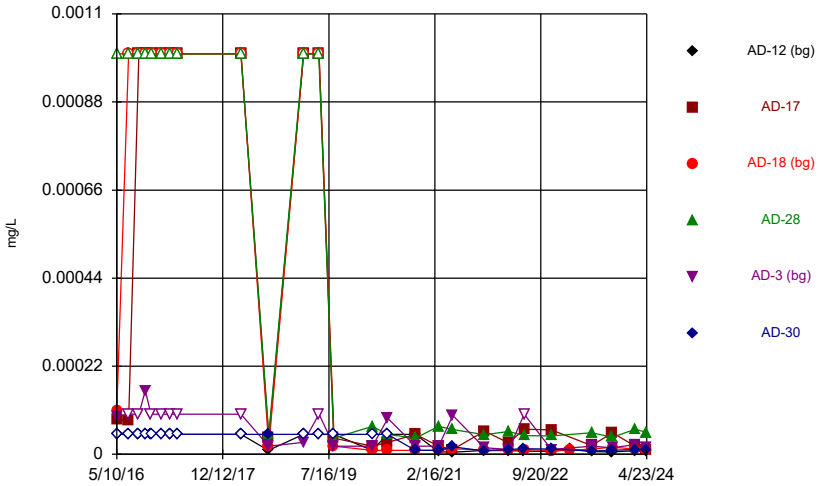
Sanitas™ v.10.0.19h Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



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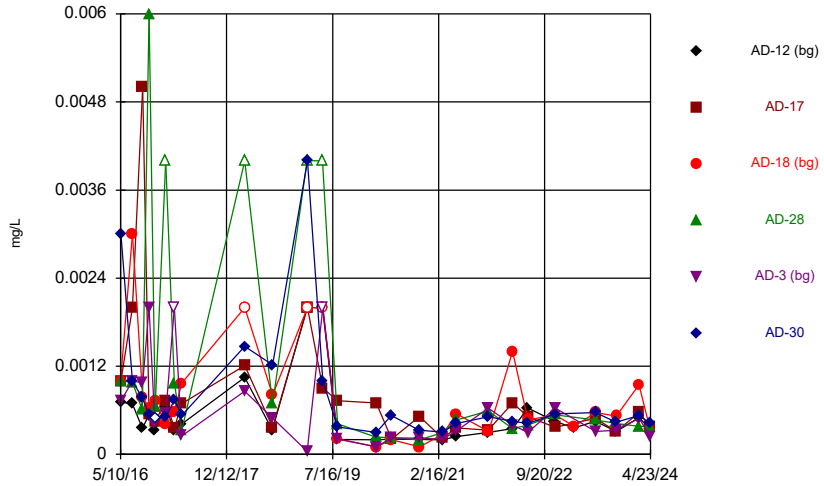
Sanitas™ v.10.0.19h Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Chromium, total Analysis Run 7/3/2024 11:06 AM View: Descriptive
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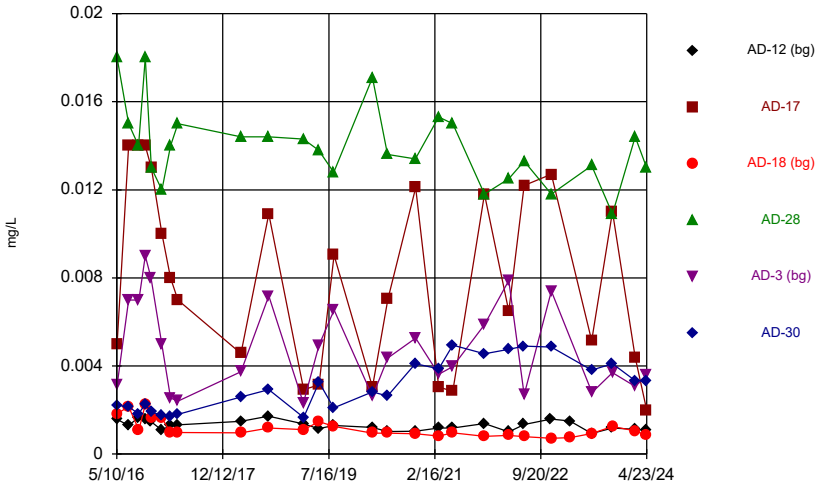
Sanitas™ v.10.0.19h Software licensed to Groundwater Stats Consulting. UG

Time Series



Constituent: Cobalt, total Analysis Run 7/3/2024 11:06 AM View: Descriptive
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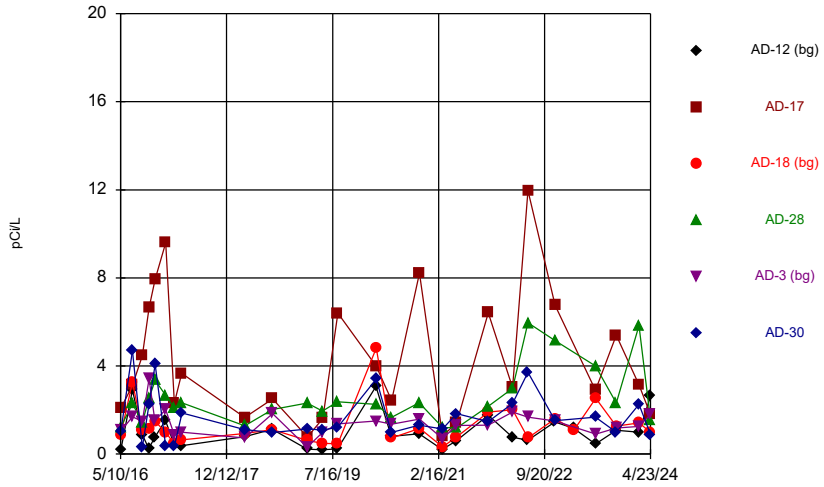
Sanitas™ v.10.0.19h Software licensed to Groundwater Stats Consulting. UG

Time Series



Constituent: Combined Radium 226 + 228 Analysis Run 7/3/2024 11:06 AM View: Descriptive
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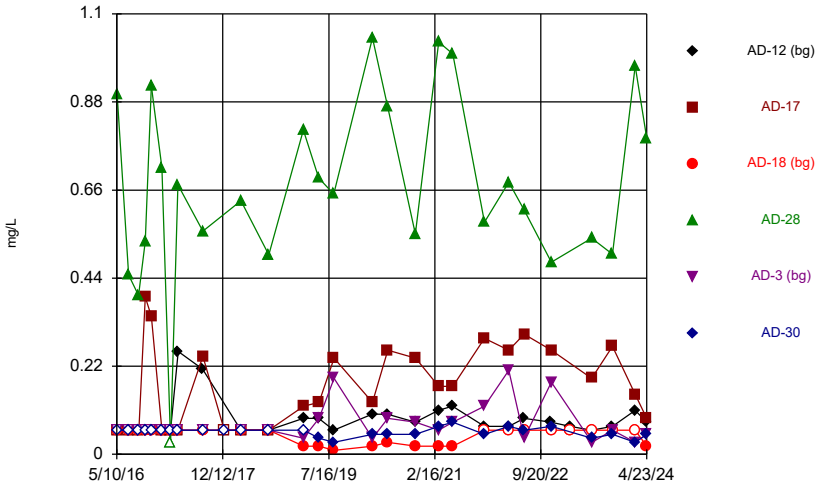
Sanitas™ v.10.0.19h Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Fluoride, total Analysis Run 7/3/2024 11:06 AM View: Descriptive
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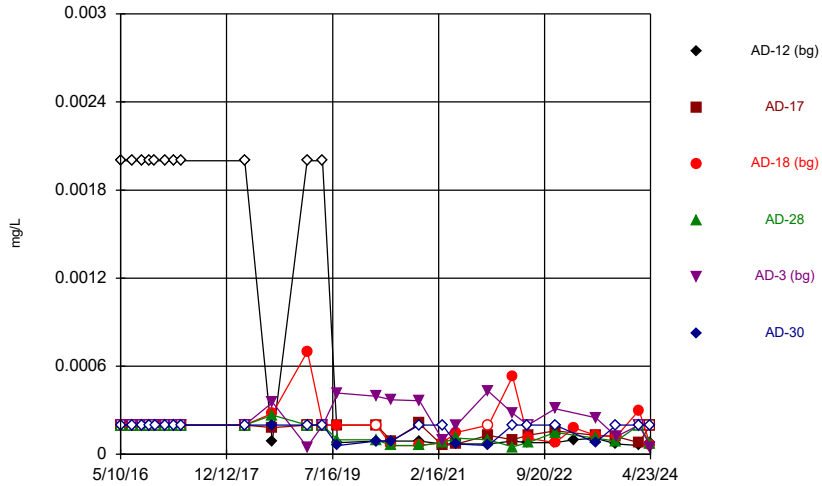
Hollow symbols indicate censored values.

Time Series



Constituent: Lead, total Analysis Run 7/3/2024 11:06 AM View: Descriptive
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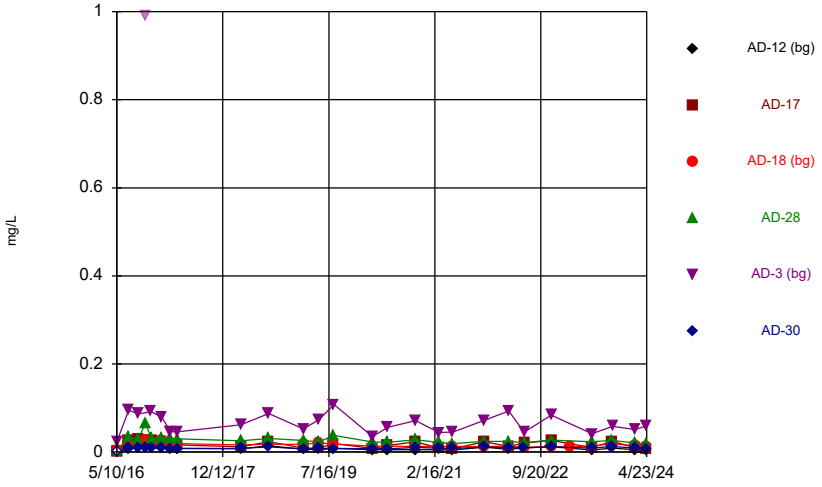
Sanitas™ v.10.0.19h Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Lithium, total Analysis Run 7/3/2024 11:06 AM View: Descriptive
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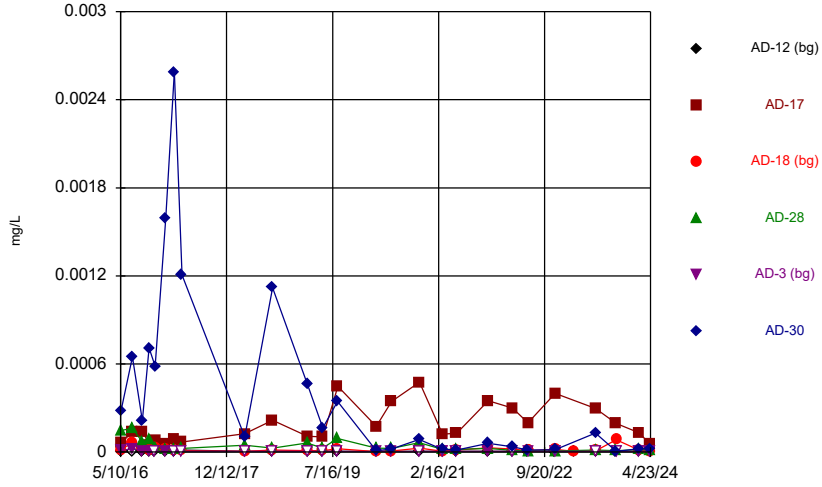
Hollow symbols indicate censored values.

Time Series



Constituent: Mercury, total Analysis Run 7/3/2024 11:06 AM View: Descriptive
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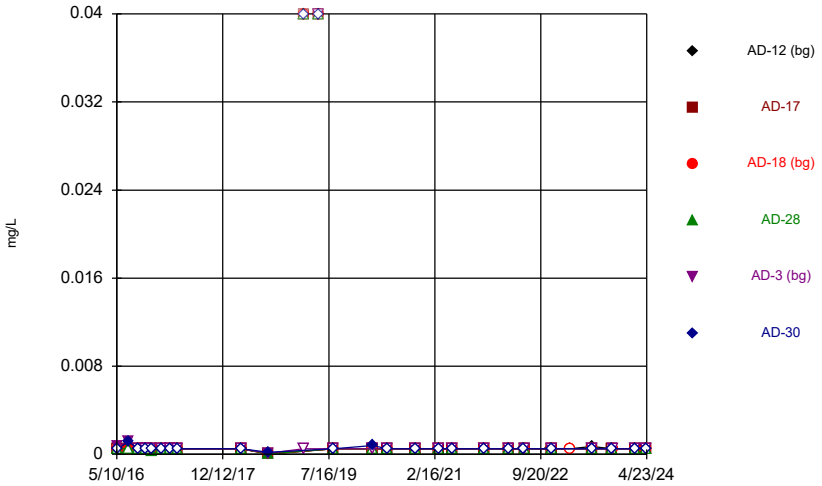
Sanitas™ v.10.0.19h Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

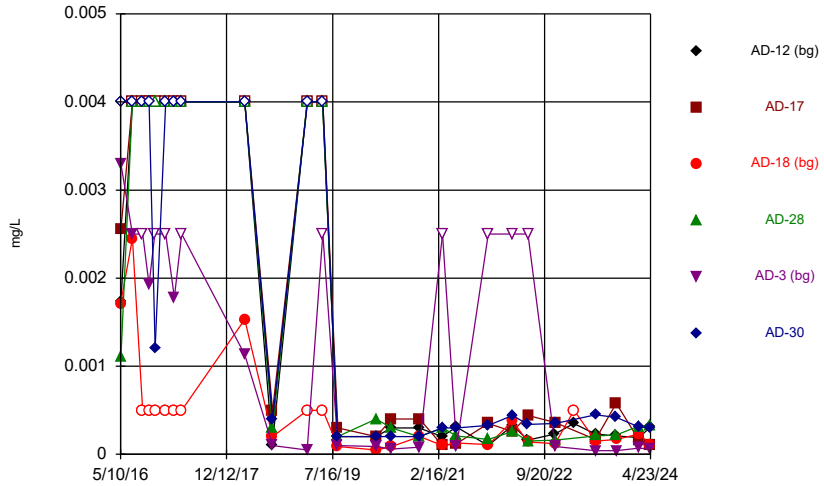
Time Series



Constituent: Molybdenum, total Analysis Run 7/3/2024 11:06 AM View: Descriptive
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.19h Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Selenium, total Analysis Run 7/3/2024 11:06 AM View: Descriptive
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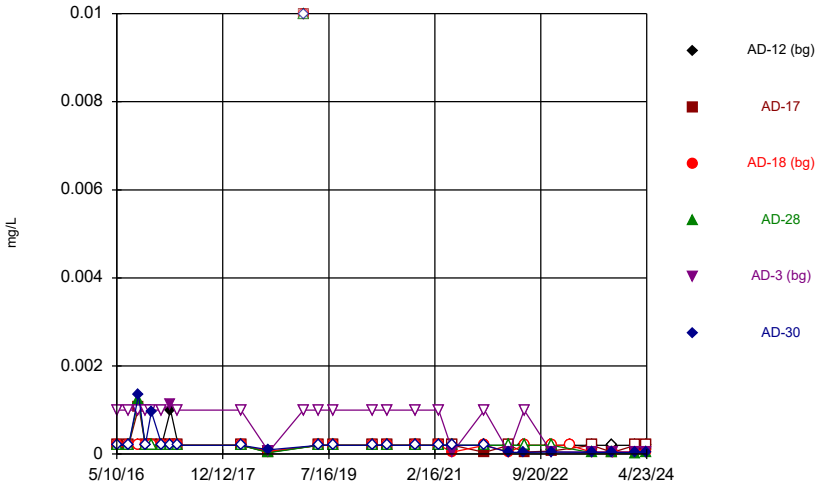
Sanitas™ v.10.0.19h Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series

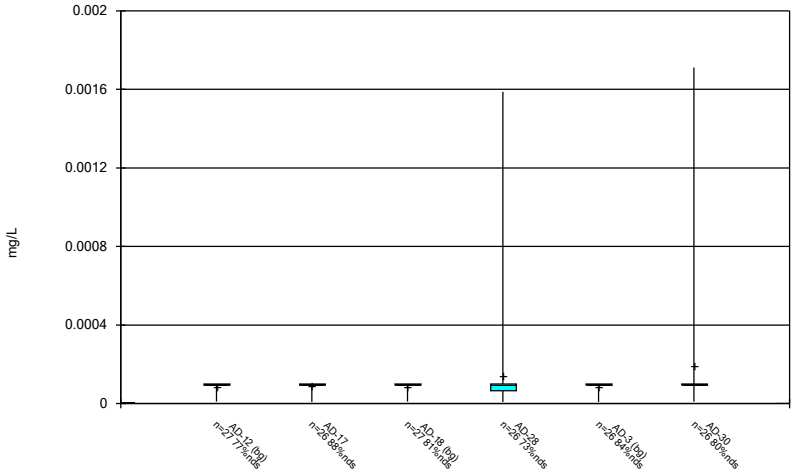


Constituent: Thallium, total Analysis Run 7/3/2024 11:06 AM View: Descriptive
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

FIGURE B

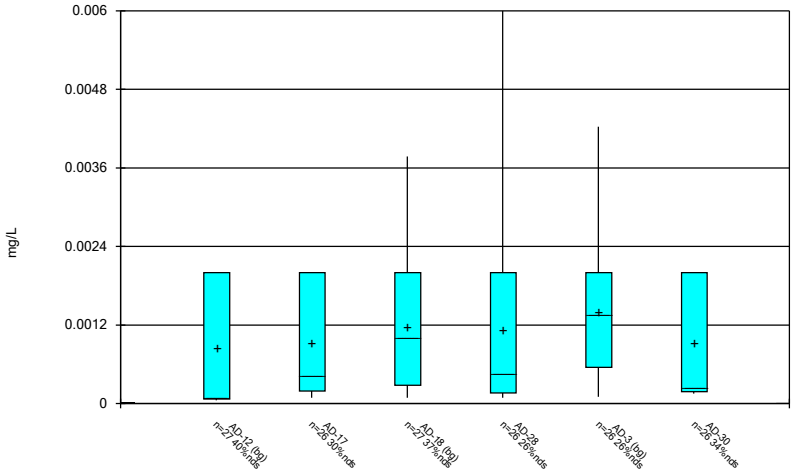
Box Plots

Box & Whiskers Plot



Constituent: Antimony, total Analysis Run 7/3/2024 11:06 AM View: Descriptive
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



Constituent: Arsenic, total Analysis Run 7/3/2024 11:07 AM View: Descriptive
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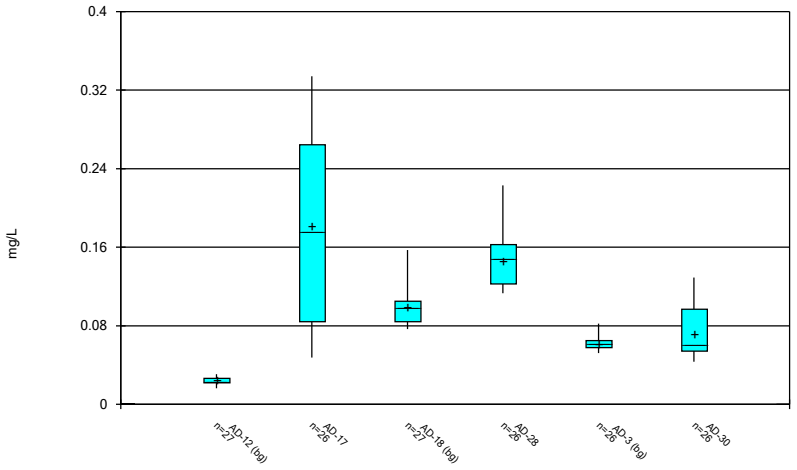
Box & Whiskers Plot



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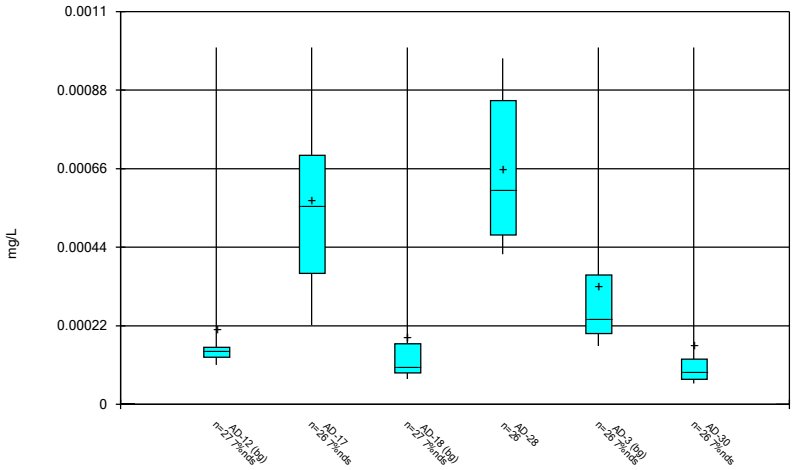
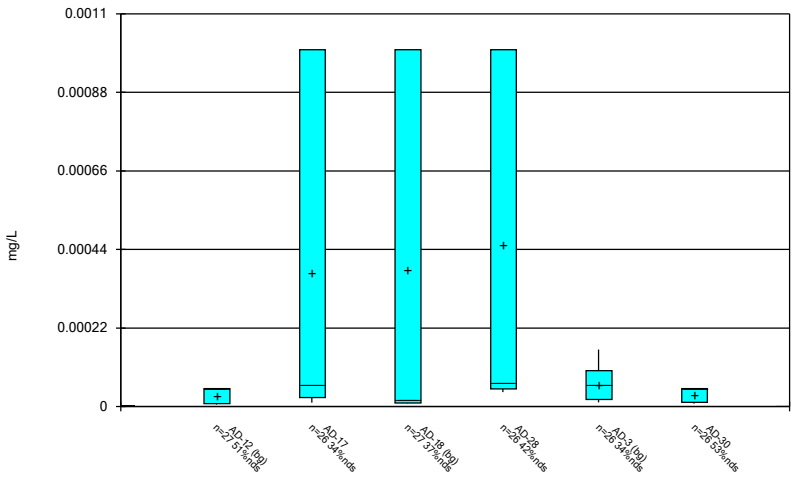
Box & Whiskers Plot



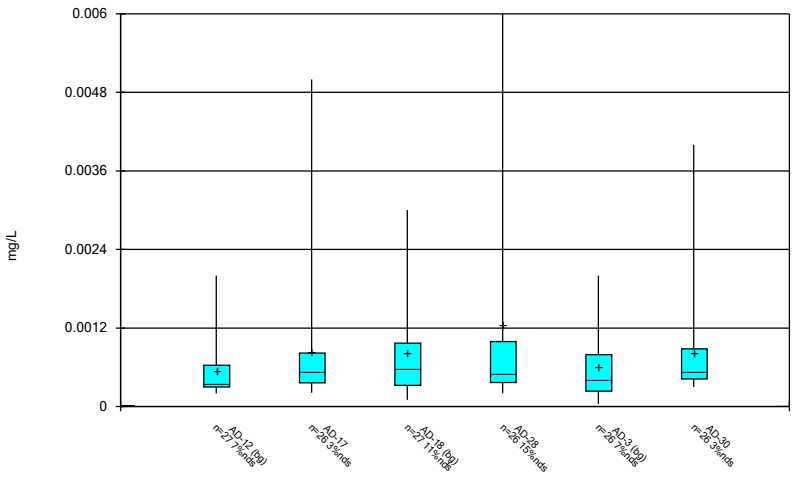
Constituent: Beryllium, total Analysis Run 7/3/2024 11:07 AM View: Descriptive
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



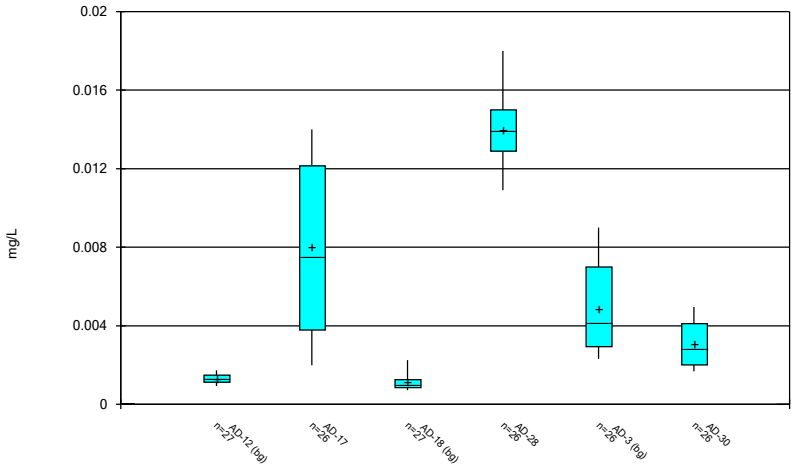
Constituent: Cadmium, total Analysis Run 7/3/2024 11:07 AM View: Descriptive
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



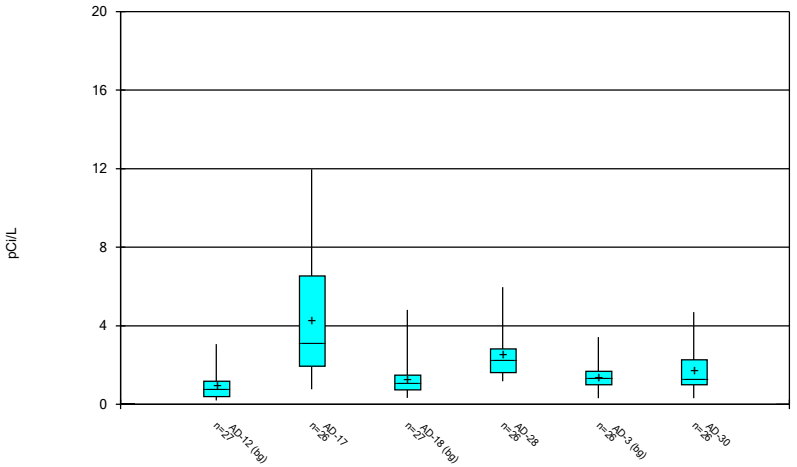
Constituent: Chromium, total Analysis Run 7/3/2024 11:07 AM View: Descriptive
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



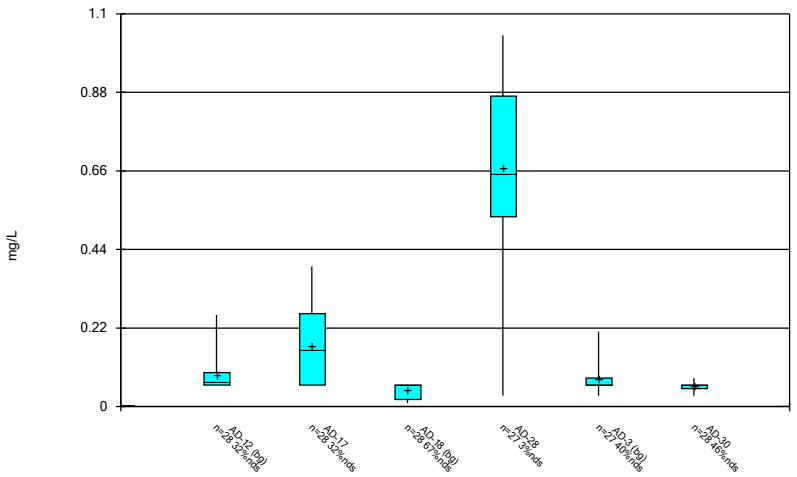
Constituent: Cobalt, total Analysis Run 7/3/2024 11:07 AM View: Descriptive
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



Constituent: Combined Radium 226 + 228 Analysis Run 7/3/2024 11:07 AM View: Descriptive
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



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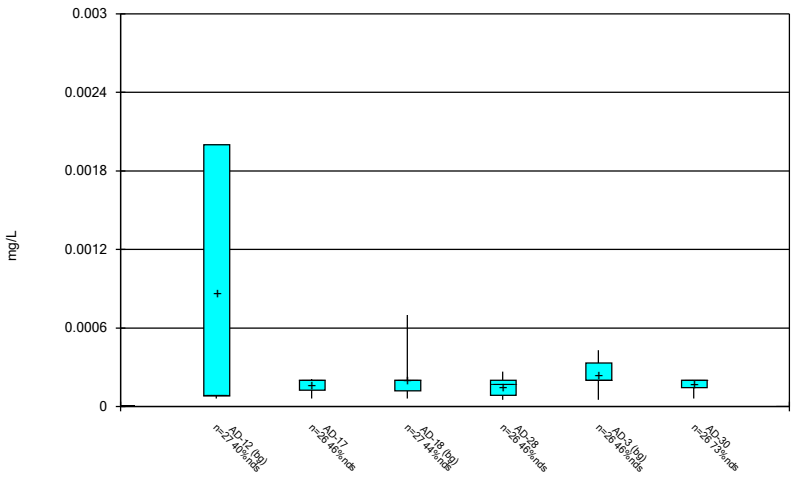
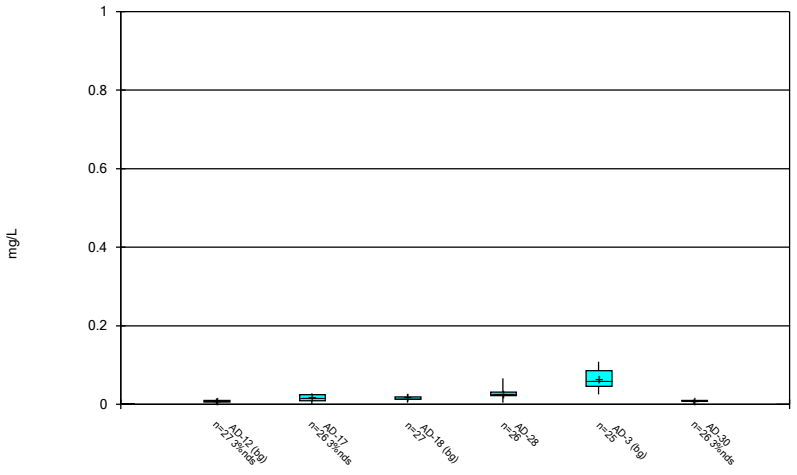
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



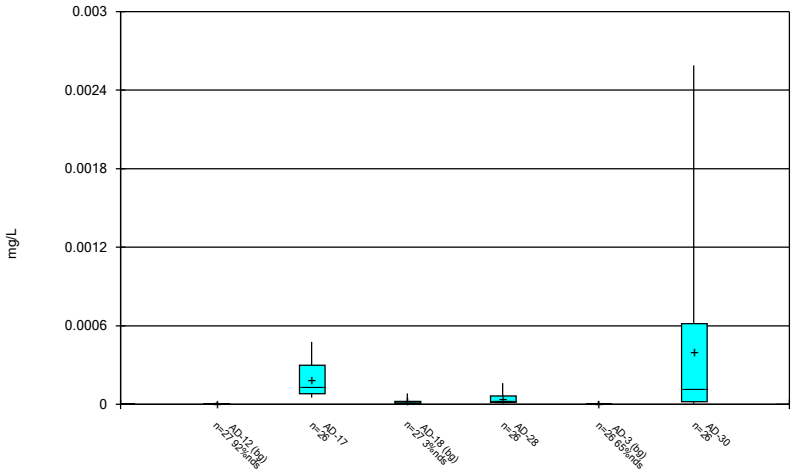
Constituent: Lead, total Analysis Run 7/3/2024 11:07 AM View: Descriptive
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



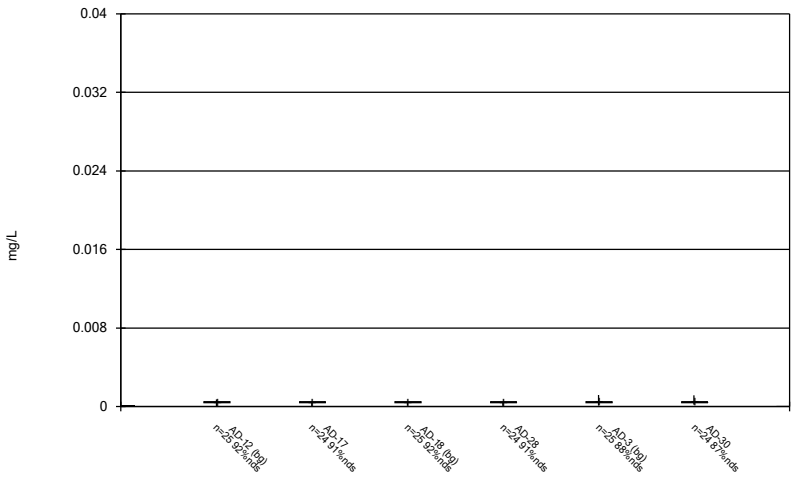
Constituent: Lithium, total Analysis Run 7/3/2024 11:07 AM View: Descriptive
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



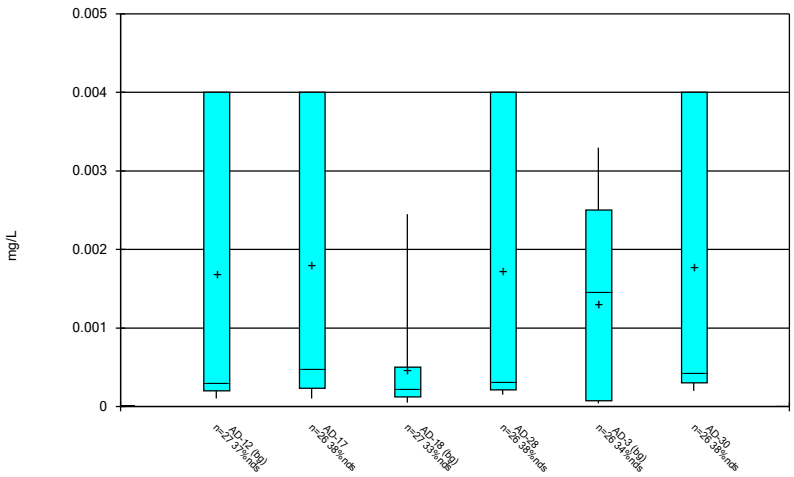
Constituent: Mercury, total Analysis Run 7/3/2024 11:07 AM View: Descriptive
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



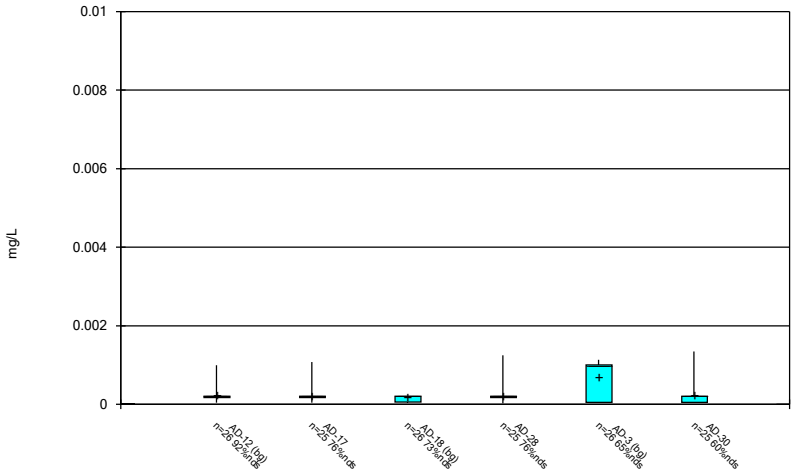
Constituent: Molybdenum, total Analysis Run 7/3/2024 11:07 AM View: Descriptive
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



Constituent: Selenium, total Analysis Run 7/3/2024 11:07 AM View: Descriptive
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 7/3/2024 11:07 AM View: Descriptive
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

FIGURE C
Outlier Summary

Outlier Summary

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 7/2/2024, 6:06 PM

	AD-3 Lithium, total (mg/L)	AD-12 Molybdenum, total (mg/L)	AD-17 Molybdenum, total (mg/L)	AD-18 Molybdenum, total (mg/L)	AD-28 Molybdenum, total (mg/L)	AD-3 Molybdenum, total (mg/L)	AD-30 Molybdenum, total (mg/L)	AD-12 Thallium, total (mg/L)	AD-17 Thallium, total (mg/L)	AD-18 Thallium, total (mg/L)
10/13/2016	0.991 (o)									
2/27/2019		<0.0005 (o)			<0.0005 (o)			<0.0002 (o)		
2/28/2019			<0.0005 (o)	<0.0005 (o)			<0.0005 (o)		<0.0002 (o)	<0.0002 (o)
5/21/2019		<0.0005 (o)								
5/22/2019					<0.0005 (o)					
5/23/2019			<0.0005 (o)	<0.0005 (o)		<0.0005 (o)	<0.0005 (o)			

	AD-28 Thallium, total (mg/L)	AD-30 Thallium, total (mg/L)
10/13/2016		
2/27/2019	<0.0002 (o)	
2/28/2019		<0.0002 (o)
5/21/2019		
5/22/2019		
5/23/2019		

FIGURE D

UTLs

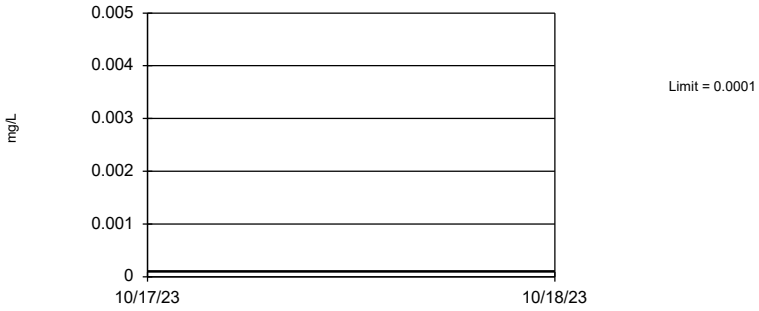
Upper Tolerance Limits Summary Table

Pirkey WBAP Data: Pirkey WBAP Printed 1/4/2024, 12:39 PM

Constituent	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Antimony, total (mg/L)	0.0001	n/a	n/a	n/a	n/a	74	85.14	n/a	0.02247	NP Inter(NDs)
Arsenic, total (mg/L)	0.004229	n/a	n/a	n/a	n/a	74	37.84	n/a	0.02247	NP Inter(normality)
Barium, total (mg/L)	0.157	n/a	n/a	n/a	n/a	74	0	n/a	0.02247	NP Inter(normality)
Beryllium, total (mg/L)	0.001	n/a	n/a	n/a	n/a	74	8.108	n/a	0.02247	NP Inter(normality)
Cadmium, total (mg/L)	0.0001592	n/a	n/a	n/a	n/a	74	44.59	n/a	0.02247	NP Inter(normality)
Chromium, total (mg/L)	0.002437	n/a	n/a	n/a	n/a	74	9.459	ln(x)	0.05	Inter
Cobalt, total (mg/L)	0.009	n/a	n/a	n/a	n/a	74	0	n/a	0.02247	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	2.983	n/a	n/a	n/a	n/a	74	0	sqrt(x)	0.05	Inter
Fluoride, total (mg/L)	0.2565	n/a	n/a	n/a	n/a	77	49.35	n/a	0.01926	NP Inter(normality)
Lead, total (mg/L)	0.001	n/a	n/a	n/a	n/a	74	45.95	n/a	0.02247	NP Inter(normality)
Lithium, total (mg/L)	0.108	n/a	n/a	n/a	n/a	73	1.37	n/a	0.02365	NP Inter(normality)
Mercury, total (mg/L)	0.000084	n/a	n/a	n/a	n/a	74	54.05	n/a	0.02247	NP Inter(NDs)
Molybdenum, total (mg/L)	0.001161	n/a	n/a	n/a	n/a	69	89.86	n/a	0.02904	NP Inter(NDs)
Selenium, total (mg/L)	0.003297	n/a	n/a	n/a	n/a	74	37.84	n/a	0.02247	NP Inter(normality)
Thallium, total (mg/L)	0.00113	n/a	n/a	n/a	n/a	72	80.56	n/a	0.02489	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 74 background values. 85.14% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

Constituent: Antimony, total Analysis Run 1/4/2024 12:38 PM View: UTLs
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

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 74 background values. 37.84% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

Constituent: Arsenic, total Analysis Run 1/4/2024 12:38 PM View: UTLs
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Non-parametric

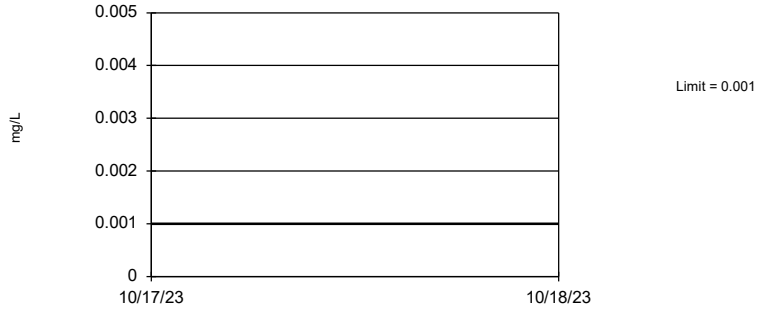
Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 74 background values. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

Constituent: Barium, total Analysis Run 1/4/2024 12:38 PM View: UTLs
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Non-parametric



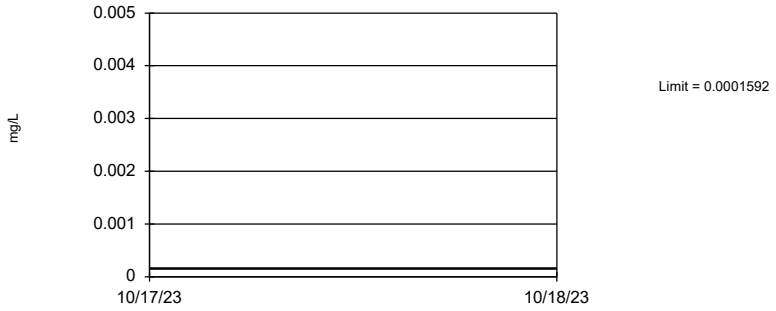
Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 74 background values. 8.108% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

Constituent: Beryllium, total Analysis Run 1/4/2024 12:38 PM View: UTLs
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Non-parametric



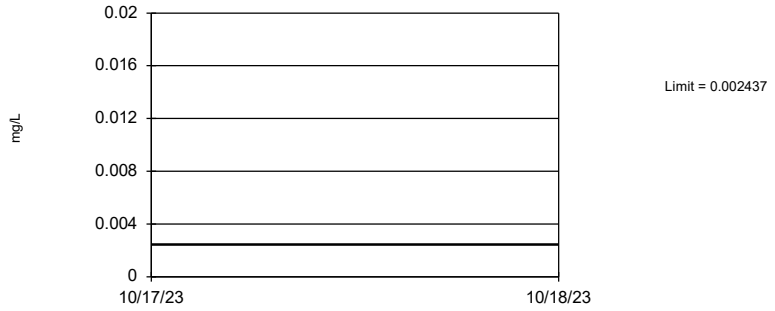
Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 74 background values. 44.59% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

Constituent: Cadmium, total Analysis Run 1/4/2024 12:38 PM View: UTLs
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Parametric



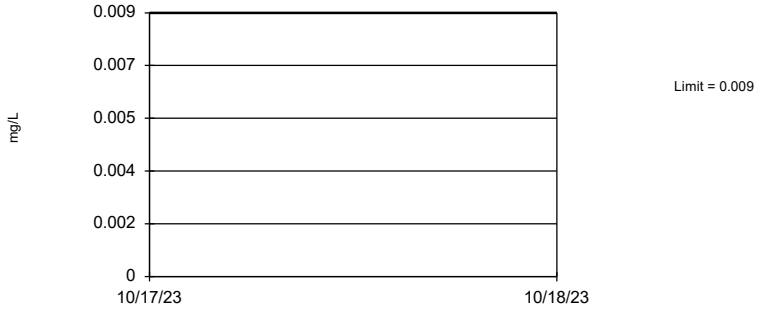
95% coverage. Background Data Summary (based on natural log transformation): Mean=-7.654, Std. Dev.=0.8289, n=74, 9.459% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9673, critical = 0.956. Report alpha = 0.05.

Constituent: Chromium, total Analysis Run 1/4/2024 12:38 PM View: UTLs
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Non-parametric



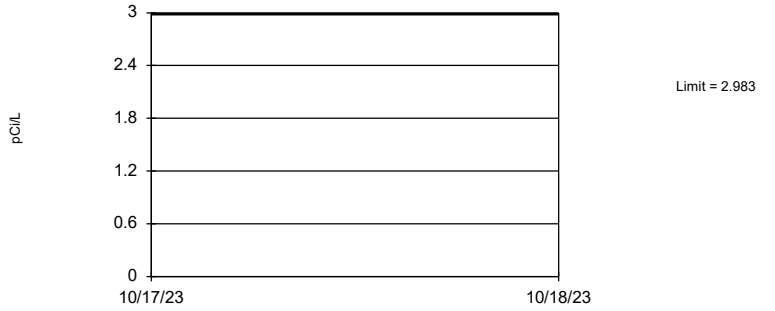
Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 74 background values. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

Constituent: Cobalt, total Analysis Run 1/4/2024 12:38 PM View: UTLs
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Parametric



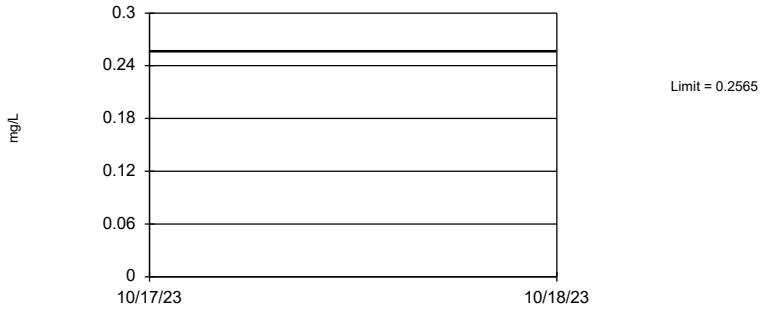
95% coverage. Background Data Summary (based on square root transformation): Mean=1.039, Std. Dev.=0.3486, n=74. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9616, critical = 0.956. Report alpha = 0.05.

Constituent: Combined Radium 226 + 228 Analysis Run 1/4/2024 12:38 PM View: UTLs
Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

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 77 background values. 49.35% NDs. 94.34% coverage at alpha=0.01; 96.29% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.01926.

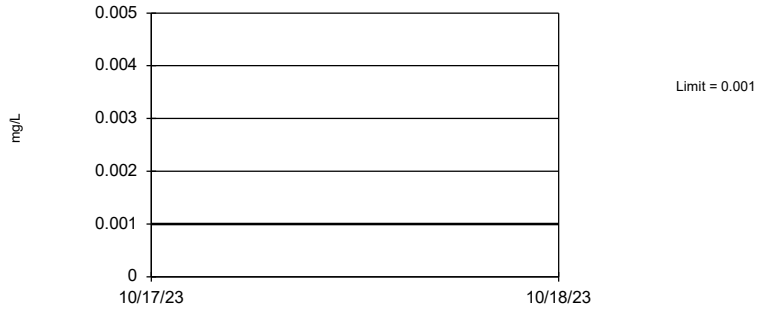
Constituent: Fluoride, total Analysis Run 1/4/2024 12:38 PM View: UTLs

Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

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 74 background values. 45.95% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

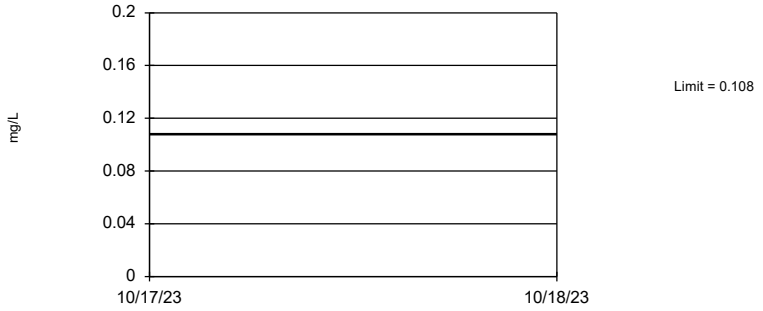
Constituent: Lead, total Analysis Run 1/4/2024 12:38 PM View: UTLs

Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

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 73 background values. 1.37% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02365.

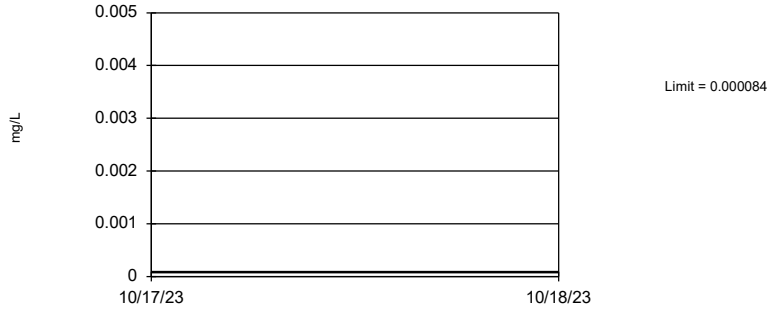
Constituent: Lithium, total Analysis Run 1/4/2024 12:38 PM View: UTLs

Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 74 background values. 54.05% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

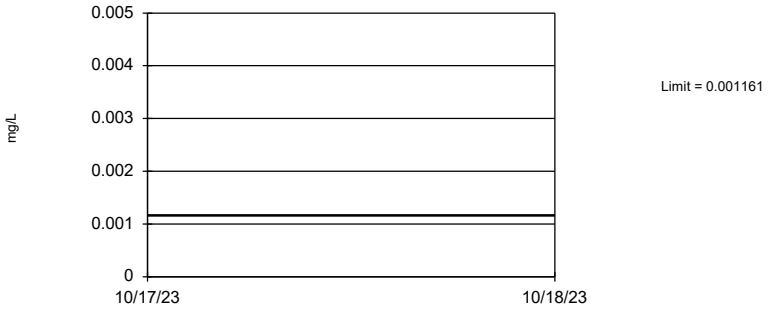
Constituent: Mercury, total Analysis Run 1/4/2024 12:38 PM View: UTLs

Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 69 background values. 89.86% NDs. 93.55% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02904.

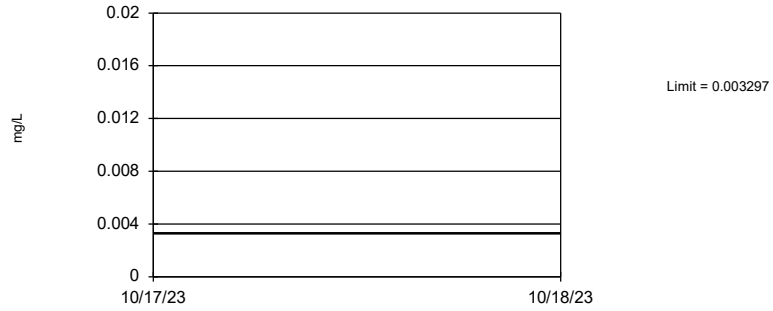
Constituent: Molybdenum, total Analysis Run 1/4/2024 12:38 PM View: UTLs

Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

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 74 background values. 37.84% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02247.

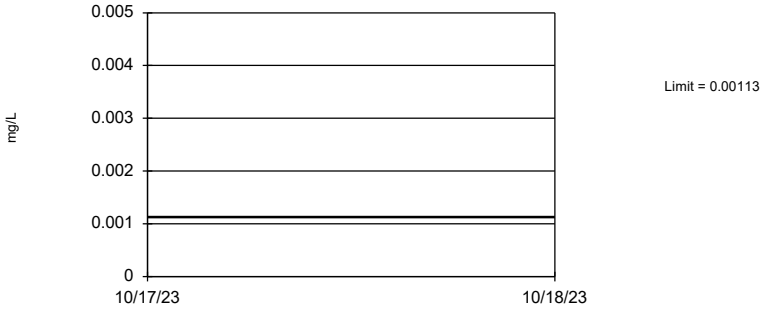
Constituent: Selenium, total Analysis Run 1/4/2024 12:38 PM View: UTLs

Pirkey WBAP Data: Pirkey WBAP

Sanitas™ v.10.0.15 . UG

Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 72 background values. 80.56% NDs. 93.95% coverage at alpha=0.01; 95.9% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.02489.

Constituent: Thallium, total Analysis Run 1/4/2024 12:38 PM View: UTLs

Pirkey WBAP Data: Pirkey WBAP

FIGURE E

GWPS

PIRKEY WBAP GWPS			
Constituent Name	**MCL**	**Background Limit**	**GWPS**
Antimony, Total (mg/L)	0.006	0.0001	0.006
Arsenic, Total (mg/L)	0.01	0.0042	0.01
Barium, Total (mg/L)	2	0.16	2
Beryllium, Total (mg/L)	0.004	0.001	0.004
Cadmium, Total (mg/L)	0.005	0.00016	0.005
Chromium, Total (mg/L)	0.1	0.0024	0.1
Cobalt, Total (mg/L)	n/a	0.009	0.009
Combined Radium, Total (pCi/L)	5	2.98	5
Fluoride, Total (mg/L)	4	0.26	4
Lead, Total (mg/L)	n/a	0.001	0.001
Lithium, Total (mg/L)	n/a	0.108	0.108
Mercury, Total (mg/L)	0.002	0.000084	0.002
Molybdenum, Total (mg/L)	n/a	0.0012	0.0012
Selenium, Total (mg/L)	0.05	0.0033	0.05
Thallium, Total (mg/L)	0.002	0.0011	0.002

**MCL = Maximum Contaminant Level*

**GWPS = Groundwater Protection Standard*

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FIGURE F
Confidence Intervals

Confidence Interval - Significant Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 7/2/2024, 5:51 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Cobalt, total (mg/L)	**AD-28**	**0.01486**	**0.01314**	**0.009**	**Yes**	**26**	**0**	**No**	**0.01**	**Param.**

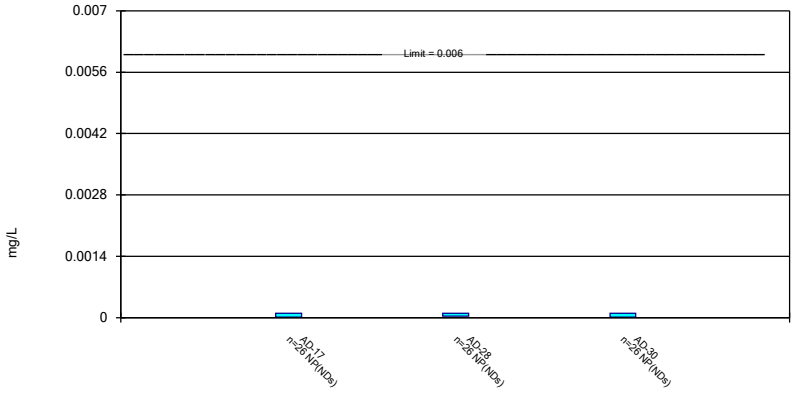
Confidence Interval - All Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 7/2/2024, 5:51 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Antimony, total (mg/L)	AD-17	0.0001	0.00001	0.006	No	26	88.46	No	0.01	NP (NDs)
Antimony, total (mg/L)	AD-28	0.0001	0.00003	0.006	No	26	73.08	No	0.01	NP (NDs)
Antimony, total (mg/L)	AD-30	0.0001	0.00001	0.006	No	26	80.77	No	0.01	NP (NDs)
Arsenic, total (mg/L)	AD-17	0.001767	0.00021	0.01	No	26	30.77	No	0.01	NP (normality)
Arsenic, total (mg/L)	AD-28	0.002	0.00016	0.01	No	26	26.92	No	0.01	NP (normality)
Arsenic, total (mg/L)	AD-30	0.002	0.00019	0.01	No	26	34.62	No	0.01	NP (normality)
Barium, total (mg/L)	AD-17	0.2269	0.136	2	No	26	0	No	0.01	Param.
Barium, total (mg/L)	AD-28	0.1578	0.1339	2	No	26	0	No	0.01	Param.
Barium, total (mg/L)	AD-30	0.0894	0.054	2	No	26	0	No	0.01	NP (normality)
Beryllium, total (mg/L)	AD-17	0.0006809	0.0004658	0.004	No	26	7.692	No	0.01	Param.
Beryllium, total (mg/L)	AD-28	0.0007355	0.0005566	0.004	No	26	0	x^(1/3)	0.01	Param.
Beryllium, total (mg/L)	AD-30	0.000125	0.00007	0.004	No	26	7.692	No	0.01	NP (normality)
Cadmium, total (mg/L)	AD-17	0.001	0.000028	0.005	No	26	34.62	No	0.01	NP (normality)
Cadmium, total (mg/L)	AD-28	0.001	0.00005	0.005	No	26	42.31	No	0.01	NP (normality)
Cadmium, total (mg/L)	AD-30	0.00005	0.000012	0.005	No	26	53.85	No	0.01	NP (NDs)
Chromium, total (mg/L)	AD-17	0.0008576	0.0004272	0.1	No	26	3.846	ln(x)	0.01	Param.
Chromium, total (mg/L)	AD-28	0.0009826	0.00038	0.1	No	26	15.38	No	0.01	NP (normality)
Chromium, total (mg/L)	AD-30	0.0007695	0.00044	0.1	No	26	3.846	No	0.01	NP (normality)
Cobalt, total (mg/L)	AD-17	0.01008	0.006023	0.009	No	26	0	No	0.01	Param.
Cobalt, total (mg/L)	**AD-28**	**0.01486**	**0.01314**	**0.009**	**Yes**	**26**	**0**	**No**	**0.01**	**Param.**
Cobalt, total (mg/L)	AD-30	0.003638	0.00253	0.009	No	26	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-17	5.692	2.85	5	No	26	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-28	2.971	1.875	5	No	26	0	x^(1/3)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-30	2.069	1.067	5	No	26	0	sqrt(x)	0.01	Param.
Fluoride, total (mg/L)	AD-17	0.26	0.09	4	No	28	32.14	No	0.01	NP (normality)
Fluoride, total (mg/L)	AD-28	0.7793	0.5609	4	No	27	3.704	No	0.01	Param.
Fluoride, total (mg/L)	AD-30	0.04608	0.03074	4	No	28	46.43	x^2	0.01	Param.
Lead, total (mg/L)	AD-17	0.0002	0.00013	0.001	No	26	46.15	No	0.01	NP (normality)
Lead, total (mg/L)	AD-28	0.0002	0.00009	0.001	No	26	46.15	No	0.01	NP (normality)
Lead, total (mg/L)	AD-30	0.0002	0.00009	0.001	No	26	73.08	No	0.01	NP (NDs)
Lithium, total (mg/L)	AD-17	0.0207	0.01294	0.108	No	26	3.846	No	0.01	Param.
Lithium, total (mg/L)	AD-28	0.0307	0.0223	0.108	No	26	0	No	0.01	NP (normality)
Lithium, total (mg/L)	AD-30	0.01002	0.008274	0.108	No	26	3.846	x^2	0.01	Param.
Mercury, total (mg/L)	AD-17	0.0002285	0.0001147	0.002	No	26	0	sqrt(x)	0.01	Param.
Mercury, total (mg/L)	AD-28	0.00004886	0.00002029	0.002	No	26	0	x^(1/3)	0.01	Param.
Mercury, total (mg/L)	AD-30	0.0004004	0.00006766	0.002	No	26	0	x^(1/3)	0.01	Param.
Molybdenum, total (mg/L)	AD-17	0.0005	0.0004858	0.0012	No	24	91.67	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	AD-28	0.0005	0.0002942	0.0012	No	24	91.67	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	AD-30	0.0008	0.0002	0.0012	No	24	87.5	No	0.01	NP (NDs)
Selenium, total (mg/L)	AD-17	0.004	0.00026	0.05	No	26	38.46	No	0.01	NP (normality)
Selenium, total (mg/L)	AD-28	0.004	0.00021	0.05	No	26	38.46	No	0.01	NP (normality)
Selenium, total (mg/L)	AD-30	0.004	0.00031	0.05	No	26	38.46	No	0.01	NP (normality)
Thallium, total (mg/L)	AD-17	0.0002	0.00007	0.002	No	25	76	No	0.01	NP (NDs)
Thallium, total (mg/L)	AD-28	0.0002	0.00003	0.002	No	25	76	No	0.01	NP (NDs)
Thallium, total (mg/L)	AD-30	0.0002	0.00005	0.002	No	25	60	No	0.01	NP (NDs)

Non-Parametric Confidence Interval

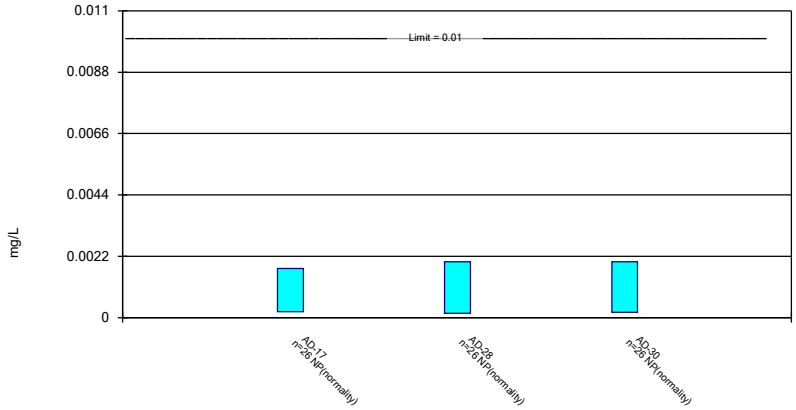
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Antimony, total Analysis Run 7/2/2024 5:49 PM View: Confidence Intervals
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Non-Parametric Confidence Interval

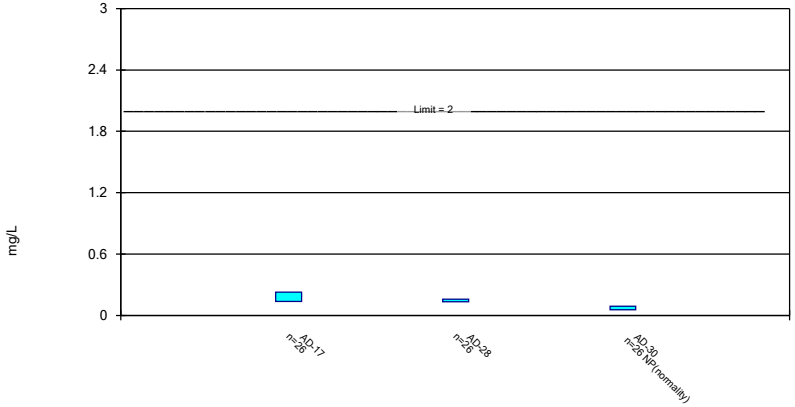
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Arsenic, total Analysis Run 7/2/2024 5:49 PM View: Confidence Intervals
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Parametric and Non-Parametric (NP) Confidence Interval

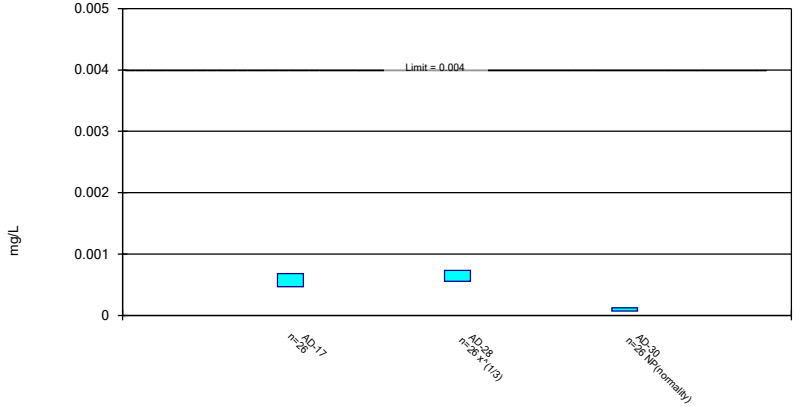
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 7/2/2024 5:49 PM View: Confidence Intervals
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Parametric and Non-Parametric (NP) Confidence Interval

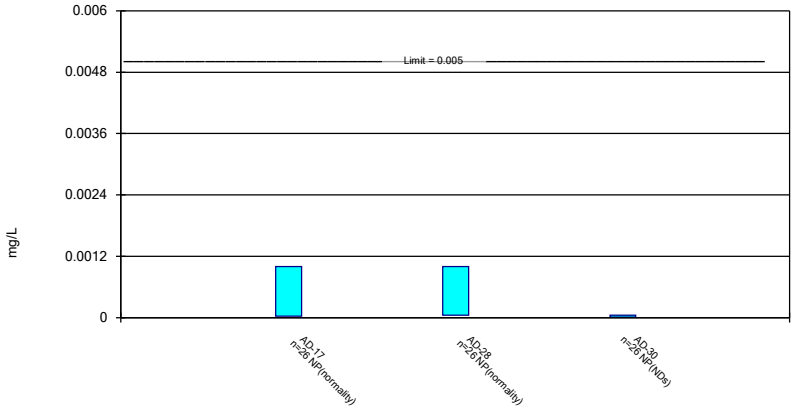
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total Analysis Run 7/2/2024 5:49 PM View: Confidence Intervals
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Non-Parametric Confidence Interval

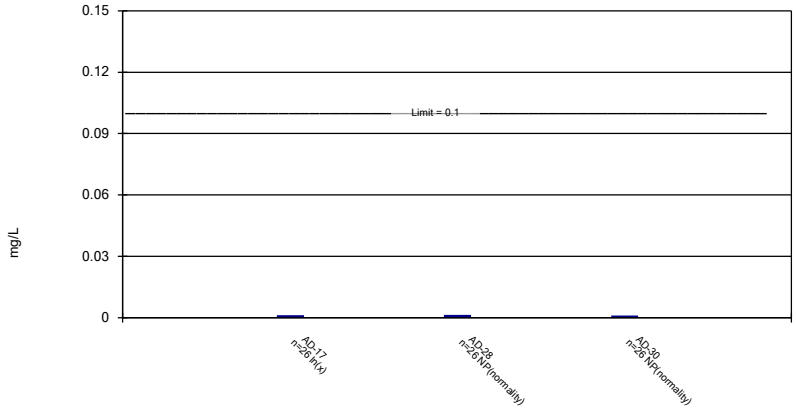
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Cadmium, total Analysis Run 7/2/2024 5:49 PM View: Confidence Intervals
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Parametric and Non-Parametric (NP) Confidence Interval

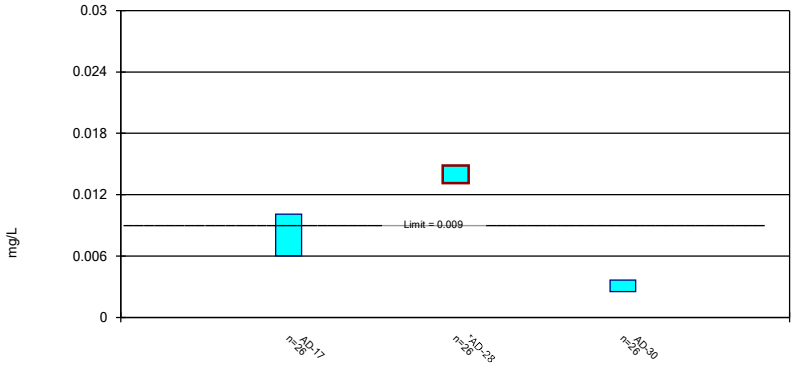
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 7/2/2024 5:49 PM View: Confidence Intervals
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Parametric Confidence Interval

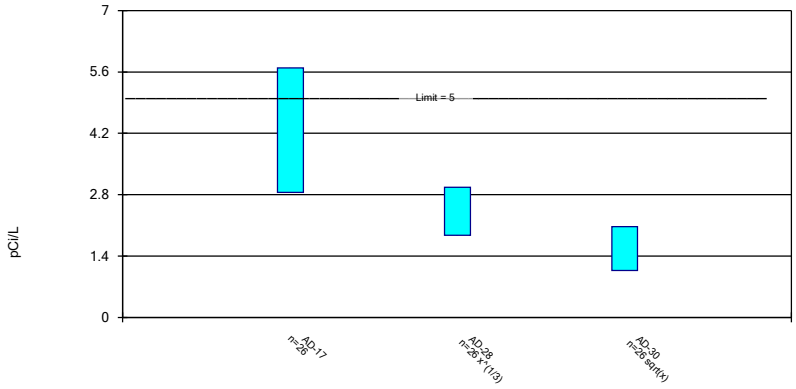
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 7/2/2024 5:49 PM View: Confidence Intervals
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Parametric Confidence Interval

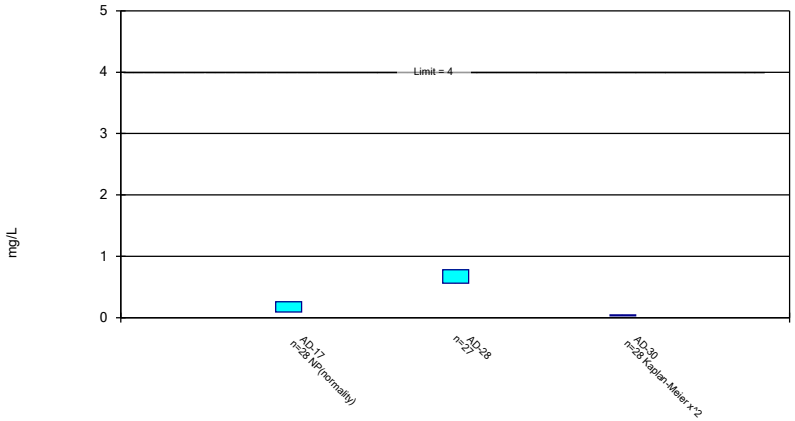
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 7/2/2024 5:49 PM View: Confidence Intervals
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Parametric and Non-Parametric (NP) Confidence Interval

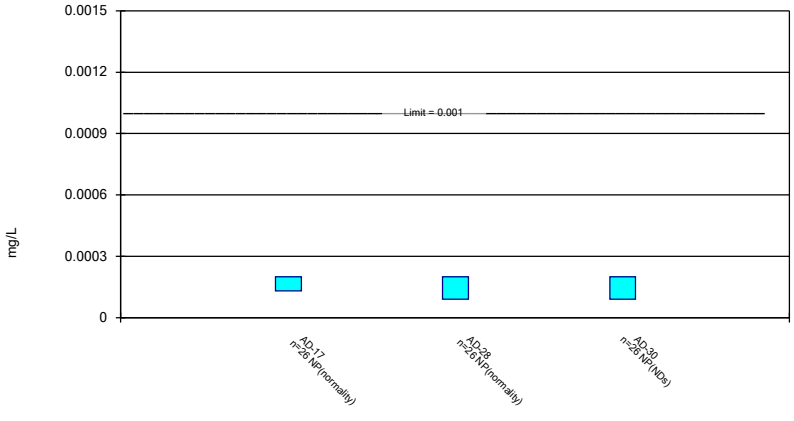
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 7/2/2024 5:49 PM View: Confidence Intervals
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Non-Parametric Confidence Interval

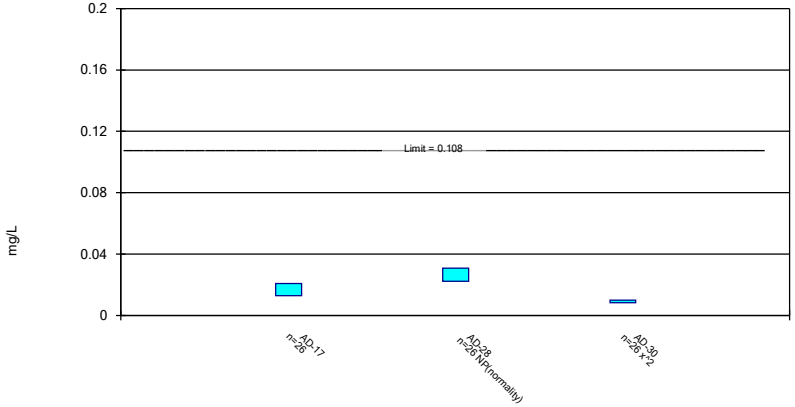
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Lead, total Analysis Run 7/2/2024 5:49 PM View: Confidence Intervals
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Parametric and Non-Parametric (NP) Confidence Interval

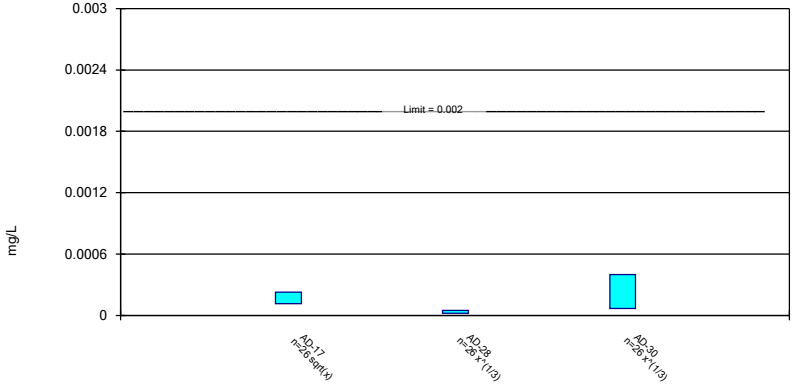
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 7/2/2024 5:49 PM View: Confidence Intervals
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Parametric Confidence Interval

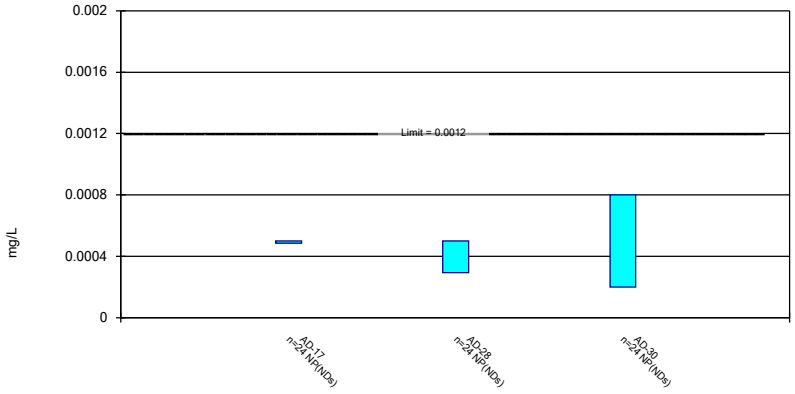
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Mercury, total Analysis Run 7/2/2024 5:49 PM View: Confidence Intervals
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Non-Parametric Confidence Interval

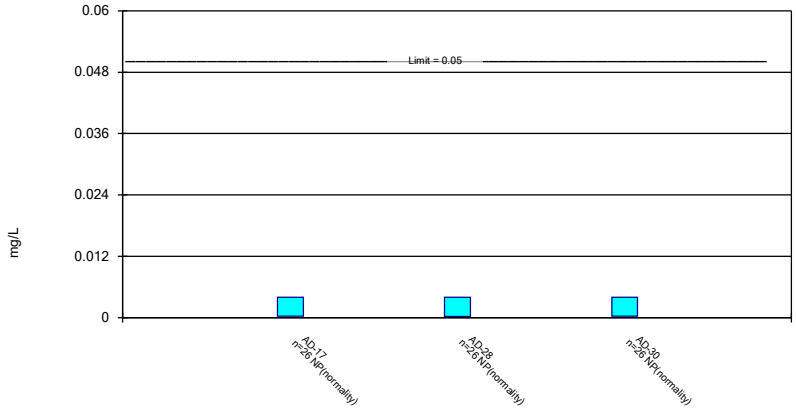
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Molybdenum, total Analysis Run 7/2/2024 5:49 PM View: Confidence Intervals
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Non-Parametric Confidence Interval

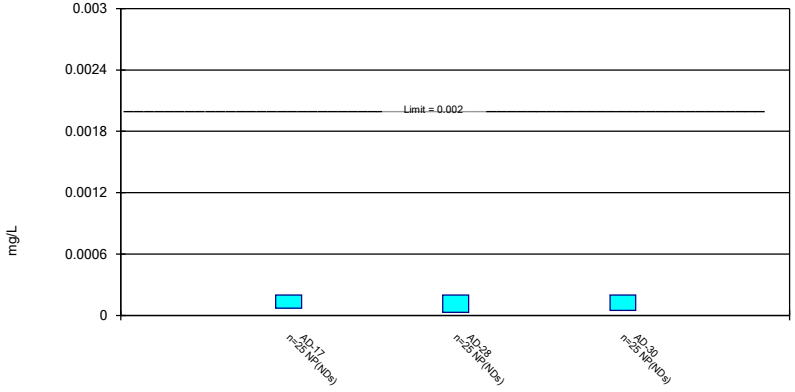
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Selenium, total Analysis Run 7/2/2024 5:49 PM View: Confidence Intervals
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Non-Parametric Confidence Interval

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



Constituent: Thallium, total Analysis Run 7/2/2024 5:49 PM View: Confidence Intervals
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

FIGURE G
Appendix IV Trend Tests

Appendix IV Trend Tests - Significant Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 7/3/2024, 10:12 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
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-18 (bg)**	**-0.000084**	**-191**	**-96**	**Yes**	**27**	**0**	**n/a**	**n/a**	**0.05**	**NP**
Cobalt, total (mg/L)	**AD-28**	**-0.0002862**	**-119**	**-90**	**Yes**	**26**	**0**	**n/a**	**n/a**	**0.05**	**NP**

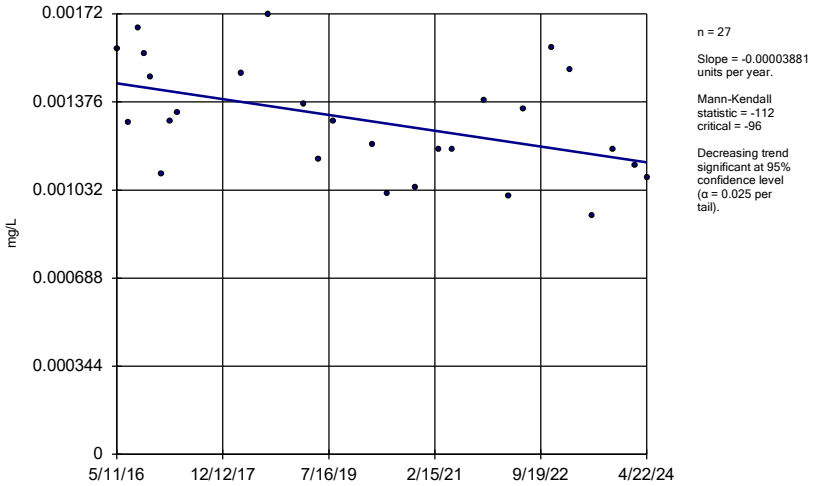
Appendix IV Trend Tests - All Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 7/3/2024, 10:12 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
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-18 (bg)**	**-0.000084**	**-191**	**-96**	**Yes**	**27**	**0**	**n/a**	**n/a**	**0.05**	**NP**
Cobalt, total (mg/L)	**AD-28**	**-0.0002862**	**-119**	**-90**	**Yes**	**26**	**0**	**n/a**	**n/a**	**0.05**	**NP**
Cobalt, total (mg/L)	AD-3 (bg)	-0.0001911	-46	-90	No	26	0	n/a	n/a	0.05	NP

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 (α = 0.025 per tail).

Constituent: Cobalt, total Analysis Run 7/3/2024 10:11 AM View: App IV Trend Tests
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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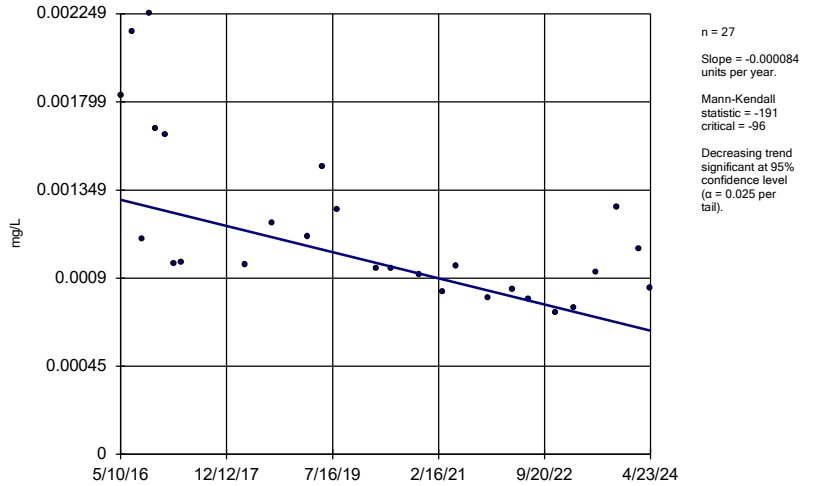
Sen's Slope Estimator

AD-18 (bg)



n = 27

Slope = -0.000084 units per year.

Mann-Kendall statistic = -191
critical = -96

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Cobalt, total Analysis Run 7/3/2024 10:11 AM View: App IV Trend Tests
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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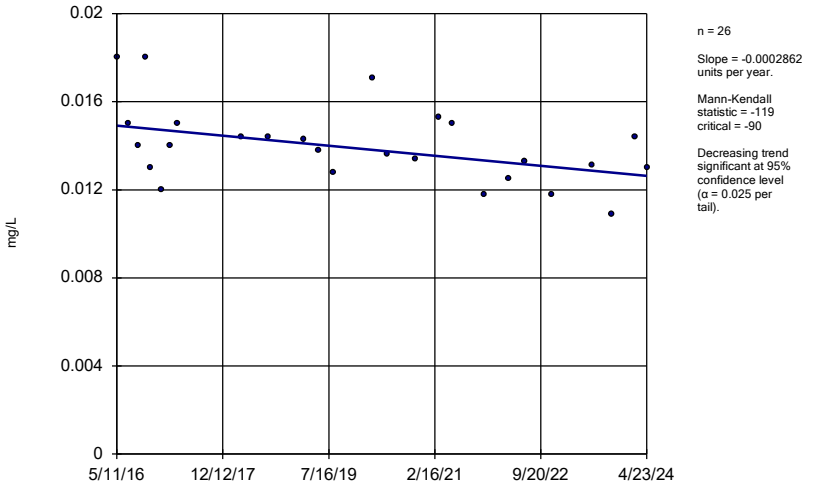
Sen's Slope Estimator

AD-28



n = 26

Slope = -0.0002862 units per year.

Mann-Kendall statistic = -119
critical = -90

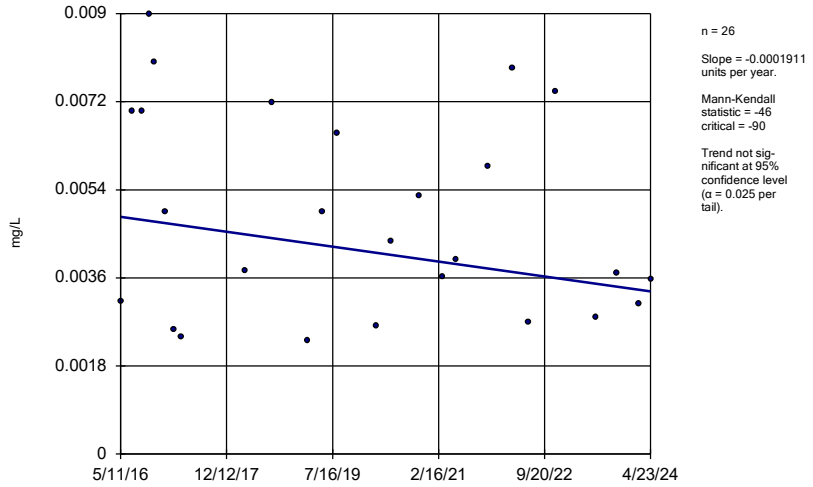
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Cobalt, total Analysis Run 7/3/2024 10:11 AM View: App IV Trend Tests
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.19h Software licensed to Groundwater Stats Consulting. UG

Sen's Slope Estimator

AD-3 (bg)



n = 26

Slope = -0.0001911 units per year.

Mann-Kendall statistic = -46
critical = -90

Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Cobalt, total Analysis Run 7/3/2024 10:11 AM View: App IV Trend Tests
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Geosyntec consultants

engineers | scientists | innovators

STATISTICAL ANALYSIS SUMMARY 2024 2ND SEMIANNUAL EVENT WEST BOTTOM ASH POND

H.W. Pirkey Power Plant

Hallsville, Texas

Prepared for

American Electric Power
1 Riverside Plaza
Columbus, Ohio 43215-2372

Prepared by

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500 West Wilson Bridge Road, Suite 250
Worthington, Ohio 43085

Project Number: CHA8500B

December 2024

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

ASD	alternative source demonstration
CCR	coal combustion residuals
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
SU	standard units
TCEQ	Texas Commission on Environmental Quality
TDS	total dissolved solids
UPL	upper prediction limit
WBAP	West Bottom Ash Pond

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 West Bottom Ash Pond (WBAP), 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 at the WBAP (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). An assessment monitoring event was conducted at the WBAP 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 SSLs of Appendix IV parameters were present above the GWPS. An SSL was identified for cobalt. Therefore, either the unit will move to an assessment of corrective measures, or an 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. WEST BOTTOM ASH POND 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 WBAP 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. An outlier was identified at background well MW-12 for fluoride; however, the identified value was not flagged due to a low concentration 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 chromium and combined radium. Nonparametric tolerance limits were calculated for arsenic, barium, beryllium, cadmium, cobalt, fluoride, lead, lithium, and selenium due to apparent nonnormal distributions, and for antimony, mercury, molybdenum, 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-17 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 barium, cobalt, combined radium, and lithium at AD-17. 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 WBAP:

- The LCL for cobalt exceeded the GWPS of 0.00900 milligrams per liter (mg/L) at AD-28 (0.0132 mg/L).

As a result, the Pirkey WBAP 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, sulfate, and total dissolved solids (TDS), and interwell tests were used to evaluate potential SSIs for boron, chloride, and fluoride. 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 WBAP. 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, sulfate, 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.

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 except for sulfate and TDS at AD-30, which were truncated due to the higher observed concentrations in more recent events.

Prediction limits for the interwell tests were recalculated using data collected during the 2024 assessment monitoring events. 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 and TDS at AD-17 (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-Francía 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, and fluoride using historical data through September 2024. Intrawell UPLs for calcium, pH, sulfate, and TDS and intrawell lower prediction limits (LPLs) for pH were updated using data through April 2024 to represent background values for most well/parameter pairs. 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 an SSL was identified, a review of the Appendix III results was 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 calculated 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 0.0652 mg/L at AD-28 (0.375 mg/L) and AD-30 (1.35 mg/L).
- Chloride concentrations were above the interwell UPL of 8.66 mg/L at AD-17 (22.2 mg/L) and AD-30 (16.8 mg/L).
- Fluoride concentrations were above the interwell UPL of 0.257 mg/L at AD-28 (0.54 mg/L).
- pH values were below the intrawell LPL of 3.2 standard units (SU) at AD-17 (3.1 SU) and the intrawell LPL of 3.4 SU at AD-28 (3.1 SU).
- Sulfate concentrations were above the intrawell UPL of 31.6 mg/L at AD-30 (110 mg/L).
- TDS concentrations were above the intrawell UPL of 206 mg/L at AD-30 (250 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. Based on these results, concentrations of Appendix III constituents appear to be above background concentrations.

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 one potential outlier 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. An SSL was identified for cobalt. Appendix III parameters were compared to calculated prediction limits; concentrations of boron, chloride, fluoride, sulfate, and TDS were identified above the prediction limits and pH values were identified below the LPLs.

Based on this evaluation, the Pirkey WBAP 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 – West Bottom Ash Pond, Pirkey, 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 – West Bottom Ash Pond

Parameter	Unit	AD-3	AD-12	AD-17	AD-18	AD-28	AD-30
		9/17/2024	9/16/2024	9/17/2024	9/18/2024	9/17/2024	9/17/2024
Antimony	µg/L	0.1 U1	0.011 J1	0.009 J1	0.016 J1	0.011 J1	0.1 U1
Arsenic	µg/L	0.57	0.09 J1	0.22	1.58	0.15	0.14
Barium	µg/L	60.5	16.6	158	78.2	124	57.8
Beryllium	µg/L	2.5 U1	2.5 U1	0.501	2.5 U1	0.617	0.078
Boron	mg/L	0.052	0.018 J1	0.029 J1	0.010 J1	0.375	1.35
Cadmium	µg/L	0.014 J1	0.007 J1	0.038	0.013 J1	0.057	0.009 J1
Calcium	mg/L	4.67	0.23	0.41	0.32	1.39	0.49
Chloride	mg/L	6.36	4.45	22.2	5.92	5.15	16.8
Chromium	µg/L	0.40	0.43	0.35	1.02	0.38	0.50
Cobalt	µg/L	4.77	1.06	7.63	1.28	13.8	3.26
Combined Radium	pCi/L	2.63	2.84	3.36	2	3	1.11
Fluoride	mg/L	0.07	0.07	0.20	0.02 J1	0.54	0.04 J1
Lead	µg/L	0.10 J1	0.08 J1	0.11 J1	0.37	0.10 J1	0.08 J1
Lithium	mg/L	0.082	0.006 J1	0.0167	0.021	0.0267	0.0103
Mercury	µg/L	0.005 U1	0.002 J1	0.135	0.013	0.016	0.019
Molybdenum	µg/L	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1
Selenium	µg/L	0.5 U1	0.19 J1	0.20 J1	0.19 J1	0.22 J1	0.22 J1
Sulfate	mg/L	30.2	3.1	3.4	10.2	26.8	110
Thallium	µg/L	0.05 J1	0.02 J1	0.03 J1	0.05 J1	0.04 J1	0.03 J1
Total Dissolved Solids	mg/L	140	60	60	130	120	250
pH	SU	4.3	3.0	3.1	4.2	3.1	3.7

Notes:
J1: Estimated value. Parameter was detected in concentrations below the reporting limit.
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 – West Bottom Ash Pond

Constituent Name	MCL	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600	0.000100	0.00600
Arsenic, Total (mg/L)	0.0100	0.00423	0.0100
Barium, Total (mg/L)	2.00	0.157	2.00
Beryllium, Total (mg/L)	0.00400	0.00125	0.00400
Cadmium, Total (mg/L)	0.00500	0.000159	0.00500
Chromium, Total (mg/L)	0.100	0.00225	0.100
Cobalt, Total (mg/L)	n/a	0.00900	0.00900
Combined Radium, Total (pCi/L)	5.00	3.09	5.00
Fluoride, Total (mg/L)	4.00	0.257	4.00
Lead, Total (mg/L)	n/a	0.00070	0.00070
Lithium, Total (mg/L)	n/a	0.108	0.108
Mercury, Total (mg/L)	0.00200	0.0000840	0.00200
Molybdenum, Total (mg/L)	n/a	0.00116	0.00116
Selenium, Total (mg/L)	0.0500	0.00330	0.0500
Thallium, Total (mg/L)	0.00200	0.00113	0.00200

Notes:
1. Calculated UTL (upper tolerance limit) represents site-specific background values.
2. Grey cells indicate the GWPS is based on the calculated UTL because an MCL does not exist.
GWPS: groundwater protection standard
MCL: maximum contaminant level
mg/L: milligrams per liter
n/a: not applicable
pCi/L: picocuries per liter

Table 3. Detection Monitoring Data Evaluation
Statistical Analysis Summary
Pirkey Plant – West Bottom Ash Pond

Analyte	Unit	Description	AD-17	AD-28	AD-30
			9/17/2024	9/17/2024	9/17/2024
Boron	mg/L	Interwell Background Value (UPL)	0.0652		
		Analytical Result	0.029	**0.375**	**1.35**
Calcium	mg/L	Intrawell Background Value (UPL)	1.13	2.16	1.02
		Analytical Result	0.41	1.39	0.49
Chloride	mg/L	Interwell Background Value (UPL)	8.66		
		Analytical Result	**22.2**	5.15	**16.8**
Fluoride	mg/L	Interwell Background Value (UPL)	0.257		
		Analytical Result	0.20	**0.54**	0.04
pH	SU	Intrawell Background Value (UPL)	4.8	5.4	5.3
		Intrawell Background Value (LPL)	3.2	3.4	3.7
		Analytical Result	**3.1**	**3.1**	3.7
Sulfate	mg/L	Intrawell Background Value (UPL)	8.05	29.9	31.6
		Analytical Result	3.4	26.8	**110**
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	99.3	128	206
		Analytical Result	60	120	**250**

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 West Bottom Ash Pond 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	Texas	12.30.2024
License Number	Licensing State	Date

ATTACHMENT B
Data Quality Review Memorandum

Geosyntec consultants

500 W. Wilson Bridge Road, Suite 250
Worthington, Ohio 43085
PH 614.468.0415
FAX 614.468.0416
www.geosyntec.com

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. 32[1] 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 (LCSD) 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 17, 2024

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

Re: Pirkey WBAP - Assessment Monitoring Event & Background Update 2024

Dear Ms. Kreinberg,

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the background update and assessment of 2024 groundwater data for American Electric Power Inc.'s Pirkey West Bottom Ash Pond. 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 Residuals (CCR) program in 2016. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** AD-3, AD-12, and AD-18
- **Downgradient wells:** AD-17, AD-28, and AD-30

Data were sent electronically, and the statistical analysis was reviewed by 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 analysis was conducted according to the Statistical Analysis Plan and initial screening evaluation prepared in November 2017 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 CCR program consists of the following constituents listed below. The terms "constituent" and "parameter" are interchangeable.

- **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 and box plots for Appendix III and IV parameters are provided for all wells and constituents, and are used to evaluate concentrations over the entire record (Figures A & B, respectively). A summary of the values identified as outliers in this report and through previous screenings follows this letter. These values are deselected prior to the statistical analysis. 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 (time series, box plots, trend tests, and confidence intervals) or intrawell basis, 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 limits of 0.06 mg/L and 0.0002 mg/L, respectively, which were substituted across all non-detects for all wells.

In earlier analyses, 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 during the initial background screening and demonstrated that the selected statistical methods for Appendix III parameters comply with the USEPA Unified Guidance recommendations as discussed below.

Summary of Statistical Methods – Appendix III Parameters

Based on the original background screening described in the 2017 screening report, the following statistical methods were selected for Appendix III parameters:

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

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. While the annual false positive rate associated with parametric limits is fixed at 10% as recommended by the EPA Unified Guidance (2009), the false positive rate associated with nonparametric limits is not fixed and depends upon the available background sample size, number of future comparisons, and verification resample plan. 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 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 is necessary to accommodate these types of changes. In the intrawell case, data for all wells and constituents may be 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 the interwell case, prediction limits are updated with upgradient well data following each sampling event after careful screening for any new outliers. In some cases, deselecting the earlier portion of data may be necessary prior to construction of limits so that resulting statistical limits are capable of rapidly detecting 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 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 background update for calcium, pH, sulfate, and TDS (which are evaluated using intrawell methods) at all wells and during the Fall 2023 background update, boron, chloride, and fluoride (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.

For calcium, pH, sulfate, 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. The records for pH at well AD-30 and sulfate at AD-28 were updated because more recent concentrations were mostly within the range of historic concentrations resulting in statistical limits similar to those previously established. Due to the continuous increase in concentrations for sulfate and TDS at AD-30, these records were not updated with compliance data.

The Sen's Slope/Mann Kendall trend test was used to evaluate data at upgradient wells for boron, chloride, and fluoride, which are tested using interwell prediction limits, to identify statistically significant increasing or decreasing trends at the 99% confidence level. The results of the trend analyses showed a decreasing trend for chloride in upgradient well AD-18. Since concentrations for this well are similar to those among all other upgradient wells, no adjustments were required at that time. All available data were used to construct statistical limits for boron, chloride, and fluoride.

Fall 2024

During this analysis, Tukey's outlier test and visual screening were used to evaluate data through April 2024 at all wells for calcium, pH, sulfate, and TDS, which are tested using intrawell prediction limits. Data were screened through September 2024 using pooled upgradient well data for boron, chloride, and fluoride, which are tested using interwell prediction limits. Results of the outlier tests follow this report (Figure C), showing that Tukey's outlier test on all wells for calcium, pH, and TDS confirmed an elevated

observation for calcium at AD-28, and this observation remains flagged as an outlier. Additionally, 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 identified significant values for fluoride. However, no values among upgradient wells for fluoride were flagged as outliers since all identified observations were low-level concentrations.

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. Results for all Appendix III parameters are shown in Figure C.

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. Several Appendix III constituents appeared to have seasonal patterns for downgradient well AD-17. Therefore, all Appendix III constituents evaluated with intrawell prediction limits at this well were tested for seasonality using the Kruskal-Wallis test (Figure D). Calcium and TDS were identified with significant seasonality; therefore, these records are deseasonalized prior to constructing intrawell prediction limits for well AD-17.

Intrawell – Mann-Whitney Test

For calcium, pH, sulfate, 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 through April 2024 to evaluate whether the groups are statistically different at the 99% confidence level. If no significant difference is found, background data may be updated with compliance data (Figure D). Any records that had been truncated in previous updates used the truncated data, not the full records, in the Mann-Whitney test. Discussions of any truncated records were included in previous background update reports. Statistically significant differences were identified for the following well/constituent pairs:

Increase:

- Sulfate: AD-30
- TDS: AD-30

Decrease:

None

Typically, when the test concludes that the medians of the two groups are significantly different, particularly in the downgradient wells, the background data are not updated to include the newer data unless it can be reasonably justified that the change in concentrations reflects a shift unrelated to practices at the site. In studies such as the current one, in which one or both of the segments being compared are short, the comparison is complicated by the fact that normal short-term variation may be mistaken for long-term change in medians.

In this analysis, due to the continuous increase in concentrations for sulfate and TDS at AD-30, these records were not updated with compliance data. Since sulfate has not been updated at well AD-30 since 2017 the background period has only 8 observations. However, the resulting prediction limits are similar to those in one or more upgradient and downgradient wells. A summary of the Mann-Whitney results follows this report along with a list of well/constituent pairs using a truncated portion of their record.

Intrawell – Prediction Limits

Intrawell prediction limits, combined with a 1-of-2 resample plan, were constructed using historical data through April 2024 for calcium, pH, sulfate, and TDS (Figure D). A summary of the limits follows this letter. As mentioned above, deseasonalized prediction limits were constructed for calcium and TDS at downgradient well AD-17. The prediction limits plots for the deseasonalized cases are included separately after the rest of the plots. No comparisons of the September 2024 observations were performed 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, and fluoride to identify statistically significant increasing or decreasing trends at the 99% confidence level (Figure E). The results of the trend analyses showed decreasing trends for boron at well AD-12 and chloride at well AD-18. Since concentrations for these wells are similar to those among all other upgradient wells, no adjustments were required at this time. All available data were used to construct interwell statistical limits for boron, chloride, and fluoride.

Interwell – Prediction Limits

Interwell prediction limits, combined with a 1-of-2 resample plan, were constructed using all available data from upgradient wells through September 2024 for boron, chloride, and fluoride (Figure F). 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. Interwell prediction limits pool upgradient well data to establish a background limit for an individual constituent No comparisons of the September 2024 observations were performed in this analysis.

Evaluation of Appendix IV Parameters – Fall 2024

Prior to evaluating Appendix IV parameters, upgradient well data are screened through both 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 through September 2024 identified outliers for fluoride. However, none of those currently identified values were flagged as since all identified observations were low-level concentrations and were below its MCL. Visual screening confirmed previously flagged values such as an elevated observation for lithium at upgradient well AD-3 along with non-detects observations from 2019 with elevated reporting limits for molybdenum and thallium in both upgradient and downgradient wells. These observations are more than an order of magnitude higher than the other detected value or current reporting limits. No changes to previously flagged outliers were made among upgradient wells for Appendix IV parameters as these measurements were confirmed by visual screening.

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. 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.

Seasonality

Several Appendix IV constituents appeared to have seasonal patterns at downgradient well AD-17. 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 barium, cobalt, combined radium 226 + 228, and lithium.

Deseasonalized confidence intervals are computed 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 I). 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 J).

Confidence Intervals

Confidence intervals were then constructed using data through September 2024 on downgradient wells 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, which use the highest and lowest order statistic, 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. Complete graphical results of the confidence intervals follow this letter (Figure K). An exceedance was identified for the following well/constituent pair:

- Cobalt: AD-28

Deseasonalized Confidence Intervals

Additional confidence intervals were constructed on deseasonalized data for constituents with detected seasonality in well AD-17 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-17 are cobalt and combined radium 226 + 228. The results are included with the confidence intervals provided in Figure K. The deseasonalized confidence intervals are presented separately, with a separate summary table, at the end of the confidence interval results section. No exceedances were identified among the deseasonalized confidence intervals.

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. 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:

- None

Decreasing:

- Cobalt: AD-12, AD-18 (both upgradient), and AD-28

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

For Groundwater Stats Consulting,

Easton Rayner
Groundwater Analyst

Andrew Collins
Project Manager

Date Ranges

Date: 11/28/2024 11:41 AM

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

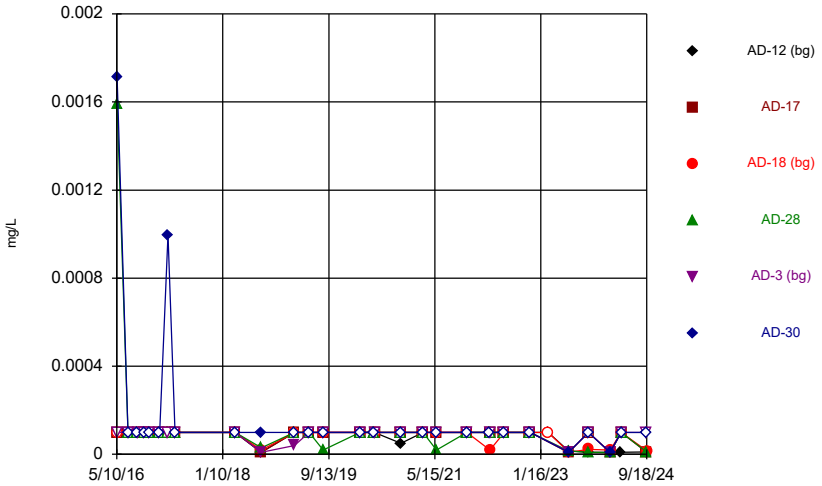
Sulfate, total (mg/L)
AD-30 background:5/11/2016-4/11/2017
Total Dissolved Solids [TDS] (mg/L)
AD-30 background:5/11/2016-6/3/2020

FIGURE A

Time Series

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

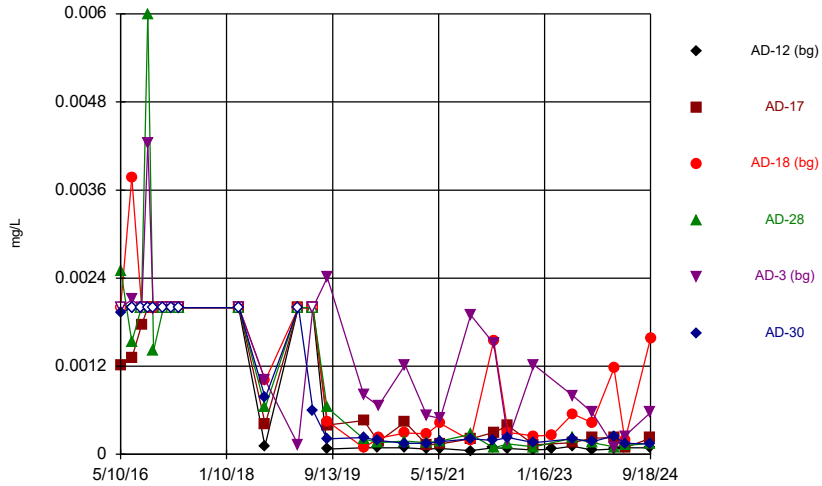
Time Series



Constituent: Antimony, total Analysis Run 12/9/2024 3:15 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

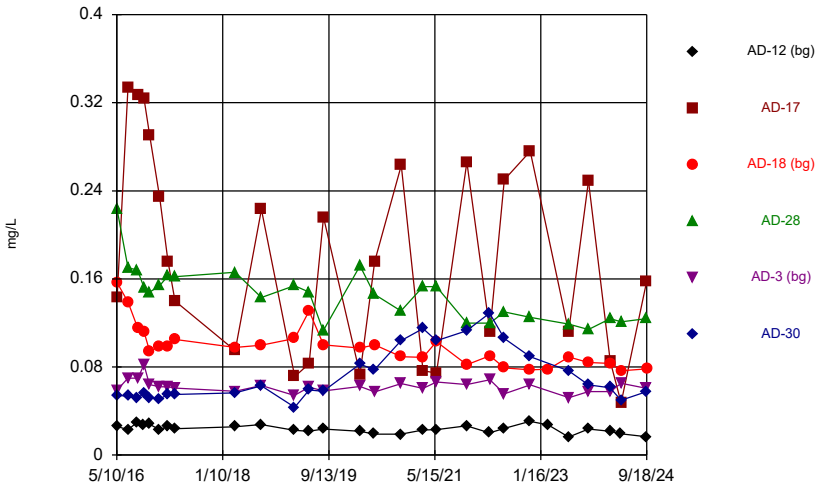
Time Series



Constituent: Arsenic, total Analysis Run 12/9/2024 3:15 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG

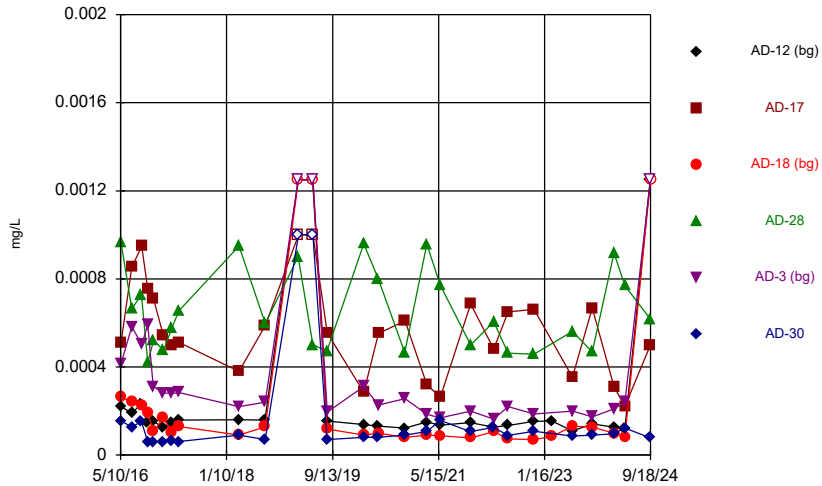
Time Series



Constituent: Barium, total Analysis Run 12/9/2024 3:15 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

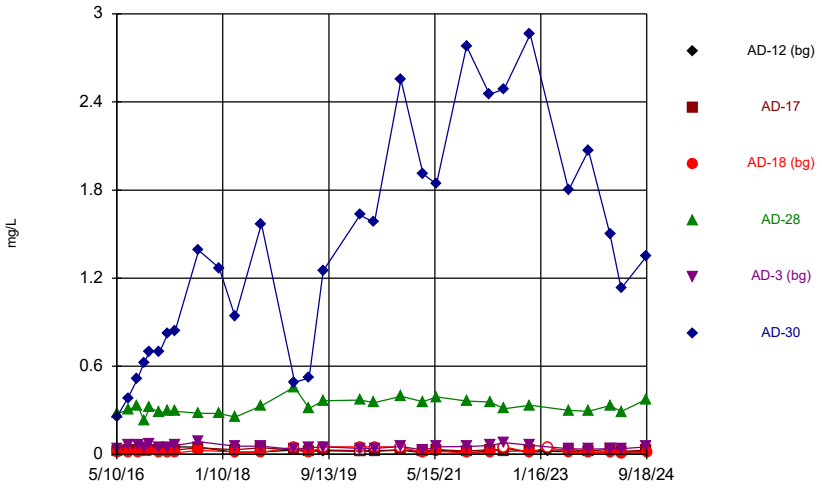
Time Series



Constituent: Beryllium, total Analysis Run 12/9/2024 3:15 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

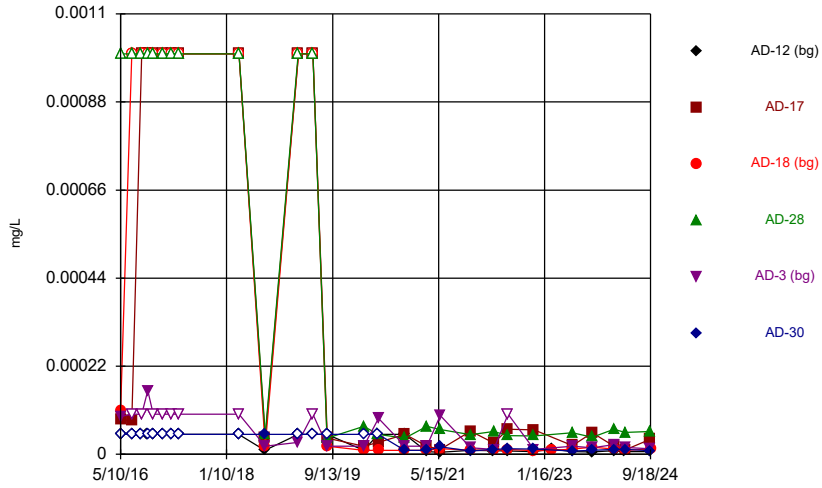
Time Series



Constituent: Boron, total Analysis Run 12/9/2024 3:15 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

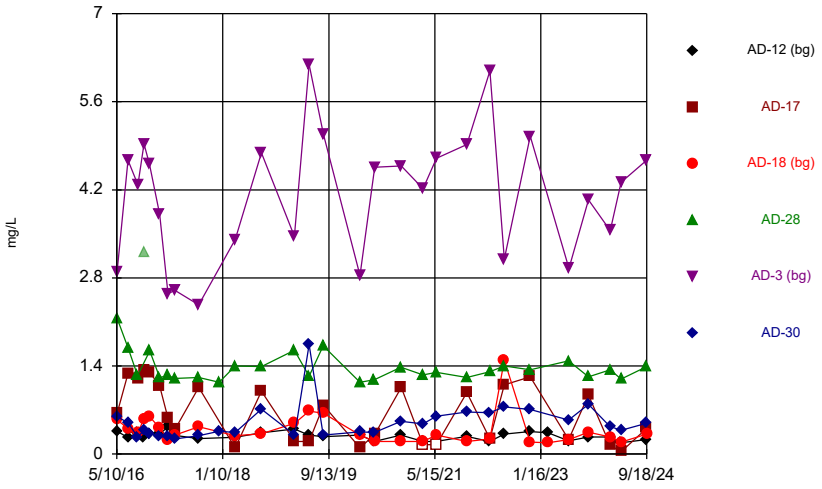
Time Series



Constituent: Cadmium, total Analysis Run 12/9/2024 3:15 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

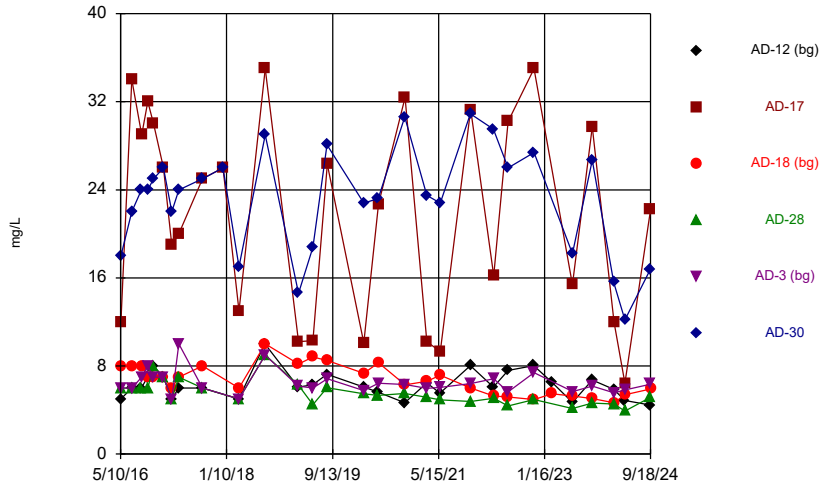
Time Series



Constituent: Calcium, total Analysis Run 12/9/2024 3:15 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG

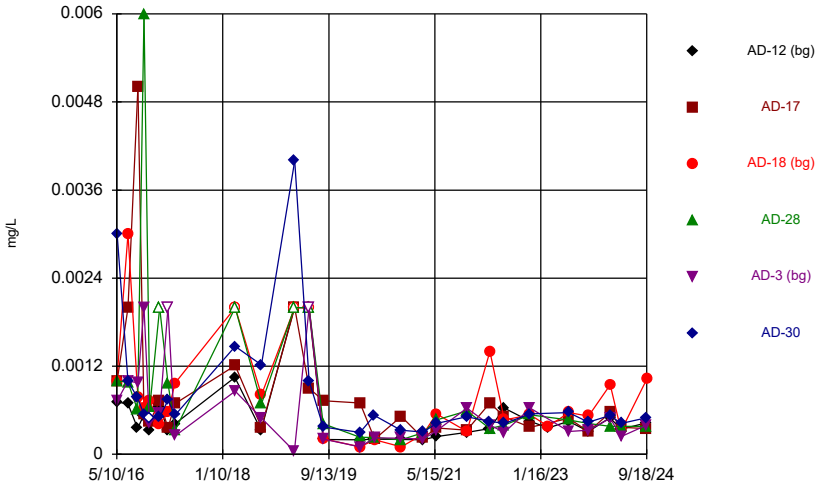
Time Series



Constituent: Chloride, total Analysis Run 12/9/2024 3:15 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

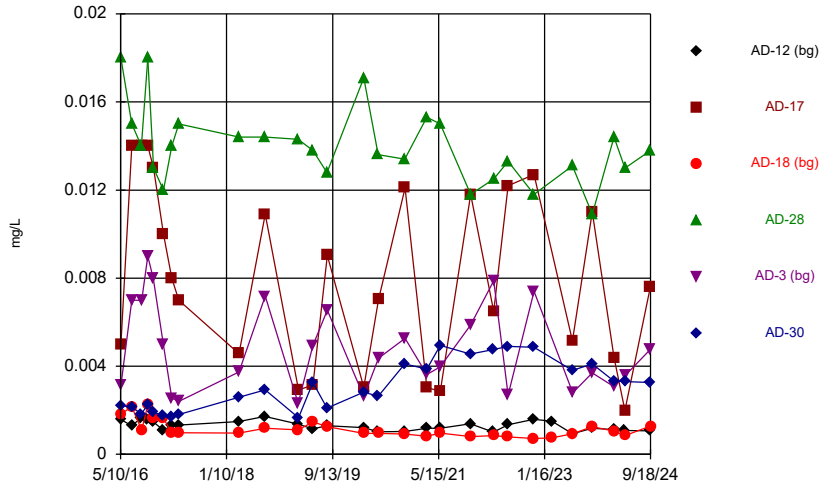
Time Series



Constituent: Chromium, total Analysis Run 12/9/2024 3:15 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG

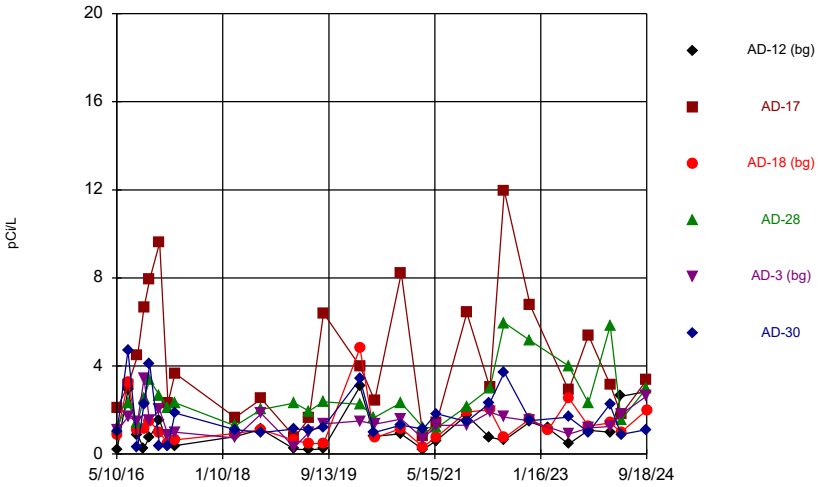
Time Series



Constituent: Cobalt, total Analysis Run 12/9/2024 3:15 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG

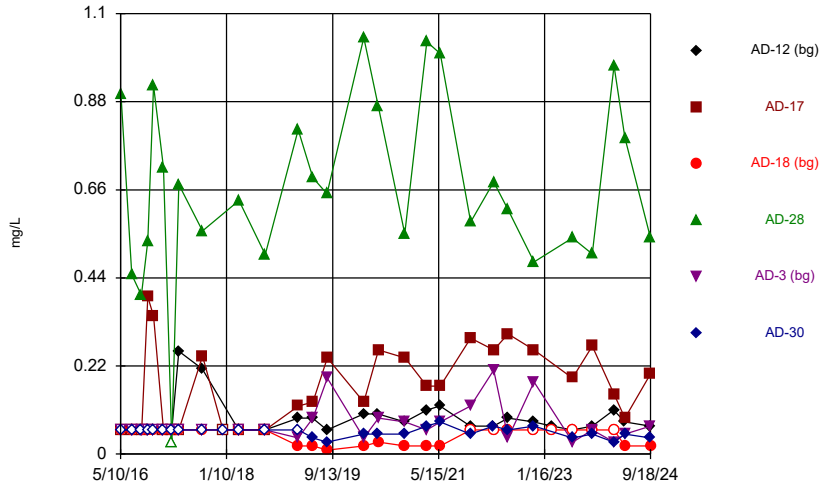
Time Series



Constituent: Combined Radium 226 + 228 Analysis Run 12/9/2024 3:15 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

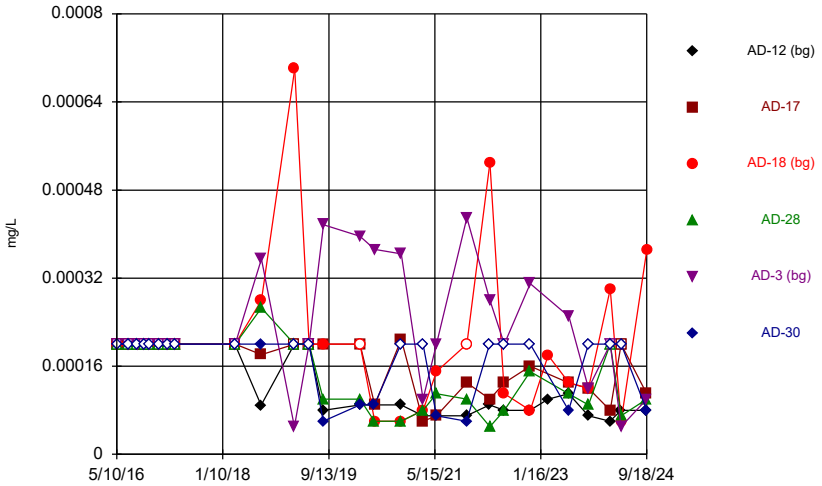
Time Series



Constituent: Fluoride, total Analysis Run 12/9/2024 3:15 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

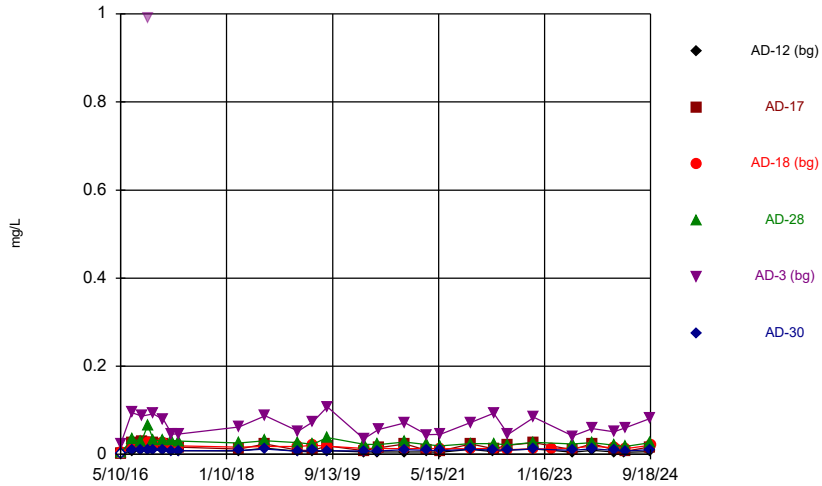
Time Series



Constituent: Lead, total Analysis Run 12/9/2024 3:15 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

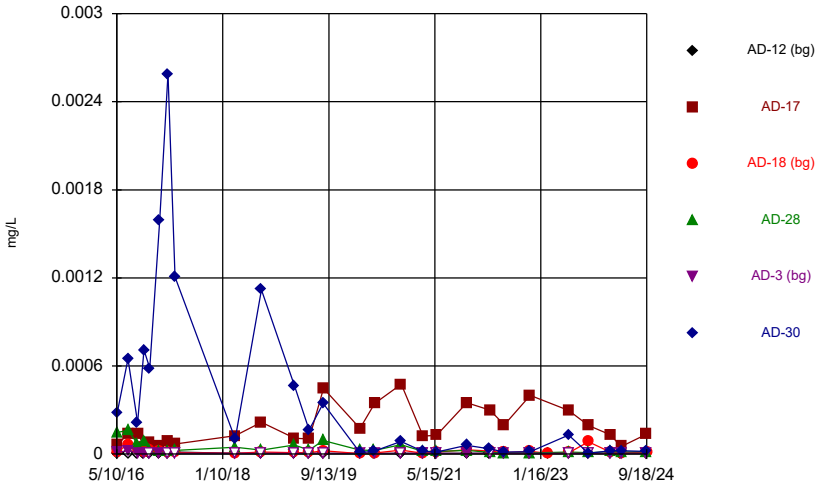
Time Series



Constituent: Lithium, total Analysis Run 12/9/2024 3:15 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

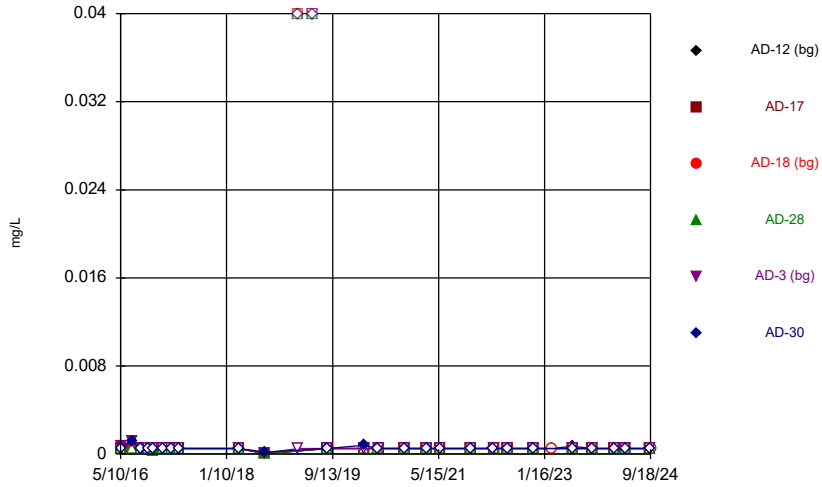
Time Series



Constituent: Mercury, total Analysis Run 12/9/2024 3:15 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

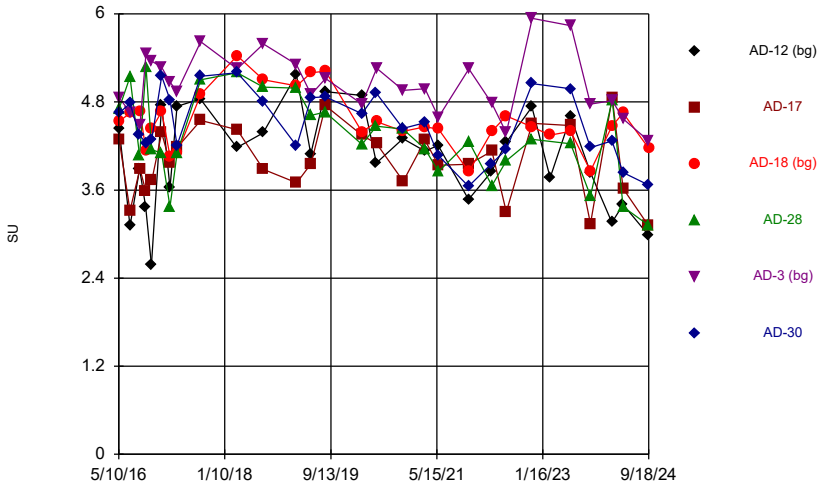
Time Series



Constituent: Molybdenum, total Analysis Run 12/9/2024 3:15 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG

Time Series



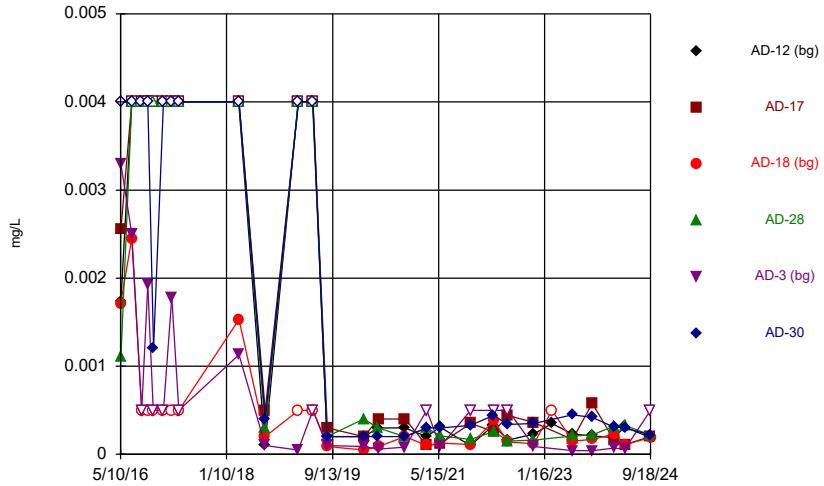
Constituent: pH, field Analysis Run 12/9/2024 3:15 PM

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG

Hollow symbols indicate censored values.

Time Series

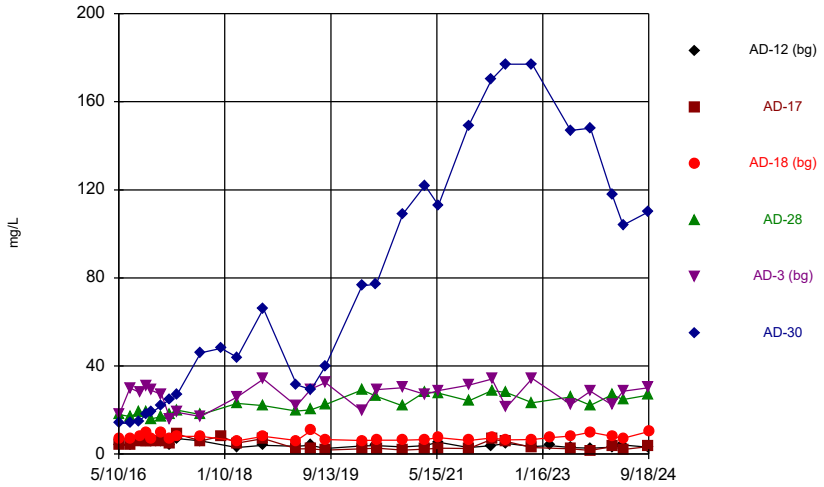


Constituent: Selenium, total Analysis Run 12/9/2024 3:15 PM

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG

Time Series



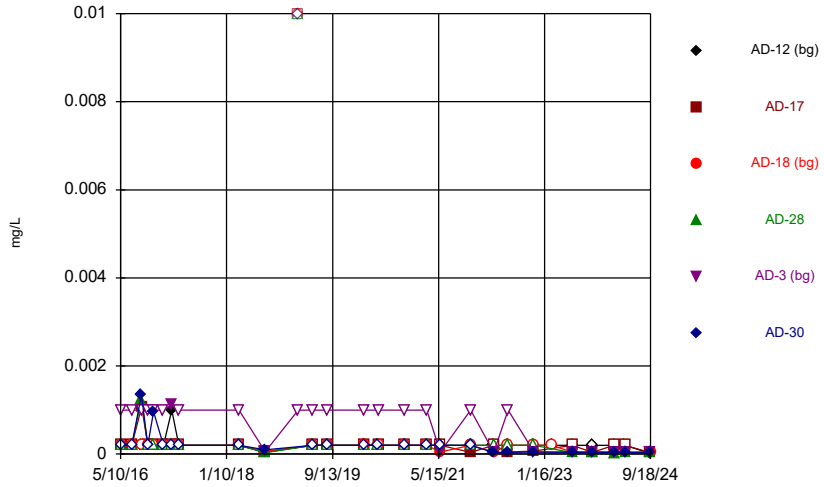
Constituent: Sulfate, total Analysis Run 12/9/2024 3:15 PM

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG

Hollow symbols indicate censored values.

Time Series

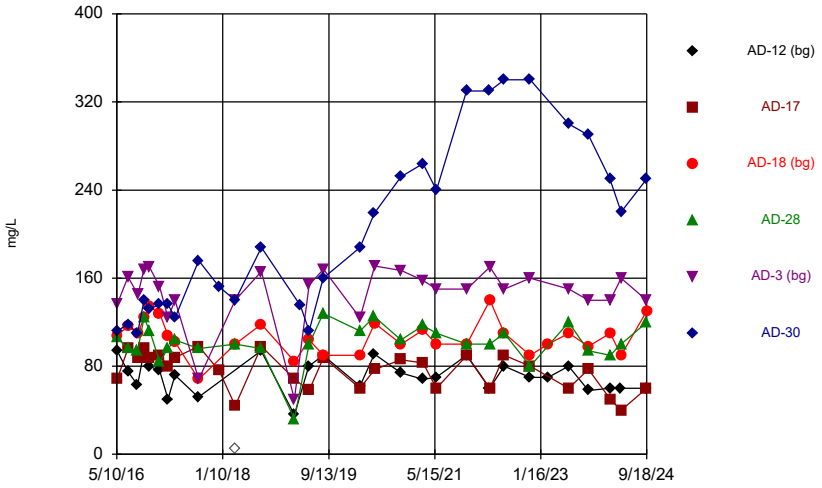


Constituent: Thallium, total Analysis Run 12/9/2024 3:15 PM

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Hollow symbols indicate censored values.

Time Series



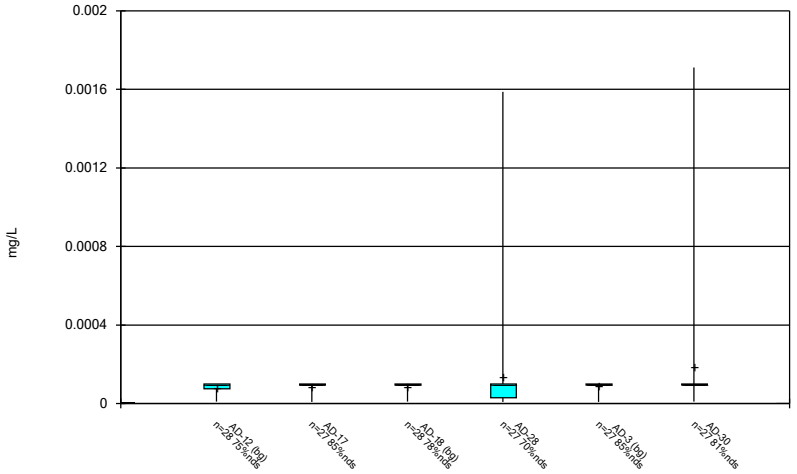
Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 3:15 PM

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

FIGURE B

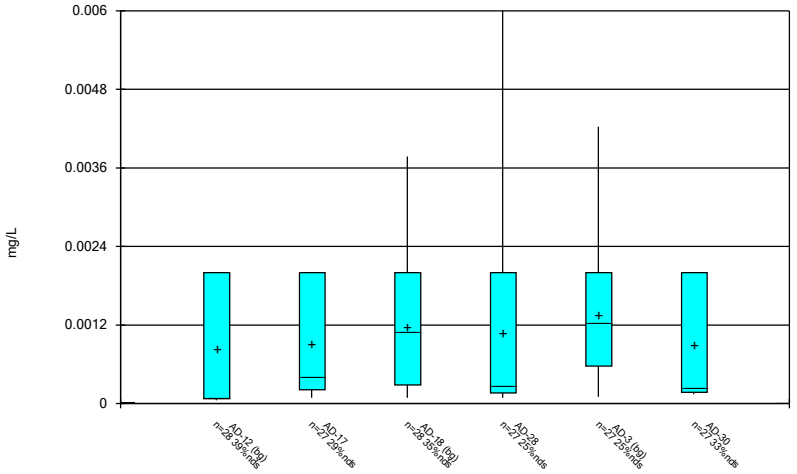
Box Plots

Box & Whiskers Plot



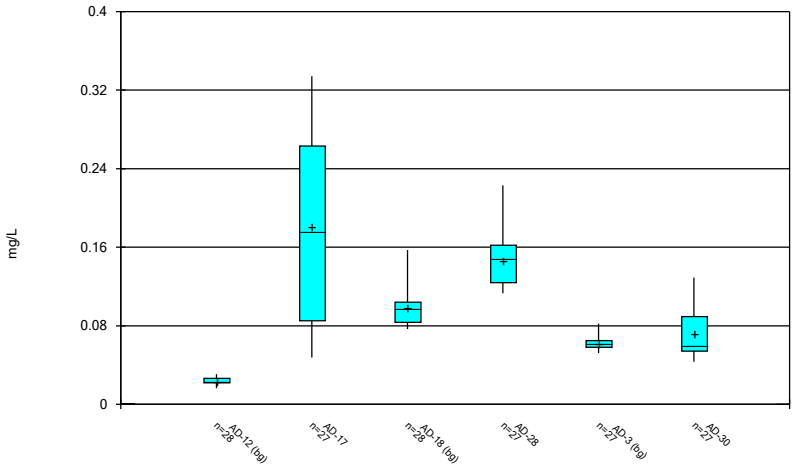
Constituent: Antimony, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



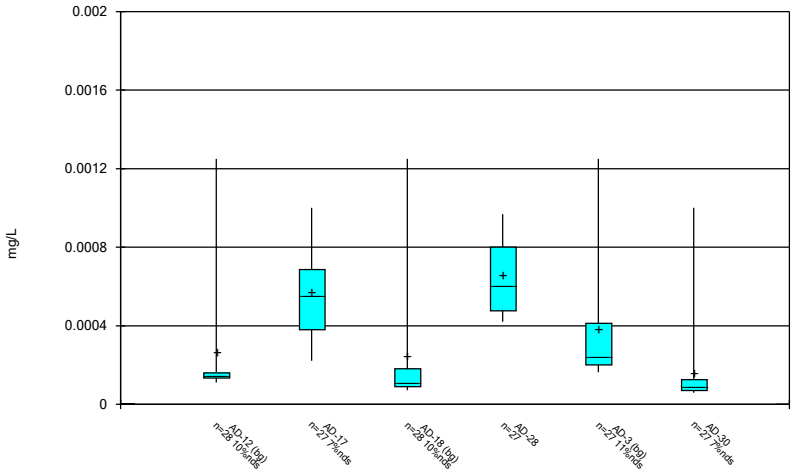
Constituent: Arsenic, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



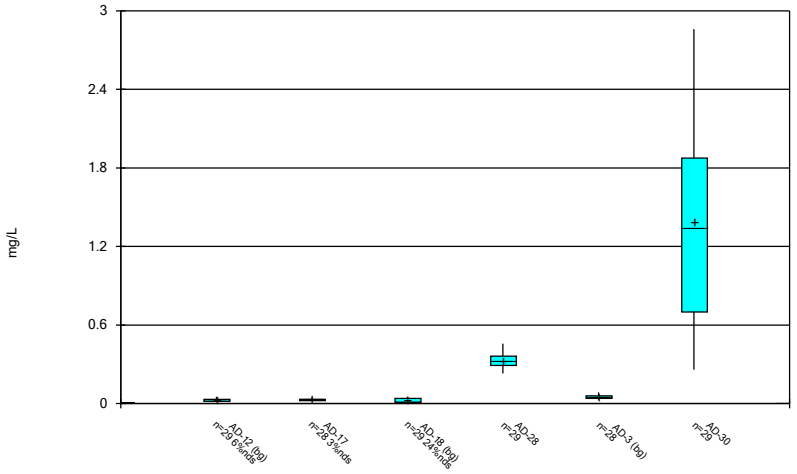
Constituent: Barium, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



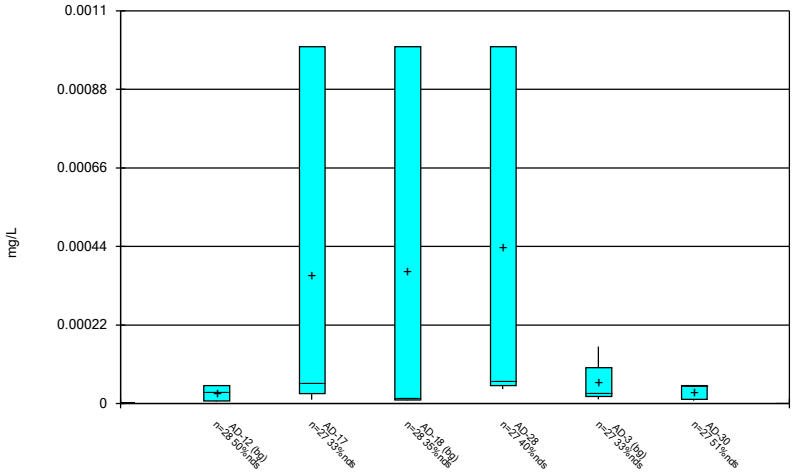
Constituent: Beryllium, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



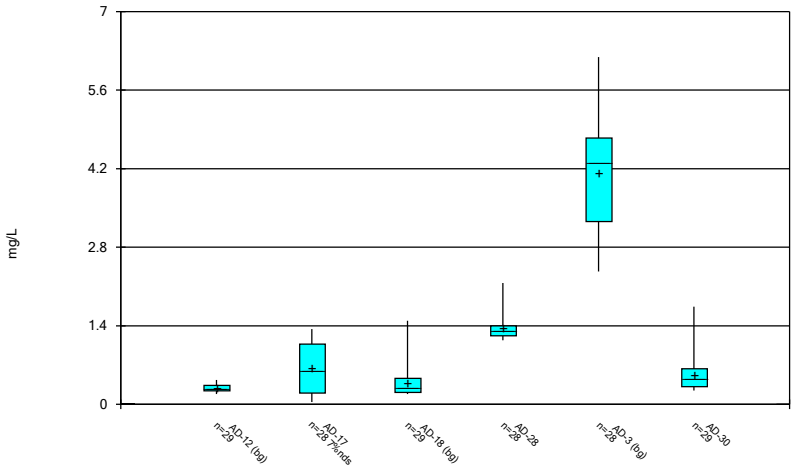
Constituent: Boron, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



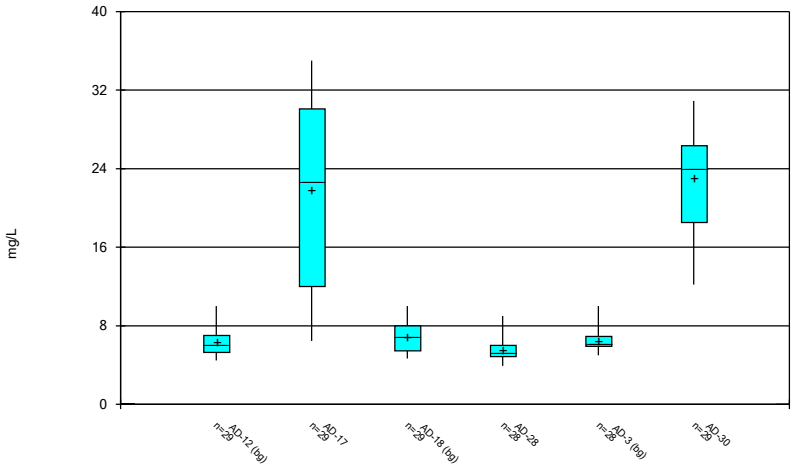
Constituent: Cadmium, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



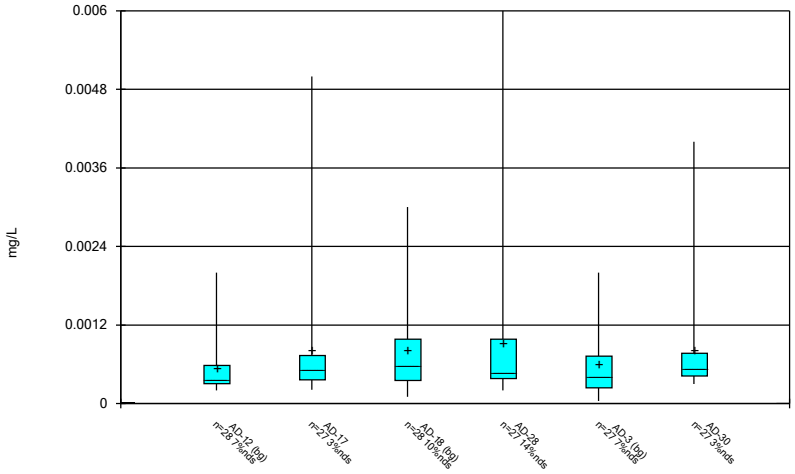
Constituent: Calcium, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



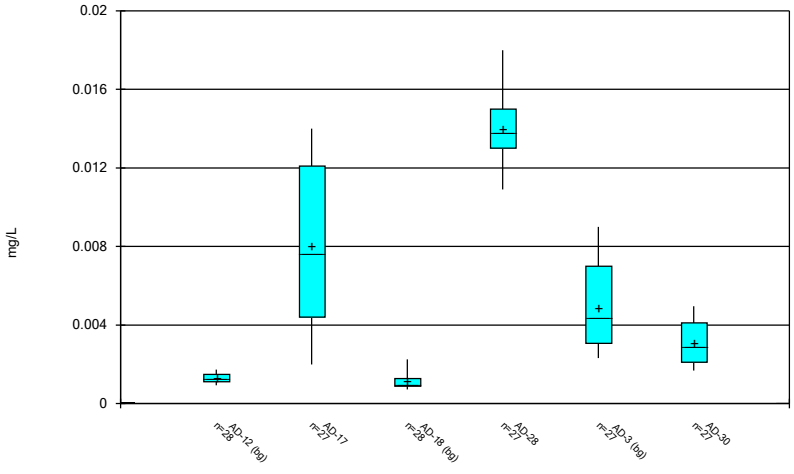
Constituent: Chloride, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



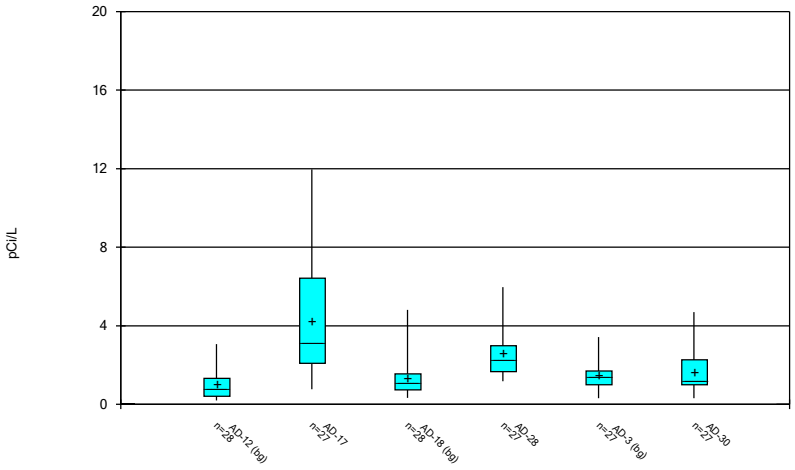
Constituent: Chromium, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



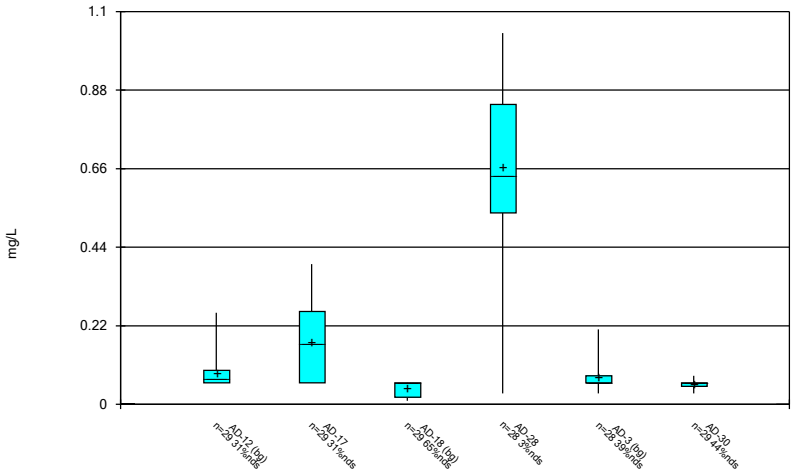
Constituent: Cobalt, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



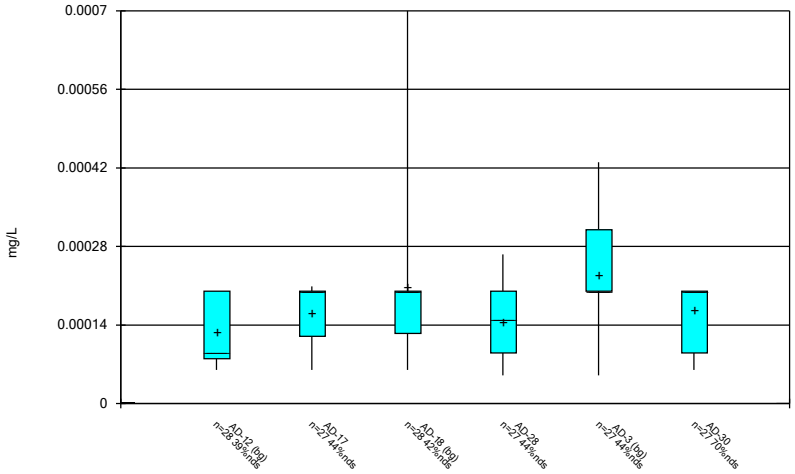
Constituent: Combined Radium 226 + 228 Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



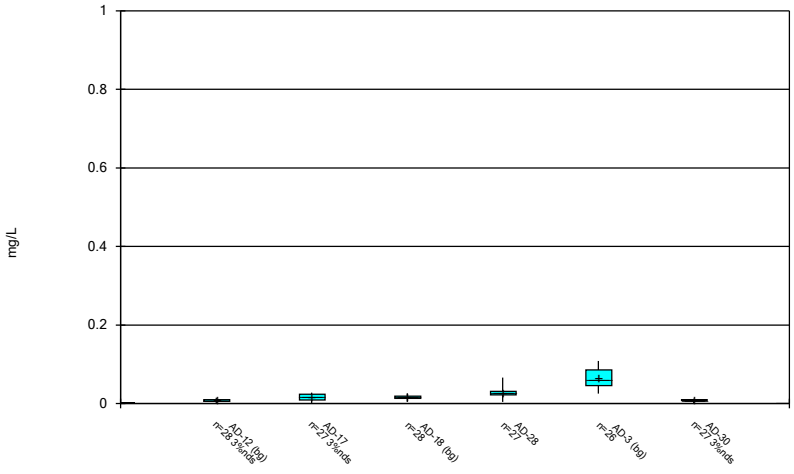
Constituent: Fluoride, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



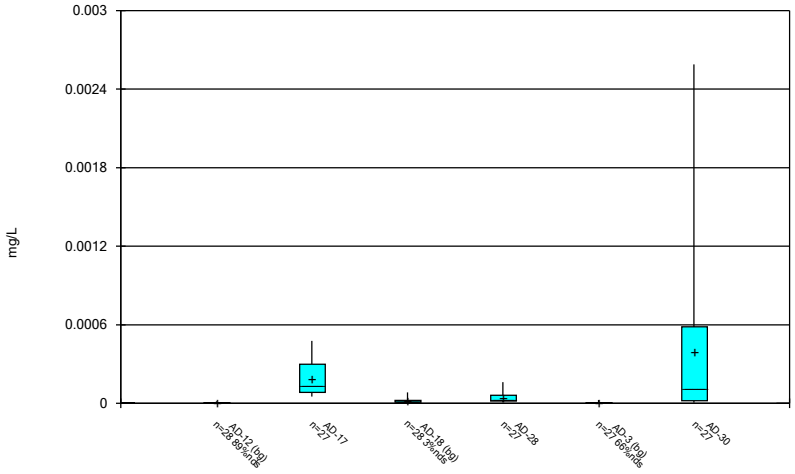
Constituent: Lead, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



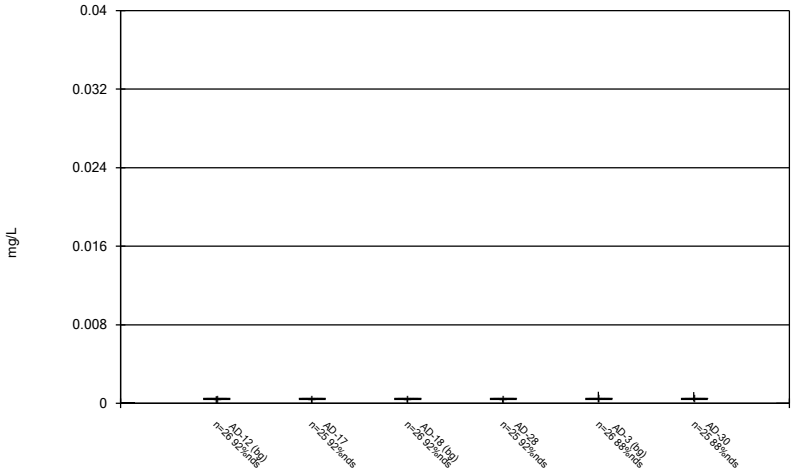
Constituent: Lithium, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



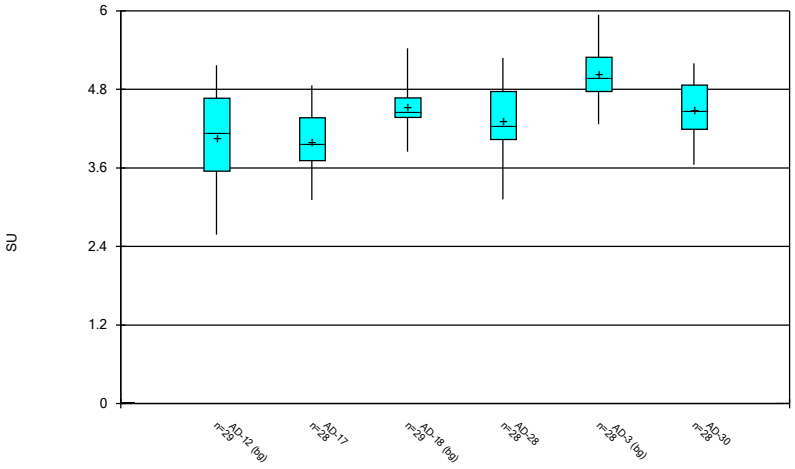
Constituent: Mercury, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



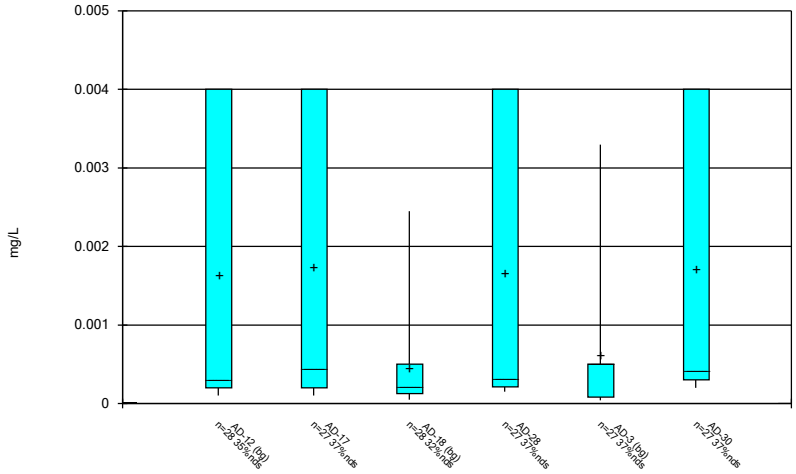
Constituent: Molybdenum, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



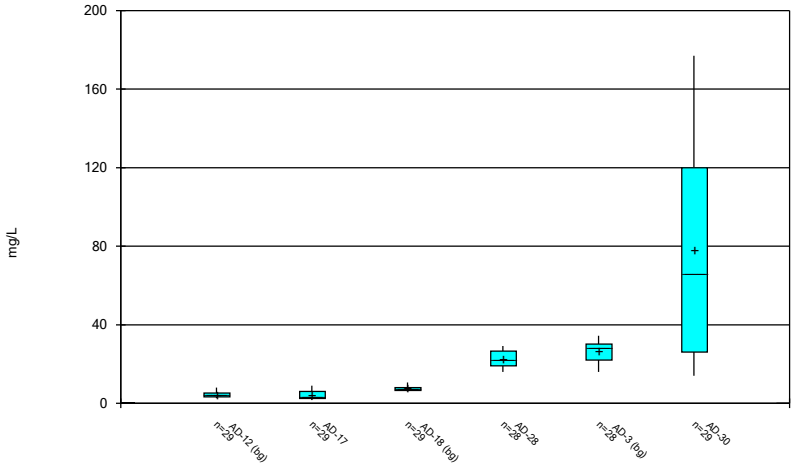
Constituent: pH, field Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



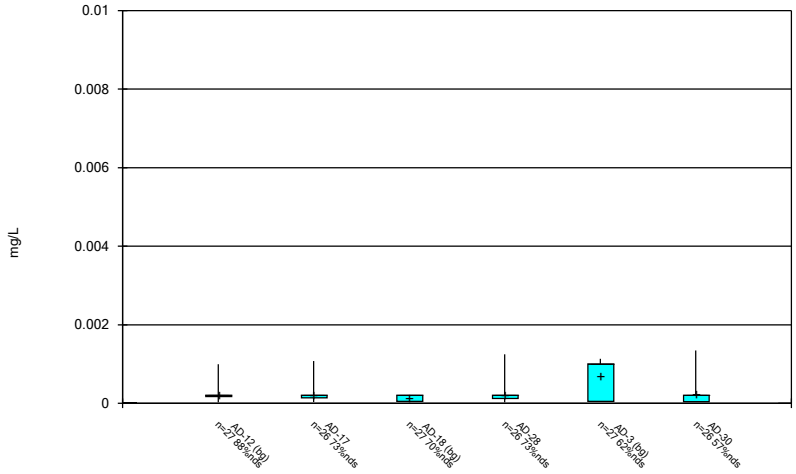
Constituent: Selenium, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



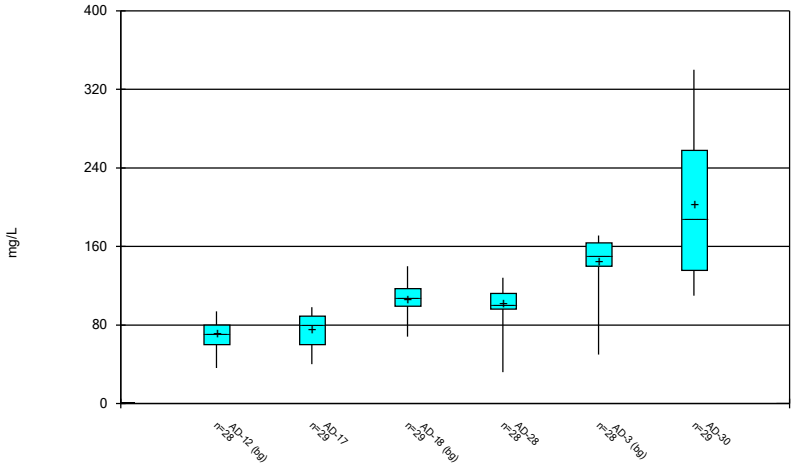
Constituent: Sulfate, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 12/9/2024 3:17 PM
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 3:17 PM

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

FIGURE C

Outlier Summary and Tukey's Outlier Test

Outlier Summary

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/9/2024, 1:40 PM

	AD-28 Calcium, total (mg/L)	AD-3 Lithium, total (mg/L)	AD-12 Molybdenum, total (mg/L)	AD-17 Molybdenum, total (mg/L)	AD-18 Molybdenum, total (mg/L)	AD-28 Molybdenum, total (mg/L)	AD-3 Molybdenum, total (mg/L)	AD-30 Molybdenum, total (mg/L)	AD-12 Thallium, total (mg/L)	AD-17 Thallium, total (mg/L)
10/13/2016	3.21 (o)	0.991 (o)								
3/21/2018										
2/27/2019			<0.04 (o)			<0.04 (o)			<0.01 (o)	
2/28/2019				<0.04 (o)	<0.04 (o)			<0.04 (o)		<0.01 (o)
5/21/2019			<0.04 (o)							
5/22/2019						<0.04 (o)				
5/23/2019				<0.04 (o)	<0.04 (o)		<0.04 (o)	<0.04 (o)		

	AD-18 Thallium, total (mg/L)	AD-28 Thallium, total (mg/L)	AD-30 Thallium, total (mg/L)	AD-12 Total Dissolved Solids [TDS] (mg/L)
10/13/2016				
3/21/2018				<5 (o)
2/27/2019		<0.01 (o)		
2/28/2019	<0.01 (o)		<0.01 (o)	
5/21/2019				
5/22/2019				
5/23/2019				

Outlier Analysis - Significant Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/9/2024, 1:15 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distr...	Normality Test
Calcium, total (mg/L)	**AD-28**	**Yes**	**3.21**	**10/13/2016**	**NP**	**NaN**	**28**	**1.434**	**0.4147**	**ln(x)**	**ShapiroWilk**

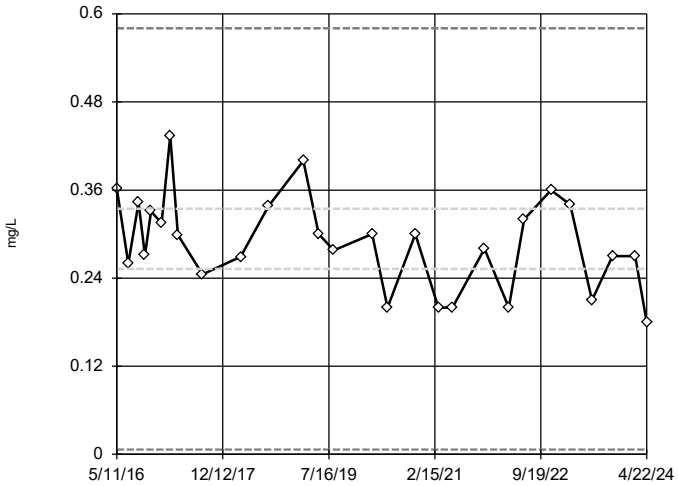
Outlier Analysis - All Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/9/2024, 1:15 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distr...	Normality Test
Calcium, total (mg/L)	AD-12 (bg)	No	n/a	n/a	NP	NaN	28	0.2884	0.06375	normal	ShapiroWilk
Calcium, total (mg/L)	AD-17	No	n/a	n/a	NP	NaN	27	0.6595	0.4661	x^(1/3)	ShapiroWilk
Calcium, total (mg/L)	AD-18 (bg)	No	n/a	n/a	NP	NaN	28	0.3858	0.2631	ln(x)	ShapiroWilk
Calcium, total (mg/L)	**AD-28**	**Yes**	**3.21**	**10/13/2016**	**NP**	**NaN**	**28**	**1.434**	**0.4147**	**ln(x)**	**ShapiroWilk**
Calcium, total (mg/L)	AD-3 (bg)	No	n/a	n/a	NP	NaN	27	4.095	1.034	normal	ShapiroWilk
Calcium, total (mg/L)	AD-30	No	n/a	n/a	NP	NaN	28	0.5055	0.2946	ln(x)	ShapiroWilk
pH, field (SU)	AD-12 (bg)	No	n/a	n/a	NP	NaN	28	4.096	0.6355	x^2	ShapiroWilk
pH, field (SU)	AD-17	No	n/a	n/a	NP	NaN	27	4.041	0.4402	x^2	ShapiroWilk
pH, field (SU)	AD-18 (bg)	No	n/a	n/a	NP	NaN	28	4.549	0.39	ln(x)	ShapiroWilk
pH, field (SU)	AD-28	No	n/a	n/a	NP	NaN	27	4.362	0.5524	normal	ShapiroWilk
pH, field (SU)	AD-3 (bg)	No	n/a	n/a	NP	NaN	27	5.067	0.4052	ln(x)	ShapiroWilk
pH, field (SU)	AD-30	No	n/a	n/a	NP	NaN	27	4.528	0.4312	normal	ShapiroWilk
Sulfate, total (mg/L)	AD-12 (bg)	No	n/a	n/a	NP	NaN	28	4.324	1.427	ln(x)	ShapiroWilk
Sulfate, total (mg/L)	AD-17	No	n/a	n/a	NP	NaN	28	4.214	2.115	ln(x)	ShapiroWilk
Sulfate, total (mg/L)	AD-18 (bg)	No	n/a	n/a	NP	NaN	28	7.487	1.299	ln(x)	ShapiroWilk
Sulfate, total (mg/L)	AD-28	No	n/a	n/a	NP	NaN	27	22.46	4.099	ln(x)	ShapiroWilk
Sulfate, total (mg/L)	AD-3 (bg)	No	n/a	n/a	NP	NaN	27	26.53	5.482	x^3	ShapiroWilk
Sulfate, total (mg/L)	AD-30	No	n/a	n/a	NP	NaN	28	76.65	56.48	ln(x)	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-12 (bg)	No	n/a	n/a	NP	NaN	28	69.63	19.58	x^2	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-17	No	n/a	n/a	NP	NaN	28	76.32	16.76	x^3	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-18 (bg)	No	n/a	n/a	NP	NaN	28	105.9	15.51	normal	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-28	No	n/a	n/a	NP	NaN	27	101.1	18.31	x^3	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-3 (bg)	No	n/a	n/a	NP	NaN	27	145.6	28.43	x^5	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	AD-30	No	n/a	n/a	NP	NaN	28	201.2	78.84	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 12/9/2024 1:13 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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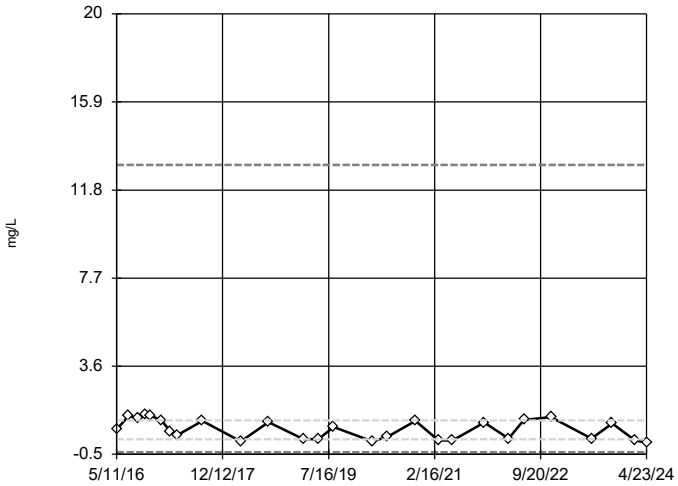
Tukey's Outlier Screening

AD-17



n = 27

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 = 12.97, low cutoff = -0.4032, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/9/2024 1:13 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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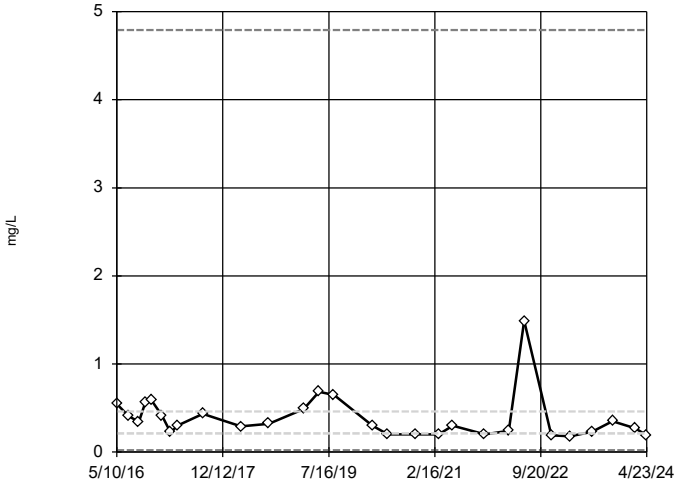
Tukey's Outlier Screening

AD-18 (bg)



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 = 4.791, low cutoff = 0.0204, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/9/2024 1:13 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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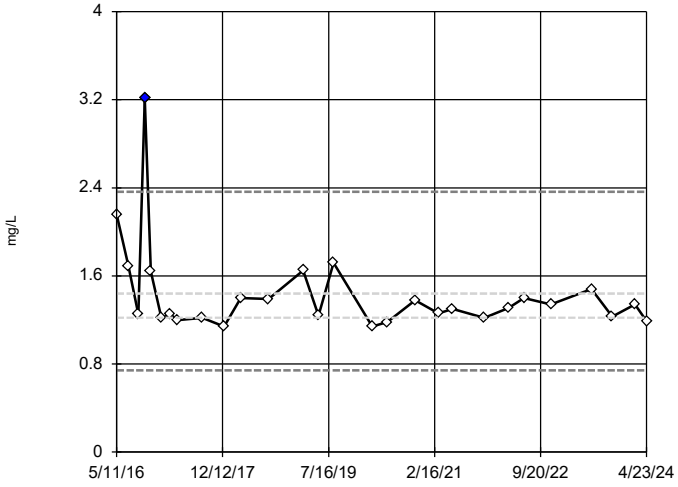
Tukey's Outlier Screening

AD-28



n = 28

Outlier is drawn as solid. Tukey's method selected by user.

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

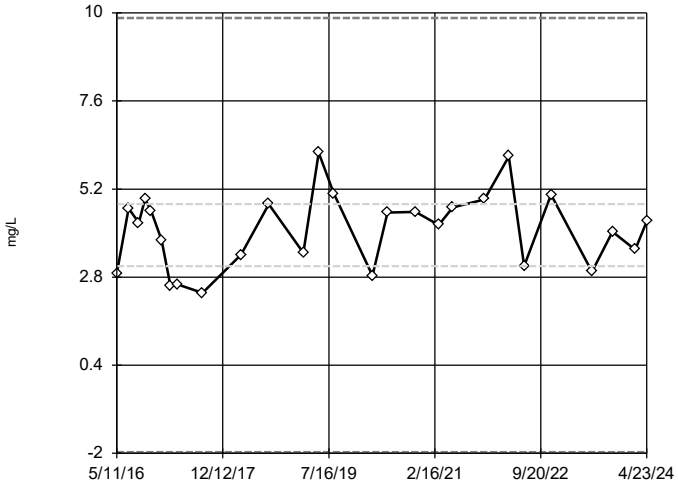
High cutoff = 2.364, low cutoff = 0.7428, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/9/2024 1:13 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tukey's Outlier Screening

AD-3 (bg)



n = 27

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

Ladder of Powers transformations did not improve normality; analysis run on raw data.

High cutoff = 9.86, low cutoff = -1.97, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/9/2024 1:13 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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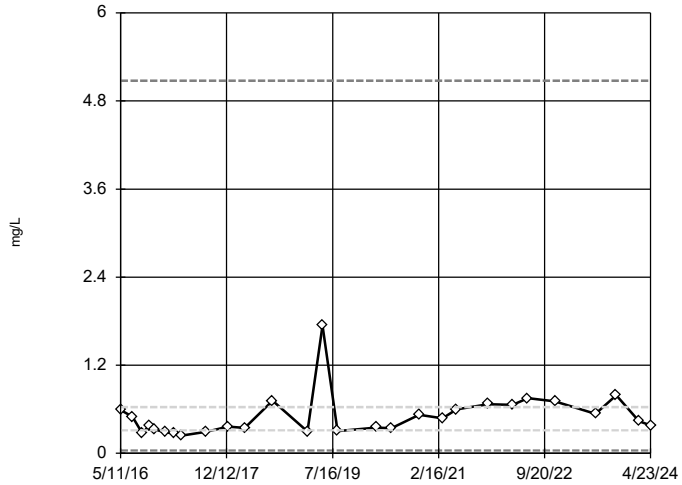
Tukey's Outlier Screening

AD-30



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 = 5.076, low cutoff = 0.0389, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/9/2024 1:13 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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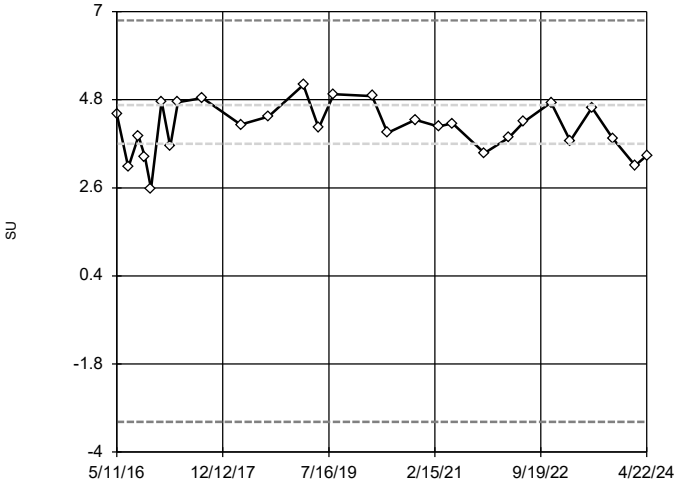
Tukey's Outlier Screening

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 12/9/2024 1:13 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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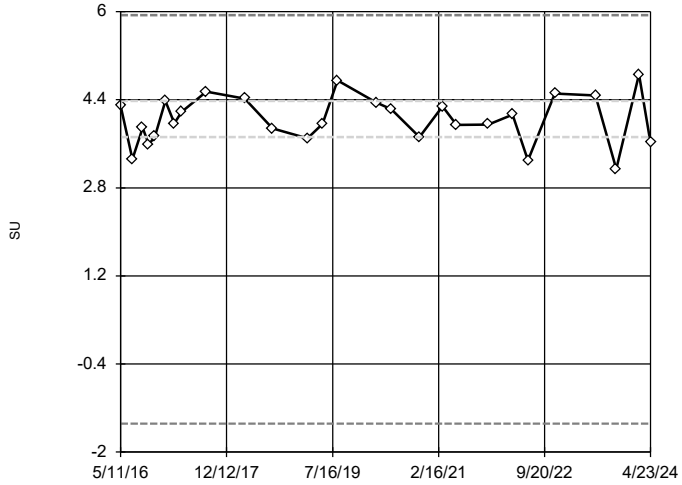
Tukey's Outlier Screening

AD-17



n = 27

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

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

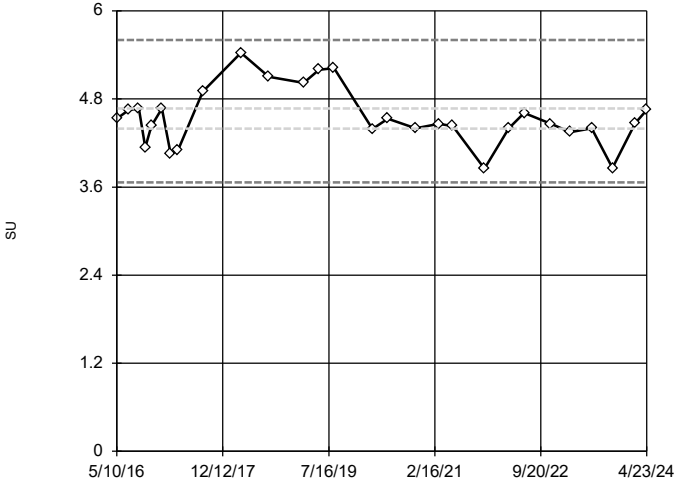
High cutoff = 5.935, low cutoff = -1.483, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/9/2024 1:13 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tukey's Outlier Screening

AD-18 (bg)



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 = 5.603, low cutoff = 3.663, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/9/2024 1:13 PM View: Outlier
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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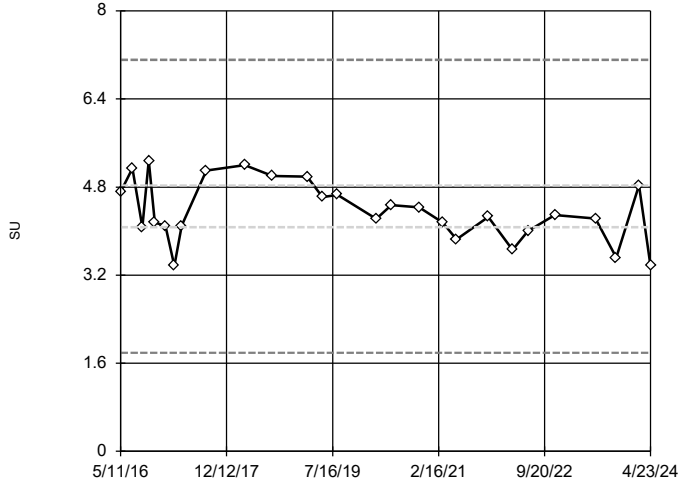
Tukey's Outlier Screening

AD-28



n = 27

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

Ladder of Powers transformations did not improve normality; analysis run on raw data.

High cutoff = 7.11, low cutoff = 1.79, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/9/2024 1:13 PM View: Outlier
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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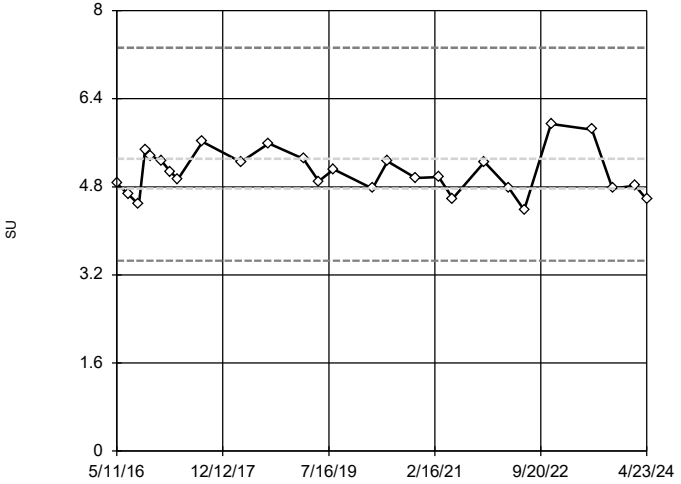
Tukey's Outlier Screening

AD-3 (bg)



n = 27

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 = 7.325, low cutoff = 3.458, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/9/2024 1:13 PM View: Outlier
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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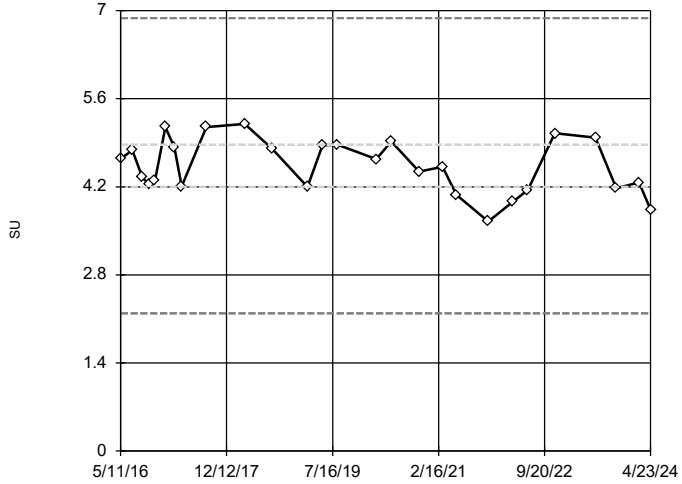
Tukey's Outlier Screening

AD-30



n = 27

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

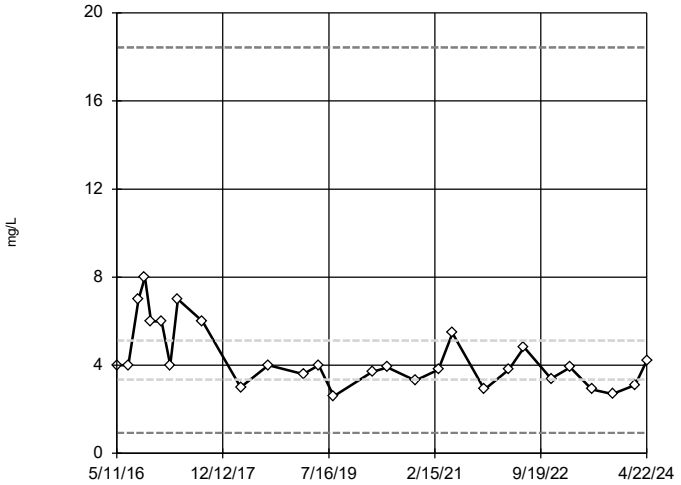
Ladder of Powers transformations did not improve normality; analysis run on raw data.

High cutoff = 6.88, low cutoff = 2.19, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/9/2024 1:13 PM View: Outlier
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tukey's Outlier Screening

AD-12 (bg)



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).

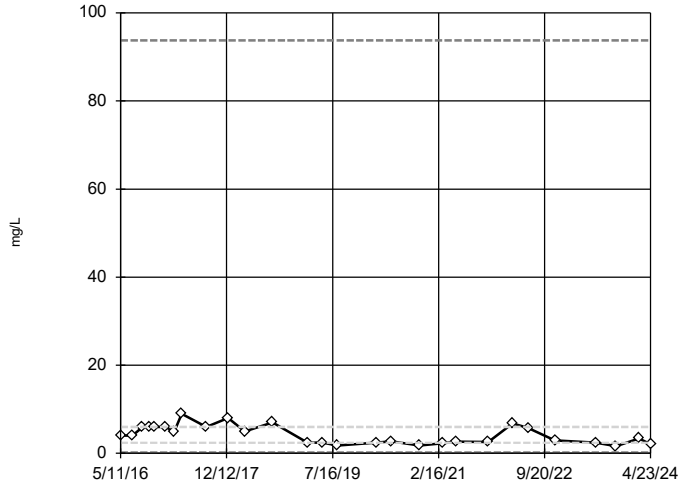
High cutoff = 18.43, low cutoff = 0.9299, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/9/2024 1:13 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tukey's Outlier Screening

AD-17



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).

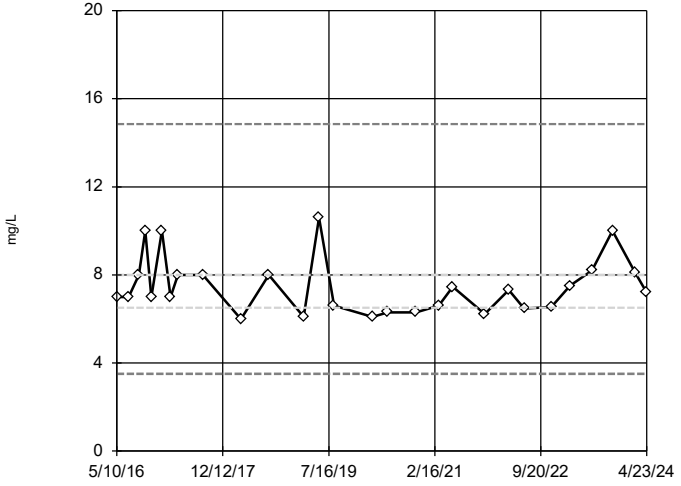
High cutoff = 93.75, low cutoff = 0.1536, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/9/2024 1:14 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tukey's Outlier Screening

AD-18 (bg)



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).

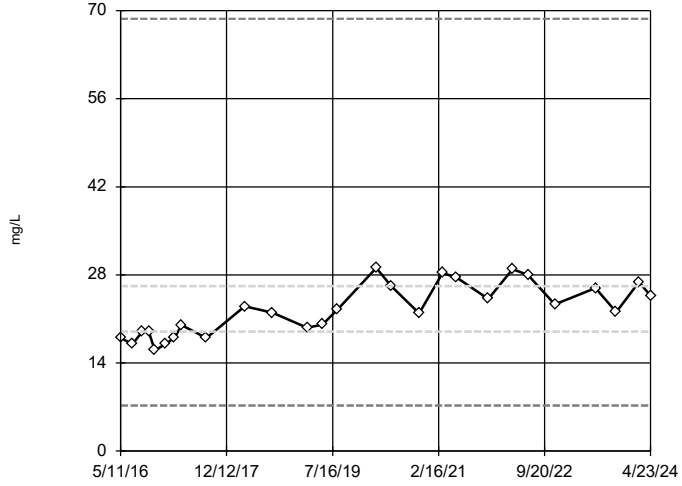
High cutoff = 14.85, low cutoff = 3.508, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/9/2024 1:14 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tukey's Outlier Screening

AD-28



n = 27

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

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

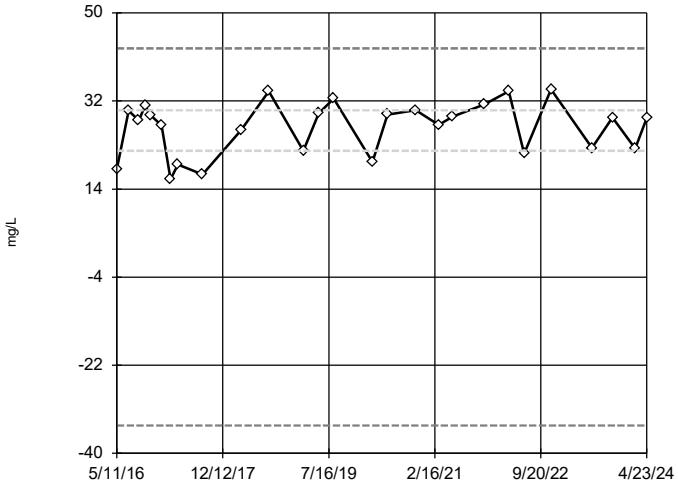
High cutoff = 68.7, low cutoff = 7.246, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/9/2024 1:14 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tukey's Outlier Screening

AD-3 (bg)



n = 27

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 = 42.73, low cutoff = -34.31, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/9/2024 1:14 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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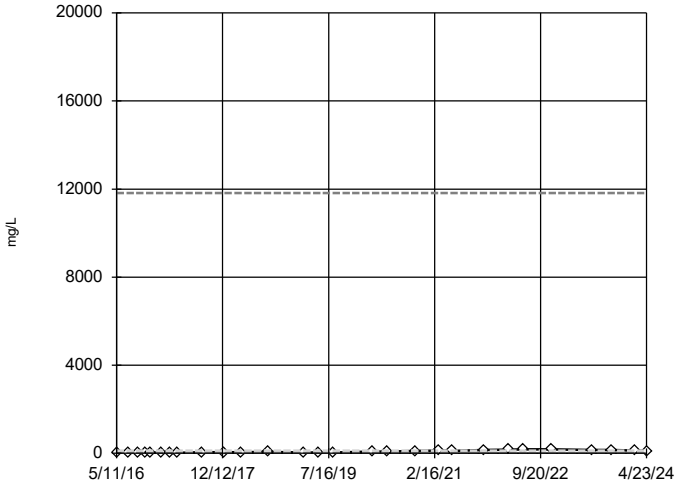
Tukey's Outlier Screening

AD-30



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 = 11818, low cutoff = 0.2638, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/9/2024 1:14 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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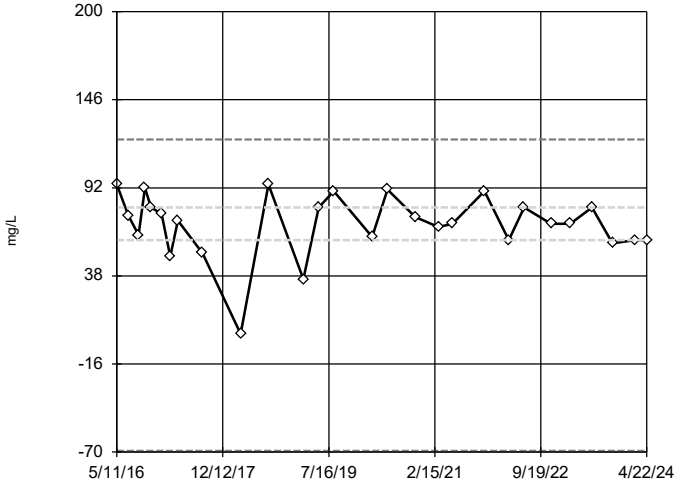
Tukey's Outlier Screening

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 12/9/2024 1:14 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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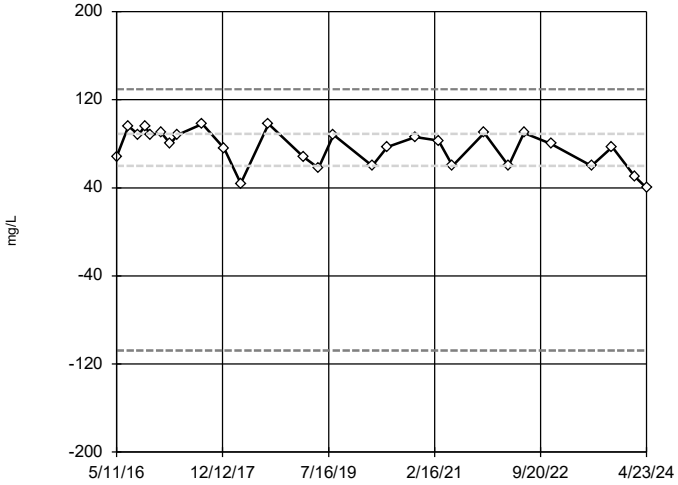
Tukey's Outlier Screening

AD-17



n = 28

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

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

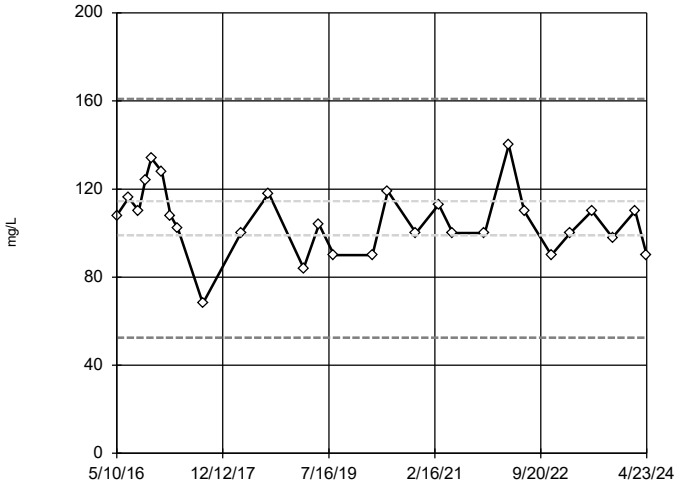
High cutoff = 129.5, low cutoff = -107.8, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 1:14 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tukey's Outlier Screening

AD-18 (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 = 161, low cutoff = 52.5, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 1:14 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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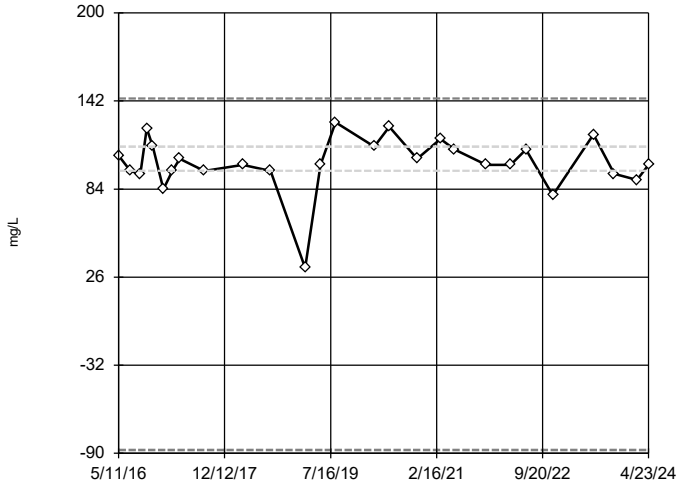
Tukey's Outlier Screening

AD-28



n = 27

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 = 143.7, low cutoff = -87.76, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 1:14 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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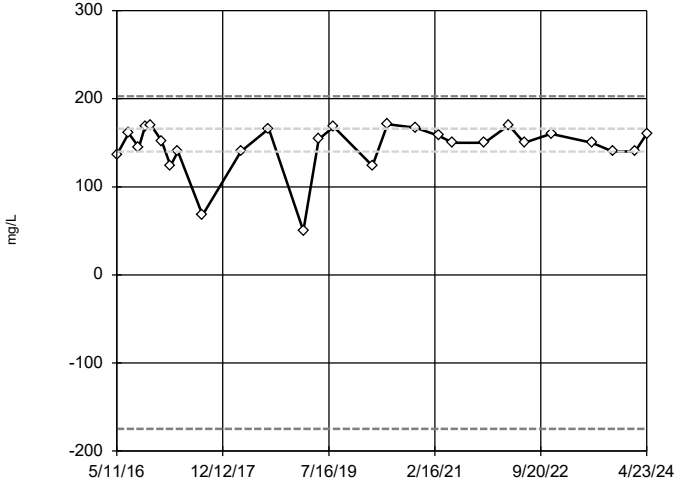
Tukey's Outlier Screening

AD-3 (bg)



n = 27

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 = 202.8, low cutoff = -174.8, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 1:14 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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Tukey's Outlier Screening

AD-30

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 = 1779, low cutoff = 19.64, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 1:14 PM View: Outlier

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Outlier Analysis - Upgradient Wells - Significant Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/9/2024, 1:18 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distr...	Normality Test
Fluoride, total (mg/L)	**AD-12,AD-18,AD-3**	**Yes**	**0.2565,0.213,0.02,0.02,0.02,0.02,0.02...**	**n/a w/com...**	**NP**	**NaN**	**86**	**0.06965**	**0.04196**	**ln(x)**	**ShapiroFrancia**
Mercury, total (mg/L)	**AD-12,AD-18,AD-3**	**Yes**	**0.000084**	**n/a w/com...**	**NP**	**NaN**	**83**	**0.000009911**	**0.00001219**	**ln(x)**	**ShapiroFrancia**

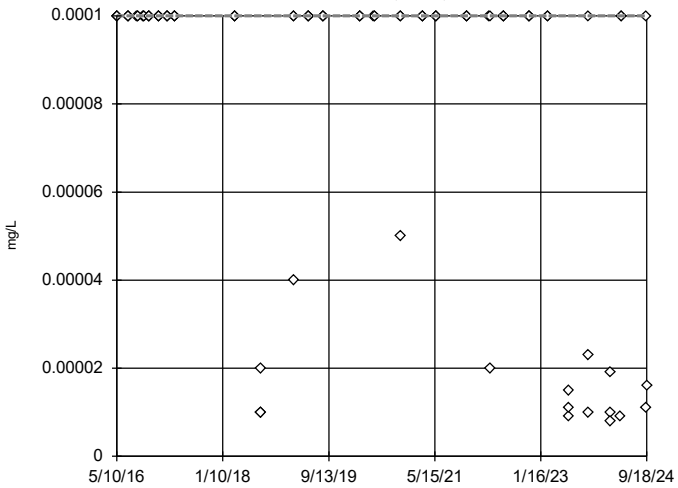
Outlier Analysis - Upgradient Wells - All Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/9/2024, 1:18 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distr...	Normality Test
Antimony, total (mg/L)	AD-12,AD-18,AD-3	n/a	n/a	NP	NaN	83	0.00008302	0.00003404	unknown	ShapiroFrancia
Arsenic, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	83	0.001121	0.0009604	x^(1/3)	ShapiroFrancia
Barium, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	83	0.06137	0.03298	sqrt(x)	ShapiroFrancia
Beryllium, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	83	0.0002979	0.0003478	ln(x)	ShapiroFrancia
Boron, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	86	0.03077	0.0184	x^(1/3)	ShapiroFrancia
Cadmium, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	83	0.00005348	0.00004491	ln(x)	ShapiroFrancia
Chloride, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	86	6.508	1.248	ln(x)	ShapiroFrancia
Chromium, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	83	0.0006494	0.0005836	ln(x)	ShapiroFrancia
Cobalt, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	83	0.002398	0.002061	ln(x)	ShapiroFrancia
Combined Radium 226 + 228 (pCi/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	83	1.268	0.8343	x^(1/3)	ShapiroFrancia
Fluoride, total (mg/L)	**AD-12,AD-18,AD-3**	**Yes**	**0.2565,0.213,0.02,0.02,...**	**NP**	**NaN**	**86**	**0.06965**	**0.04196**	**ln(x)**	**ShapiroFrancia**
Lead, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	83	0.000188	0.0001132	ln(x)	ShapiroFrancia
Lithium, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	83	0.04035	0.1093	ln(x)	ShapiroFrancia
Mercury, total (mg/L)	**AD-12,AD-18,AD-3**	**Yes**	**0.000084**	**NP**	**NaN**	**83**	**0.000009911**	**0.00001219**	**ln(x)**	**ShapiroFrancia**
Molybdenum, total (mg/L)	AD-12,AD-18,AD-3	n/a	n/a	NP	NaN	83	0.0004972	0.0001162	unknown	ShapiroFrancia
Selenium, total (mg/L)	AD-12,AD-18,AD-3	No	n/a	NP	NaN	83	0.0004796	0.0005975	ln(x)	ShapiroFrancia
Thallium, total (mg/L)	AD-12,AD-18,AD-3	n/a	n/a	NP	NaN	83	0.0001857	0.0001533	unknown	ShapiroFrancia

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 83

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

Data were cube root 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 12/9/2024 1:16 PM View: Outlier Upgradient

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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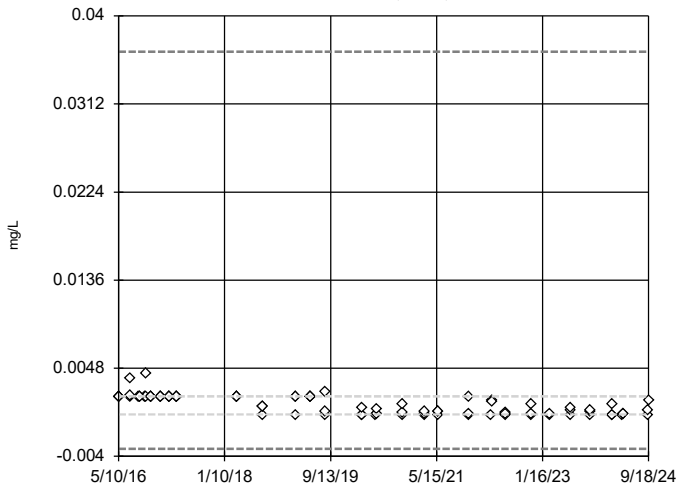
Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 83

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 = 0.03643, low cutoff = -0.003243, based on IQR multiplier of 3.

Constituent: Arsenic, total Analysis Run 12/9/2024 1:16 PM View: Outlier Upgradient

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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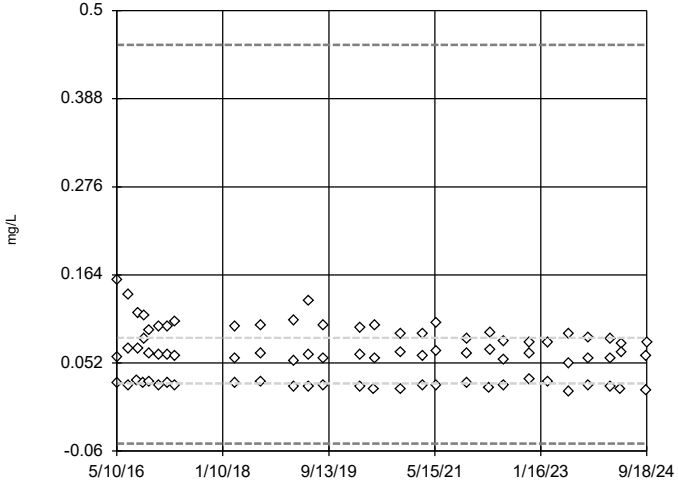
Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 83

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 = 0.4564, low cutoff = -0.0504, based on IQR multiplier of 3.

Constituent: Barium, total Analysis Run 12/9/2024 1:16 PM View: Outlier Upgradient

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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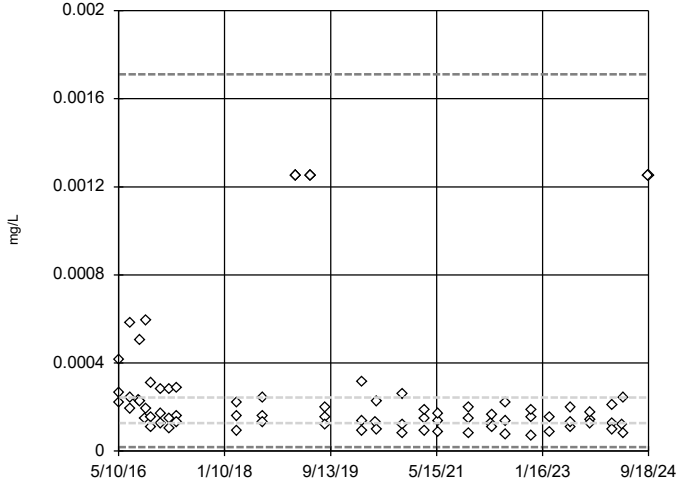
Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 83

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

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

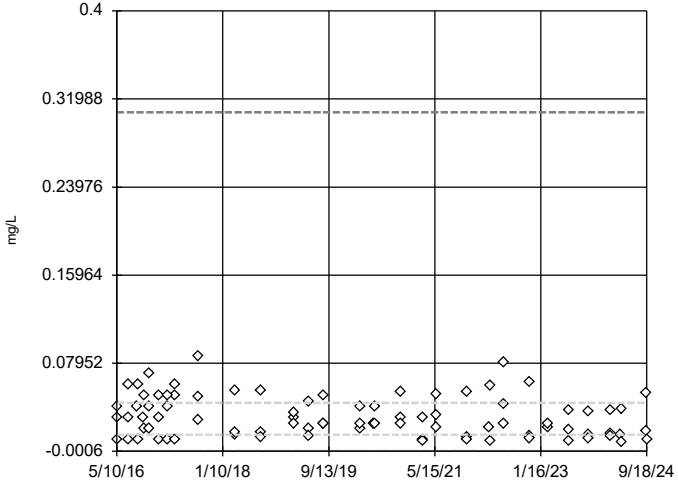
High cutoff = 0.001711, low cutoff = 0.00001806, based on IQR multiplier of 3.

Constituent: Beryllium, total Analysis Run 12/9/2024 1:16 PM View: Outlier Upgradient

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 86

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 = 0.3077, low cutoff = -0.0005056, based on IQR multiplier of 3.

Constituent: Boron, total Analysis Run 12/9/2024 1:16 PM View: Outlier Upgradient

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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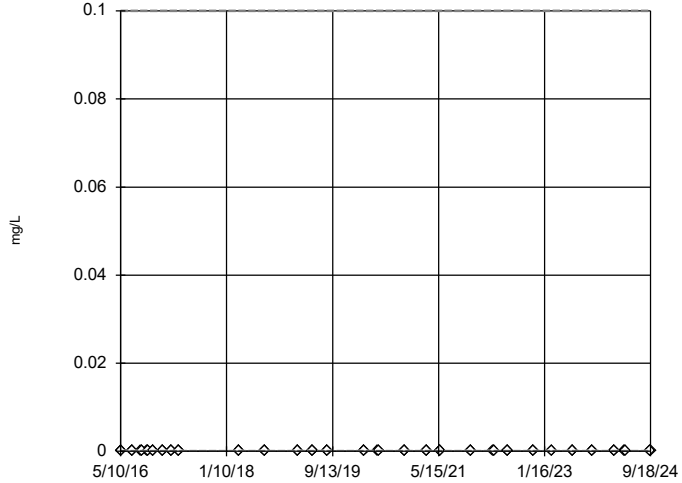
Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 83

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 = 0.1, low cutoff = 1.0e-8, based on IQR multiplier of 3.

Constituent: Cadmium, total Analysis Run 12/9/2024 1:16 PM View: Outlier Upgradient

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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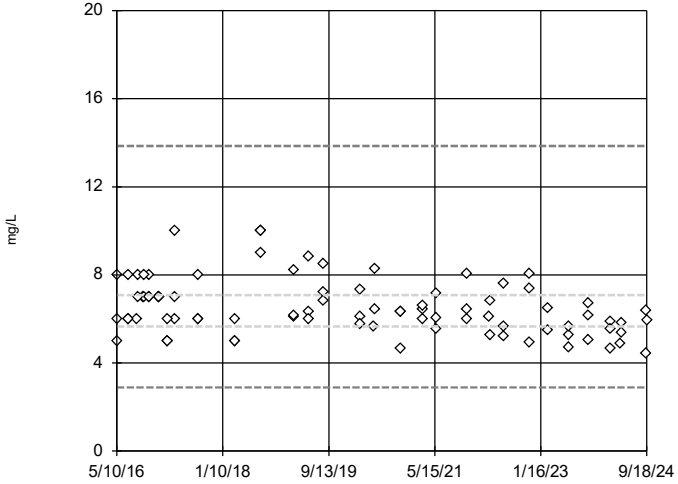
Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 86

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 = 13.85, low cutoff = 2.892, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 12/9/2024 1:16 PM View: Outlier Upgradient

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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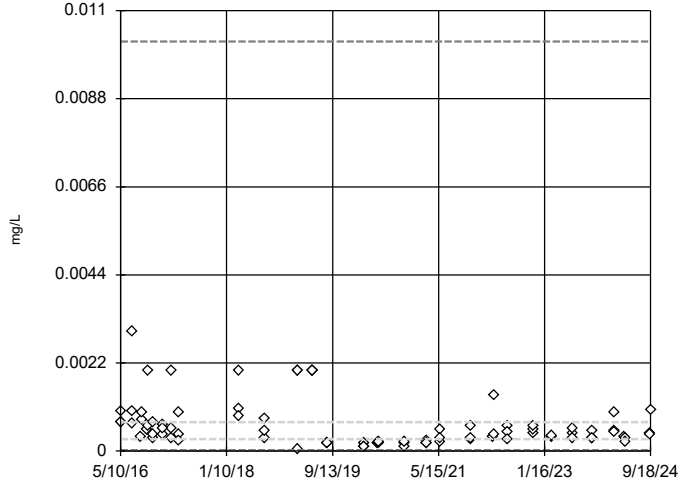
Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 83

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

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

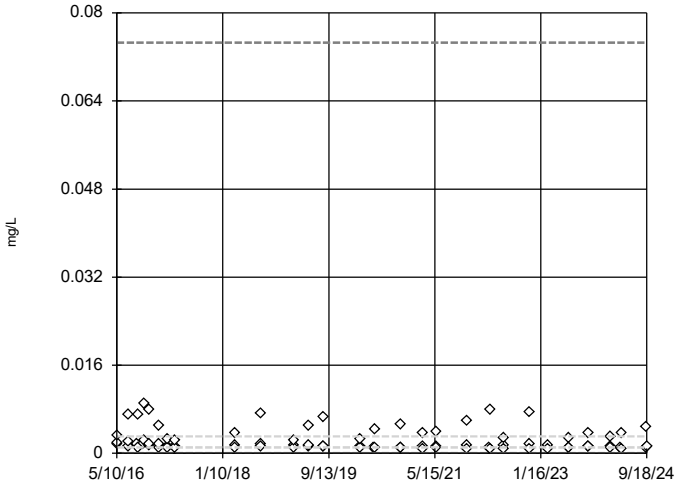
High cutoff = 0.01023, low cutoff = 0.00002126, based on IQR multiplier of 3.

Constituent: Chromium, total Analysis Run 12/9/2024 1:16 PM View: Outlier Upgradient

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 83

No outliers found.
Tukey's method select-ed by user.

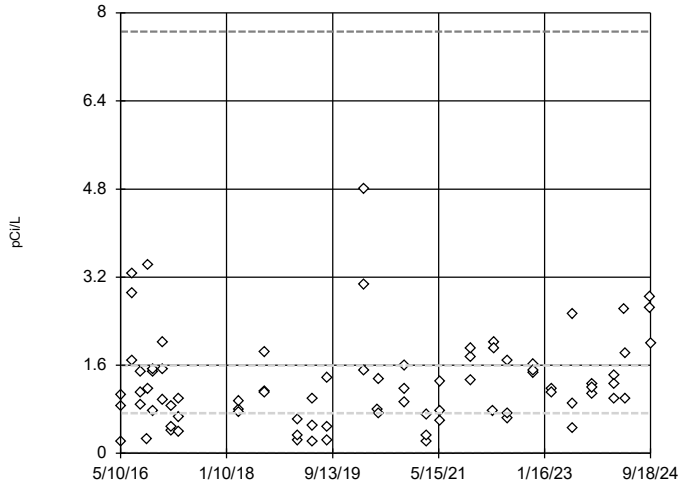
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.07458, low cutoff = 0.00004363, based on IQR multiplier of 3.

Constituent: Cobalt, total Analysis Run 12/9/2024 1:16 PM View: Outlier Upgradient
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 83

No outliers found.
Tukey's method select-ed by user.

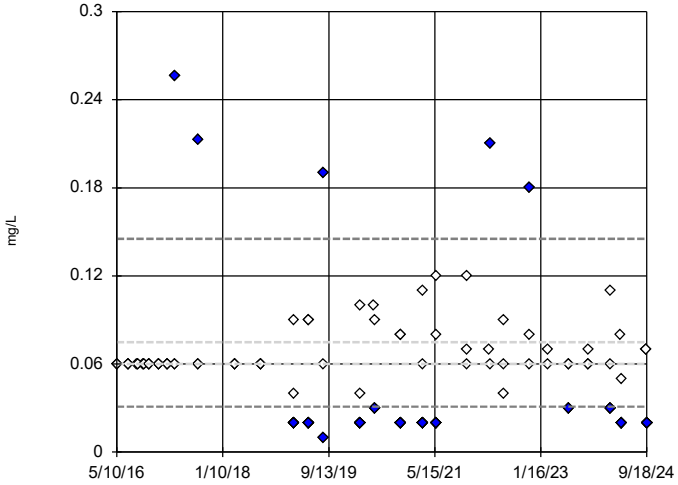
Data were cube root trans-formed to achieve best W statistic (graph shown in original units).

High cutoff = 7.661, low cutoff = 0.0009188, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 12/9/2024 1:16 PM View: Outlier Upgradient
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 86

Outliers are drawn as solid.
Tukey's method select-ed by user.

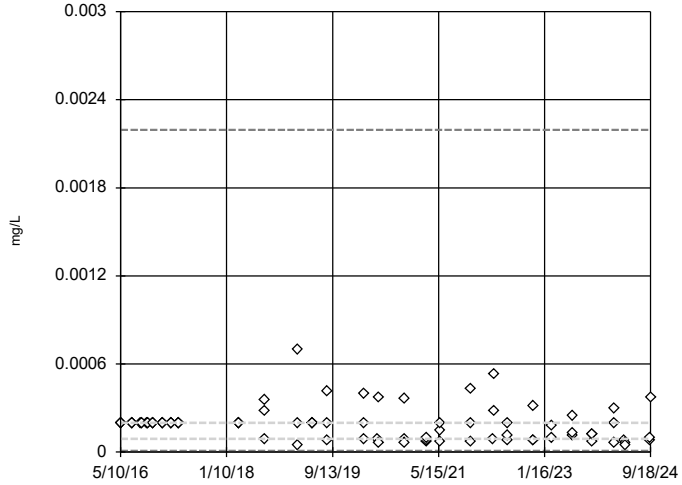
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.1452, low cutoff = 0.03093, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 12/9/2024 1:16 PM View: Outlier Upgradient
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 83

No outliers found.
Tukey's method select-ed by user.

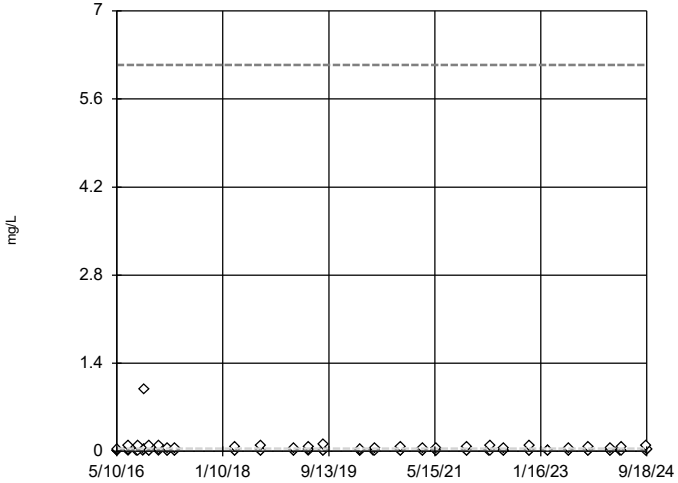
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.002195, low cutoff = 0.000008201, based on IQR multiplier of 3.

Constituent: Lead, total Analysis Run 12/9/2024 1:16 PM View: Outlier Upgradient
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 83

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 = 6.142, low cutoff = 0.00006741, based on IQR multiplier of 3.

Constituent: Lithium, total Analysis Run 12/9/2024 1:16 PM View: Outlier Upgradient

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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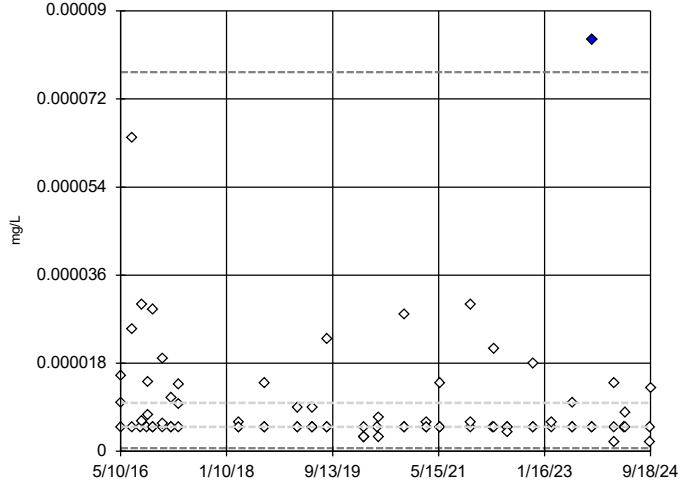
Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 83

Outlier is 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 = 0.00007747, low cutoff = 6.4e-7, based on IQR multiplier of 3.

Constituent: Mercury, total Analysis Run 12/9/2024 1:16 PM View: Outlier Upgradient

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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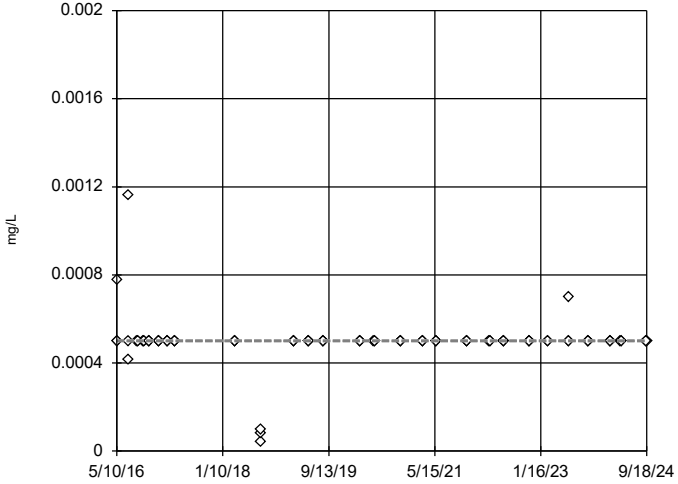
Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 83

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 12/9/2024 1:16 PM View: Outlier Upgradient

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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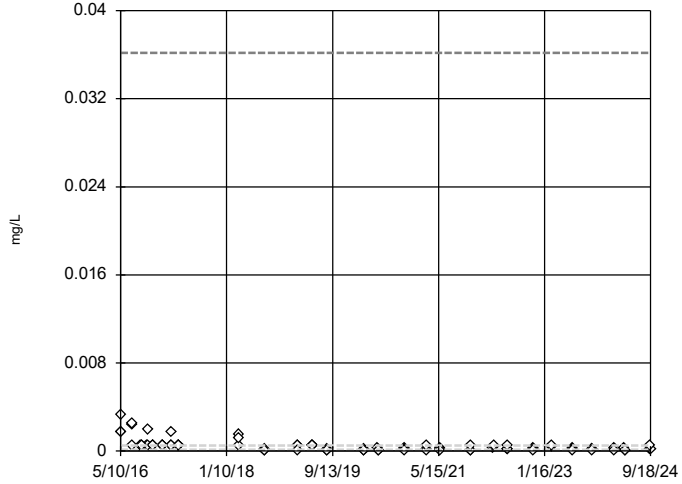
Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 83

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

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

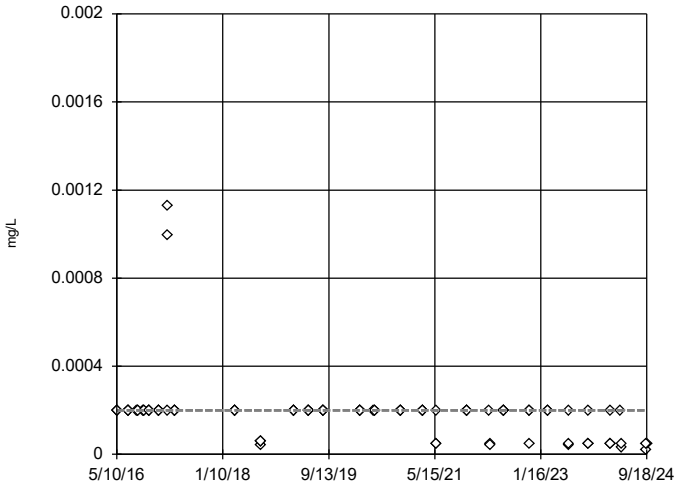
High cutoff = 0.03617, low cutoff = 0.000001659, based on IQR multiplier of 3.

Constituent: Selenium, total Analysis Run 12/9/2024 1:16 PM View: Outlier Upgradient

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tukey's Outlier Screening, Pooled Background

AD-12,AD-18,AD-3



n = 83

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 12/9/2024 1:16 PM View: Outlier Upgradient

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

FIGURE D

Seasonality

Seasonality Summary Table - Significant Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/9/2024, 11:39 AM

Constituent	Well	Sig.	K.-W.	Chi-Sq.	df	N	Alpha
Barium, total (mg/L)	**AD-17**	**Yes**	**14.81**	**7.815**	**3**	**27**	**0.05**
Calcium, total (mg/L)	**AD-17**	**Yes**	**15.92**	**7.815**	**3**	**28**	**0.05**
Cobalt, total (mg/L)	**AD-17**	**Yes**	**13.72**	**7.815**	**3**	**27**	**0.05**
Combined Radium 226 + 228 (pCi/L)	**AD-17**	**Yes**	**13.56**	**7.815**	**3**	**27**	**0.05**
Lithium, total (mg/L)	**AD-17**	**Yes**	**14.02**	**7.815**	**3**	**27**	**0.05**
Total Dissolved Solids [TDS] (mg/L)	**AD-17**	**Yes**	**8.935**	**7.815**	**3**	**29**	**0.05**

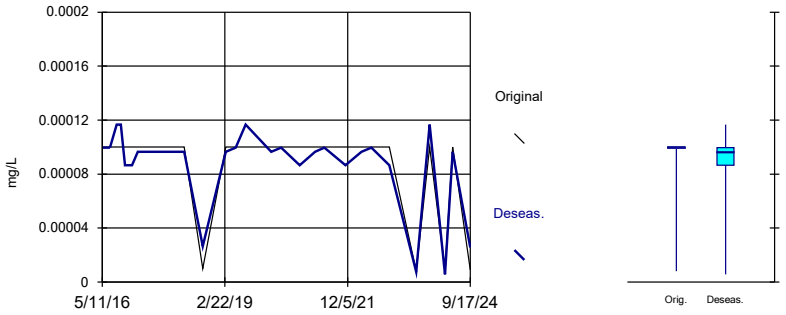
Seasonality Summary Table - All Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/9/2024, 11:39 AM

Constituent	Well	Sig.	K.-W.	Chi-Sq.	df	N	Alpha
Antimony, total (mg/L)	AD-17	No	2.193	7.815	3	27	0.05
Arsenic, total (mg/L)	AD-17	No	0.519	7.815	3	27	0.05
Barium, total (mg/L)	**AD-17**	**Yes**	**14.81**	**7.815**	**3**	**27**	**0.05**
Beryllium, total (mg/L)	AD-17	No	7.718	7.815	3	27	0.05
Cadmium, total (mg/L)	AD-17	No	1.533	7.815	3	27	0.05
Calcium, total (mg/L)	**AD-17**	**Yes**	**15.92**	**7.815**	**3**	**28**	**0.05**
Chromium, total (mg/L)	AD-17	No	0.7764	7.815	3	27	0.05
Cobalt, total (mg/L)	**AD-17**	**Yes**	**13.72**	**7.815**	**3**	**27**	**0.05**
Combined Radium 226 + 228 (pCi/L)	**AD-17**	**Yes**	**13.56**	**7.815**	**3**	**27**	**0.05**
Fluoride, total (mg/L)	AD-17	No	3.098	7.815	3	29	0.05
Lead, total (mg/L)	AD-17	No	1.579	7.815	3	27	0.05
Lithium, total (mg/L)	**AD-17**	**Yes**	**14.02**	**7.815**	**3**	**27**	**0.05**
Mercury, total (mg/L)	AD-17	No	2.658	7.815	3	27	0.05
Molybdenum, total (mg/L)	AD-17	No	2.264	7.815	3	25	0.05
pH, field (SU)	AD-17	No	1.711	7.815	3	28	0.05
Selenium, total (mg/L)	AD-17	No	0.7946	7.815	3	27	0.05
Sulfate, total (mg/L)	AD-17	No	0.7909	7.815	3	29	0.05
Thallium, total (mg/L)	AD-17	No	3.183	7.815	3	26	0.05
Total Dissolved Solids [TDS] (mg/L)	**AD-17**	**Yes**	**8.935**	**7.815**	**3**	**29**	**0.05**

Seasonality: AD-17

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat 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 = 2.193
Tabulated Chi-Squared value = 7.815 with 3 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) = 0.8376
Adjusted Kruskal-Wallis statistic (H') = 2.193



Constituent: Antimony, total Analysis Run 12/9/2024 11:37 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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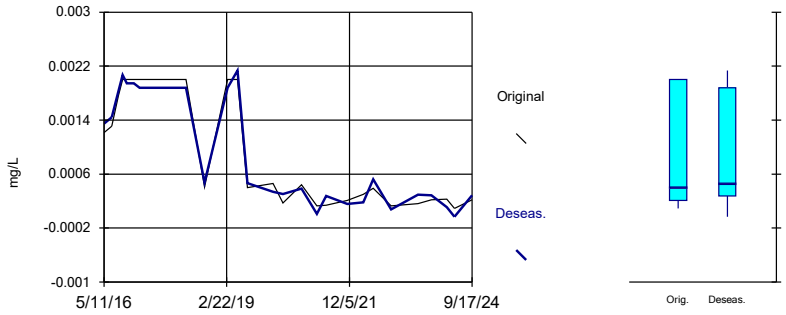
Seasonality: AD-17

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat 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 = 0.519
Tabulated Chi-Squared value = 7.815 with 3 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) = 0.5054
Adjusted Kruskal-Wallis statistic (H') = 0.519



Constituent: Arsenic, total Analysis Run 12/9/2024 11:37 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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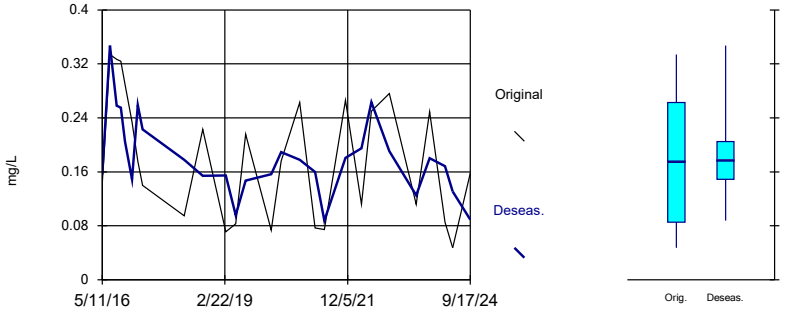
Seasonality: AD-17

For the selected data, the Kruskal-Wallis test indicates SEASONALITYat 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 = 14.81
Tabulated Chi-Squared value = 7.815 with 3 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) = 14.8
Adjusted Kruskal-Wallis statistic (H') = 14.81



Constituent: Barium, total Analysis Run 12/9/2024 11:37 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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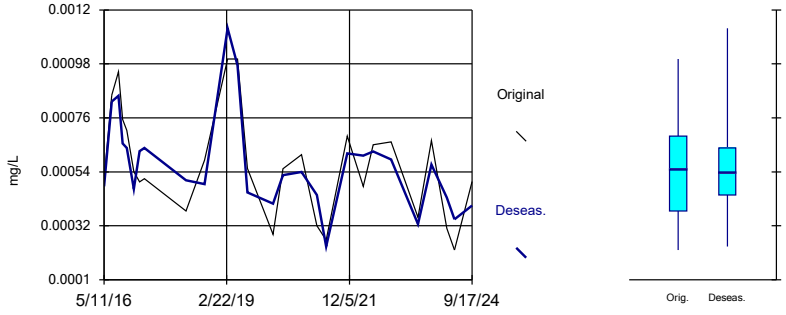
Seasonality: AD-17

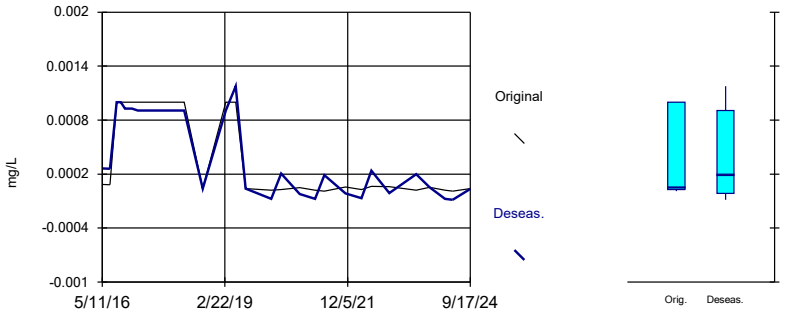
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 7.718
Tabulated Chi-Squared value = 7.815 with 3 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) = 7.716
Adjusted Kruskal-Wallis statistic (H') = 7.718



Constituent: Beryllium, total Analysis Run 12/9/2024 11:37 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Seasonality: AD-17

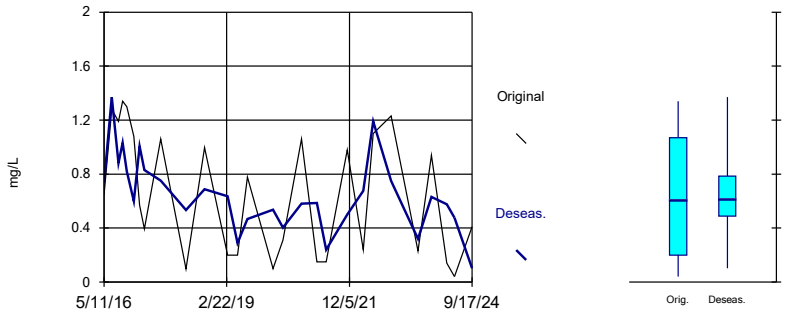
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.533
Tabulated Chi-Squared value = 7.815 with 3 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) = 1.474
Adjusted Kruskal-Wallis statistic (H') = 1.533



Constituent: Cadmium, total Analysis Run 12/9/2024 11:37 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Seasonality: AD-17

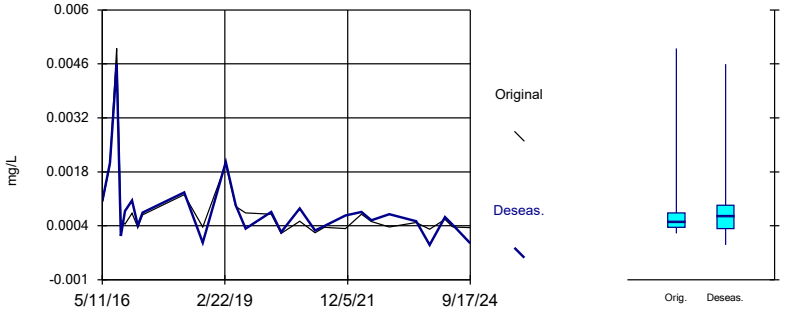
For the selected data, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 15.92
Tabulated Chi-Squared value = 7.815 with 3 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) = 15.9
Adjusted Kruskal-Wallis statistic (H') = 15.92



Constituent: Calcium, total Analysis Run 12/9/2024 11:37 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Seasonality: AD-17

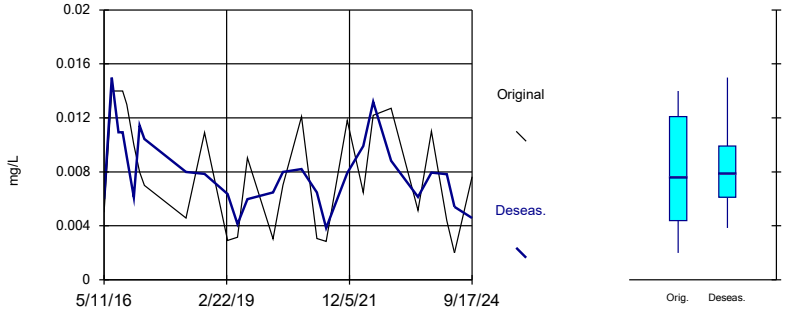
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.7764
Tabulated Chi-Squared value = 7.815 with 3 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) = 0.7759
Adjusted Kruskal-Wallis statistic (H') = 0.7764



Constituent: Chromium, total Analysis Run 12/9/2024 11:37 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Seasonality: AD-17

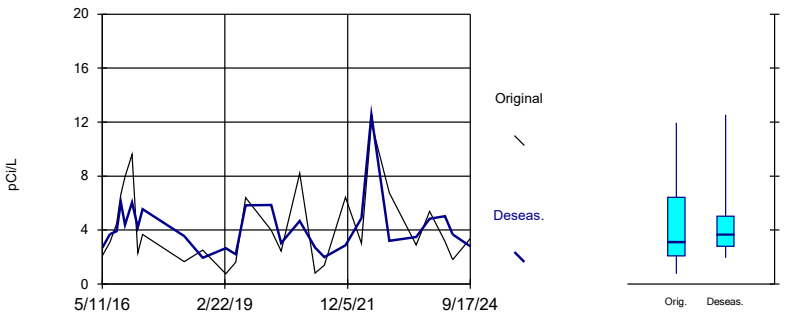
For the selected data, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 13.72
Tabulated Chi-Squared value = 7.815 with 3 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) = 13.71
Adjusted Kruskal-Wallis statistic (H') = 13.72



Constituent: Cobalt, total Analysis Run 12/9/2024 11:37 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Seasonality: AD-17

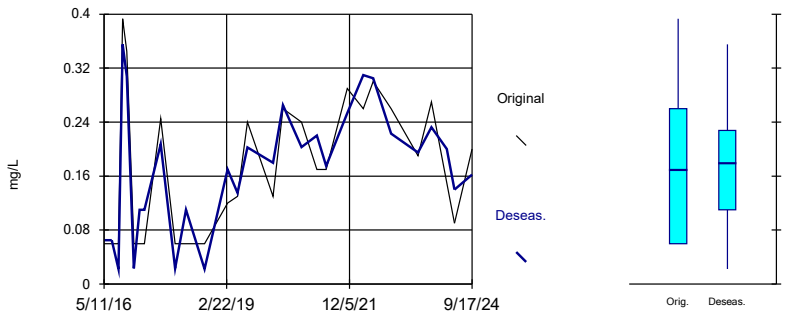
For the selected data, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 13.56
Tabulated Chi-Squared value = 7.815 with 3 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 12/9/2024 11:37 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Seasonality: AD-17

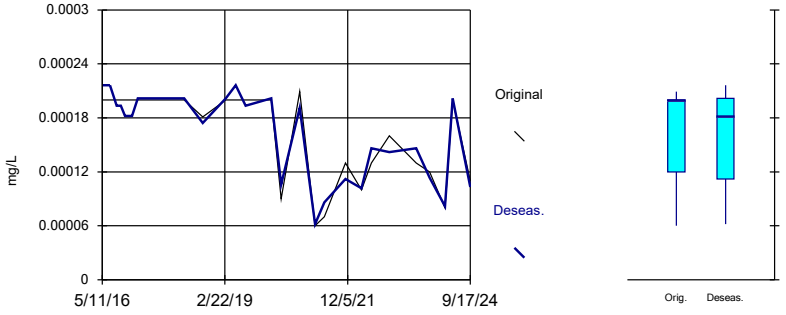
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 3.098
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 5 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) = 3.001
Adjusted Kruskal-Wallis statistic (H') = 3.098



Constituent: Fluoride, total Analysis Run 12/9/2024 11:37 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Seasonality: AD-17

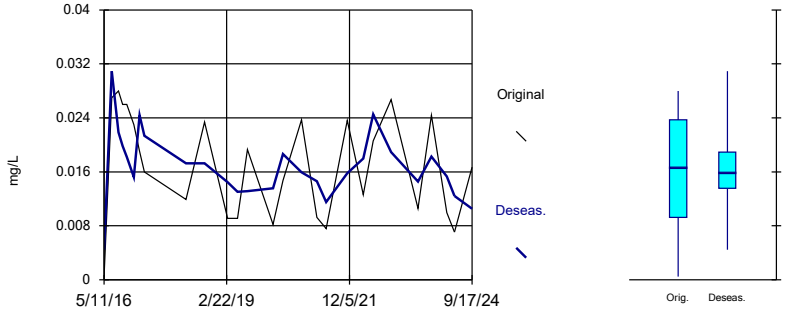
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.579
Tabulated Chi-Squared value = 7.815 with 3 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) = 1.358
Adjusted Kruskal-Wallis statistic (H') = 1.579



Constituent: Lead, total Analysis Run 12/9/2024 11:38 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Seasonality: AD-17

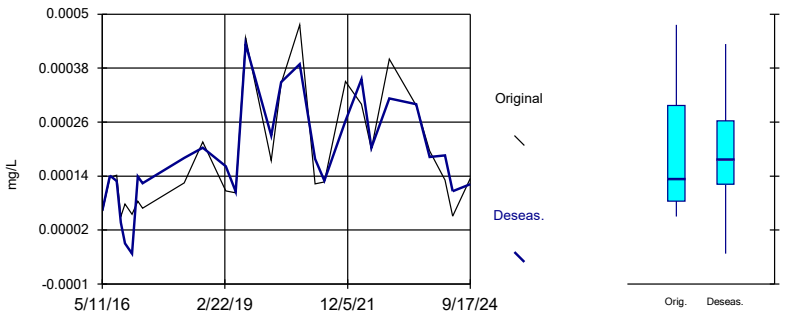
For the selected data, the Kruskal-Wallis test indicates SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 14.02
Tabulated Chi-Squared value = 7.815 with 3 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) = 14.01
Adjusted Kruskal-Wallis statistic (H') = 14.02



Constituent: Lithium, total Analysis Run 12/9/2024 11:38 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Seasonality: AD-17

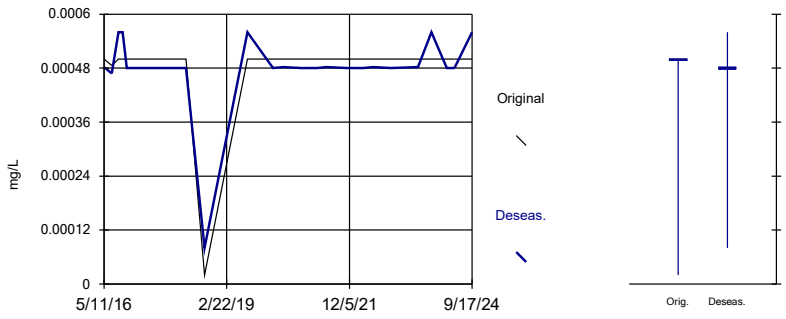
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 2.658
Tabulated Chi-Squared value = 7.815 with 3 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 12/9/2024 11:38 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Seasonality: AD-17

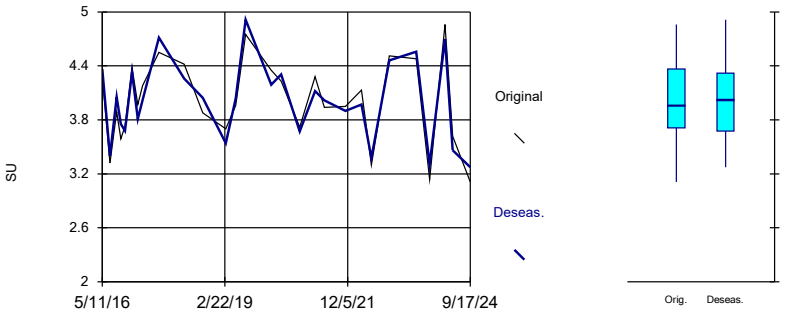
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 2.264
Tabulated Chi-Squared value = 7.815 with 3 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) = 0.5015
Adjusted Kruskal-Wallis statistic (H') = 2.264



Constituent: Molybdenum, total Analysis Run 12/9/2024 11:38 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Seasonality: AD-17

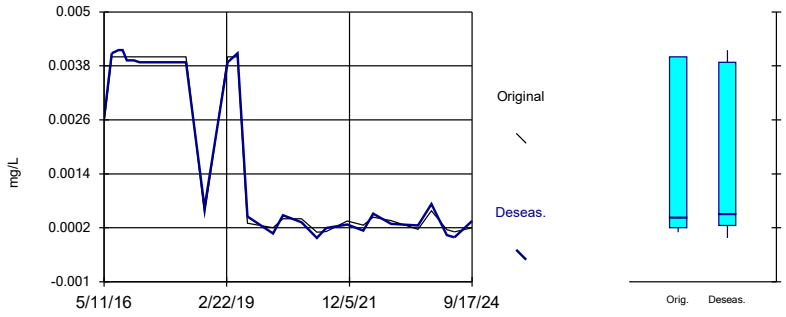
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.711
Tabulated Chi-Squared value = 7.815 with 3 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: pH, field Analysis Run 12/9/2024 11:38 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Seasonality: AD-17

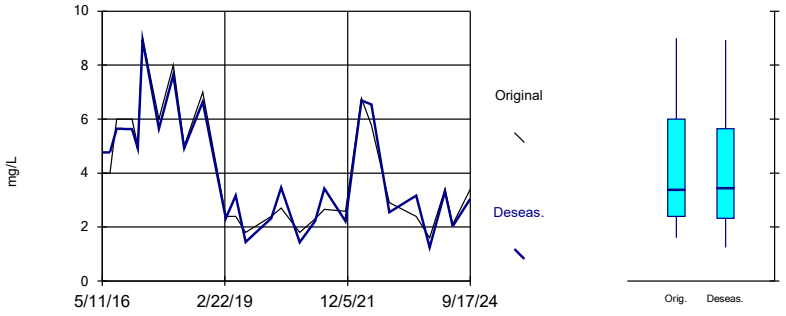
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.7946
Tabulated Chi-Squared value = 7.815 with 3 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) = 0.7541
Adjusted Kruskal-Wallis statistic (H') = 0.7946



Constituent: Selenium, total Analysis Run 12/9/2024 11:38 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Seasonality: AD-17

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat 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 = 0.7909
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 6 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) = 0.7843
Adjusted Kruskal-Wallis statistic (H') = 0.7909



Constituent: Sulfate, total Analysis Run 12/9/2024 11:38 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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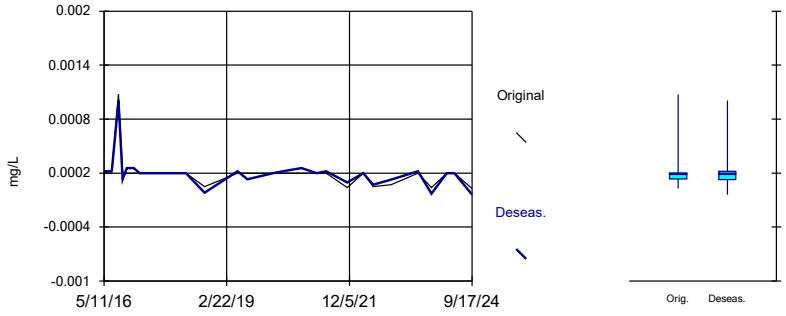
Seasonality: AD-17

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat 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 = 3.183
Tabulated Chi-Squared value = 7.815 with 3 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) = 1.941
Adjusted Kruskal-Wallis statistic (H') = 3.183



Constituent: Thallium, total Analysis Run 12/9/2024 11:38 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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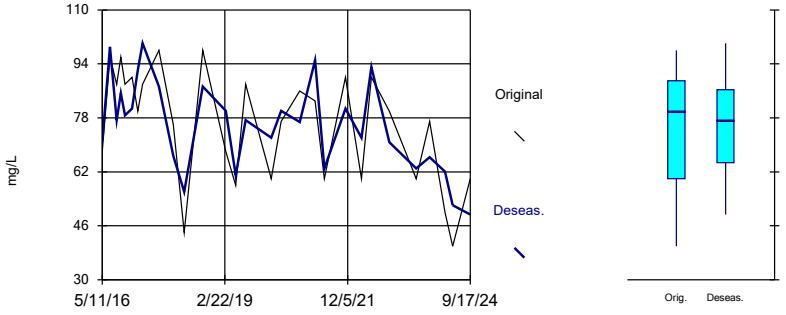
Seasonality: AD-17

For the selected data, the Kruskal-Wallis test indicates SEASONALITYat 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 = 8.935
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 8 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) = 8.849
Adjusted Kruskal-Wallis statistic (H') = 8.935



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 11:38 AM View: Seasonality
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

FIGURE E
Mann-Whitney

Welch's t-test/Mann-Whitney - Significant Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/9/2024, 1:35 PM

Constituent	Well	Calc.	0.01	Sig.	Method
Sulfate, total (mg/L)	**AD-30**	**4.044**	**Yes**	**Yes**	**Mann-W**
Total Dissolved Solids [TDS] (mg/L)	**AD-30**	**4.378**	**Yes**	**Yes**	**Mann-W**

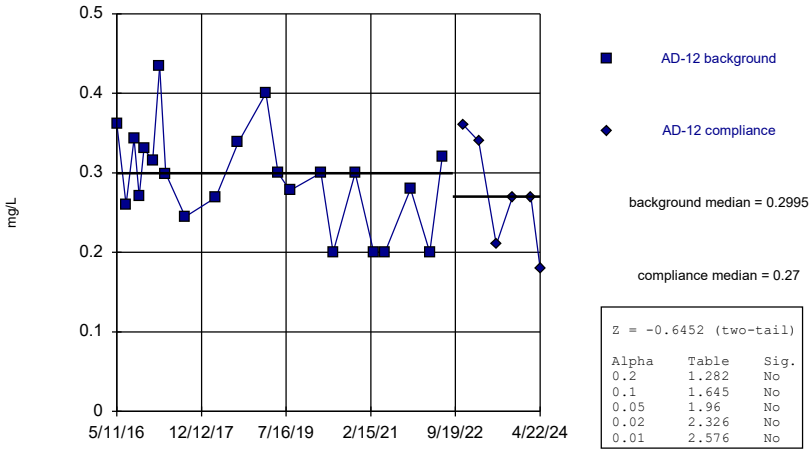
Welch's t-test/Mann-Whitney - All Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/9/2024, 1:35 PM

Constituent	Well	Calc.	0.01	Sig.	Method
Calcium, total (mg/L)	AD-12 (bg)	-0.6452	No	No	Mann-W
Calcium, total (mg/L)	AD-17	-1.03	No	No	Mann-W
Calcium, total (mg/L)	AD-18 (bg)	-2.44	No	No	Mann-W
Calcium, total (mg/L)	AD-28	-0.1562	No	No	Mann-W
Calcium, total (mg/L)	AD-3 (bg)	-0.2185	No	No	Mann-W
Calcium, total (mg/L)	AD-30	1.56	No	No	Mann-W
pH, field (SU)	AD-12 (bg)	-1.092	No	No	Mann-W
pH, field (SU)	AD-17	0.593	No	No	Mann-W
pH, field (SU)	AD-18 (bg)	-1.261	No	No	Mann-W
pH, field (SU)	AD-28	-1.061	No	No	Mann-W
pH, field (SU)	AD-3 (bg)	0.06244	No	No	Mann-W
pH, field (SU)	AD-30	-0.3434	No	No	Mann-W
Sulfate, total (mg/L)	AD-12 (bg)	-1.939	No	No	Mann-W
Sulfate, total (mg/L)	AD-17	-2.019	No	No	Mann-W
Sulfate, total (mg/L)	AD-18 (bg)	1.489	No	No	Mann-W
Sulfate, total (mg/L)	AD-28	1.343	No	No	Mann-W
Sulfate, total (mg/L)	AD-3 (bg)	0.1561	No	No	Mann-W
Sulfate, total (mg/L)	**AD-30**	**4.044**	**Yes**	**Yes**	**Mann-W**
Total Dissolved Solids [TDS] (mg/L)	AD-12 (bg)	-1.463	No	No	Mann-W
Total Dissolved Solids [TDS] (mg/L)	AD-17	-2.138	No	No	Mann-W
Total Dissolved Solids [TDS] (mg/L)	AD-18 (bg)	-1.379	No	No	Mann-W
Total Dissolved Solids [TDS] (mg/L)	AD-28	-1.38	No	No	Mann-W
Total Dissolved Solids [TDS] (mg/L)	AD-3 (bg)	-0.3759	No	No	Mann-W
Total Dissolved Solids [TDS] (mg/L)	**AD-30**	**4.378**	**Yes**	**Yes**	**Mann-W**

Mann-Whitney (Wilcoxon Rank Sum)

AD-12 (bg)



Z = -0.6452 (two-tail)

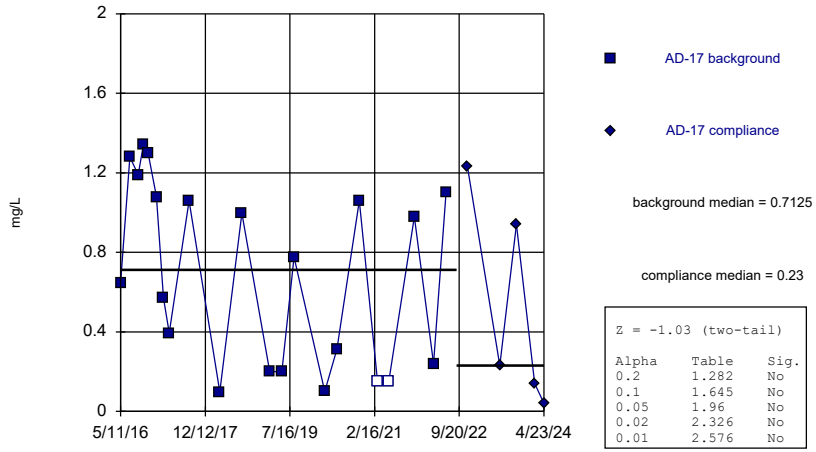
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-17



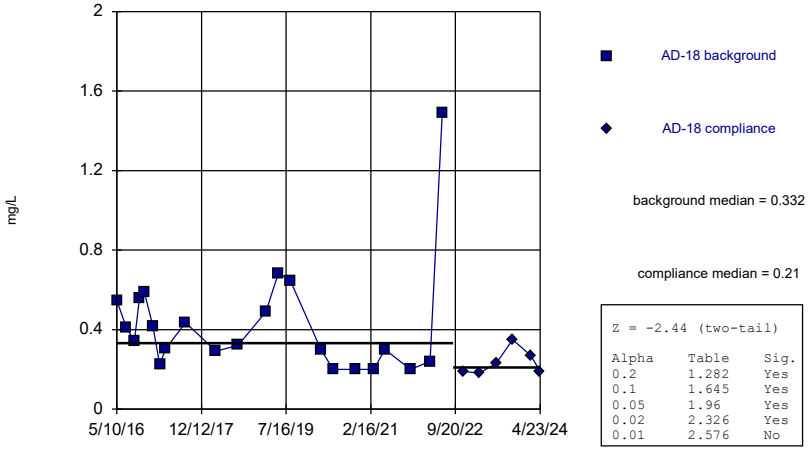
Z = -1.03 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Mann-Whitney (Wilcoxon Rank Sum)

AD-18 (bg)



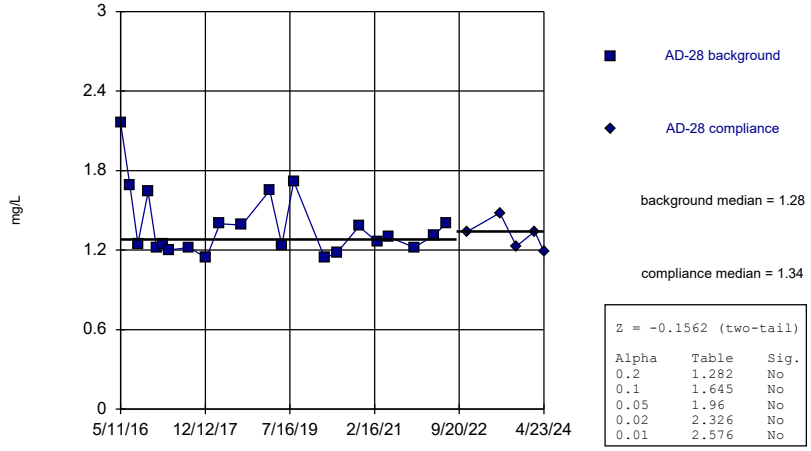
Z = -2.44 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Mann-Whitney (Wilcoxon Rank Sum)

AD-28



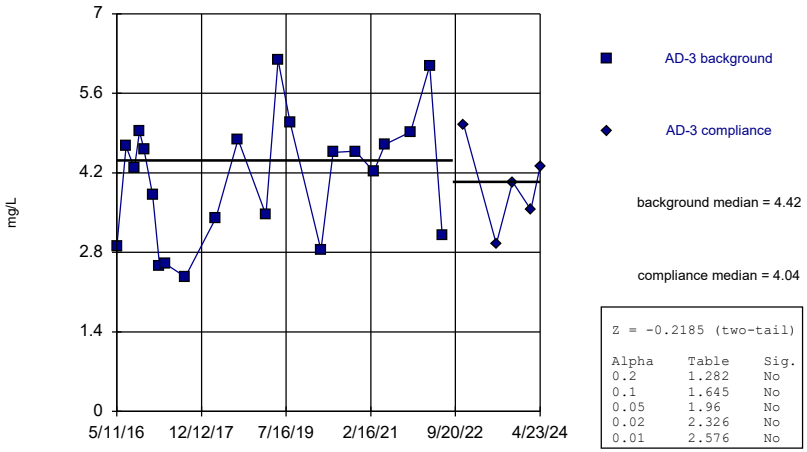
Z = -0.1562 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Mann-Whitney (Wilcoxon Rank Sum)

AD-3 (bg)



Z = -0.2185 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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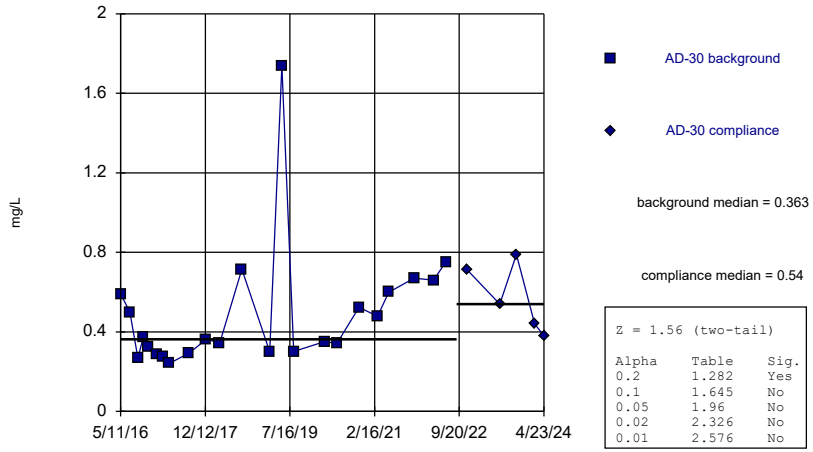
Mann-Whitney (Wilcoxon Rank Sum)

AD-30



Z = 1.56 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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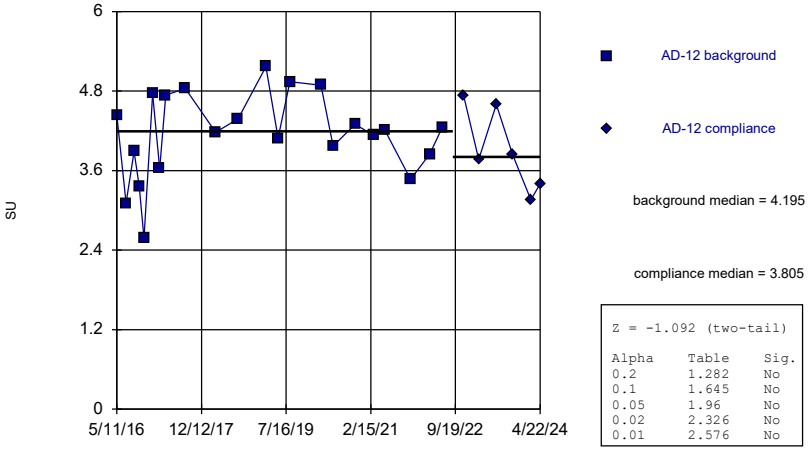
Mann-Whitney (Wilcoxon Rank Sum)

AD-12 (bg)



Z = -1.092 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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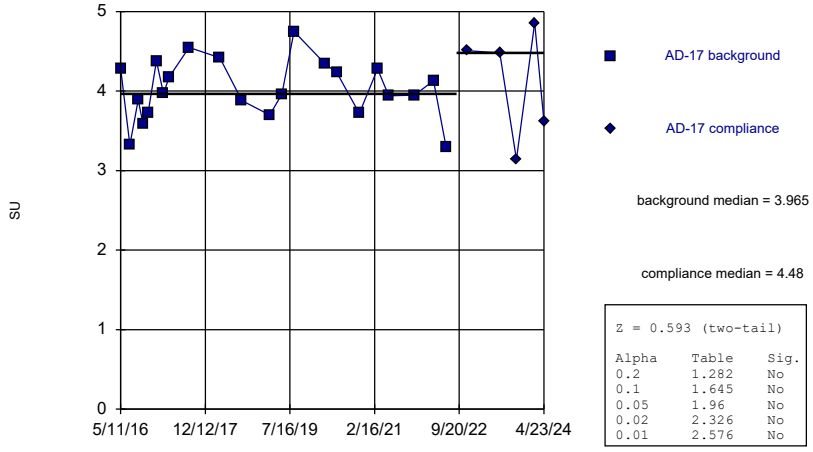
Mann-Whitney (Wilcoxon Rank Sum)

AD-17



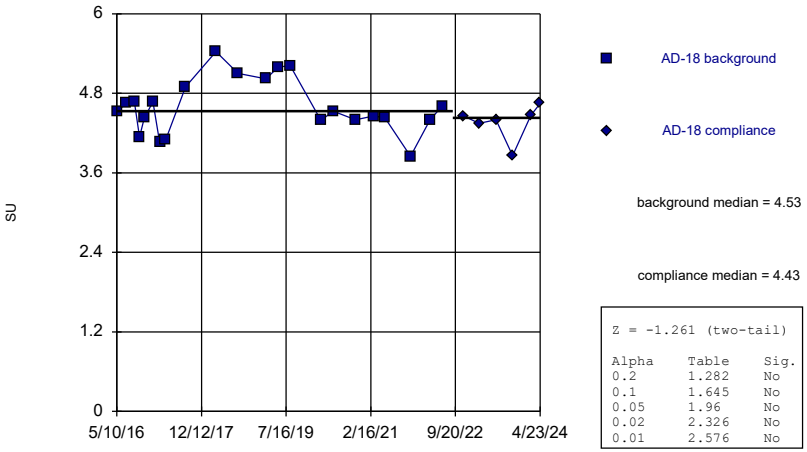
Z = 0.593 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Mann-Whitney (Wilcoxon Rank Sum)

AD-18 (bg)



background median = 4.53

compliance median = 4.43

Z = -1.261 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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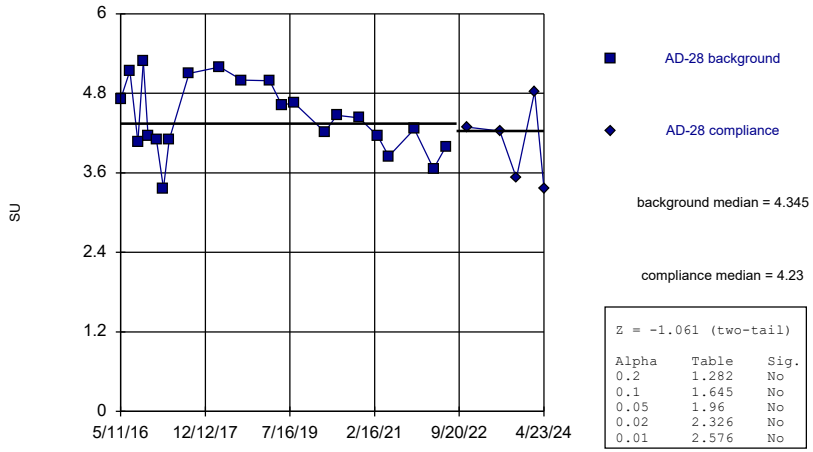
Mann-Whitney (Wilcoxon Rank Sum)

AD-28



background median = 4.345

compliance median = 4.23

Z = -1.061 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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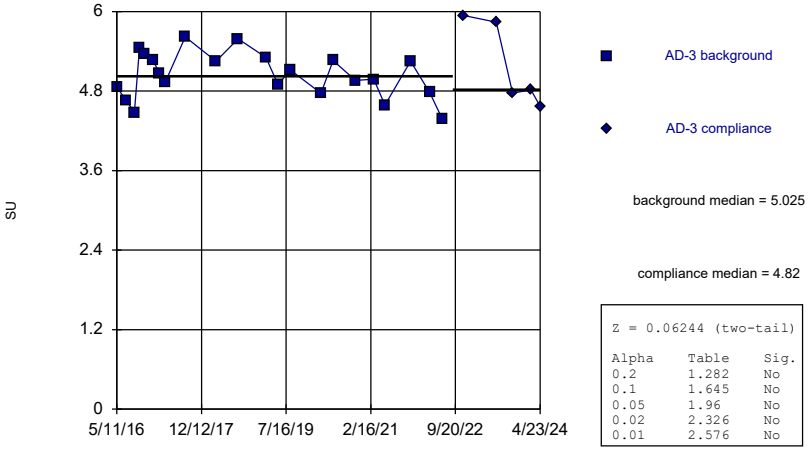
Mann-Whitney (Wilcoxon Rank Sum)

AD-3 (bg)



background median = 5.025

compliance median = 4.82

Z = 0.06244 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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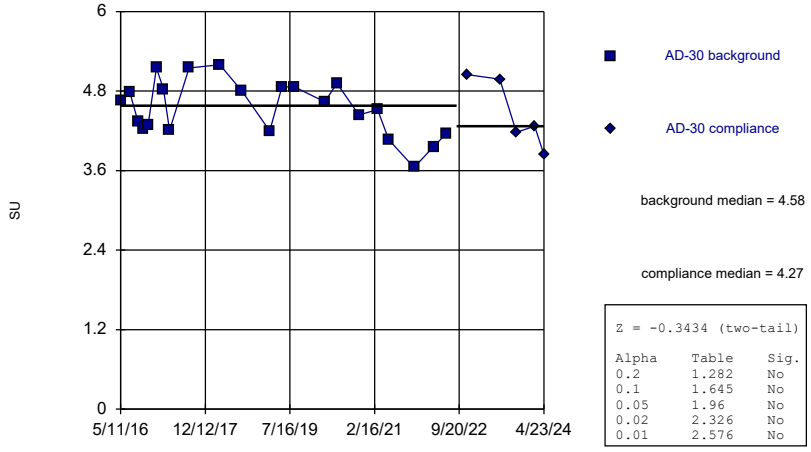
Mann-Whitney (Wilcoxon Rank Sum)

AD-30



background median = 4.58

compliance median = 4.27

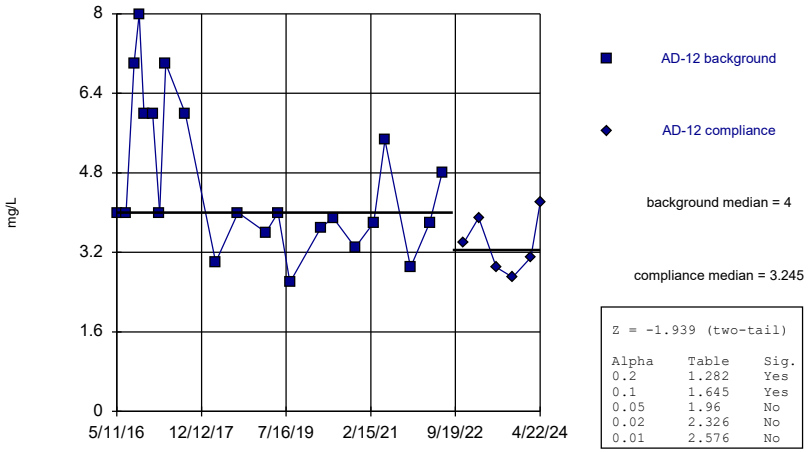
Z = -0.3434 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Mann-Whitney (Wilcoxon Rank Sum)

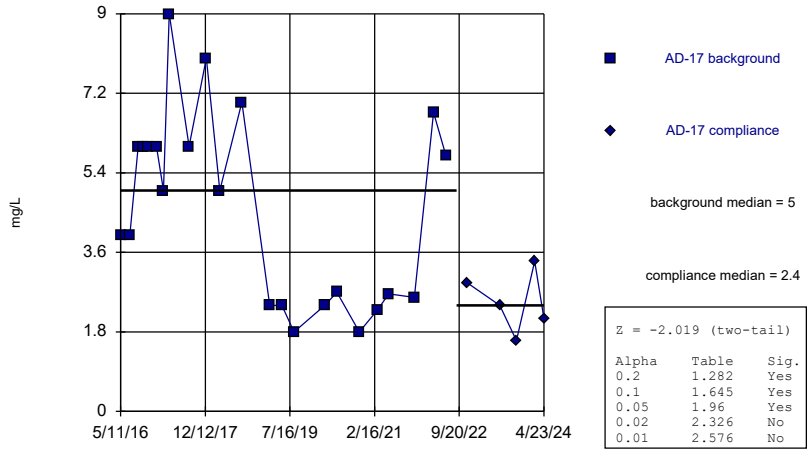
AD-12 (bg)



Constituent: Sulfate, total Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Mann-Whitney (Wilcoxon Rank Sum)

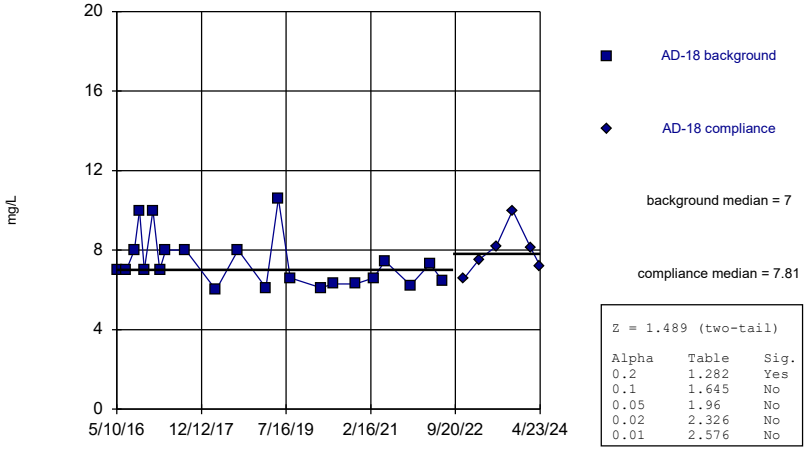
AD-17



Constituent: Sulfate, total Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Mann-Whitney (Wilcoxon Rank Sum)

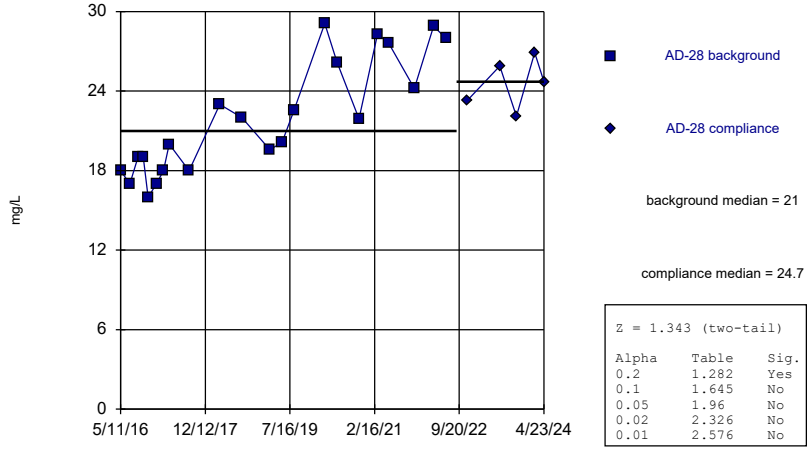
AD-18 (bg)



Constituent: Sulfate, total Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Mann-Whitney (Wilcoxon Rank Sum)

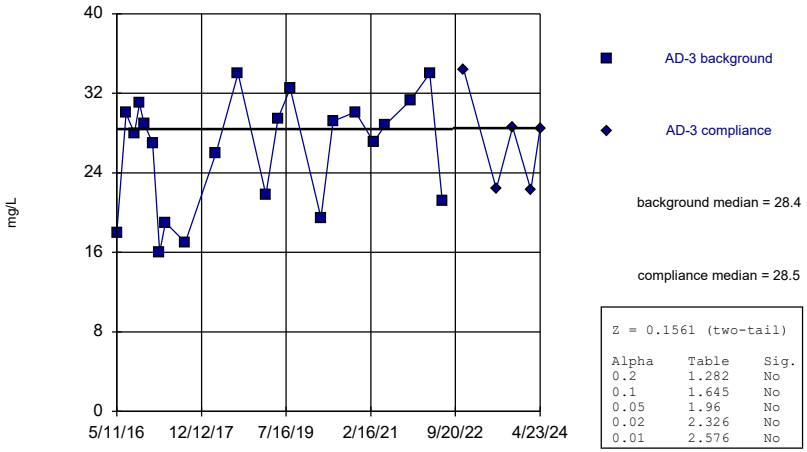
AD-28



Constituent: Sulfate, total Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Mann-Whitney (Wilcoxon Rank Sum)

AD-3 (bg)



Z = 0.1561 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Sulfate, total Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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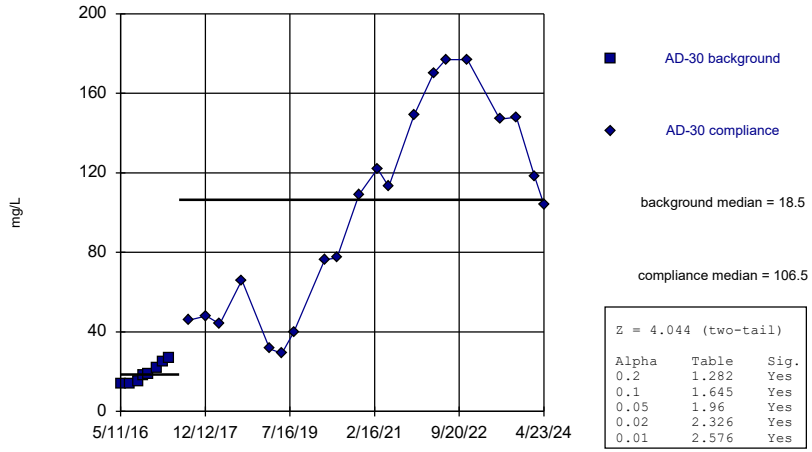
Mann-Whitney (Wilcoxon Rank Sum)

AD-30



Z = 4.044 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	Yes

Constituent: Sulfate, total Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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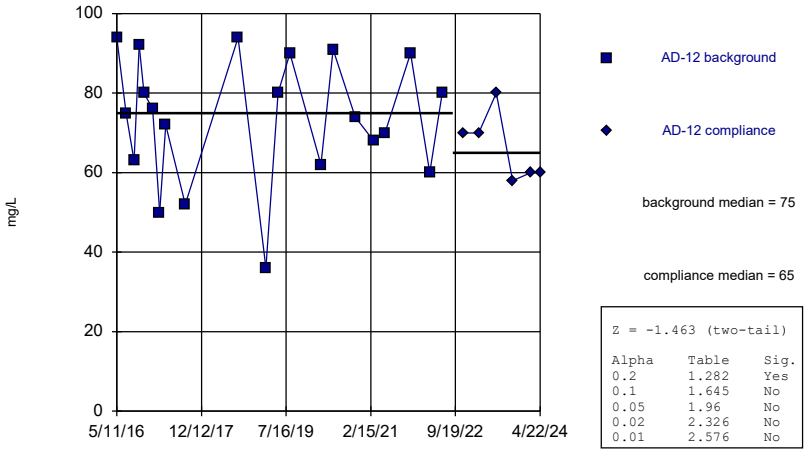
Mann-Whitney (Wilcoxon Rank Sum)

AD-12 (bg)



Z = -1.463 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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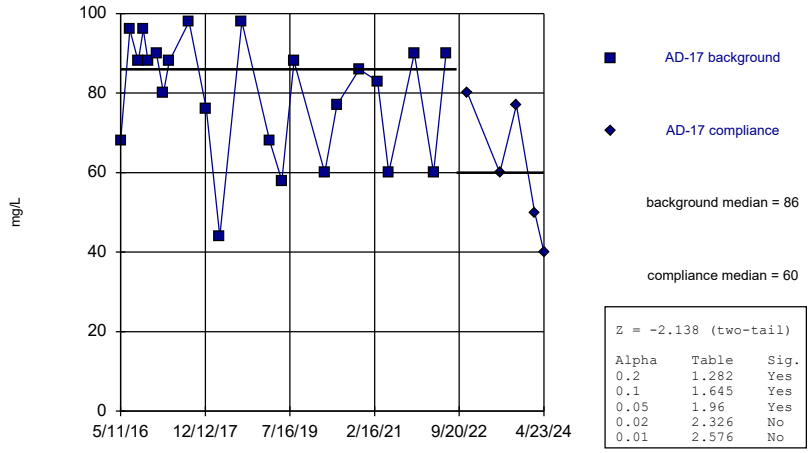
Mann-Whitney (Wilcoxon Rank Sum)

AD-17



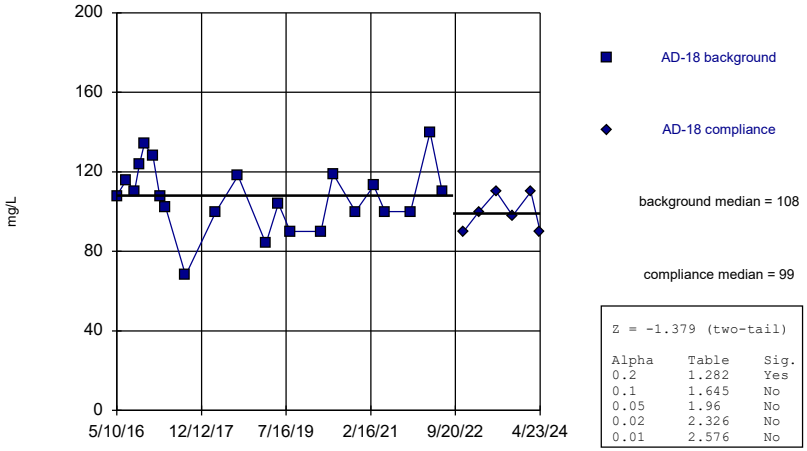
Z = -2.138 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	No
0.01	2.576	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Mann-Whitney (Wilcoxon Rank Sum)

AD-18 (bg)



Z = -1.379 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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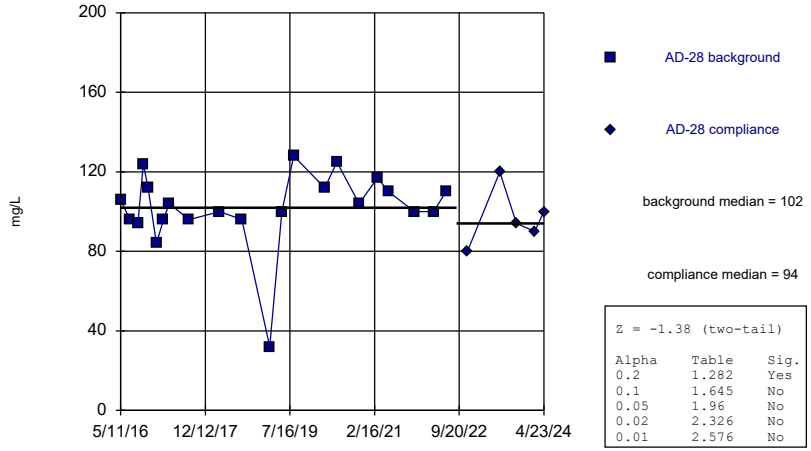
Mann-Whitney (Wilcoxon Rank Sum)

AD-28



Z = -1.38 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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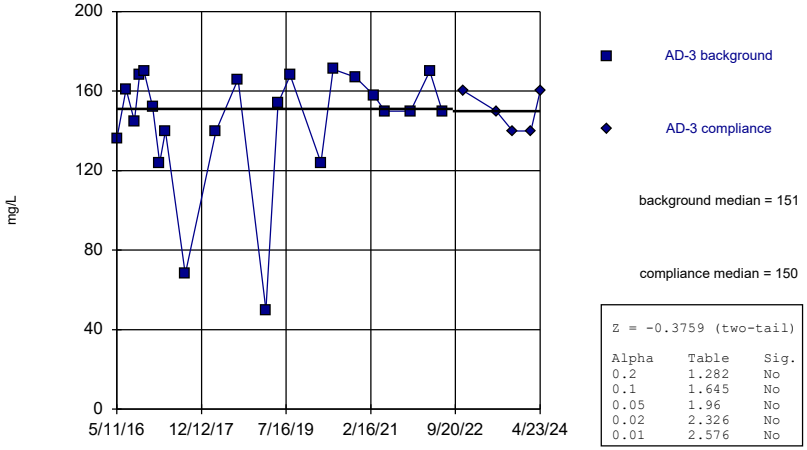
Mann-Whitney (Wilcoxon Rank Sum)

AD-3 (bg)



Z = -0.3759 (two-tail)

Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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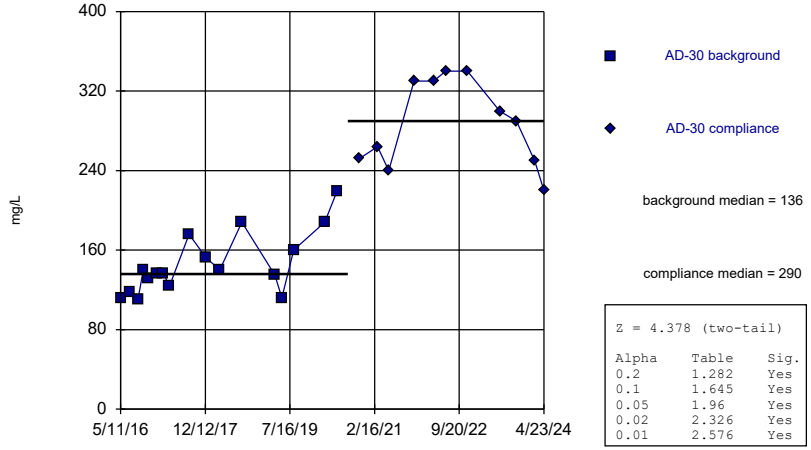
Mann-Whitney (Wilcoxon Rank Sum)

AD-30



Z = 4.378 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	Yes

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 1:34 PM View: Mann-Whitney
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

FIGURE F

Intrawell PLs

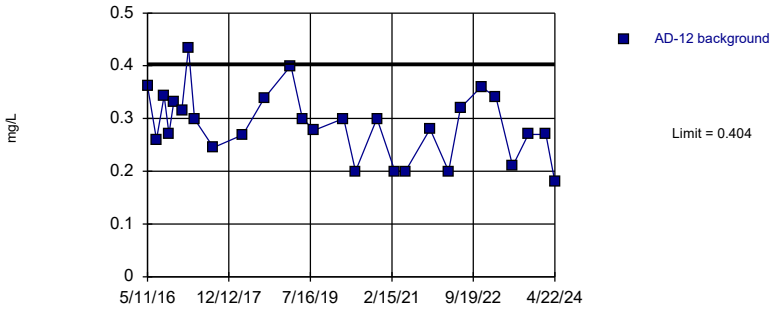
Intrawell Prediction Limits

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/9/2024, 1:32 PM

Constituent	Well	Upper Lim.	Lower Lim.	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Calcium, total (mg/L)	AD-12	0.404	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-17	1.132	n/a	1 future	n/a	27	0.6706	0.2535	7.407	None	No	0.002505	Param Intra 1 of 2 Deseas
Calcium, total (mg/L)	AD-18	0.8357	n/a	1 future	n/a	28	-1.097	0.5058	0	None	ln(x)	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-28	2.16	n/a	1 future	n/a	27	n/a	n/a	0	n/a	n/a	0.002502	NP Intra (normality) 1 of 2
Calcium, total (mg/L)	AD-3	5.977	n/a	1 future	n/a	27	4.095	1.034	0	None	No	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-30	1.018	n/a	1 future	n/a	28	-0.7927	0.4468	0	None	ln(x)	0.002505	Param Intra 1 of 2
pH, field (SU)	AD-12	5.249	2.944	1 future	n/a	28	4.096	0.6355	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-17	4.843	3.24	1 future	n/a	27	4.041	0.4402	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-18	5.257	3.842	1 future	n/a	28	4.549	0.39	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-28	5.368	3.357	1 future	n/a	27	4.362	0.5524	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-3	5.804	4.329	1 future	n/a	27	5.067	0.4052	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-30	5.313	3.743	1 future	n/a	27	4.528	0.4312	0	None	No	0.001253	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-12	6.996	n/a	1 future	n/a	28	2.055	0.3255	0	None	sqrt(x)	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-17	8.05	n/a	1 future	n/a	28	4.214	2.115	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-18	9.928	n/a	1 future	n/a	28	2	0.1629	0	None	ln(x)	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-28	29.92	n/a	1 future	n/a	27	22.46	4.099	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-3	36.51	n/a	1 future	n/a	27	26.53	5.482	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-30	31.56	n/a	1 future	n/a	8	19.25	5.007	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	AD-12	99.01	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-17	99.3	n/a	1 future	n/a	28	76.32	12.67	0	None	No	0.002505	Param Intra 1 of 2 Deseas
Total Dissolved Solids [TDS] (mg/L)	AD-18	134	n/a	1 future	n/a	28	105.9	15.51	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	AD-28	127.8	n/a	1 future	n/a	27	10546	3173	0	None	x^2	0.002505	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	AD-3	178.9	n/a	1 future	n/a	27	3381765	1285508	0	None	x^3	0.002505	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	AD-30	206.4	n/a	1 future	n/a	17	145.8	31.08	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 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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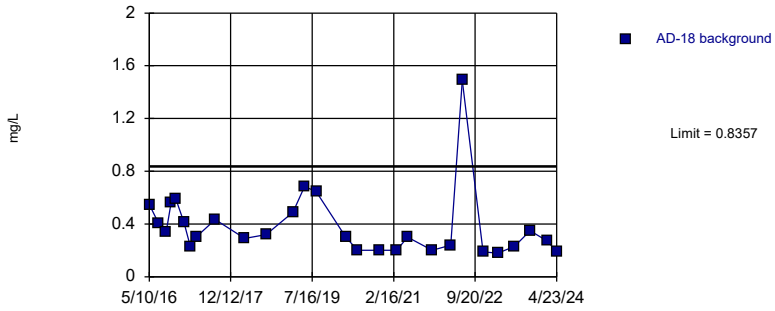
Prediction Limit

Intrawell Parametric, AD-18 (bg)



Background Data Summary (based on natural log transformation): Mean=-1.097, Std. Dev.=0.5058, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9148, 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 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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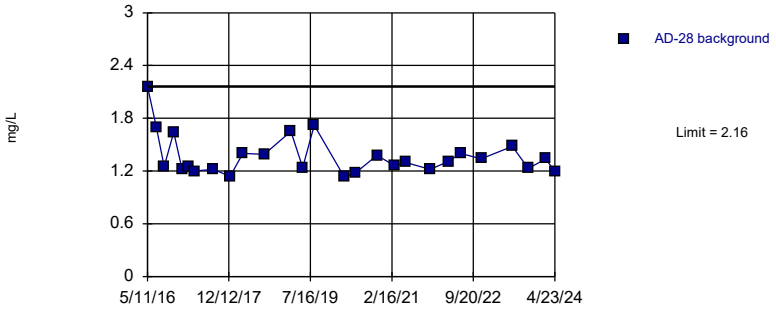
Prediction Limit

Intrawell Non-parametric, AD-28



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 27 background values. Well-constituent pair annual alpha = 0.004998. Individual comparison alpha = 0.002502 (1 of 2). Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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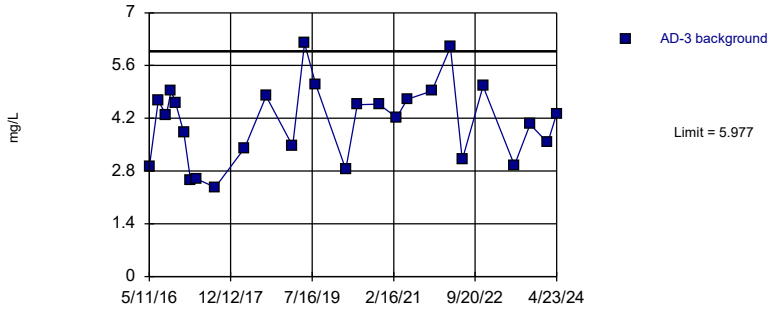
Prediction Limit

Intrawell Parametric, AD-3 (bg)

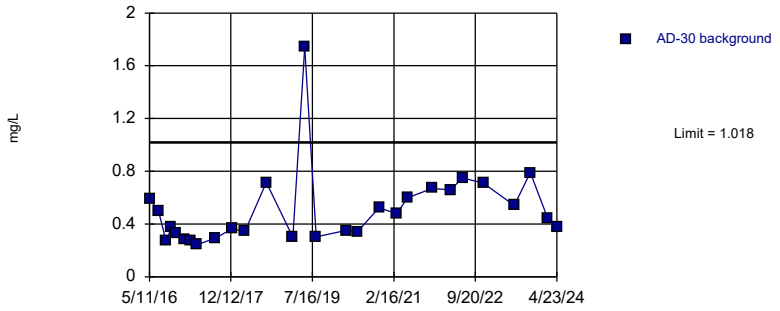


Background Data Summary: Mean=4.095, Std. Dev.=1.034, n=27. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.954, critical = 0.894. Kappa = 1.82 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Prediction Limit

Intrawell Parametric, AD-30

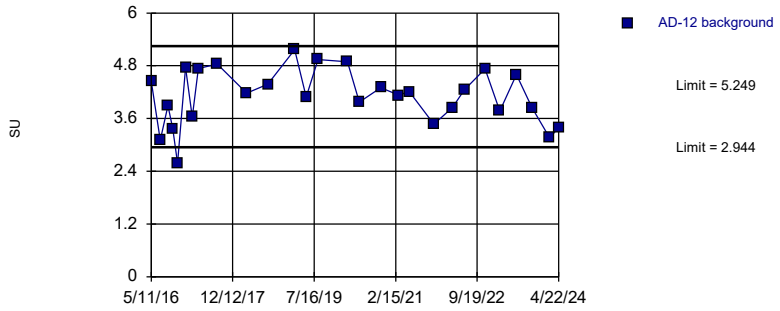


Background Data Summary (based on natural log transformation): Mean=-0.7927, Std. Dev.=0.4468, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9219, critical = 0.896. Kappa = 1.814 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Prediction Limit

Intrawell Parametric, AD-12 (bg)

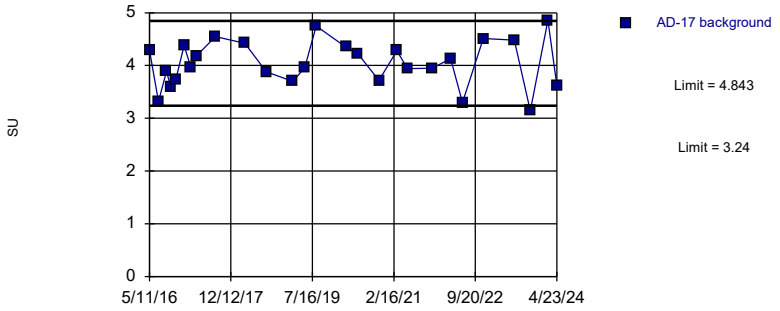


Background Data Summary: Mean=4.096, Std. Dev.=0.6355, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9753, critical = 0.896. Kappa = 1.814 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Prediction Limit

Intrawell Parametric, AD-17

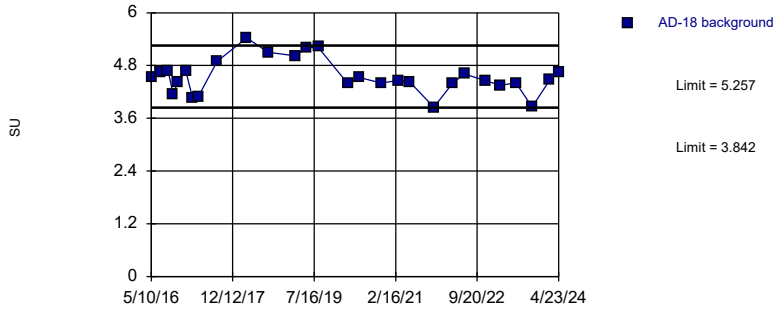


Background Data Summary: Mean=4.041, Std. Dev.=0.4402, n=27. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9798, critical = 0.894. Kappa = 1.82 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Prediction Limit

Intrawell Parametric, AD-18 (bg)

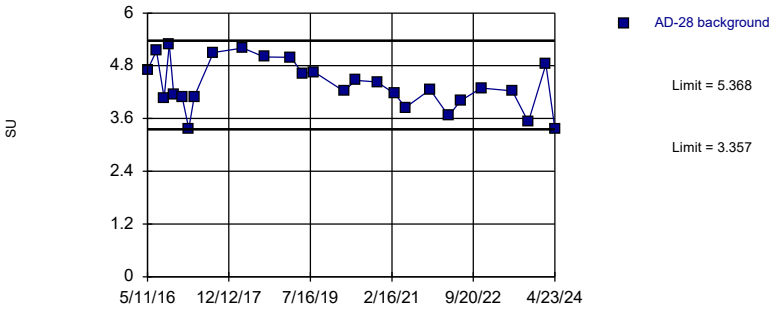


Background Data Summary: Mean=4.549, Std. Dev.=0.39, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9487, critical = 0.896. Kappa = 1.814 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Prediction Limit

Intrawell Parametric, AD-28



Background Data Summary: Mean=4.362, Std. Dev.=0.5524, n=27. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9577, 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: pH, field Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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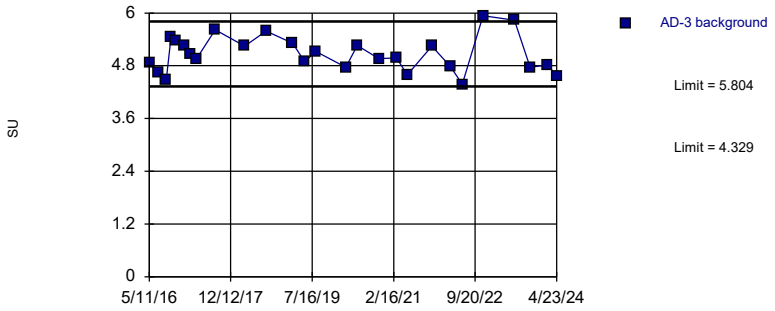
Prediction Limit

Intrawell Parametric, AD-3 (bg)



Background Data Summary: Mean=5.067, Std. Dev.=0.4052, n=27. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9721, 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: pH, field Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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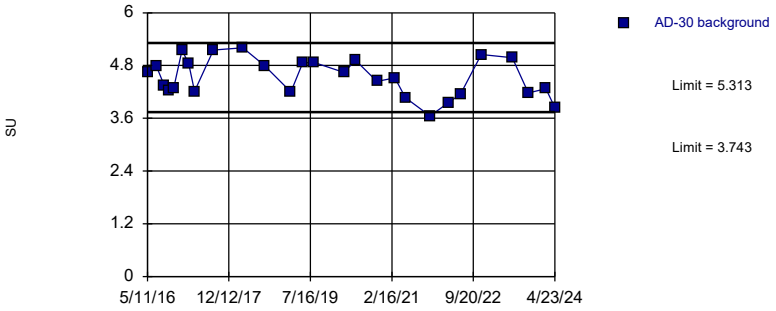
Prediction Limit

Intrawell Parametric, AD-30



Background Data Summary: Mean=4.528, Std. Dev.=0.4312, n=27. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9571, 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: pH, field Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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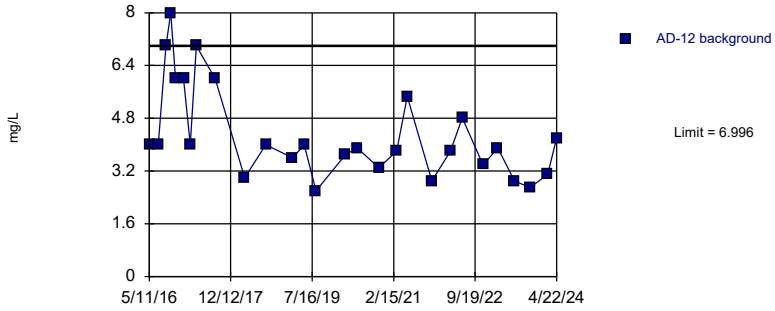
Prediction Limit

Intrawell Parametric, AD-12 (bg)

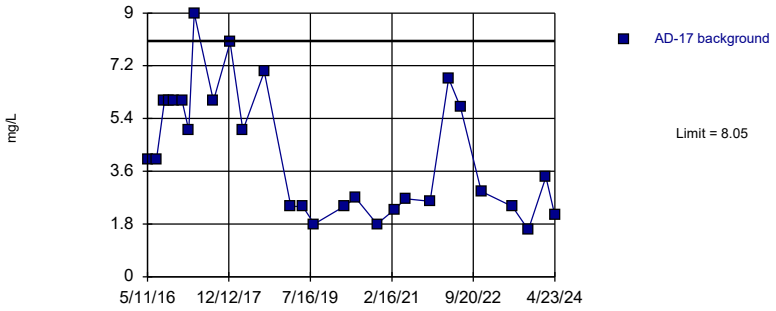


Background Data Summary (based on square root transformation): Mean=2.055, Std. Dev.=0.3255, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9015, critical = 0.896. Kappa = 1.814 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Prediction Limit

Intrawell Parametric, AD-17

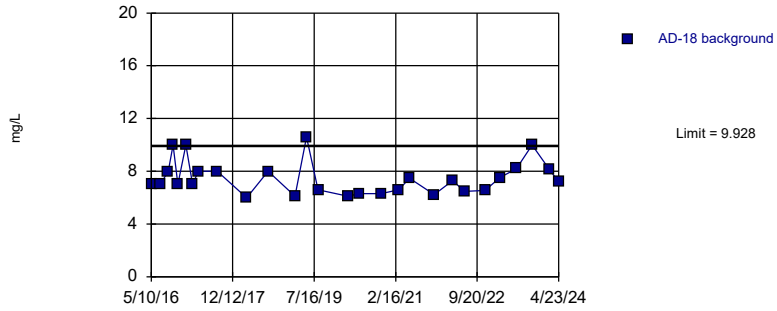


Background Data Summary: Mean=4.214, Std. Dev.=2.115, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8971, critical = 0.896. Kappa = 1.814 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Prediction Limit

Intrawell Parametric, AD-18 (bg)

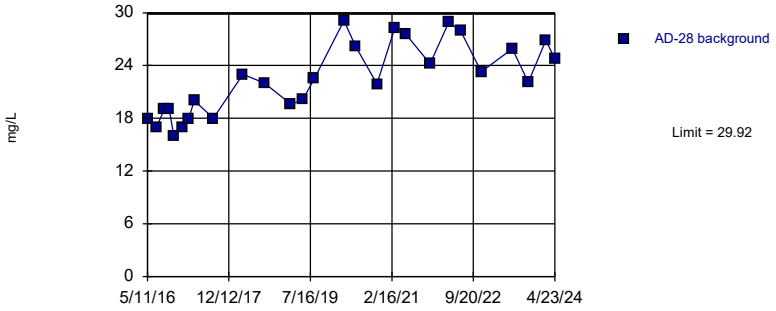


Background Data Summary (based on natural log transformation): Mean=2, Std. Dev.=0.1629, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9005, critical = 0.896. Kappa = 1.814 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Prediction Limit

Intrawell Parametric, AD-28

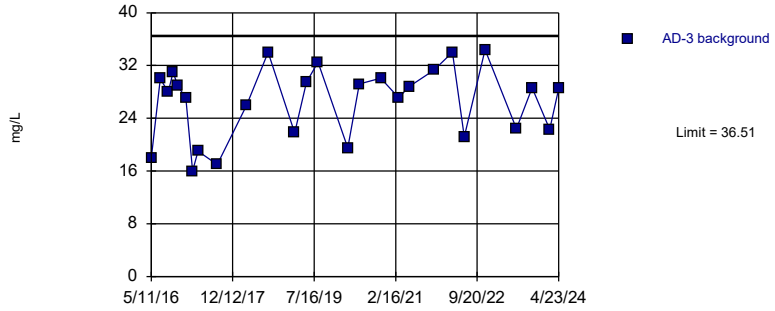


Background Data Summary: Mean=22.46, Std. Dev.=4.099, n=27. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.938, critical = 0.894. Kappa = 1.82 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Prediction Limit

Intrawell Parametric, AD-3 (bg)

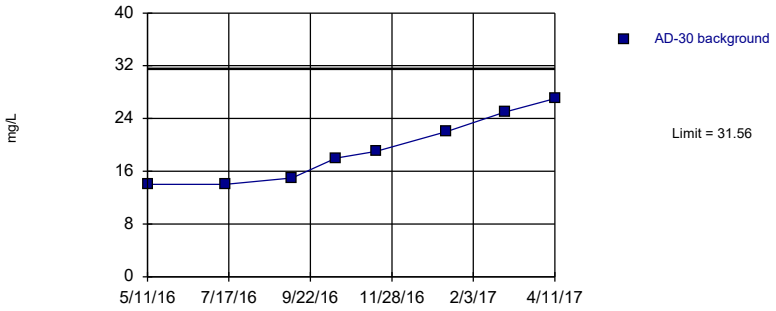


Background Data Summary: Mean=26.53, Std. Dev.=5.482, n=27. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9255, critical = 0.894. Kappa = 1.82 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Prediction Limit

Intrawell Parametric, AD-30

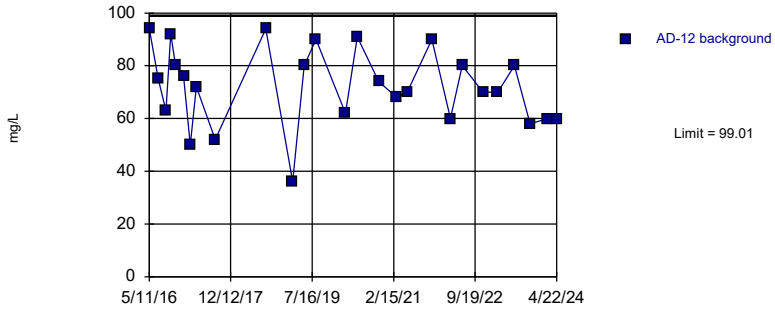


Background Data Summary: Mean=19.25, Std. Dev.=5.007, n=8. Normality test: Shapiro Wilk @alpha = 0.1, calculated = 0.9081, critical = 0.851. Kappa = 2.458 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Prediction Limit

Intrawell Parametric, AD-12 (bg)

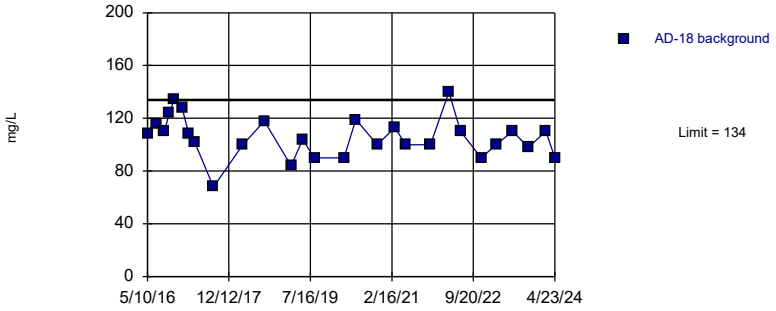


Background Data Summary: Mean=72.11, Std. Dev.=14.78, n=27. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9598, critical = 0.894. Kappa = 1.82 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Prediction Limit

Intrawell Parametric, AD-18 (bg)

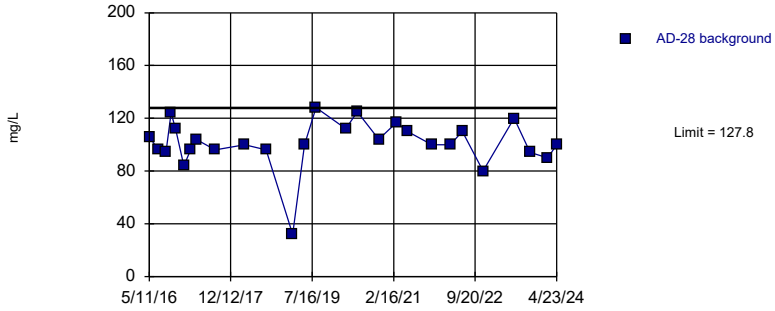


Background Data Summary: Mean=105.9, Std. Dev.=15.51, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9794, critical = 0.896. Kappa = 1.814 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Prediction Limit

Intrawell Parametric, AD-28

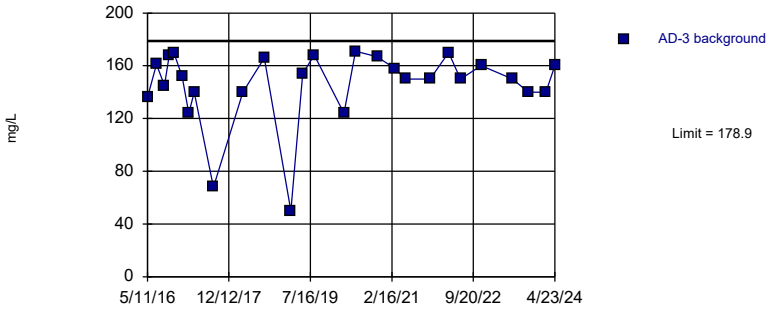


Background Data Summary (based on square transformation): Mean=10546, Std. Dev.=3173, n=27. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9401, critical = 0.894. Kappa = 1.82 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Prediction Limit

Intrawell Parametric, AD-3 (bg)



Background Data Summary (based on cube transformation): Mean=3381765, Std. Dev.=1285508, n=27. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9094, 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 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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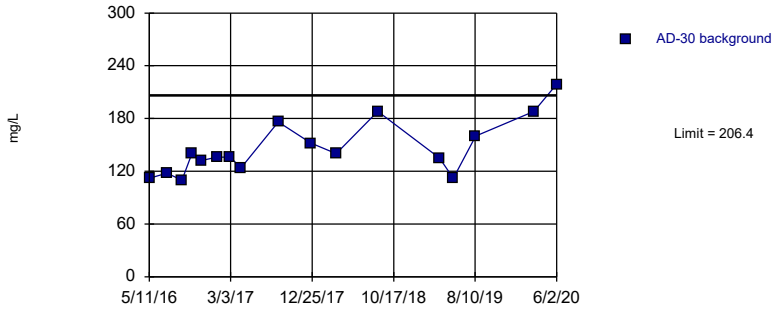
Prediction Limit

Intrawell Parametric, AD-30



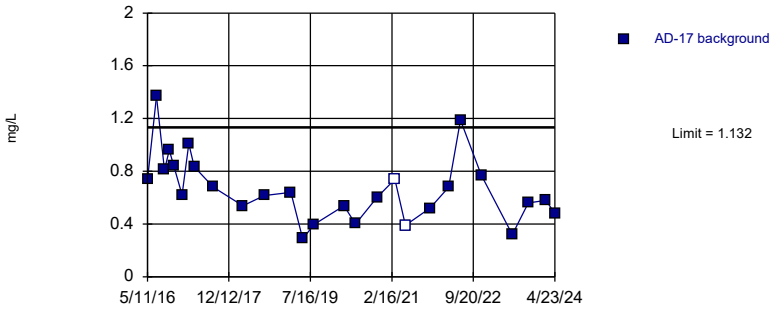
Background Data Summary: Mean=145.8, Std. Dev.=31.08, n=17. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9021, critical = 0.892. Kappa = 1.951 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/9/2024 1:25 PM View: Intrawell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Hollow symbols indicate censored values.

Prediction Limit

Intrawell Parametric, AD-17



Background Data Summary: Mean=0.6706, Std. Dev.=0.2535, n=27, 7.407% NDs. Data were deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9413, 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: Calcium, total Analysis Run 12/9/2024 1:28 PM View: Intrawell - Deseasonalized
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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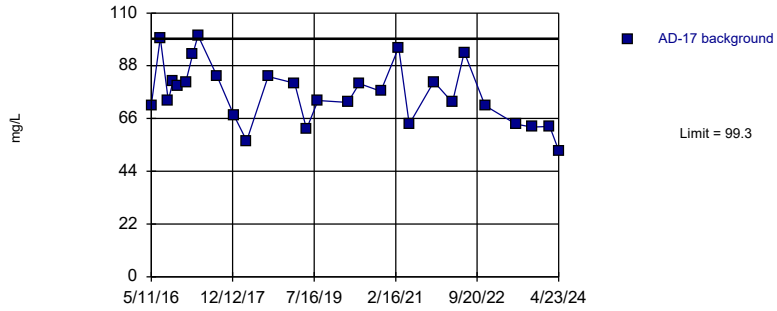
Prediction Limit

Intrawell Parametric, AD-17



Background Data Summary: Mean=76.32, Std. Dev.=12.67, n=28. Data were deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9656, 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 12/9/2024 1:28 PM View: Intrawell - Deseasonaliz
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

FIGURE G

Trend Tests – Appendix III

Appendix III - Upgradient Well Trend Test Summary - Significant Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/6/2024, 8:11 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron, total (mg/L)	**AD-12 (bg)**	**-0.001963**	**-150**	**-139**	**Yes**	**29**	**6.897**	**n/a**	**n/a**	**0.01**	**NP**
Chloride, total (mg/L)	**AD-18 (bg)**	**-0.3278**	**-193**	**-139**	**Yes**	**29**	**0**	**n/a**	**n/a**	**0.01**	**NP**

Appendix III - Upgradient Well Trend Test Summary - All Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/6/2024, 8:11 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron, total (mg/L)	**AD-12 (bg)**	**-0.001963**	**-150**	**-139**	**Yes**	**29**	**6.897**	**n/a**	**n/a**	**0.01**	**NP**
Boron, total (mg/L)	AD-18 (bg)	0	-3	-139	No	29	24.14	n/a	n/a	0.01	NP
Boron, total (mg/L)	AD-3 (bg)	-0.00116	-70	-131	No	28	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	AD-12 (bg)	-0.01827	-18	-139	No	29	0	n/a	n/a	0.01	NP
Chloride, total (mg/L)	**AD-18 (bg)**	**-0.3278**	**-193**	**-139**	**Yes**	**29**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Chloride, total (mg/L)	AD-3 (bg)	-0.05793	-63	-131	No	28	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	AD-12 (bg)	0.00136	89	139	No	29	31.03	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	AD-18 (bg)	0	-59	-139	No	29	65.52	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	AD-3 (bg)	0	12	131	No	28	39.29	n/a	n/a	0.01	NP

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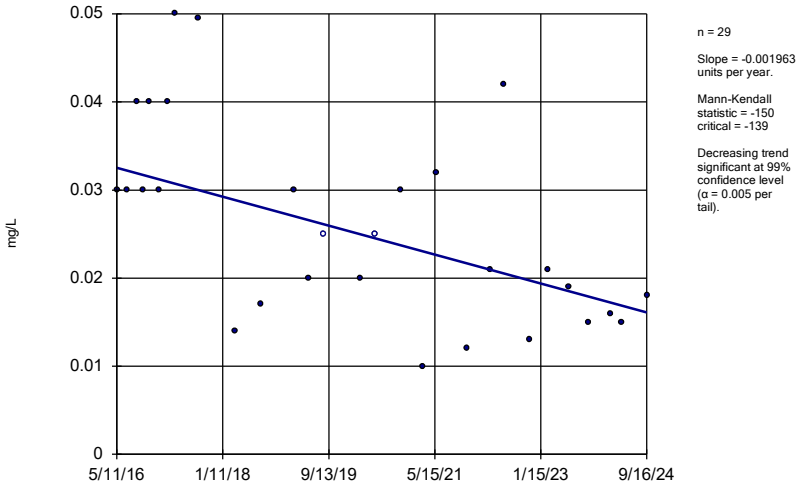
Hollow symbols indicate censored values.

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 (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 12/6/2024 8:10 PM View: Interwell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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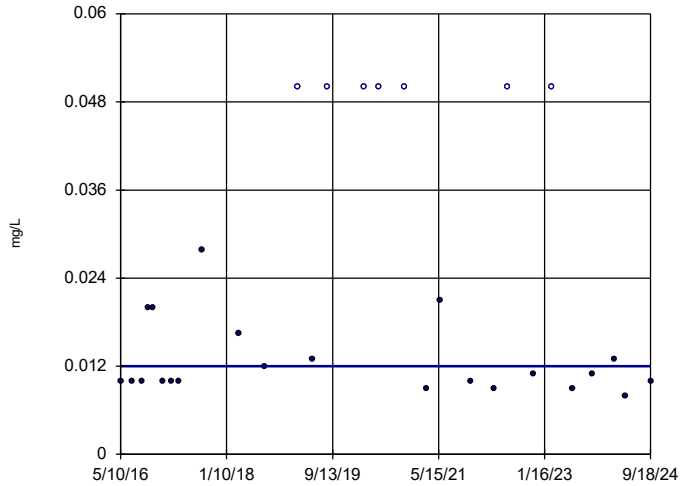
Hollow symbols indicate censored values.

Sen's Slope Estimator

AD-18 (bg)



n = 29

Slope = 0 units per year.

Mann-Kendall statistic = -3
critical = -139

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 12/6/2024 8:10 PM View: Interwell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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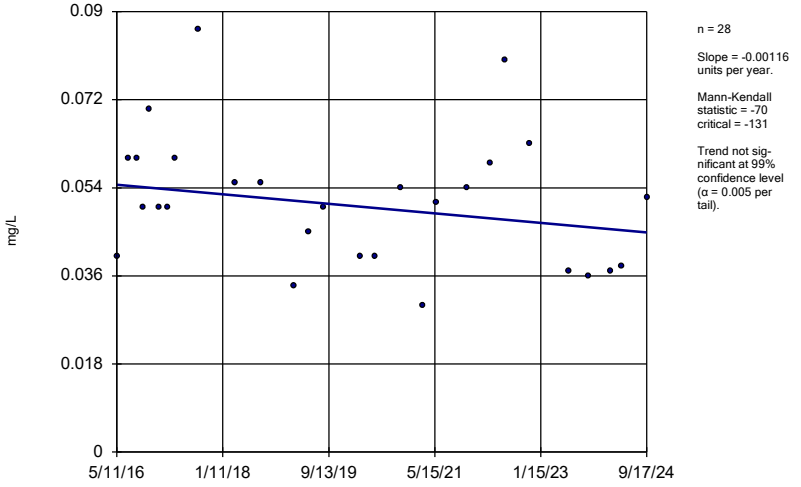
Sen's Slope Estimator

AD-3 (bg)



n = 28

Slope = -0.00116 units per year.

Mann-Kendall statistic = -70
critical = -131

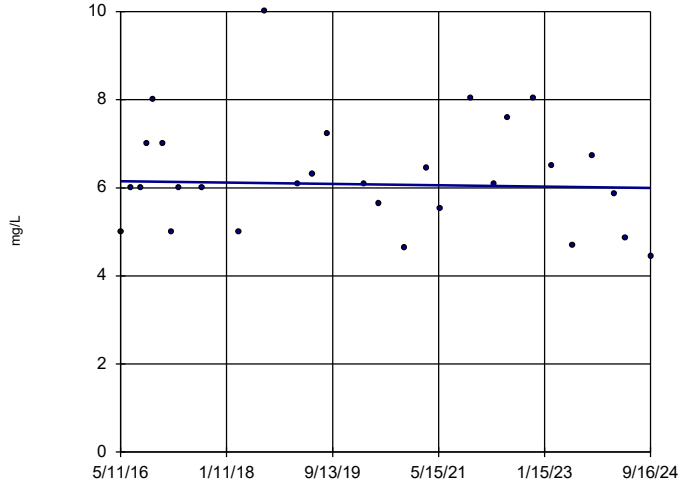
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 12/6/2024 8:10 PM View: Interwell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23 Software licensed to Groundwater Stats Consulting. UG

Sen's Slope Estimator

AD-12 (bg)



n = 29

Slope = -0.01827 units per year.

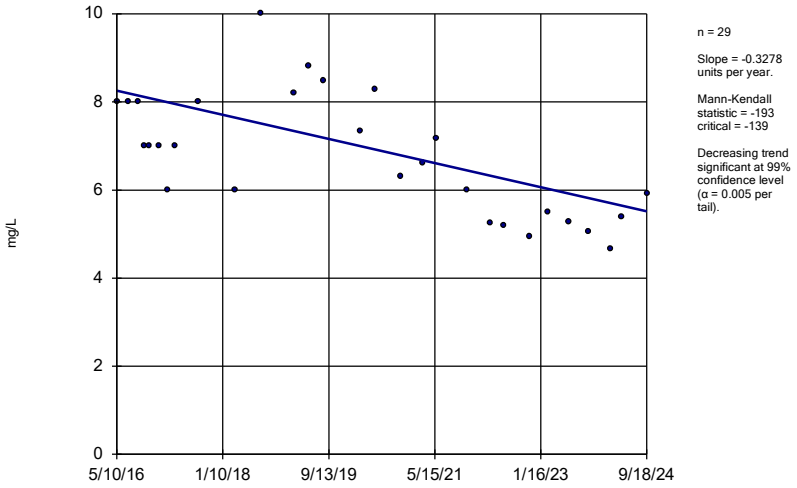
Mann-Kendall statistic = -18
critical = -139

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride, total Analysis Run 12/6/2024 8:10 PM View: Interwell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sen's Slope Estimator

AD-18 (bg)



n = 29

Slope = -0.3278 units per year.

Mann-Kendall statistic = -193 critical = -139

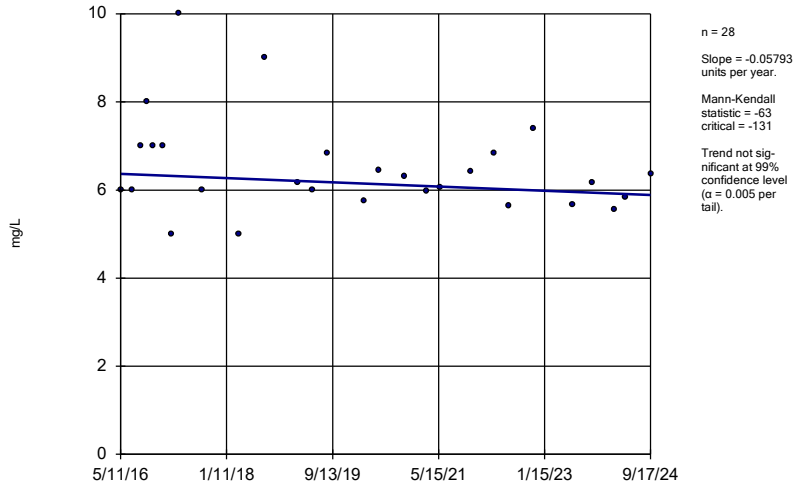
Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride, total Analysis Run 12/6/2024 8:10 PM View: Interwell

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sen's Slope Estimator

AD-3 (bg)



n = 28

Slope = -0.05793 units per year.

Mann-Kendall statistic = -63 critical = -131

Trend not significant at 99% confidence level (α = 0.005 per tail).

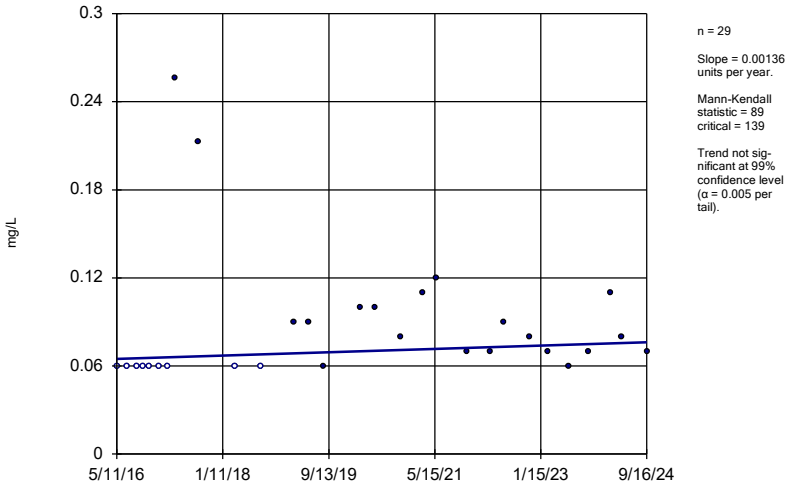
Constituent: Chloride, total Analysis Run 12/6/2024 8:10 PM View: Interwell

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Hollow symbols indicate censored values.

Sen's Slope Estimator

AD-12 (bg)



n = 29

Slope = 0.00136 units per year.

Mann-Kendall statistic = 89 critical = 139

Trend not significant at 99% confidence level (α = 0.005 per tail).

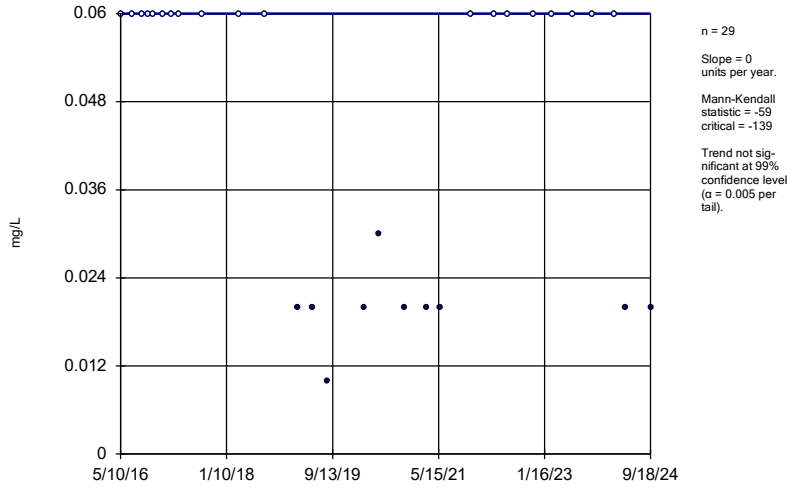
Constituent: Fluoride, total Analysis Run 12/6/2024 8:10 PM View: Interwell

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Hollow symbols indicate censored values.

Sen's Slope Estimator

AD-18 (bg)



n = 29

Slope = 0 units per year.

Mann-Kendall statistic = -59 critical = -139

Trend not significant at 99% confidence level (α = 0.005 per tail).

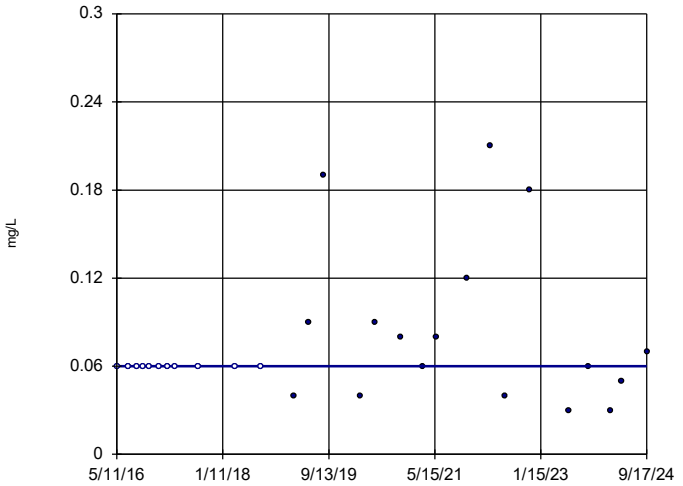
Constituent: Fluoride, total Analysis Run 12/6/2024 8:10 PM View: Interwell

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Hollow symbols indicate censored values.

Sen's Slope Estimator

AD-3 (bg)



n = 28

Slope = 0 units per year.

Mann-Kendall statistic = 12 critical = 131

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Fluoride, total Analysis Run 12/6/2024 8:10 PM View: Interwell

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

FIGURE H

Interwell PLs

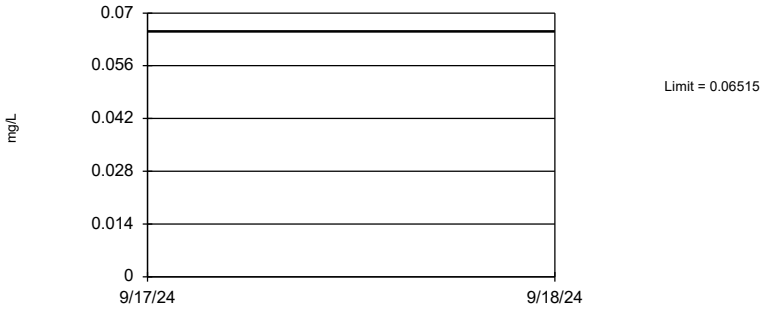
Interwell Prediction Limits

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/12/2024, 1:36 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron, total (mg/L)	n/a	0.06515	n/a	n/a	3 future	n/a	86	0.1676	0.05197	10.47	None	sqrt(x)	0.002505	Param Inter 1 of 2
Chloride, total (mg/L)	n/a	8.659	n/a	n/a	3 future	n/a	86	2.54	0.2388	0	None	sqrt(x)	0.002505	Param Inter 1 of 2
Fluoride, total (mg/L)	n/a	0.2565	n/a	n/a	3 future	n/a	86	n/a	n/a	45.35	n/a	n/a	0.0002629	NP Inter (normality) 1 of 2

Prediction Limit

Interwell Parametric

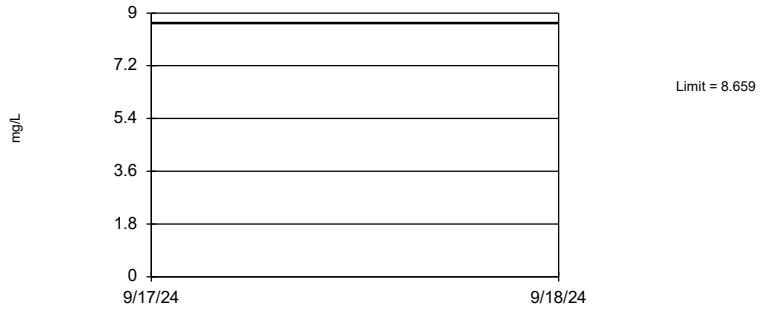


Background Data Summary (based on square root transformation): Mean=0.1676, Std. Dev.=0.05197, n=86, 10.47% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9628, critical = 0.961. Kappa = 1.686 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Assumes 3 future values.

Constituent: Boron, total Analysis Run 12/12/2024 1:34 PM View: Interwell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Prediction Limit

Interwell Parametric

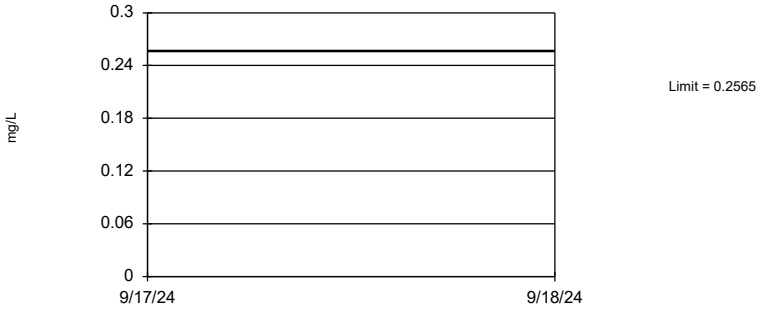


Background Data Summary (based on square root transformation): Mean=2.54, Std. Dev.=0.2388, n=86. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9644, critical = 0.961. Kappa = 1.686 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Assumes 3 future values.

Constituent: Chloride, total Analysis Run 12/12/2024 1:34 PM View: Interwell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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 86 background values. 45.35% NDs. Annual per-constituent alpha = 0.001576. Individual comparison alpha = 0.0002629 (1 of 2). Assumes 3 future values.

Constituent: Fluoride, total Analysis Run 12/12/2024 1:34 PM View: Interwell
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

FIGURE I

UTLs

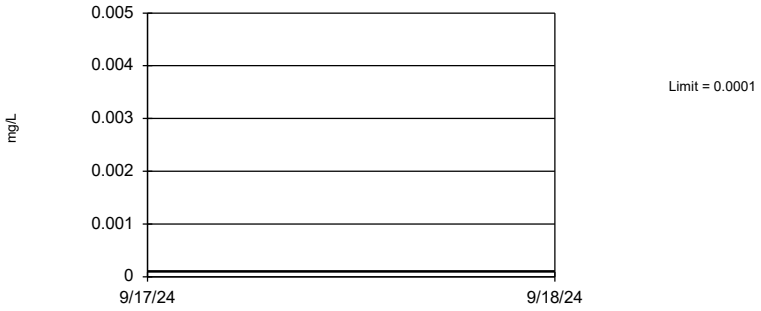
Upper Tolerance Limits

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/9/2024, 3:22 PM

Constituent	Upper Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Antimony, total (mg/L)	0.0001	n/a	n/a	n/a	83	79.52	n/a	0.01416	NP Inter(NDs)
Arsenic, total (mg/L)	0.004229	n/a	n/a	n/a	83	33.73	n/a	0.01416	NP Inter(normality)
Barium, total (mg/L)	0.157	n/a	n/a	n/a	83	0	n/a	0.01416	NP Inter(normality)
Beryllium, total (mg/L)	0.00125	n/a	n/a	n/a	83	10.84	n/a	0.01416	NP Inter(normality)
Cadmium, total (mg/L)	0.0001592	n/a	n/a	n/a	83	39.76	n/a	0.01416	NP Inter(normality)
Chromium, total (mg/L)	0.002249	n/a	n/a	n/a	83	8.434	ln(x)	0.05	Inter
Cobalt, total (mg/L)	0.009	n/a	n/a	n/a	83	0	n/a	0.01416	NP Inter(normality)
Combined Radium 226 + 228 (pCi/L)	3.094	n/a	n/a	n/a	83	0	sqrt(x)	0.05	Inter
Fluoride, total (mg/L)	0.2565	n/a	n/a	n/a	86	45.35	n/a	0.01214	NP Inter(normality)
Lead, total (mg/L)	0.0007	n/a	n/a	n/a	83	42.17	n/a	0.01416	NP Inter(normality)
Lithium, total (mg/L)	0.108	n/a	n/a	n/a	82	1.22	n/a	0.01491	NP Inter(normality)
Mercury, total (mg/L)	0.000084	n/a	n/a	n/a	83	53.01	n/a	0.01416	NP Inter(NDs)
Molybdenum, total (mg/L)	0.001161	n/a	n/a	n/a	78	91.03	n/a	0.0183	NP Inter(NDs)
Selenium, total (mg/L)	0.003297	n/a	n/a	n/a	83	34.94	n/a	0.01416	NP Inter(normality)
Thallium, total (mg/L)	0.00113	n/a	n/a	n/a	81	74.07	n/a	0.01569	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 83 background values. 79.52% NDs. 94.73% coverage at alpha=0.01; 96.29% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.01416.

Constituent: Antimony, total Analysis Run 12/9/2024 3:21 PM View: Appendix IV - UTLs
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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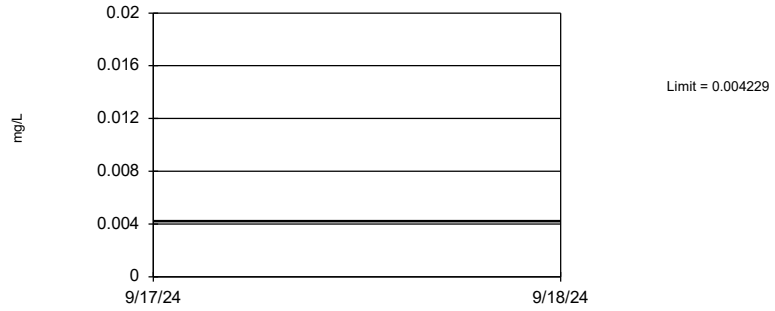
Tolerance Limit

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 83 background values. 33.73% NDs. 94.73% coverage at alpha=0.01; 96.29% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.01416.

Constituent: Arsenic, total Analysis Run 12/9/2024 3:21 PM View: Appendix IV - UTLs
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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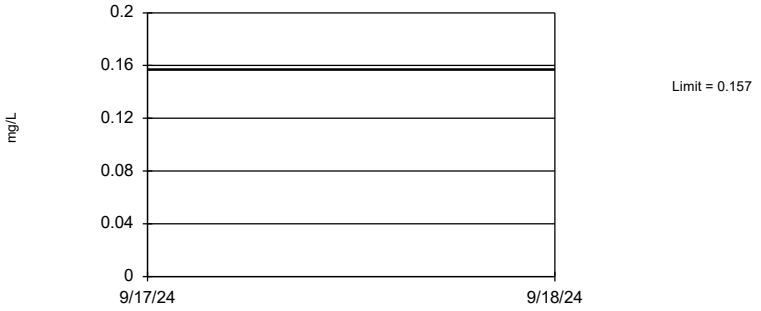
Tolerance Limit

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 83 background values. 94.73% coverage at alpha=0.01; 96.29% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.01416.

Constituent: Barium, total Analysis Run 12/9/2024 3:21 PM View: Appendix IV - UTLs
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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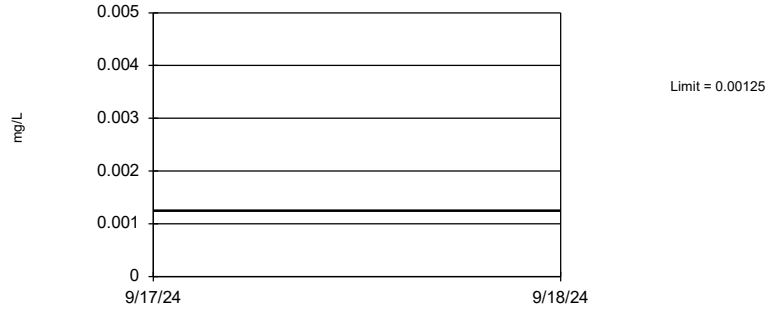
Tolerance Limit

Interwell Non-parametric

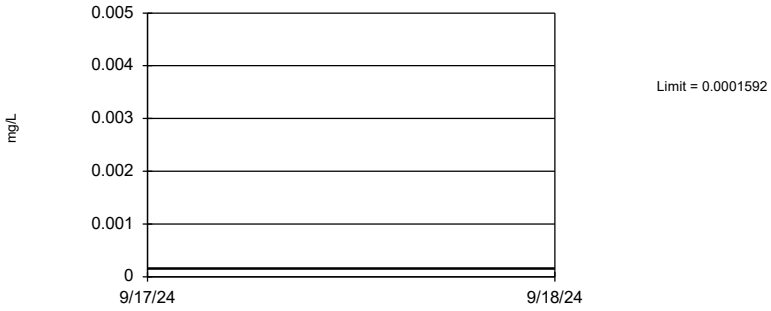


Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 83 background values. 10.84% NDs. 94.73% coverage at alpha=0.01; 96.29% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.01416.

Constituent: Beryllium, total Analysis Run 12/9/2024 3:21 PM View: Appendix IV - UTLs
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tolerance Limit

Interwell Non-parametric

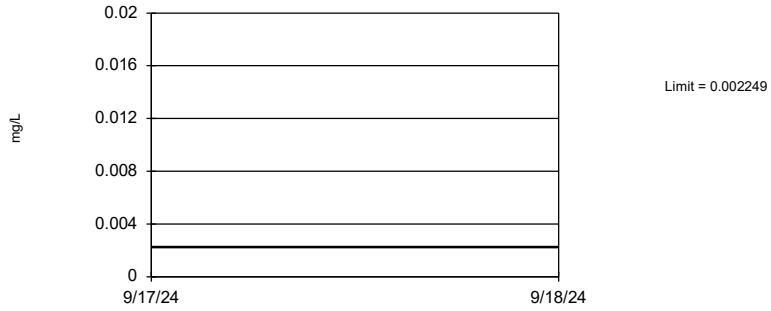


Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 83 background values. 39.76% NDs. 94.73% coverage at alpha=0.01; 96.29% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.01416.

Constituent: Cadmium, total Analysis Run 12/9/2024 3:21 PM View: Appendix IV - UTLs
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tolerance Limit

Interwell Parametric

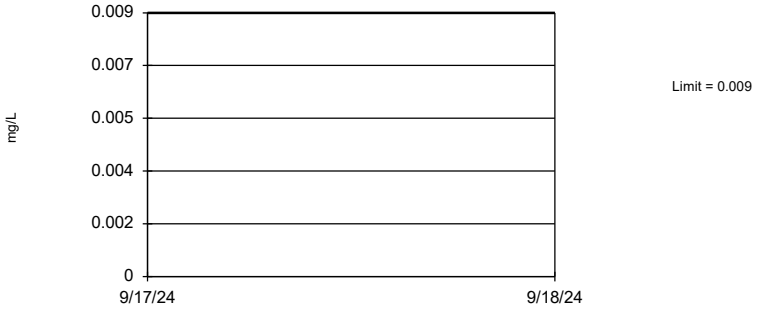


95% coverage. Background Data Summary (based on natural log transformation): Mean=-7.655, Std. Dev.=0.7964, n=83, 8.434% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9667, critical = 0.96. Report alpha = 0.05.

Constituent: Chromium, total Analysis Run 12/9/2024 3:21 PM View: Appendix IV - UTLs
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tolerance Limit

Interwell Non-parametric

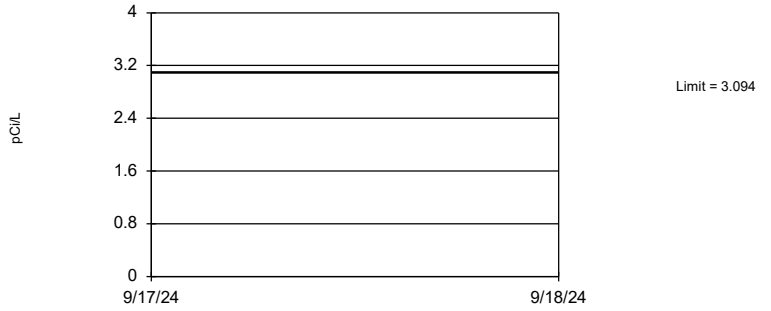


Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 83 background values. 94.73% coverage at alpha=0.01; 96.29% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.01416.

Constituent: Cobalt, total Analysis Run 12/9/2024 3:21 PM View: Appendix IV - UTLs
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tolerance Limit

Interwell Parametric

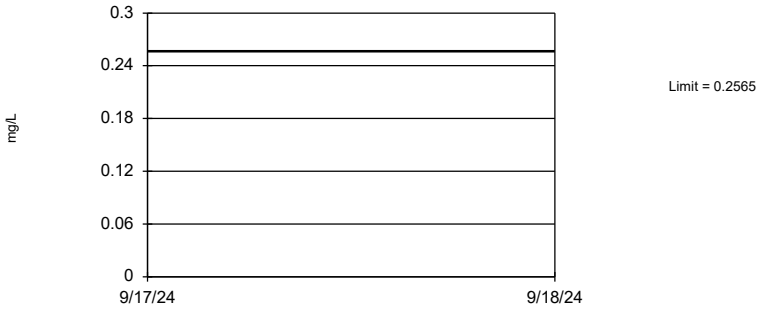


95% coverage. Background Data Summary (based on square root transformation): Mean=1.071, Std. Dev.=0.3518, n=83. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9747, critical = 0.96. Report alpha = 0.05.

Constituent: Combined Radium 226 + 228 Analysis Run 12/9/2024 3:21 PM View: Appendix IV - UTLs
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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 86 background values. 45.35% NDs. 94.73% coverage at alpha=0.01; 96.68% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.01214.

Constituent: Fluoride, total Analysis Run 12/9/2024 3:21 PM View: Appendix IV - UTLs
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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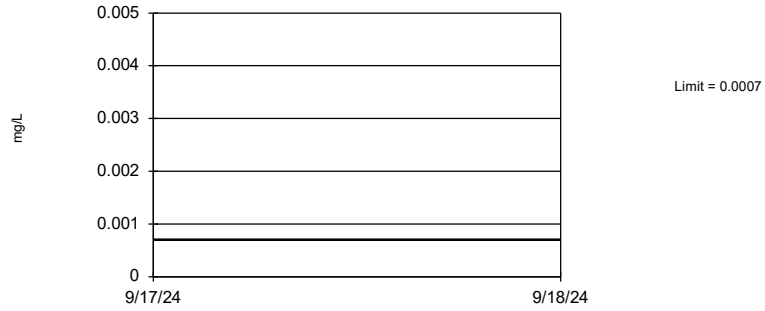
Tolerance Limit

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 83 background values. 42.17% NDs. 94.73% coverage at alpha=0.01; 96.29% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.01416.

Constituent: Lead, total Analysis Run 12/9/2024 3:21 PM View: Appendix IV - UTLs
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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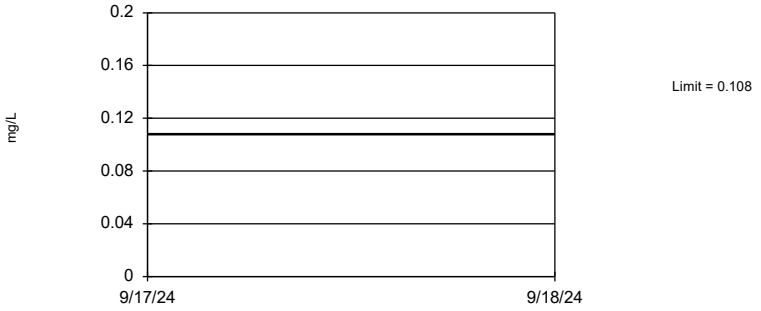
Tolerance Limit

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 82 background values. 1.22% NDs. 94.73% coverage at alpha=0.01; 96.29% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.01491.

Constituent: Lithium, total Analysis Run 12/9/2024 3:21 PM View: Appendix IV - UTLs
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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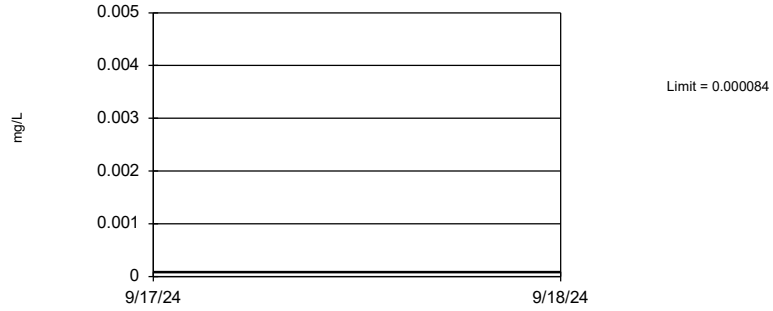
Tolerance Limit

Interwell Non-parametric

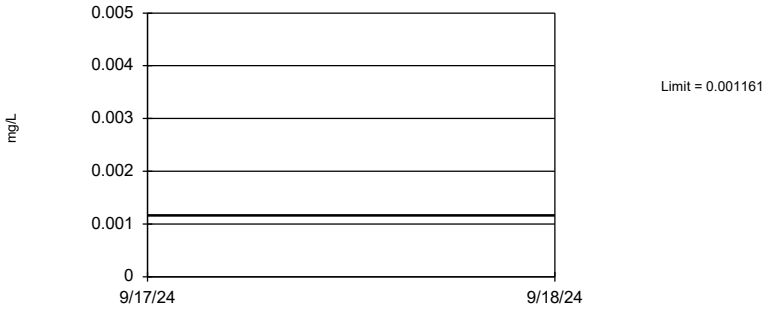


Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 83 background values. 53.01% NDs. 94.73% coverage at alpha=0.01; 96.29% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.01416.

Constituent: Mercury, total Analysis Run 12/9/2024 3:21 PM View: Appendix IV - UTLs
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 78 background values. 91.03% NDs. 94.34% coverage at alpha=0.01; 96.29% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.0183.

Constituent: Molybdenum, total Analysis Run 12/9/2024 3:21 PM View: Appendix IV - UTLs
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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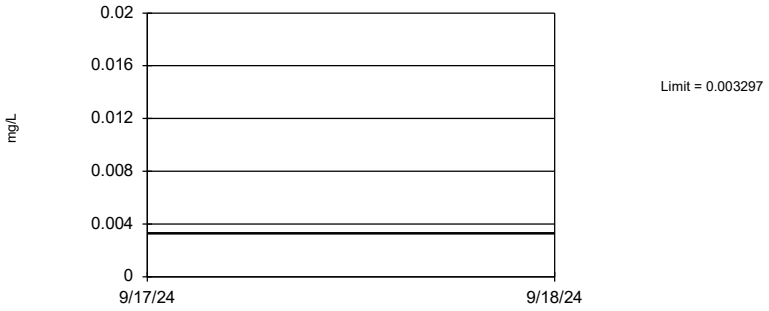
Tolerance Limit

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 83 background values. 34.94% NDs. 94.73% coverage at alpha=0.01; 96.29% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.01416.

Constituent: Selenium, total Analysis Run 12/9/2024 3:21 PM View: Appendix IV - UTLs
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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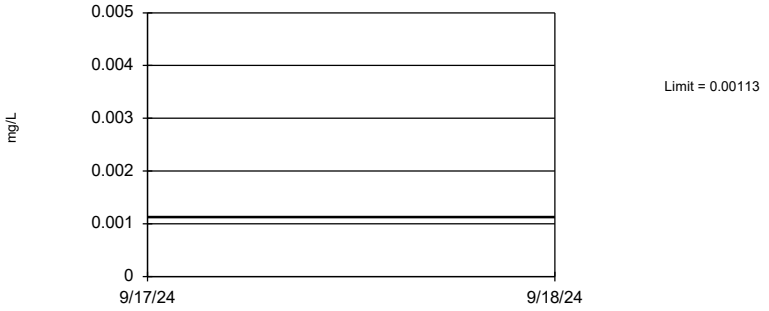
Tolerance Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 81 background values. 74.07% NDs. 94.34% coverage at alpha=0.01; 96.29% coverage at alpha=0.05; 99.02% coverage at alpha=0.5. Report alpha = 0.01569.

Constituent: Thallium, total Analysis Run 12/9/2024 3:21 PM View: Appendix IV - UTLs
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

FIGURE J

GWPS

PIRKEY WBAP GWPS			
Constituent Name	**MCL**	**Background Limit**	**GWPS**
Antimony, Total (mg/L)	0.006	0.0001	0.006
Arsenic, Total (mg/L)	0.01	0.0042	0.01
Barium, Total (mg/L)	2	0.16	2
Beryllium, Total (mg/L)	0.004	0.0013	0.004
Cadmium, Total (mg/L)	0.005	0.00016	0.005
Chromium, Total (mg/L)	0.1	0.0022	0.1
Cobalt, Total (mg/L)	n/a	0.009	0.009
Combined Radium, Total (pCi/L)	5	3.094	5
Fluoride, Total (mg/L)	4	0.26	4
Lead, Total (mg/L)	n/a	0.0007	0.0007
Lithium, Total (mg/L)	n/a	0.108	0.108
Mercury, Total (mg/L)	0.002	0.000084	0.002
Molybdenum, Total (mg/L)	n/a	0.0012	0.0012
Selenium, Total (mg/L)	0.05	0.0033	0.05
Thallium, Total (mg/L)	0.002	0.0011	0.002

**MCL = Maximum Contaminant Level*

**GWPS = Groundwater Protection Standard*

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FIGURE K
Confidence Intervals

Appendix IV - Confidence Intervals - Significant Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/13/2024, 8:37 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Cobalt, total (mg/L)	**AD-28**	**0.01481**	**0.01316**	**0.009**	**Yes**	**27**	**0.01399**	**0.001729**	**0**	**None**	**No**	**0.01**	**Param.**

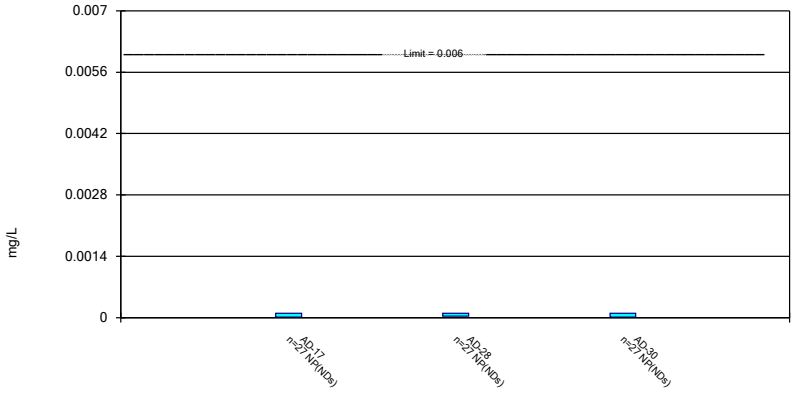
Appendix IV - Confidence Intervals - All Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/13/2024, 8:37 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	AD-17	0.0001	0.00001	0.006	No	27	0.00008652	0.00003294	85.19	None	No	0.01	NP (NDs)
Antimony, total (mg/L)	AD-28	0.0001	0.00003	0.006	No	27	0.0001334	0.0002932	70.37	None	No	0.01	NP (NDs)
Antimony, total (mg/L)	AD-30	0.0001	0.00001	0.006	No	27	0.0001862	0.0003518	81.48	None	No	0.01	NP (NDs)
Arsenic, total (mg/L)	AD-17	0.001767	0.00021	0.01	No	27	0.0009033	0.0008219	29.63	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	AD-28	0.002	0.00016	0.01	No	27	0.001072	0.001312	25.93	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	AD-30	0.002	0.00017	0.01	No	27	0.0008929	0.0008702	33.33	None	No	0.01	NP (normality)
Barium, total (mg/L)	AD-17	0.2243	0.1369	2	No	27	0.1806	0.09162	0	None	No	0.01	Param.
Barium, total (mg/L)	AD-28	0.1567	0.1334	2	No	27	0.145	0.02447	0	None	No	0.01	Param.
Barium, total (mg/L)	AD-30	0.0894	0.054	2	No	27	0.0718	0.02446	0	None	No	0.01	NP (normality)
Beryllium, total (mg/L)	AD-17	0.0006741	0.0004672	0.004	No	27	0.0005707	0.0002168	7.407	None	No	0.01	Param.
Beryllium, total (mg/L)	AD-28	0.0007346	0.0005613	0.004	No	27	0.0006573	0.0001866	0	None	sqrt(x)	0.01	Param.
Beryllium, total (mg/L)	AD-30	0.000125	0.000078	0.004	No	27	0.0001625	0.0002432	7.407	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	AD-17	0.001	0.000028	0.005	No	27	0.0003606	0.0004611	33.33	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	AD-28	0.001	0.00005	0.005	No	27	0.000439	0.0004741	40.74	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	AD-30	0.00005	0.000012	0.005	No	27	0.00003285	0.00001964	51.85	None	No	0.01	NP (NDs)
Chromium, total (mg/L)	AD-17	0.0008318	0.0004229	0.1	No	27	0.000814	0.0009522	3.704	None	ln(x)	0.01	Param.
Chromium, total (mg/L)	AD-28	0.0009121	0.0004198	0.1	No	27	0.0009245	0.00117	14.81	None	ln(x)	0.01	Param.
Chromium, total (mg/L)	AD-30	0.0007695	0.00044	0.1	No	27	0.0008119	0.0008348	3.704	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	AD-17	0.009985	0.006089	0.009	No	27	0.008037	0.004084	0	None	No	0.01	Param.
Cobalt, total (mg/L)	**AD-28**	**0.01481**	**0.01316**	**0.009**	**Yes**	**27**	**0.01399**	**0.001729**	**0**	**None**	**No**	**0.01**	**Param.**
Cobalt, total (mg/L)	AD-30	0.003623	0.002558	0.009	No	27	0.003091	0.001115	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-17	5.604	2.871	5	No	27	4.237	2.865	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-28	2.973	1.91	5	No	27	2.574	1.298	0	None	x^(1/3)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-30	2.029	1.069	5	No	27	1.672	1.125	0	None	sqrt(x)	0.01	Param.
Fluoride, total (mg/L)	AD-17	0.245	0.09	4	No	29	0.1722	0.1007	31.03	None	No	0.01	NP (normality)
Fluoride, total (mg/L)	AD-28	0.7711	0.5599	4	No	28	0.6655	0.226	3.571	None	No	0.01	Param.
Fluoride, total (mg/L)	AD-30	0.04531	0.03017	4	No	29	0.05552	0.01152	44.83	Kaplan-Meier	x^2	0.01	Param.
Lead, total (mg/L)	AD-17	0.0002	0.00012	0.0007	No	27	0.0001619	0.00004998	44.44	None	No	0.01	NP (normality)
Lead, total (mg/L)	AD-28	0.0002	0.00009	0.0007	No	27	0.0001454	0.00006266	44.44	None	No	0.01	NP (normality)
Lead, total (mg/L)	AD-30	0.0002	0.00009	0.0007	No	27	0.0001678	0.00005584	70.37	None	No	0.01	NP (NDs)
Lithium, total (mg/L)	AD-17	0.02054	0.01309	0.108	No	27	0.01682	0.0078	3.704	None	No	0.01	Param.
Lithium, total (mg/L)	AD-28	0.0307	0.0226	0.108	No	27	0.02693	0.01008	0	None	No	0.01	NP (normality)
Lithium, total (mg/L)	AD-30	0.01003	0.008353	0.108	No	27	0.008972	0.002205	3.704	None	x^2	0.01	Param.
Mercury, total (mg/L)	AD-17	0.0002245	0.0001155	0.002	No	27	0.0001845	0.0001266	0	None	sqrt(x)	0.01	Param.
Mercury, total (mg/L)	AD-28	0.0000473	0.00002006	0.002	No	27	0.00004063	0.00004004	0	None	x^(1/3)	0.01	Param.
Mercury, total (mg/L)	AD-30	0.000249	0.00004421	0.002	No	27	0.0003884	0.0006094	0	None	ln(x)	0.01	Param.
Molybdenum, total (mg/L)	AD-17	0.0005	0.0004858	0.0012	No	25	0.0004802	0.00009592	92	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	AD-28	0.0005	0.0002942	0.0012	No	25	0.0004738	0.0000974	92	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	AD-30	0.0008	0.0002	0.0012	No	25	0.0005257	0.0001548	88	None	No	0.01	NP (NDs)
Selenium, total (mg/L)	AD-17	0.004	0.00026	0.05	No	27	0.001748	0.001815	37.04	None	No	0.01	NP (normality)
Selenium, total (mg/L)	AD-28	0.004	0.00021	0.05	No	27	0.001669	0.00183	37.04	None	No	0.01	NP (normality)
Selenium, total (mg/L)	AD-30	0.004	0.0003	0.05	No	27	0.00171	0.001799	37.04	None	No	0.01	NP (normality)
Thallium, total (mg/L)	AD-17	0.0002	0.00007	0.002	No	26	0.0001983	0.0001906	73.08	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	AD-28	0.0002	0.00004	0.002	No	26	0.0002011	0.0002255	73.08	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	AD-30	0.0002	0.00005	0.002	No	26	0.0002195	0.0002901	57.69	None	No	0.01	NP (NDs)

Non-Parametric Confidence Interval

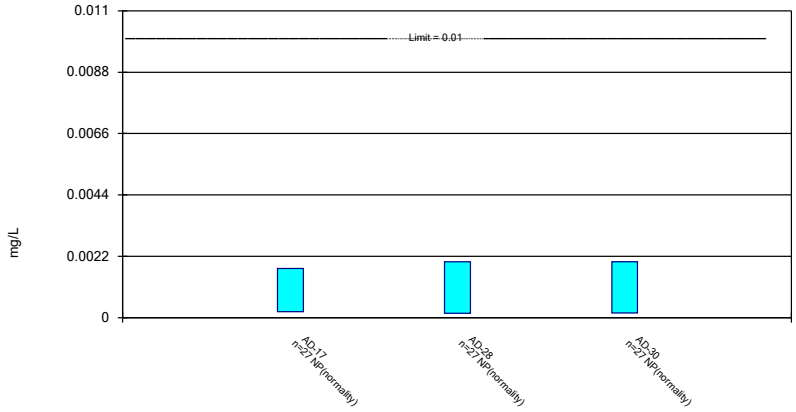
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Antimony, total Analysis Run 12/13/2024 8:36 AM View: Appendix IV
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Non-Parametric Confidence Interval

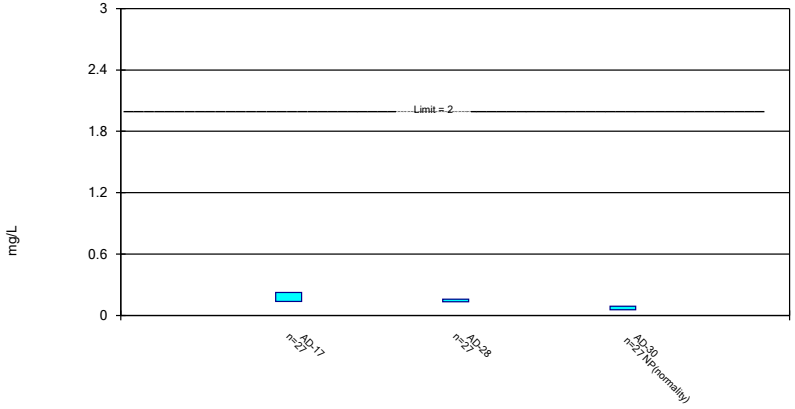
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Arsenic, total Analysis Run 12/13/2024 8:36 AM View: Appendix IV
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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 12/13/2024 8:36 AM View: Appendix IV
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

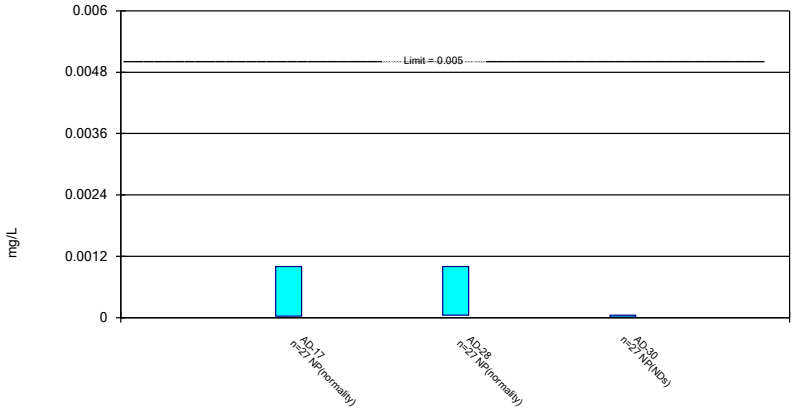
Parametric and Non-Parametric (NP) Confidence Interval

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

Constituent: Beryllium, total Analysis Run 12/13/2024 8:37 AM View: Appendix IV
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Non-Parametric Confidence Interval

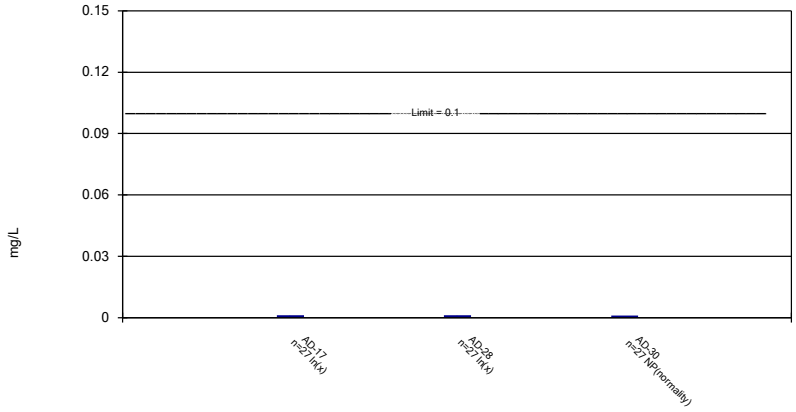
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Cadmium, total Analysis Run 12/13/2024 8:37 AM View: Appendix IV
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Parametric and Non-Parametric (NP) Confidence Interval

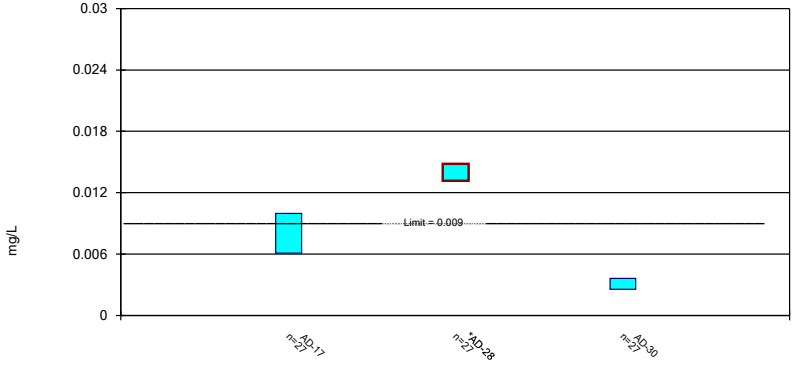
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 12/13/2024 8:37 AM View: Appendix IV
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Parametric Confidence Interval

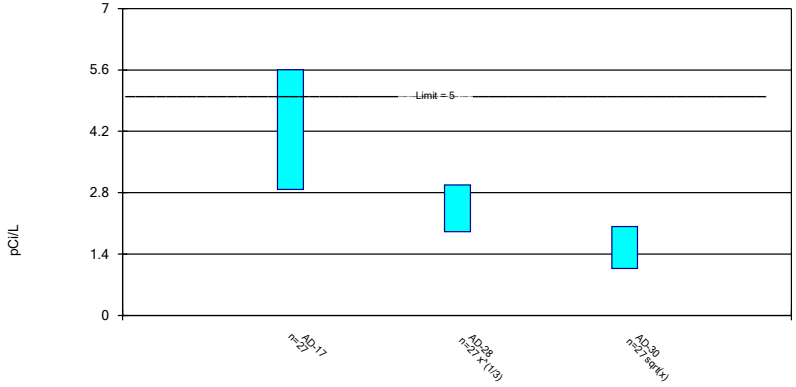
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 12/13/2024 8:37 AM View: Appendix IV
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Parametric Confidence Interval

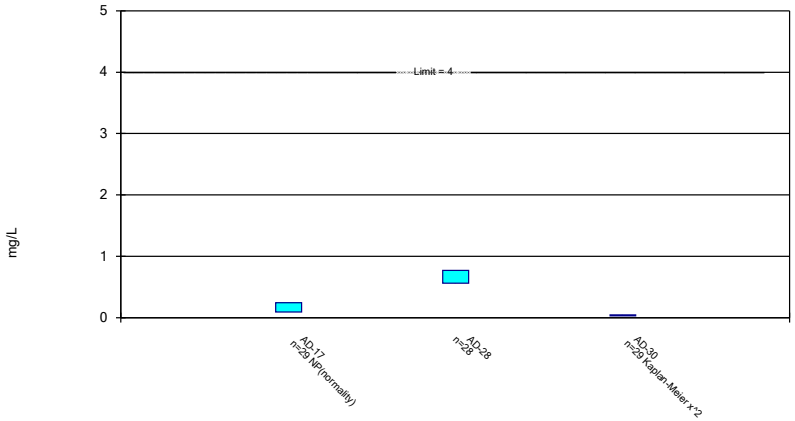
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 12/13/2024 8:37 AM View: Appendix IV
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Parametric and Non-Parametric (NP) Confidence Interval

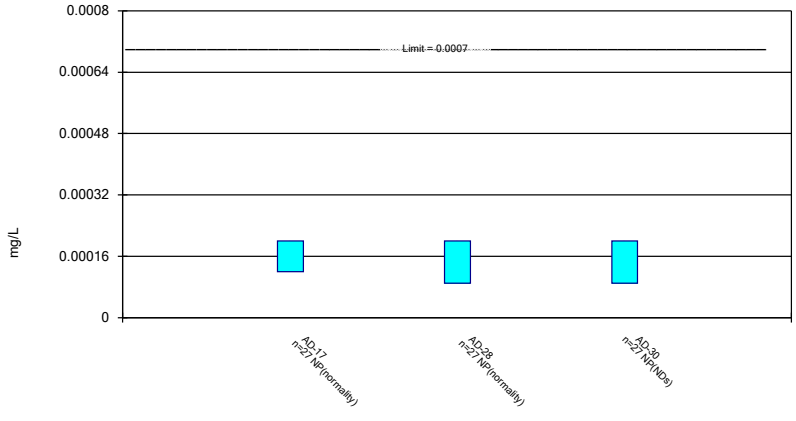
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 12/13/2024 8:37 AM View: Appendix IV
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Non-Parametric Confidence Interval

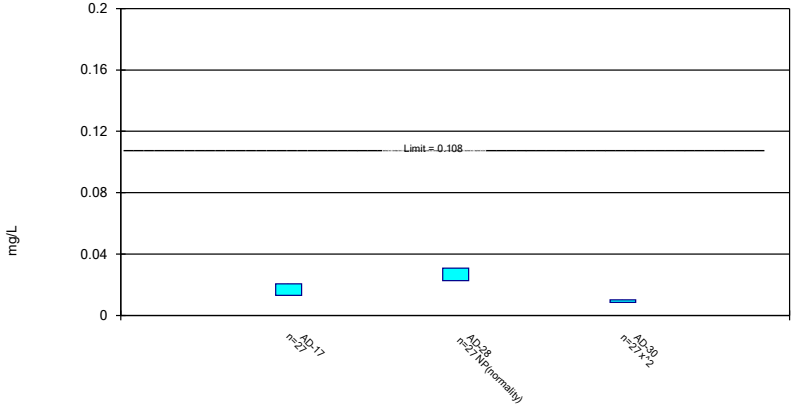
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Lead, total Analysis Run 12/13/2024 8:37 AM View: Appendix IV
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Parametric and Non-Parametric (NP) Confidence Interval

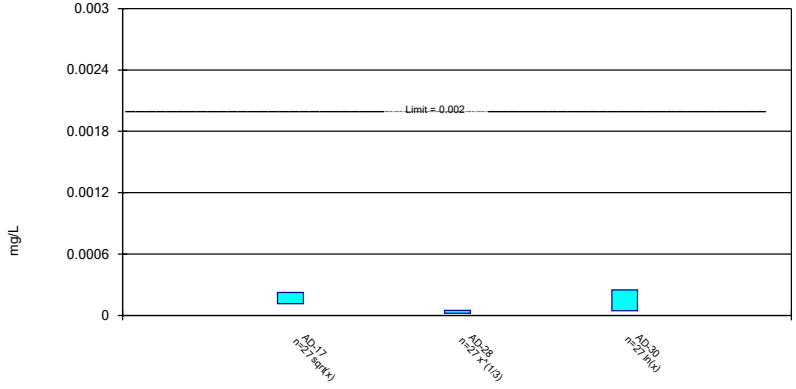
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 12/13/2024 8:37 AM View: Appendix IV
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Parametric Confidence Interval

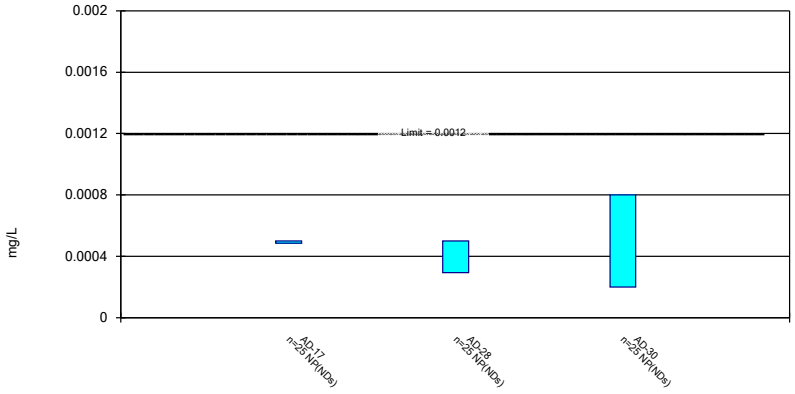
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Mercury, total Analysis Run 12/13/2024 8:37 AM View: Appendix IV
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Non-Parametric Confidence Interval

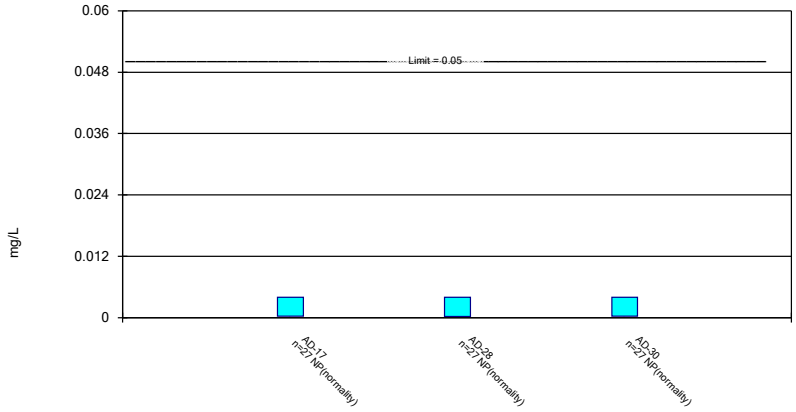
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Molybdenum, total Analysis Run 12/13/2024 8:37 AM View: Appendix IV
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Non-Parametric Confidence Interval

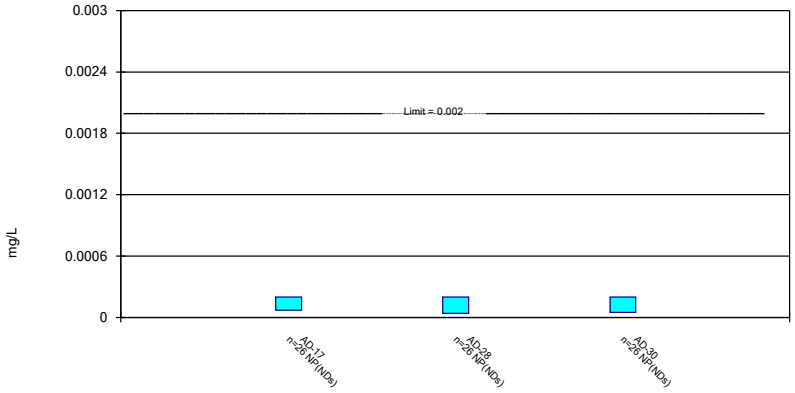
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Selenium, total Analysis Run 12/13/2024 8:37 AM View: Appendix IV
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Non-Parametric Confidence Interval

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



Constituent: Thallium, total Analysis Run 12/13/2024 8:37 AM View: Appendix IV
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

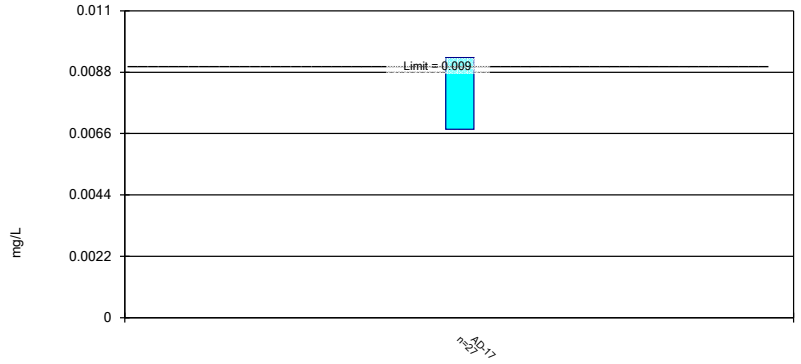
Appendix IV - Deseasonalized Confidence Intervals - All Results (No Significant)

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/13/2024, 8:41 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Cobalt, total (mg/L)	AD-17	0.009324	0.006749	0.009	No	27	0.008036	0.002699	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-17	4.866	3.221	5	No	27	4.237	2.096	0	None	x^(1/3)	0.01	Param.

Parametric Confidence Interval

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



Constituent: Cobalt, total, Alt. Values Analysis Run 12/13/2024 8:39 AM View: Deseasonalized Confidenc
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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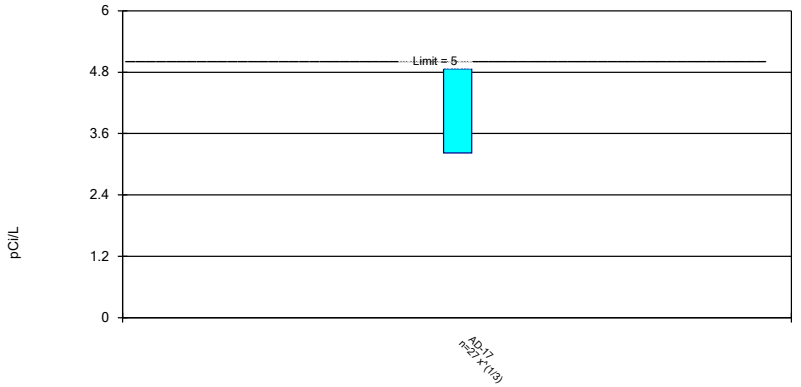
Parametric Confidence Interval

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 12/13/2024 8:40 AM View: Deseaso
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

FIGURE L
Trend Tests – Appendix IV

Appendix IV Trend Tests - Significant Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/13/2024, 8:44 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Alpha	Method
Cobalt, total (mg/L)	**AD-12 (bg)**	**-0.00004082**	**-131**	**-101**	**Yes**	**28**	**0**	**n/a**	**0.05**	**NP**
Cobalt, total (mg/L)	**AD-18 (bg)**	**-0.00007253**	**-176**	**-101**	**Yes**	**28**	**0**	**n/a**	**0.05**	**NP**
Cobalt, total (mg/L)	**AD-28**	**-0.0002681**	**-120**	**-96**	**Yes**	**27**	**0**	**n/a**	**0.05**	**NP**

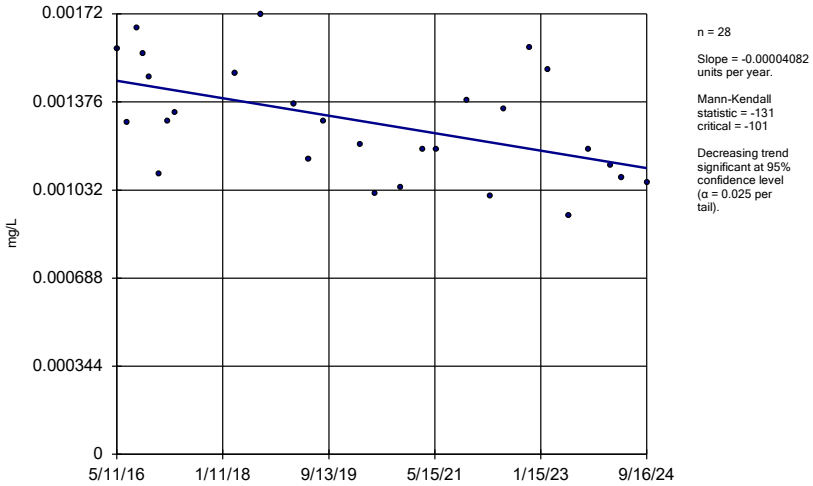
Appendix IV Trend Tests - All Results

Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP Printed 12/13/2024, 8:44 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Alpha	Method
Cobalt, total (mg/L)	**AD-12 (bg)**	**-0.00004082**	**-131**	**-101**	**Yes**	**28**	**0**	**n/a**	**0.05**	**NP**
Cobalt, total (mg/L)	**AD-18 (bg)**	**-0.00007253**	**-176**	**-101**	**Yes**	**28**	**0**	**n/a**	**0.05**	**NP**
Cobalt, total (mg/L)	**AD-28**	**-0.0002681**	**-120**	**-96**	**Yes**	**27**	**0**	**n/a**	**0.05**	**NP**
Cobalt, total (mg/L)	AD-3 (bg)	-0.0001773	-44	-96	No	27	0	n/a	0.05	NP

Sen's Slope Estimator

AD-12 (bg)



n = 28

Slope = -0.00004082 units per year.

Mann-Kendall statistic = -131
critical = -101

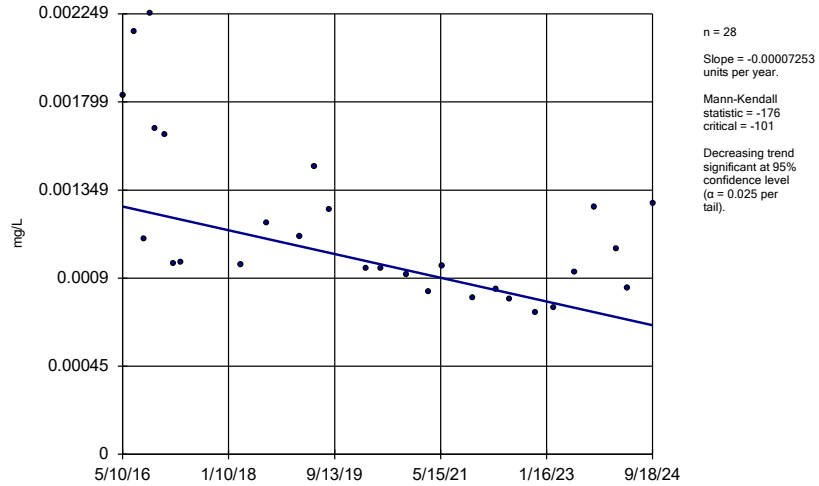
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Cobalt, total Analysis Run 12/13/2024 8:42 AM View: Appendix IV - Trend
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Sen's Slope Estimator

AD-18 (bg)



n = 28

Slope = -0.00007253 units per year.

Mann-Kendall statistic = -176
critical = -101

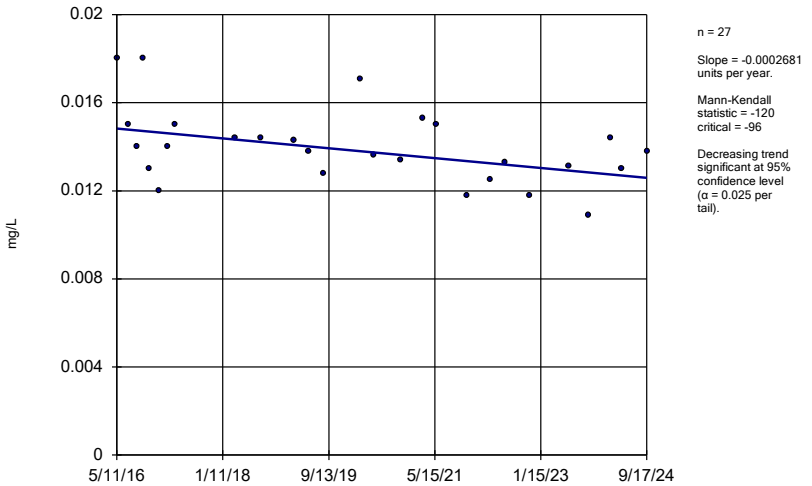
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Cobalt, total Analysis Run 12/13/2024 8:42 AM View: Appendix IV - Trend
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Sen's Slope Estimator

AD-28



n = 27

Slope = -0.0002681 units per year.

Mann-Kendall statistic = -120
critical = -96

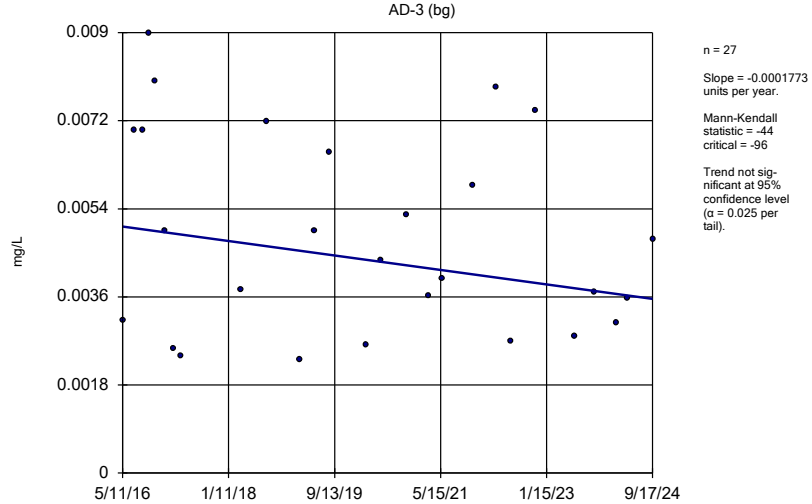
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Cobalt, total Analysis Run 12/13/2024 8:42 AM View: Appendix IV - Trend
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Sen's Slope Estimator

AD-3 (bg)



n = 27

Slope = -0.0001773 units per year.

Mann-Kendall statistic = -44
critical = -96

Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Cobalt, total Analysis Run 12/13/2024 8:42 AM View: Appendix IV - Trend
Pirkey WBAP Client: Geosyntec Data: Pirkey WBAP

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.

Geosyntec consultants

engineers | scientists | innovators

ALTERNATIVE SOURCE DEMONSTRATION REPORT TEXAS STATE CCR RULE

H.W. Pirkey Power Plant West Bottom Ash Pond

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
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Project CHA8495B

June 2024

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS

LIST OF ACRONYMS

Å	angstrom
amsl	above mean sea level
ASD	alternative source demonstration
bgs	below ground surface
CCR	coal combustion residuals
EBAP	East Bottom Ash Pond
EDS	energy-dispersive spectroscopy
EPRI	Electric Power Research Institute
ft	feet
GSC	Groundwater Stats Consulting, LLC
GWPS	groundwater protection standard
LCL	lower confidence limit
MCL	maximum contaminant level
mg/kg	milligram per kilogram
mg/L	milligram per liter
SEM	scanning electron microscopy
SPLP	Synthetic Precipitation Leaching Procedure
SSL	statistically significant level
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
UTL	upper tolerance limit
USEPA	United States Environmental Protection Agency
VAP	vertical aquifer profiling
WBAP	West Bottom Ash Pond
XRD	X-ray diffraction

1. INTRODUCTION AND SUMMARY

This Alternative Source Demonstration (ASD) report has been prepared to address a statistically significant level (SSL) for cobalt in the groundwater monitoring network for the former West Bottom Ash Pond (WBAP), located at the H.W. Pirkey Plant 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 WBAP (**Figure 1**). Three of the units, including the former WBAP, have been cleaned closed, and one unit is still active.

In October 2023, a semiannual assessment monitoring event was conducted at the former WBAP in accordance with 30 TAC §352.951(a). The monitoring data were submitted to Groundwater Stats Consulting, LLC (GSC) for statistical analysis.

Groundwater protection standards (GWPS) were re-established for the Appendix IV parameters and confidence intervals were re-calculated for Appendix IV parameters at the compliance wells; these values were used to assess whether these parameters were present at statistically significant levels (SSLs) above the GWPSs. An SSL was concluded if the lower confidence limit (LCL) of a parameter exceeded the GWPS (i.e., if the entire confidence interval exceeded the GWPS). An SSL was identified for cobalt at AD-28 at the former WBAP, where the LCL of 0.0131 milligrams per liter (mg/L) exceeded the calculated GWPS of 0.0090 mg/L (Geosyntec Consultants, Inc. [Geosyntec] 2024a). 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 has prepared this ASD report to document that the SSL identified for cobalt at AD-28 is from a source other than the former WBAP.

1.2 Demonstration of Alternative Sources

An evaluation was completed to assess possible alternative sources to which the identified SSLs 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 Source (i.e., anthropogenic impacts)

A demonstration was conducted to show that the SSL identified for cobalt at AD-28 was based on a Type IV cause and not by a release from the former Pirkey WBAP.

2. SUMMARY OF SITE CONDITIONS

The WBAP design and construction, regional geology and site hydrogeology, and groundwater monitoring system and flow conditions are described below.

2.1 WBAP Design and Construction

The WBAP was a 30.9-acre CCR surface impoundment located at the north end of the Pirkey Plant, immediately west of the East Bottom Ash Pond (EBAP) (**Figure 1**). It was constructed while the Pirkey Plant was being developed in 1983 and 1984 and placed into operation in 1985 to receive bottom ash and economizer ash sluiced from the Plant boiler (Arcadis 2016). The WBAP ceased receipt of CCR and non-CCR waste streams on March 30, 2022 (AEP 2022). At that time, the WBAP commenced closure by removal in accordance with the certified closure plan, with CCR material removal occurring from April to June of 2022. The final inspection for CCR material removal was completed on July 26, 2022. On May 5, 2023, the WBAP was certified closed by removal in accordance with 30 TAC §352.1221 and the most recent Written Closure Plan, and notification was placed in the Operating Record (AEP 2023).

The former WBAP was constructed with compacted clay embankments around the pond perimeter and a compacted clay liner over the pond base (Arcadis 2016). Multiple lithological borings advanced following installation of the clay liner confirmed that at least 6 feet of clay was present below the base of the former EBAP (Arcadis 2016). The bottom elevation of the former WBAP was approximately 347 feet above mean sea level (ft amsl), and the elevation of the top of the pond embankment was approximately 357 ft amsl prior to pond closure.

2.2 Regional Geology / Site Hydrogeology

The WBAP was positioned on an outcrop of the Eocene-age Recklaw Formation, which consists predominantly of clay and fine-grained sand (Arcadis 2016). 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.

2.3 Groundwater Monitoring History and Flow Conditions

The monitoring well network for the former WBAP unit monitors groundwater within the Uppermost Aquifer, which was defined by Arcadis (2016) as very fine to fine grained clayey and silty sand with an average thickness of approximately 15 feet. Geologic cross-section A-A' from the Arcadis (2016), provided as **Attachment A**, shows the subsurface structure of the uppermost aquifer (indicated on the figure as clayey silty sand, tan to gray) underlying the former WBAP and the EBAP. Geologic cross-section A-A' demonstrates lateral continuity of the uppermost aquifer spanning the entire length of the WBAP.

Groundwater flow direction in the area of the former WBAP is west-southwesterly (**Figure 1**). Seasonal variability in groundwater flow has not been observed since the monitoring well network was installed. Groundwater flow through the Uppermost Aquifer contains a hydraulic gradient of

approximately 0.01 feet per foot. The monitoring well network for the former WBAP unit consists of upgradient monitoring wells AD-3, AD-12, and AD-18 and compliance wells AD-17, AD-28, and AD-30, all of which are screened within the Uppermost Aquifer at depths ranging from 10 to 57 feet below ground surface (ft bgs) (301 to 348 ft amsl). Groundwater elevations at the unit have ranged from approximately 320 to 375 ft amsl (approximately 10 to 35 ft bgs depending on well location).

3. ALTERNATIVE SOURCE DEMONSTRATION

The ASD evaluation method and proposed alternative source of cobalt in AD-28 and the 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 cobalt 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 2020b). As described below, the SSLs have been attributed to natural variation associated with the underlying geology, which is a Type IV (natural variation) issue.

Monitoring well AD-28 is located near the southwest corner of the former WBAP, as shown in **Figure 1**. Previous ASDs for cobalt at the WBAP provided evidence that cobalt is present in the aquifer media at the site and that the observed cobalt concentrations in groundwater were due to natural variation (Geosyntec 2019a, Geosyntec 2019b, Geosyntec 2020a, Geosyntec 2020b, Geosyntec 2021, Geosyntec 2022, Geosyntec 2023, Geosyntec 2024b). The previous ASDs discussed how the WBAP did not appear to be a source for cobalt in downgradient groundwater, based on observed concentrations of cobalt both in the ash material and in leachate from Synthetic Precipitation Leaching Procedure (SPLP) analysis (SW-864 Test Method 1312, [USEPA 1994]) of the ash material. Cobalt was not detected in the SPLP leachate above the reporting limit of 0.01 mg/L, which is lower than the average concentration at AD-28 (0.0140 mg/L) (**Table 1**).

Cobalt was detected at a concentration of 0.000501 mg/L in a surface water sample previously collected from the WBAP on November 4, 2020. Cobalt was detected in a surface water sample collected on June 24, 2022 from the EBAP at a concentration of 0.00128 mg/L (**Table 1**). Both the WBAP and EBAP have been closed by removal since the samples were collected (AEP 2023a, AEP 2023b). The EBAP and WBAP had historically received the same process water, with the use of each pond dependent on available freeboard and cleaning schedule; thus, there is a basis for the equivalency between these two surface water samples. These concentrations are lower than the reported cobalt concentrations for downgradient network wells from the most recent sampling event (**Figure 2**). Additionally, both pond surface water samples were over an order of magnitude lower than the average concentration observed at AD-28 (**Table 1**). Thus, the WBAP is not the source of cobalt at AD-28.

As noted in the previous ASDs, soil samples collected across the site, including from locations near the WBAP, identified cobalt in the aquifer solids at concentrations ranging from non-detect to 23.5 milligrams per kilogram (mg/kg) with the highest value reported at AD-41, which is upgradient of the WBAP and EBAP (**Figure 3**). SB-28 was advanced in the vicinity of AD-28 in April 2020 to re-log the geology at AD-28 and collect samples for laboratory analysis of total metals and mineralogy. The SB-28 field boring log, which was generated by Auckland Consulting

LLC, is provided as **Attachment B**. Cobalt was identified at SB-28 at concentrations of 4.53 mg/kg at 15.5-16 ft bgs and 8.70 mg/kg at 40-41 ft bgs (**Table 2**). The 15.5-16 ft bgs interval at SB-28 correlates to the depth of the monitoring well screen of AD-28 (15-35 ft bgs), indicating that cobalt is present in aquifer solids within the AD-28 screened interval.

In addition to total cobalt, soil samples were submitted for mineralogical analysis to evaluate the presence of cobalt-containing minerals. X-ray diffraction (XRD) analysis of soils from SB-28 identified pyrite (an iron sulfide mineral) in samples collected at 25-30 ft bgs and 40-41 ft bgs at concentrations up to 3% by weight (**Table 3**). Cobalt is known to undergo isomorphic substitution for iron in crystalline iron minerals such as pyrite due to their similar ionic radii of approximately 1.56 angstrom (Å) for iron vs. 1.52 Å for cobalt (Clementi and Raimondi 1963, Krupka and Serne 2002, Hitzman et al. 2017).

The aquifer solids at SB-28 are distinctly red in color at shallow depths, as illustrated in the photolog of soil cores provided in **Attachment C**. Red color in soils is often associated with the presence of oxidized iron-bearing minerals such as hematite and goethite. Goethite, an iron oxide mineral (FeOOH), was present at depths up to 16 ft bgs at SB-28 at up to 37% of the total aquifer solids (**Table 3**). The weathering of 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). Pyrite weathering processes likely result in the release of isomorphically substituted cobalt from the pyrite crystal structure as the mineral undergoes oxidative weathering to iron oxide minerals.

As described in an ASD previously generated for the WBAP, vertical aquifer profiling (VAP) was used to collect groundwater samples from upgradient locations B-2 and B-3 during the soil boring and sample collection process (Geosyntec 2019b). A groundwater sample was also collected from AD-30, one of the existing compliance wells within the WBAP groundwater monitoring network. Solid phase materials within these groundwater samples were separated and submitted for analysis of chemical composition and mineralogy. For the VAP samples, separation was completed using a centrifuge due to the high abundance of solids. For the groundwater sample at AD-30, the sample was filtered using a 1.5-micron filter. Based on total metals analysis, cobalt was identified both in the centrifuged solid material collected from upgradient VAP location B-3 [VAP-B3-(40-45)] and in the material retained on the filter after processing groundwater from permanent monitoring wells AD-30, B-2, and B-3 (**Table 2**). The concentrations of cobalt in the solid material retained after filtration were comparable to the bulk soil samples collected from the same locations.

The solid sample [VAP-B3-(40-45)] was submitted for mineralogical analysis via XRD and scanning electron microscopy (SEM) using an energy dispersive spectroscopic analyzer (EDS). The XRD results identified pyrite as approximately 3% of the solid phase (**Table 4**). Pyrite was identified during SEM/EDS analysis of lignite which is mined immediately adjacent to the site. Logging completed while the VAP boring was advanced identified coal at several intervals, including 45 and 48 ft bgs (**Figure 4**). Furthermore, SEM/EDS of both centrifuged solid samples [VAP-B3-(40-45) and VAP-B3-(50-55)] identified pyrite in backscattered electron micrographs

by the distinctive framboidal morphology (Harris et al. 1981, Sawlowicz 2000). Major peaks involving iron and sulfur were identified in the EDS spectrum, which further support the identification of pyrite (**Attachment C**). While cobalt was not identified in the EDS spectrum, it is likely present at concentrations below the detection limit.

The former WBAP was not identified as the source of cobalt at wells in the WBAP monitoring well network based on the low concentrations of cobalt in the pond itself and the ubiquity of naturally occurring cobalt in the aquifer formation, especially in soil and groundwater samples upgradient from the WBAP. Cobalt in the WBAP network groundwater is believed to be a result of natural variability within the aquifer. Naturally occurring cobalt is known to substitute for iron in pyrite, which is then known to weather to iron oxides in a process that involves a breakdown of the crystal structure which creates an opportunity to mobilize substituted cobalt. The presence of pyrite and iron oxides has been confirmed at AD-28 and across the Site. The presence of these aquifer minerals suggests that weathering of pyritic minerals may be providing a source for aqueous cobalt in groundwater.

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 SSL for cobalt identified at AD-28 during assessment monitoring in October 2023 was not due to a release from the former WBAP. The identified SSL should instead be attributed to natural variation in the underlying geology, including the presence of pyrite and goethite in the solid aquifer material. Therefore, no further action is warranted, and the Pirkey WBAP will remain in the assessment monitoring program. Certification of this ASD by a qualified professional engineer is provided in **Attachment E**.

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TABLES

Table 1: Summary of Key Cobalt Analytical Data
West Bottom Ash Pond - H.W. Pirkey Plant

Geosyntec Consultants, Inc.

Sample	Sample Date	Unit	Cobalt Concentration
Bottom Ash (Solid Material)	2/11/2019	mg/kg	5.8
SPLP Leachate of Bottom Ash	2/11/2019	mg/L	<0.01
WBAP Pond Water	11/4/2020	mg/L	0.000501
EBAP Pond Water	6/24/2022	mg/L	0.00128
AD-28 - Average	May 2016 - October 2023	mg/L	0.0140

Notes:
1. The average value for AD-28 was calculated using all cobalt data collected under 40 CFR 257 Subpart D.

mg/kg: milligram per kilogram
mg/L: milligram per liter
SPLP: Synthetic precipitation leaching procedure
WBAP: West Bottom Ash Pond
EBAP: East Bottom Ash Pond

Table 2: Soil Cobalt Data
West Bottom Ash Pond - H.W. Pirkey Plant

Geosyntec Consultants, Inc.

Location ID	Location	Sample Depth (ft bgs)	Cobalt (mg/kg)
Bulk Soil Samples			
AD-28	WBAP Network	6-6.5	< 2.38
		15.5-16	4.53
		25-30	< 2.50
		40-41	8.70
AD-30	WBAP Network	7	1.00
		23	15.0
B-2	Upgradient	10	2.36
		16	3.62
		71	10.30
		82	7.21
		87	3.11
B-3	Upgradient	10	1.30
		20	0.59
		97	1.11
AD-41	Upgradient	15	<1.0
		35	23.5
		95	1.90
Solid Material Retained After Filtration			
AD-30	WBAP Network	15-25	9.3 J
B-2	Upgradient	38-48	4.3 J
B-3	Upgradient	29-34	12.0
		VAP 40-45	18.0

Notes:

1. For AD-28 and AD-30, samples were collected from additional boreholes advanced in the immediate area of the location identified by the well ID. Samples were not collected from the cuttings of the borings advanced for well installation.

2. Samples at B-2, B-3, and AD-41 were collected from cores removed from the borehole during well lithology logging.

3. Depths for samples collected after filtration represent the screened interval for the permanent well where the sample was collected.

WBAP: West Bottom Ash Pond
VAP: Vertical aquifer profile
mg/kg: milligram per kilogram
ft bgs: feet below ground surface
J: estimated value

Table 3: AD-28 Mineralogy Results
West Bottom Ash Pond - H.W. Pirkey Plant

Boring ID	**SB-28 (AD-28)**			
Sample Depth Interval	6-6.5	15.5-16	25-30	40-41
Sample Location	Above Screened Interval	Within Screened Interval		Below Screened Interval
Color	Red-brown to yellow-brown	Light gray, light red-brown	Brown, light red-brown	Gray to dark gray
Mineralogy				
Quartz	58%	46%	73%	34%
Pyrite	--	--	3%	3%
K-Feldspar	--	1%	1%	1%
Siderite	--	--	2%	52%
Goethite	37%	15%	--	--
Anhydrite	--	--	--	2%
Clay/Mica	5%	38%	21%	8%

Notes:

1. Sample depths are shown in feet below ground surface (ft bgs)
2. Well AD-28 is screened from 15-35 ft below ground surface.
3. Mineralogical component results are shown in relative % abundance.

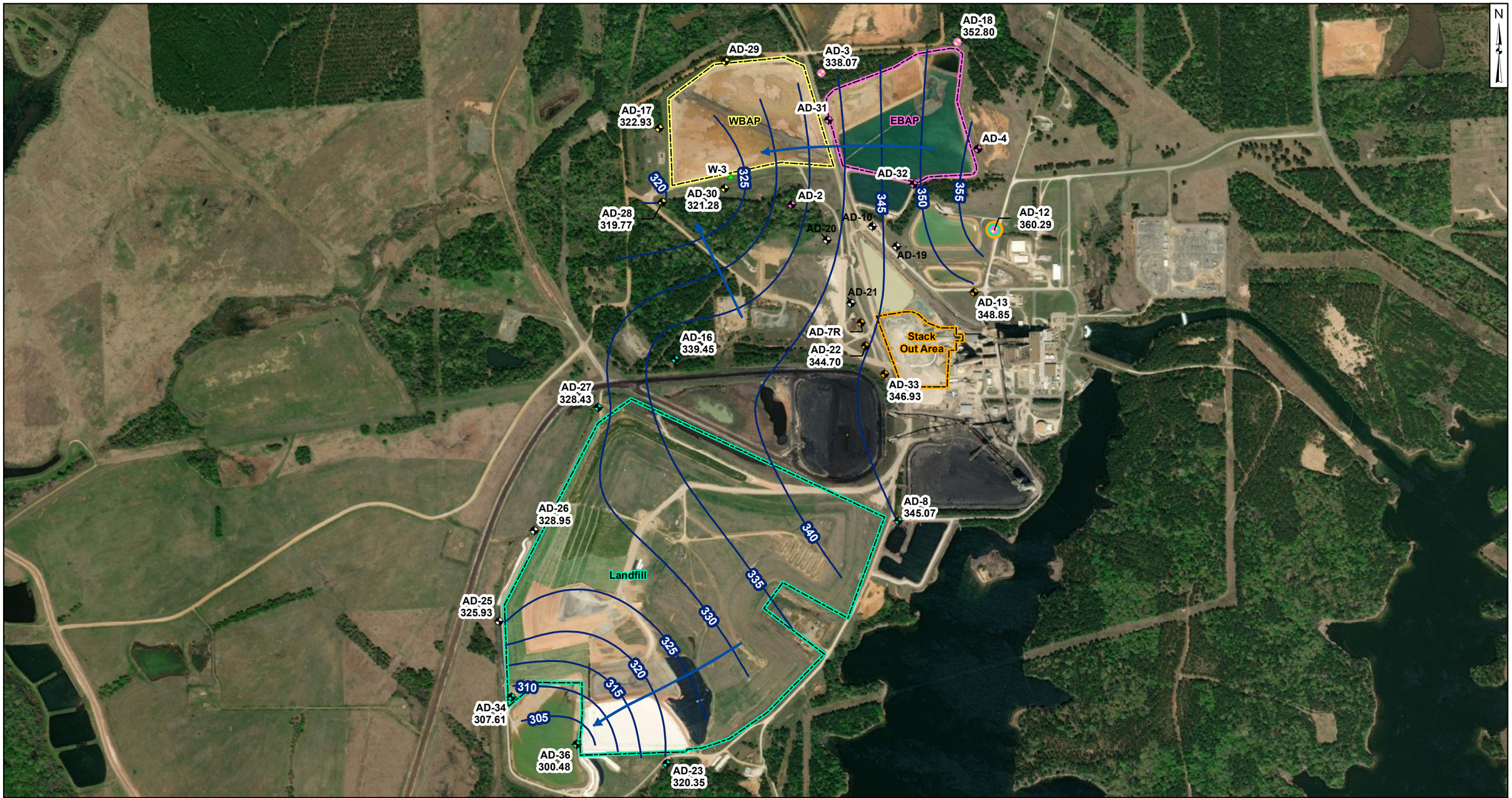
Table 4: B-3 X-Ray Diffraction Results
West Bottom Ash Pond - H.W. Pirkey Plant

Constituent	VAP-B3-(40-45)
Quartz	15
Plagioclase Feldspar	0.5
Orthoclase	ND
Calcite	ND
Dolomite	ND
Siderite	0.5
Goethite	ND
Hematite	2
Pyrite	3
Kaolinte	42
Chlorite	4
Illite/Mica	6
Smectite	12
Amorphous	15

Notes:
1. Results given in units of relative percent (%) abundance.
2. VAP-B3-(40-45) represents the centrifuged solid material from the groundwater sample collected at that interval.

ND: Not detected

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 Landfill - 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 Bottom Ash Pond (WBAP).
10. Removal of CCR plus one foot of material was completed on July 20, 2023, for the East Bottom Ash Pond (EBAP).
11. Removal of CCR plus one foot of material was completed on September 18, 2023, for FGD Stackout Area.

1,000 500 1,000 Feet

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED
PROFESSIONAL ENGINEER

Beth Ann Gross

January 19, 2024

Geosyntec Consultants, Inc.
Texas Firm
Registration No. 1182

Potentiometric Contours: Uppermost Aquifer October 2023

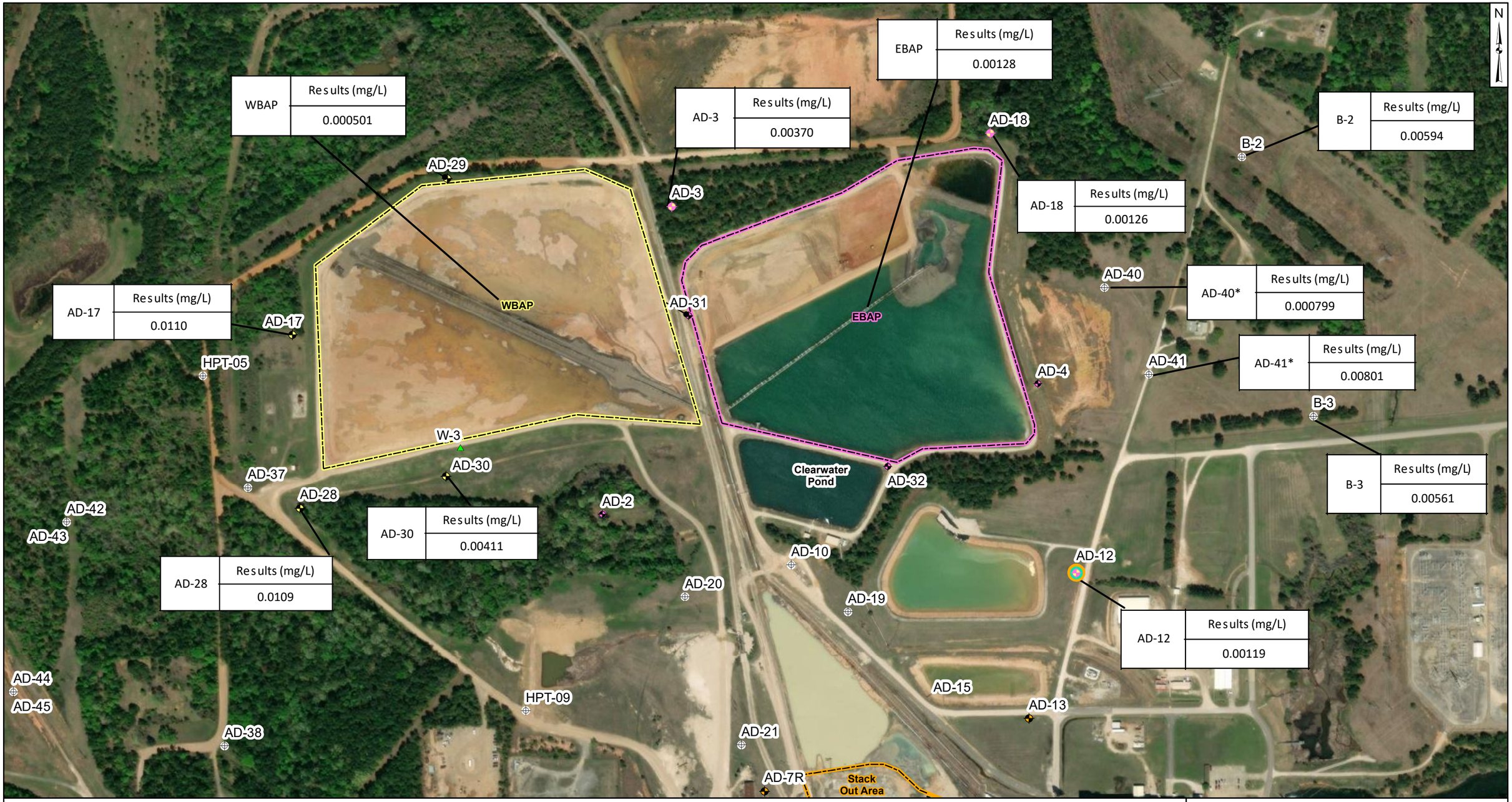
AEP Pirkey Power Plant
Hallsville, Texas

Geosyntec consultants

Columbus, Ohio | June 2024

Figure 1

\\annarbor-01\Data\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Pirkey\2023\AEP-Pirkey_GW_2023-10Pirkey_v2.mxd. ASoltero. 1/10/2024. Project/Phase/Task.



Legend

- Out of Network
- EBAP
- WBAP
- Landfill
- Stackout Area
- EBAP and WBAP
- All CCR Unit Networks
- Piezometer
- EBAP
- Stack Out Area
- WBAP

Notes

- Monitoring well coordinates, site features, and data provided by AEP.
- AD-15 location is approximated.
- Samples collected in October 2023.
- * - Well most recently sampled August 2019.
- AD-29 included in the well network for water level measurements only.
- WBAP surface water results shown for November 2020 sample. EBAP surface water results shown for June 2022 sample.

400 200 0 400 Feet

Aqueous Cobalt Distribution

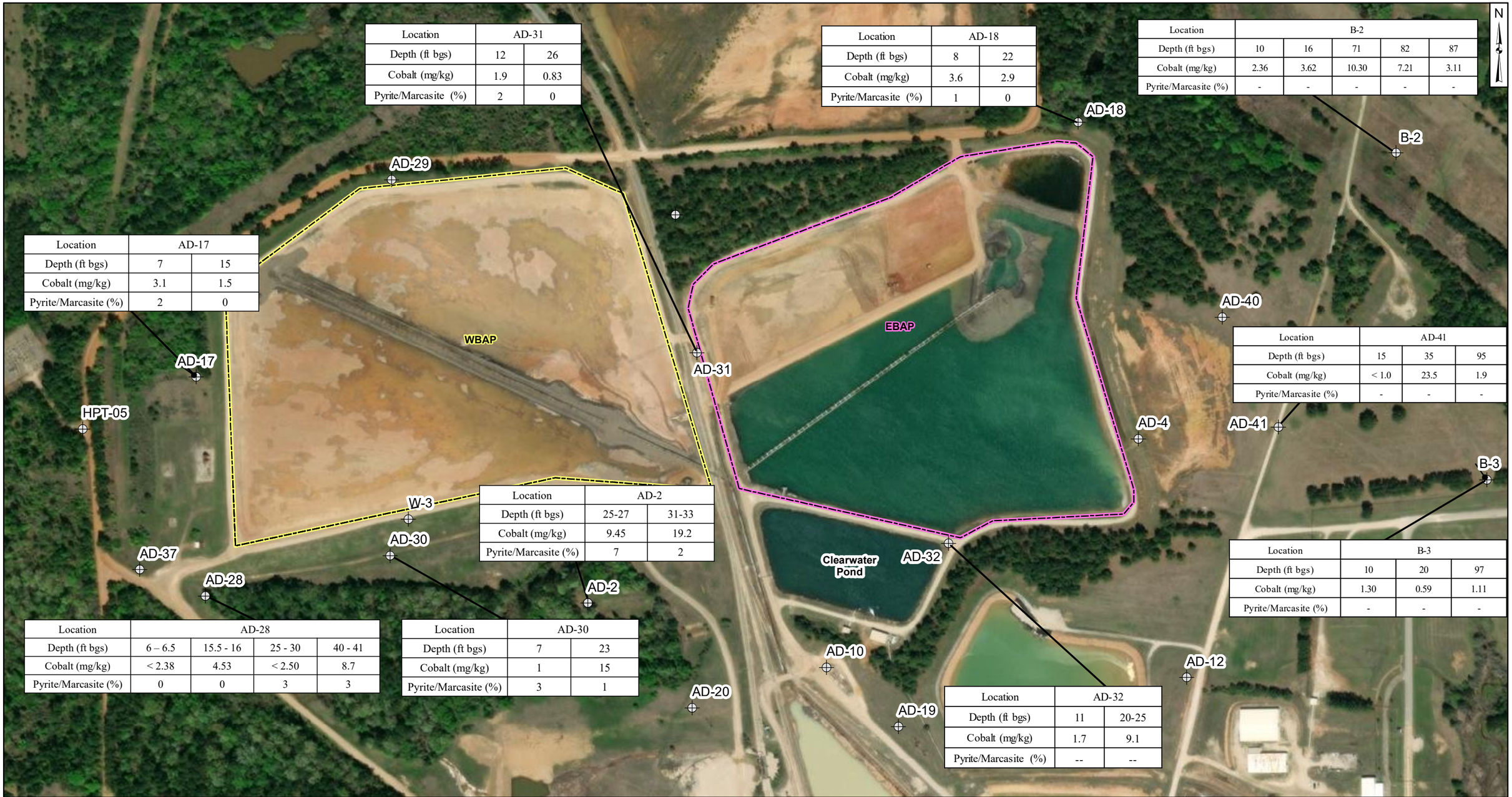
AEP Pirkey Power Plant
Hallsville, Texas

Geosyntec consultants

Columbus, Ohio | June 2024

Figure 2

\\annarbor-01\Data\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Pirkey\2023\20240116_AEP_WBAP_Pirkey_Cobalt.mxd. ASoltero. 1/16/2024. Project/Phase/Task.



Legend

- Monitoring Wells
- EBAP
- WBAP

Notes
- Monitoring well coordinates provided by AEP.
- AD-2 and AD-28 samples collected on April 20, 2020
- All other data provided by AEP, 2019.
- ft bgs: feet below ground surface.
- mg/kg: milligrams per kilogram.
- -- not analyzed.

300 150 0 300 Feet

Cobalt Distribution in Soil

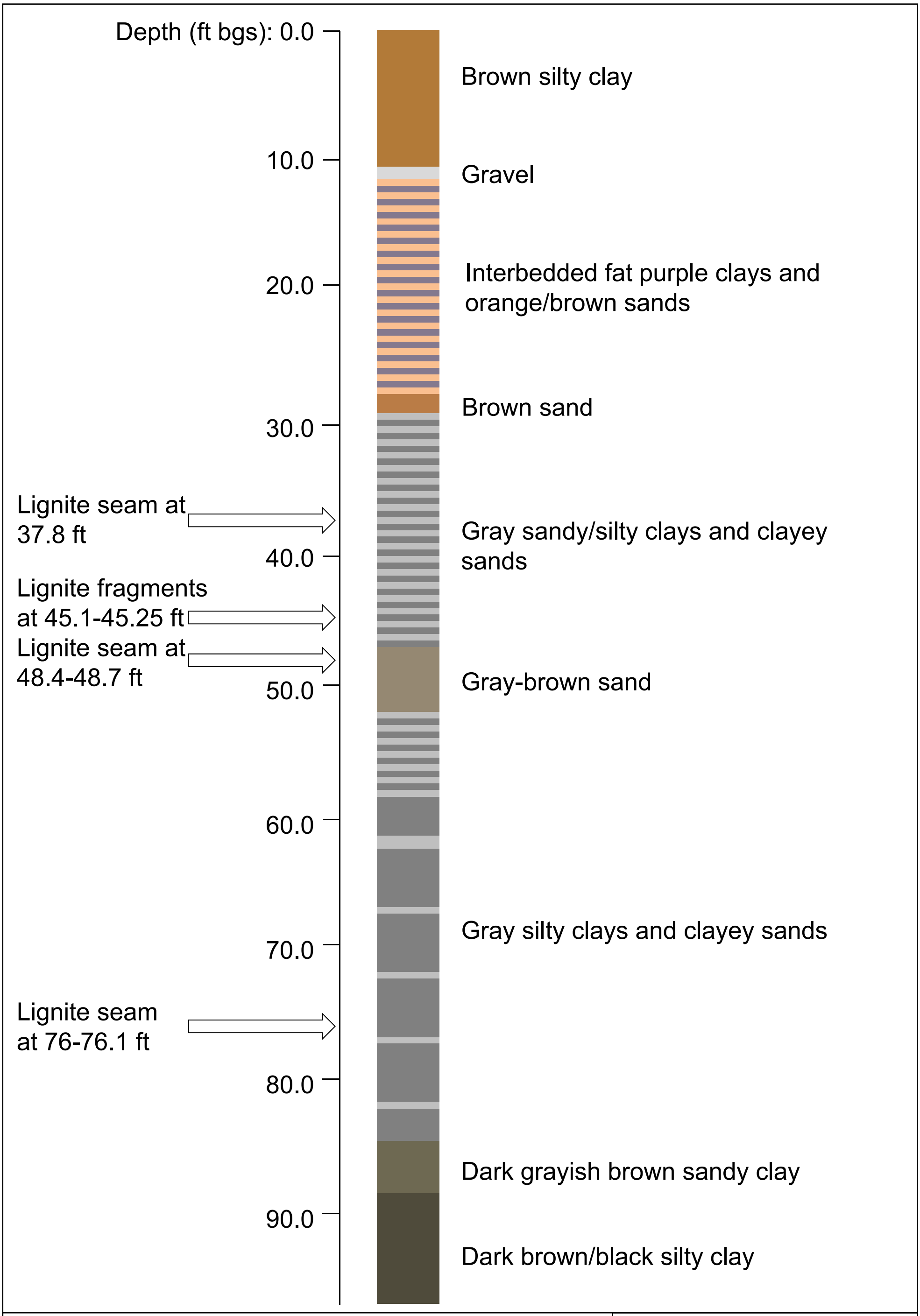
AEP Pirkey Power Plant
Hallsville, Texas

Geosyntec consultants

Columbus, Ohio | June 2024

Figure 3

\\annarbor-01\Data\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Pirkey\2023\20240116 Pirkey_SoilChem_minerals.mxd. ASoltero. 1/16/2024. Project/Phase/Task.



Notes:
- Ft = feet
- Bgs = below ground surface
- Boring completed May 2019
- Total depth of 97.5 ft bgs
- Well installed in offset boring screened at 29-34 ft bgs

B-3 Visual Boring Log

AEP Pirkey Power Plant
Hallsville, TX

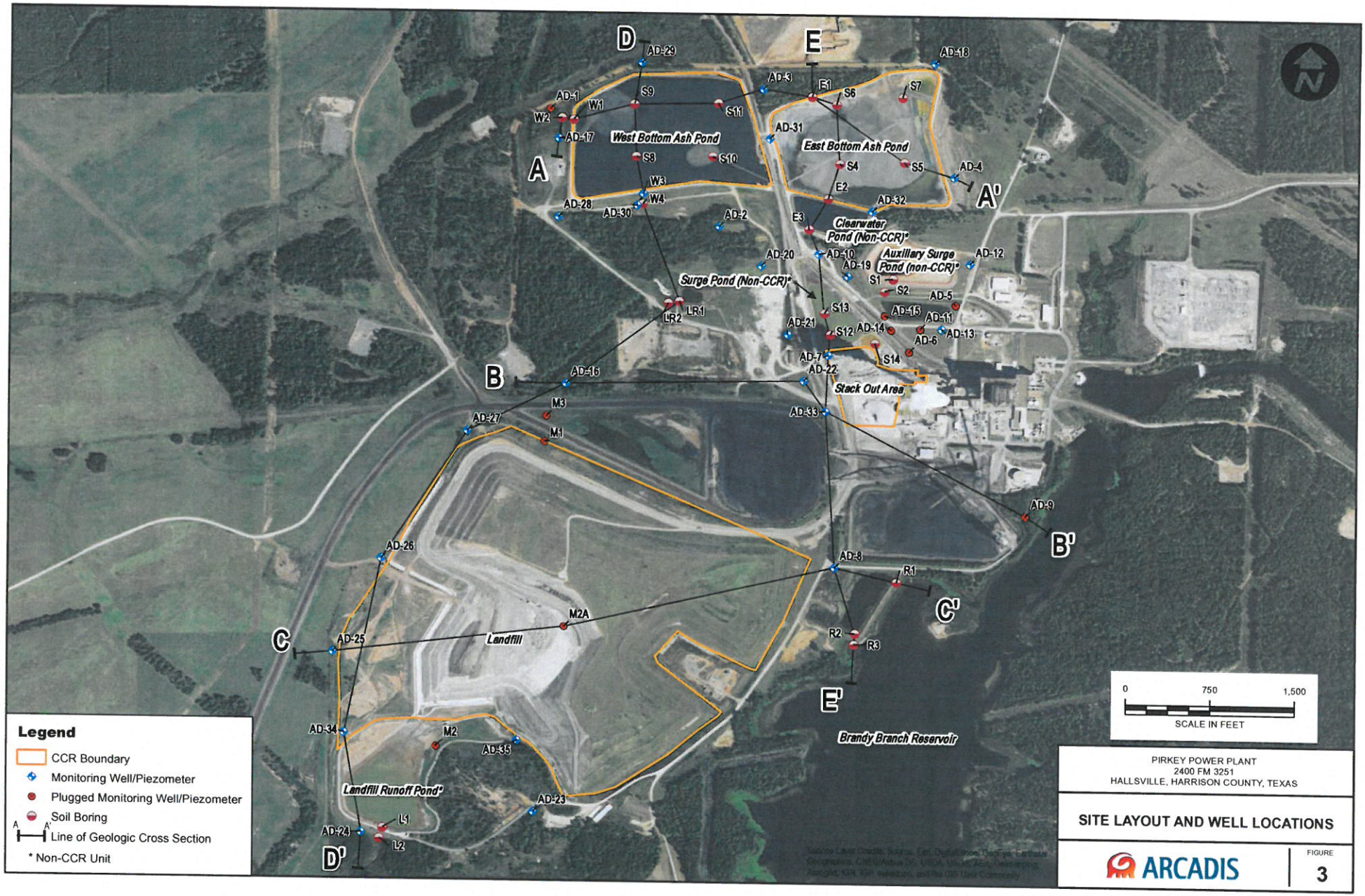
Geosyntec consultants

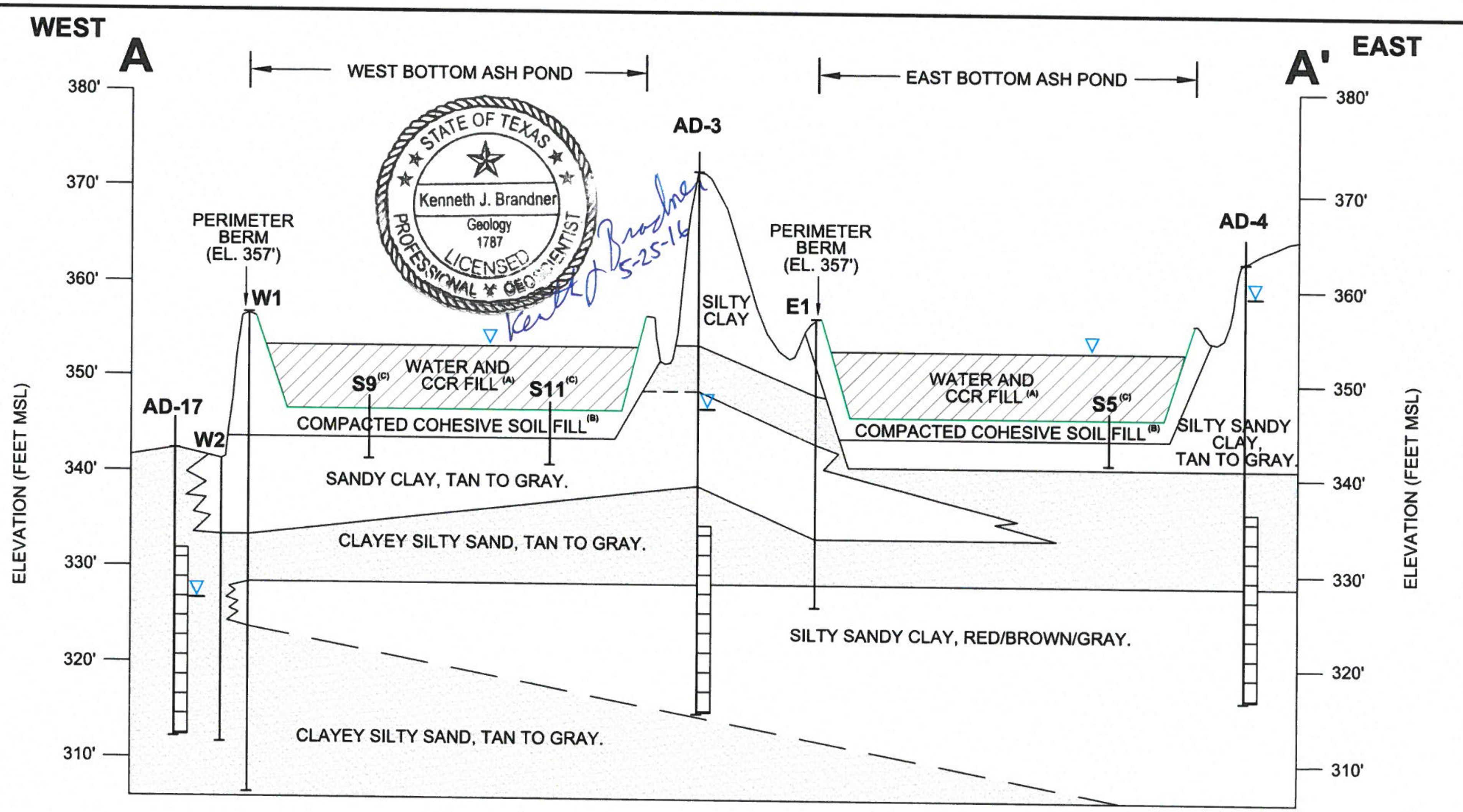
CHA8495B	June 2024

Figure 4

\\annarbor-01\data\Projects\AEP\Legal Department - ASD Review\Pirkey\2019-05 Field Investigation\Field Forms\Compiled Boring Logs\Visual boring logs

ATTACHMENT A
Geologic Cross Section A-A’


D
E
A
A'
B
B'
C
C'
D'
E'
AD-29
AD-18
AD-3
AD-1
E1
S6
S7
S9
W1
S11
W2
AD-17
West Bottom Ash Pond
AD-31
East Bottom Ash Pond
S8
S10
S4
S5
AD-4
W3
E2
W4
AD-28
AD-30
AD-2
AD-32
E3
Clearwater Pond (Non-CCR)*
AD-20
AD-10
Auxiliary Surge Pond (non-CCR)*
AD-12
AD-19
S1
Surge Pond (Non-CCR)*
S2
AD-5
LR1
LR2
S13
AD-15
AD-11
AD-21
S12
AD-14
AD-13
AD-6
AD-7
S14
AD-16
AD-22
Stack Out Area
M3
AD-27
AD-33
M1
AD-9
AD-26
AD-8
R1
M2A
AD-25
Landfill
R2
R3
AD-34
M2
AD-35
Landfill Runoff Pond*
AD-23
AD-24
L1
L2
Brandy Branch Reservoir
0
750
1,500
SCALE IN FEET
Legend
CCR Boundary
Monitoring Well/Piezometer
Plugged Monitoring Well/Piezometer
Soil Boring
Line of Geologic Cross Section
* Non-CCR Unit
PIRKEY POWER PLANT
2400 FM 3251
HALLSVILLE, HARRISON COUNTY, TEXAS
SITE LAYOUT AND WELL LOCATIONS
ARCADIS
FIGURE
3
Document Path: Z:\GIS\PROJECTS_ENVAEP\Pirkey Plant\MXD\Figure 3 - Site Layout and Well Locations.mxd



0 300'
HORIZONTAL SCALE

LEGEND

- MONITORING WELL SCREENED INTERVAL
- WATER LEVEL IN MONITORING WELL (1/20/16)
- BASE OF CCR UNIT

NOTES:

A) TOP OF WEST BOTTOM ASH POND AND EAST BOTTOM ASH POND PERIMETER BERM ELEVATION IS 357', OPERATING ELEVATION IS 354'(JOHNSON & PACE, MAY 2011). BASE ELEVATION OF WEST BOTTOM ASH POND AND EAST BOTTOM ASH POND IS 347' (SARGENT & LUNDY, JANUARY 1983).
B) COMPACTED COHESIVE SOIL FROM ELEVATION 344' TO 347' (SARGENT & LUNDY, SEPTEMBER 1984;AMEC, AUGUST 2011).
C) SOIL BORING INSTALLED BY SOUTHWESTERN LABORATORIES DURING ASH POND CONSTRUCTION IN 1983.

PIRKEY POWER PLANT
2400 FM 3251
HALLSVILLE, HARRISON COUNTY, TEXAS

CROSS SECTION A - A'

ARCADIS

FIGURE 4

ATTACHMENT B
SB-28 Boring Log

PROJECT NO. _____ PROJ. _____ BOR. NO. SB-28

LOCATION AD-28/MW-28 - Pirkey Power Plant ELEV. _____ DATE 4/20/20

SILTS & SANDS		COHESIVE SOILS - CLAYS			COLORS	MATERIALS	SAND ADJ.	CHARACTERTICS
CONDITION		CONSISTENCY	PENETROMETER	N - VALUE	Li .... Light .....Br ....Brown	Cl ..... Clay, Clayer	F.....Fine	Calc ..... Calcareous
VLo ..... Very Loose	0- 4	Vso.. Very Soft	0 - 0.25	<2	Dk ... Dark .....Bk ....Black	Si ..... Silt, Silty	M ....Medium	Lig ..... Lignite
Lo ..... Loose	4-10	So.... Soft	0.25 - 0.5	2 - 4	G ..... Grey ....Bl ....Blue	Sa .... Sand, Sandy	Co....Coarse	Org ..... Organic
MDe ..... Med. Dense	10-30	Mst.. Stiff	0.5 - 1.0	4 - 8	T ..... Tan .....Gr ....Grenn	Ls .... Limestone	Si.....Silty	Lam ..... Laminate
De ..... Dense	30-50	St..... Stiff	1.0 - 2.0	8 - 15	R ..... Red .....Y .....Yellow	Gr .... Gravel		Sls ..... Slickensided
VDe ..... Very Dense	>50	VSt.. Very Stiff	2.0 - 4.0	15 - 30	Rdish.Reddish.Wh ...White	SiS ... Siltstone		SL ..... Slightly
		H..... Hard	> 4.0	>30		SS .... Sandstone		Sm(s) ... Seam (s)
						Sh..... Shale, Shaley		Nod ..... Nodules

Sample Interval - TEST ASSIGNMENT	SAMPLE NO. Recovery	DEPTH FT.	SAMPLES	STRATUM DESCRIPTION: CONDITION OR CONSISTENCY	COLOR	MINOR MATERIALS OR ADJECTIVES	PREDOMINATE MATERIAL	CHARACTERISTICS OR MODIFICATIONS	STANDARD PENETROMETER: SEAT - 6"	1st - 6"	2nd - 6"	UNIFIED SOIL CLASSIFICATION	N - VALUE OR HAND PENETROMETER
0													
0-5	4'			0-2	Br, Lt.Br, Lt.Rd Br	Si	Sa	Silty sand, trace clay & roots, trace fine rnd ore gravel,				moist	(0-2)
SM 2'		2		2-10'	Rd Br, Yllw Br	Si, Gr	Cl	Clay - some silt, trace vf. sand, trace coarse iron ore concretions,				moist	(2-5)
CL													
5-10	1.5'											moist	(5-10)
								- some vf. sand, ironstone layer @ 6-6.5					
10'													
		10						clayey vf to f					
10-15	1'			10'-16'	Rd Br, Lt. Br	Si Cl	Sa	Silty Sand with clay in thin lenses, trace cemented clayey sand				V. Moist	(10-15)
SC-SM													
15-20	1.5'				Lt. Gr & Lt. Rd Br			- clay lense @ 15' (6")				v. moist	(15-16)
16'								- ironstone layer @ 15.5' & cemented sand to 16'					
SM													
20-25	3"			16-40	Br, Lt. Rd Br	Si	Sa	Silty Sand - some ironstone				Saturated @ 16' to 40'	
					Gray			- gray @ 20'					
25-30	3"							+ some cemented clayey sand (only recovery @ 25-30')					
30-35	NR												
35-40	NR												
								B.T. @ 40'					
40'													
SC								* Split Spoon Driven from 40-41'					
40-41	1'			40-41	Gray, Dk Gray	Cl	Sa	clayey sand w/ lenses of cemented sand @ 41.5-41.75				V. Moist	40-41
								trace gypsum crystals @ 40-41'					
								* 6-6.5' collected @ 1140					
								* 15.5-16' collected @ 1215					
								* 25-30' collected @ 1230					
								* 40-41' collected @ 1300					

Type Boring HSA Dry Auger ☒ Rotary Wash ☐

SEEPAGE @ 16 FT. WHILE DRILLING, W.L. @ ___ FT. ON COMPL.
(OR) BAILED TO ___ FT. UPON COMPLETION.
W.L. @ ___ FT AND CAVED TO ___ FT. ON _____.

* GPS: 32.46544°, -94.49432 (18' W-NW of AD-28/MW-28)

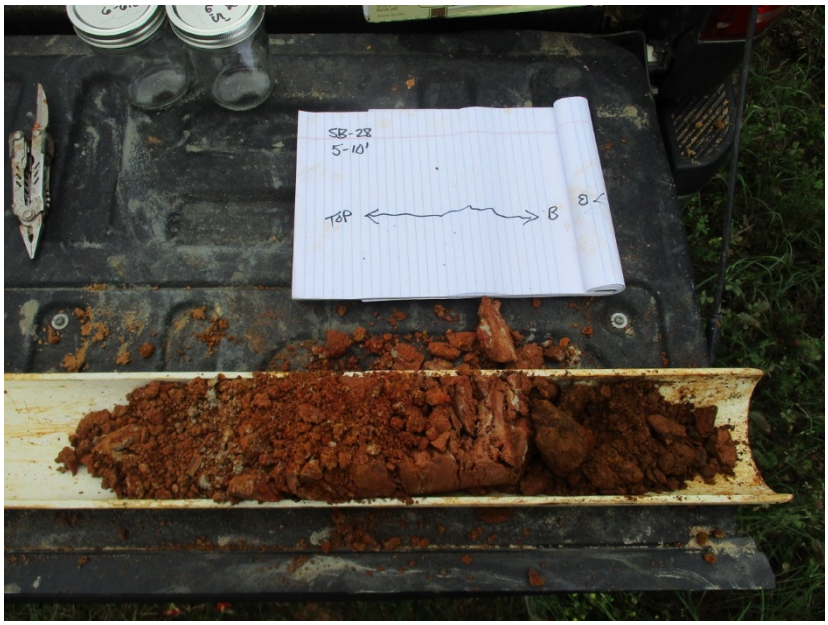
ATTACHMENT C
SB-28 Boring Photographic Log

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

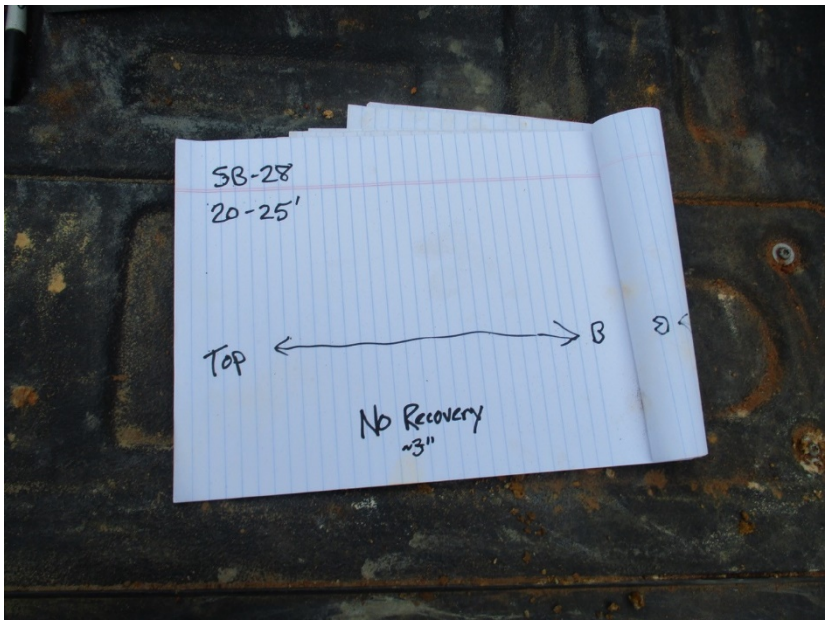
Client: American Electric Power	**Project Number: CHA8495/12A/02**
Site Name: H.W. Pirkey Plant WBAP	**Site Location: Hallsville, Texas**

Photograph 1 **Date: 4/21/2020** **Direction: N/A** **Comments:** Multiple sections of core from soil boring SB-28 advanced near downgradient monitoring well AD-28 within the Western Bottom Ash Pond (WBAP) CCR unit. 5-foot pushes were used. Note the reddish color indicating the presence of oxidized iron-bearing minerals.	
Photograph 2 **Date: 4/21/2020** **Direction: N/A** **Comments:** 0-5 foot interval of SB-28.	

Photograph 3	
Date: 4/21/2020	
Direction: N/A	
Comments: 5-10 foot interval of SB-28. Recovery of this interval was limited. A sample was collected from this interval from 6-6.5 ft. below ground surface (bgs).	

Photograph 4	
Date: 4/21/2020	
Direction: N/A	
Comments: 10-15 foot interval of SB-28. Recovery of this interval was limited.	

Photograph 5	
Date: 4/21/2020	
Direction: N/A	
Comments: 15-20 foot interval of SB-28. Recovery of this interval was limited. A sample was collected from this interval from 15.5-16 ft. bgs.	

Photograph 6	
Date: 4/21/2020	
Direction: N/A	
Comments: Field geologist's note indicating that very little of the 20-25 foot interval of SB-28 was recovered.	

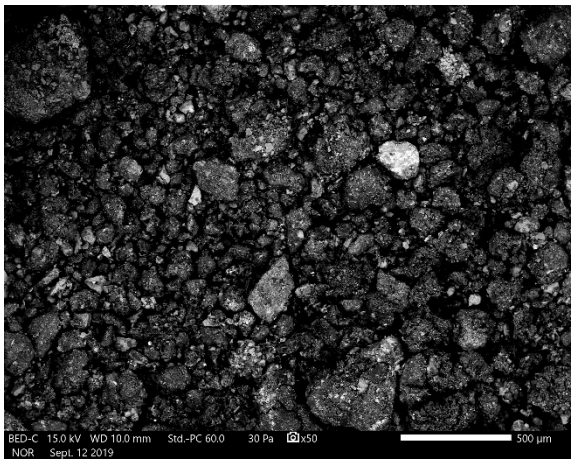
Photograph 7	
Date: 4/21/2020	
Direction: N/A	
Comments: 25-30 foot interval of SB-28. Very little of this interval was recovered. Note the color change of the soil from red to dark brown/black. A sample was collected from this interval.	

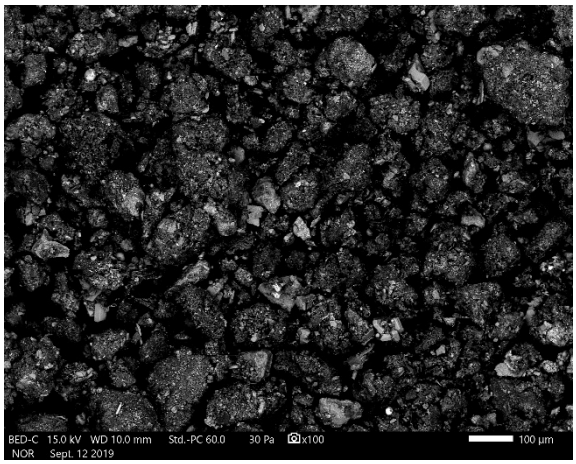
Photograph 8	
Date: 4/21/2020	
Direction: N/A	
Comments: Bottom of SB-28. The boring log indicates no recovery of soil from the 30-40 foot interval. A sample was collected from this interval.	

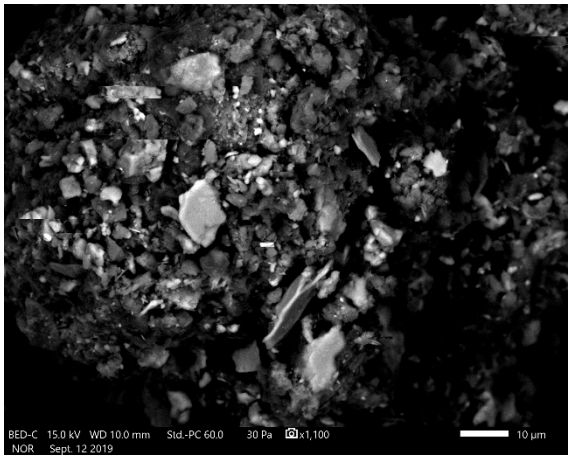
ATTACHMENT D
SEM/EDS Analysis

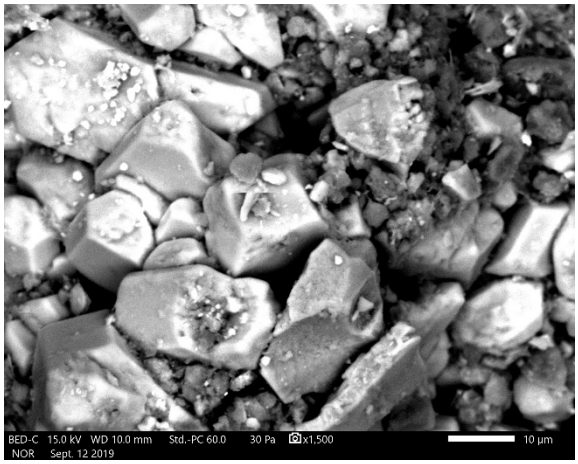
September 16, 2019

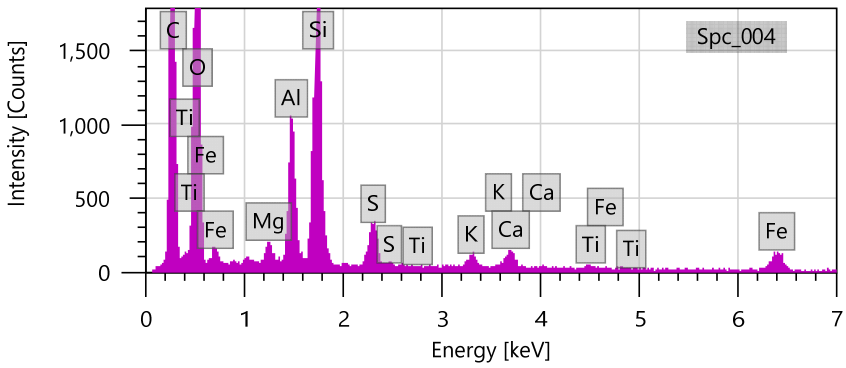
Dr. Bruce Sass
941 Chatham Lane, Suite 103, Columbus, OH 43221
via Email: BSass@geosyntec.com



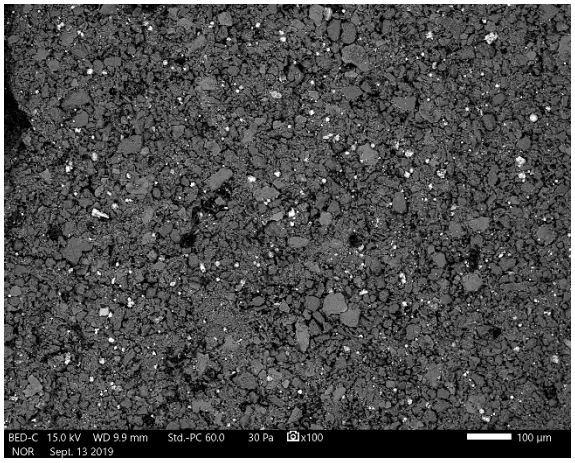


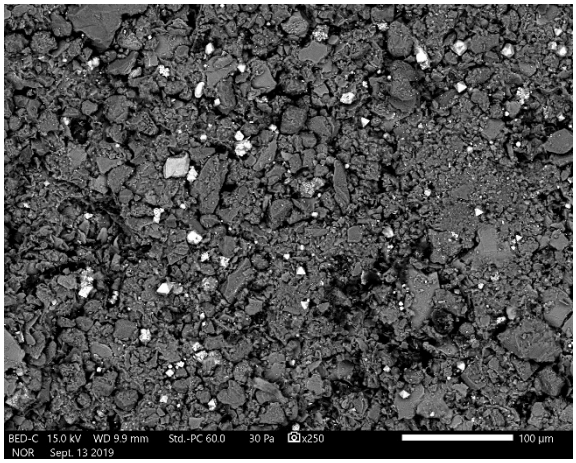


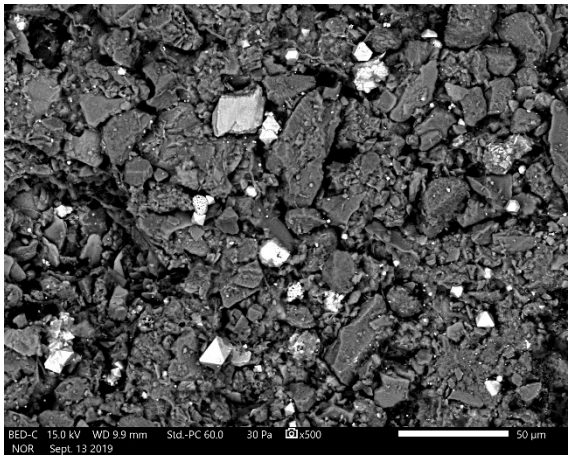


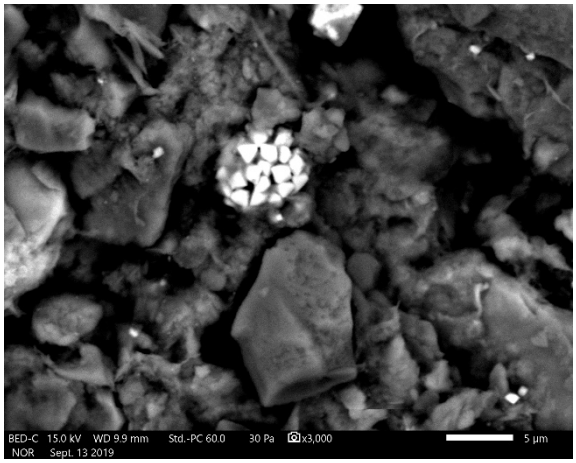


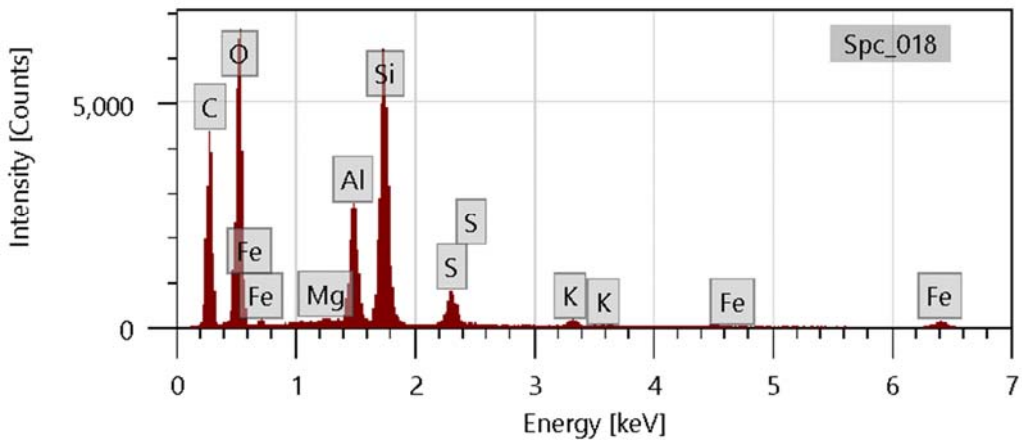
Lignite. Backscattered electron micrographs show the sample at 100X, 1,100X, and 1,500X. EDS spectrum at bottom is an area scan of the region shown in top right micrograph. Bright particles are mostly quartz and feldspar. Major peaks for carbon, oxygen, silicon, and aluminum suggest coal and clay.





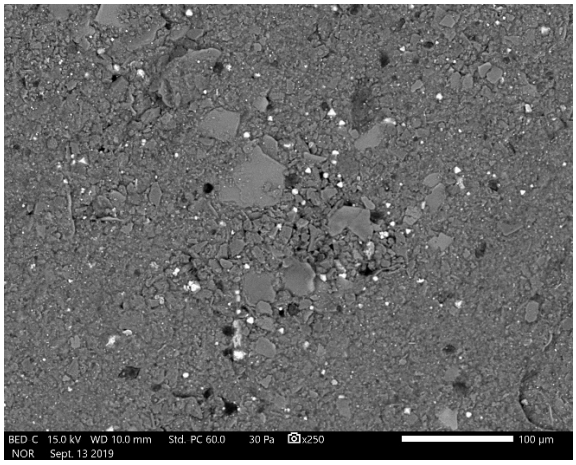


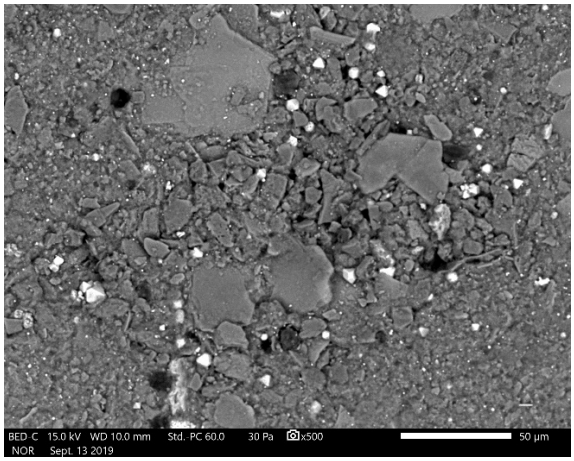


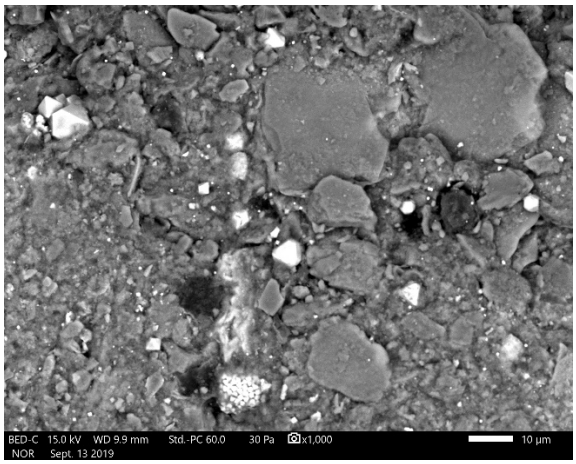


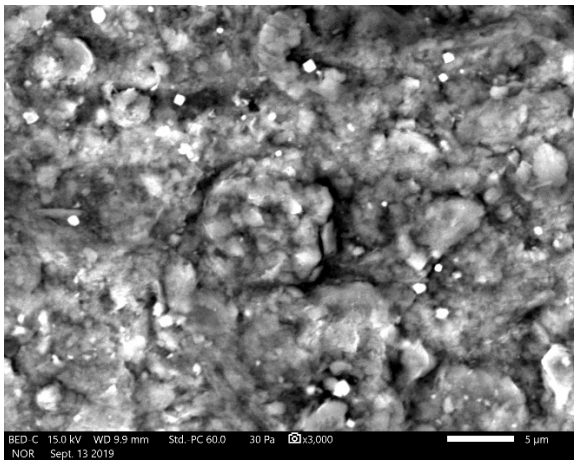
Sample VAP B3 40-45. Backscattered electron micrographs show the sample at 100X, 250X, 500X, and 3000X. EDS spectrum at bottom is an area scan of the region shown at 500X. Bright particles are pyrite (framboid in bottom right micrograph). Major peaks for carbon, oxygen, silicon, and aluminum suggest coal and clay.

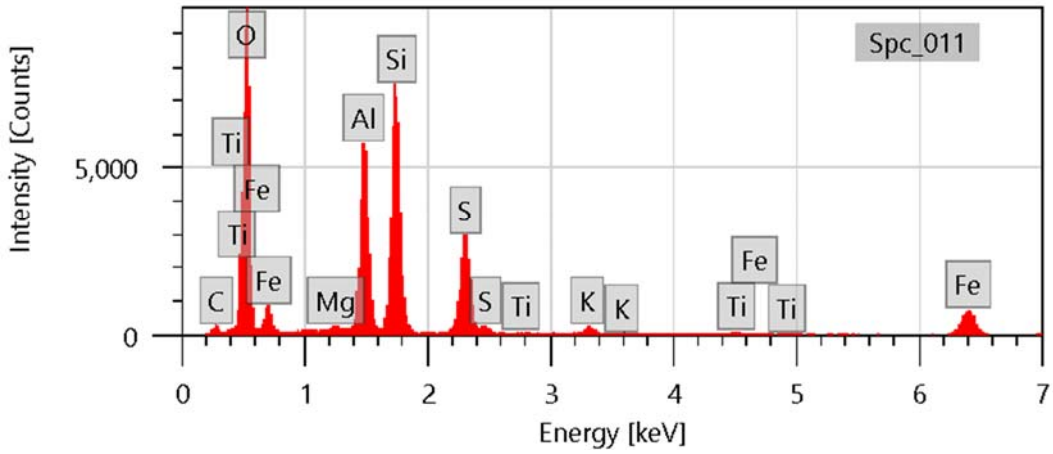
Geosyntec
CTLGroup 150350











Sample VAP B3 50-55. Backscattered electron micrographs show the sample at 250X, 500X, 1000X, and 3000X. EDS spectrum at bottom is an area scan of the region shown at 3000X. Bright particles are mostly pyrite (framboid in bottom left micrograph); occasional particles of Fe-Ti oxide are detected. Major peaks for oxygen, silicon, and aluminum suggest clay. Large blocky particles are mostly quartz, feldspar, and clay.

ATTACHMENT E
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 CCR management area of the former Pirkey West Bottom Ash Pond 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	Texas	June 3, 2024
License Number	Licensing State	Date

Geosyntec consultants

engineers | scientists | innovators

ALTERNATIVE SOURCE DEMONSTRATION REPORT

2024 1st SEMIANNUAL EVENT

TEXAS STATE CCR RULE

H.W. Pirkey Power Plant
West Bottom Ash Pond
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

Geosyntec consultants

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS

LIST OF ACRONYMS

Å	angstrom
amsl	above mean sea level
ASD	alternative source demonstration
bgs	below ground surface
CCR	coal combustion residuals
EBAP	East Bottom Ash Pond
EDS	energy-dispersive spectroscopy
EPRI	Electric Power Research Institute
ft	feet
GWPS	groundwater protection standard
LCL	lower confidence limit
mg/kg	milligram per kilogram
mg/L	milligram per liter
SEM	scanning electron microscopy
SPLP	Synthetic Precipitation Leaching Procedure
SSL	statistically significant level
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
USEPA	United States Environmental Protection Agency
VAP	vertical aquifer profiling
WBAP	West Bottom Ash Pond
XRD	X-ray diffraction

1. INTRODUCTION AND SUMMARY

This alternative source demonstration (ASD) report has been prepared to address a statistically significant level (SSL) for cobalt in the groundwater monitoring network for the former West Bottom Ash Pond (WBAP), 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 (**Figure 1**). Three of the units, including the former WBAP, have been closed by removal, and one unit is still active.

In April 2024, a semiannual assessment monitoring event was conducted at the former WBAP in accordance with the Texas Administrative Code (TAC), Title 30, §352.951(a) [30 TAC §352.951(a)]. The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. Confidence intervals were recalculated for the Appendix IV parameters at the compliance wells to assess whether these parameters were present at SSLs above the groundwater protection standards (GWPSs). An SSL was concluded if the lower confidence limit (LCL) of a parameter exceeded the GWPS (i.e., if the entire confidence interval exceeded the GWPS). The following SSL was identified at the former WBAP (Geosyntec 2024c):

- The LCL for cobalt exceeded the GWPS of 0.00900 milligrams per liter (mg/L) at AD-28 (0.0131 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 (Geosyntec) has prepared this ASD report to document that the SSL identified for cobalt at AD-28 is from a source other than the former WBAP.

1.2 Demonstration of Alternative Sources

An evaluation was completed to assess possible alternative sources to which the identified SSLs 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 Source (i.e., anthropogenic impacts)

A demonstration was conducted to show that the SSL identified for cobalt at AD-28 was based on a Type IV cause and not by a release from the former Pirkey WBAP.

2. SUMMARY OF SITE CONDITIONS

The WBAP design and construction, regional geology and site hydrogeology, and groundwater monitoring system and flow conditions are described below.

2.1 WBAP Design and Construction

The WBAP was a 30.9-acre CCR surface impoundment located at the north end of the Pirkey Plant, immediately west of the East Bottom Ash Pond (EBAP) (**Figure 1**). It was constructed while the Pirkey Plant was being developed in 1983 and 1984 and placed into operation in 1985 to receive bottom ash and economizer ash sluiced from the Plant boiler (Arcadis 2016). Pirkey Power Plant placed CCR and non-CCR waste streams into the pond complex, alternating between the EBAP and WBAP. Bottom ash generated at the plant was sluiced to one of the ponds (the active pond) until it was close to full. Bottom ash in the inactive pond was drained and dewatered, and then removed from the pond. Dry ash was loaded into trucks and transported to the Landfill. It typically took approximately twelve months for the active pond to fill, at which time the second pond (which has been emptied of bottom ash) became the active pond, and the first pond was drained.

A Closure Plan was developed in October 2016 and revised in December 2021 (AEP 2021). This document detailed the closure activities which were to take place throughout the closure of the WBAP. AEP submitted a certified notification that the receipt of CCR materials had ceased as of March 30, 2022 and the closure activities had been initiated (AEP 2022). At that time, the WBAP commenced closure by removal in accordance with the Closure Plan, with CCR material removal occurring from April to June of 2022. The final inspection for CCR material removal was completed on July 26, 2022. On May 5, 2023, the WBAP was certified closed by removal in accordance with 30 TAC §352.1221 and the most recent Closure Plan, and notification was placed in the Operating Record (AEP 2023a).

The former WBAP was constructed with compacted clay embankments around the pond perimeter and a compacted clay liner over the pond base (Arcadis 2016). Multiple lithological borings advanced following installation of the clay liner confirmed that at least 6 feet of clay was present below the base of the former EBAP (Arcadis 2016). The bottom elevation of the former WBAP was approximately 347 feet above mean sea level (ft amsl), and the elevation of the top of the pond embankment was approximately 357 ft amsl prior to pond closure.

2.2 Regional Geology / Site Hydrogeology

The former WBAP was positioned on an outcrop of the Eocene-age Recklaw Formation, which consists predominantly of clay and fine-grained sand (Arcadis 2016). 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 found beneath an upper silty to silty sandy clay layer in the vicinity of the former WBAP is considered to be the Uppermost Aquifer below this CCR unit (Arcadis, 2016). Here it is approximately 15-feet thick and located between an elevation of 325 and 340 feet mean sea level.

2.3 Groundwater Monitoring History and Flow Conditions

The monitoring well network for the former WBAP monitors groundwater within the Uppermost Aquifer. Geologic cross-section A-A' from the Arcadis (2016), provided as **Attachment A**, shows the subsurface structure of the uppermost aquifer (indicated on the figure as clayey silty sand, tan to gray) underlying the former WBAP and the former EBAP. Geologic cross-section A-A' demonstrates lateral continuity of the uppermost aquifer spanning the entire length of the former WBAP.

Groundwater flow direction in the area of the former WBAP is west-southwesterly (**Figure 1**). Seasonal variability in groundwater flow has not been observed since the monitoring well network was installed. Groundwater flow through the Uppermost Aquifer contains a hydraulic gradient of approximately 0.01 feet per foot. The monitoring well network for the former WBAP unit consists of upgradient monitoring wells AD-3, AD-12, and AD-18 and compliance wells AD-17, AD-28, and AD-30, all of which are screened within the Uppermost Aquifer at depths ranging from 10 to 57 feet below ground surface (ft bgs) (301 to 348 ft amsl). Groundwater elevations at the unit have ranged from approximately 320 to 375 ft amsl (approximately 10 to 35 ft bgs depending on well location).

3. ALTERNATIVE SOURCE DEMONSTRATION

The ASD evaluation method and proposed alternative source of cobalt in AD-28 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 cobalt 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 have been attributed to natural variation associated with the underlying geology, which is a Type IV (natural variation) issue.

Monitoring well AD-28 is located near the southwest corner of the former WBAP, as shown in **Figure 1**. Previous ASDs for cobalt at the former WBAP provided evidence that cobalt is present in the aquifer geologic media at the site and that the observed cobalt concentrations in groundwater were due to natural variation of native geogenic sources (Geosyntec 2019a, Geosyntec 2019b, Geosyntec 2020a, Geosyntec 2020b, Geosyntec 2021, Geosyntec 2022, Geosyntec 2023, Geosyntec 2024a, Geosyntec 2024b). The previous ASDs discussed how the former WBAP did not appear to be a source for cobalt in downgradient groundwater, based on observed concentrations of cobalt both in the ash material and in leachate from Synthetic Precipitation Leaching Procedure (SPLP) analysis (SW-864 Test Method 1312, [United States Environmental Protection Agency, USEPA 1994]) of the ash material. Cobalt was not detected in the most recent SPLP ash leachate sample, collected in 2019, below the reporting limit of 0.01 mg/L, which is lower than the average concentration at AD-28 (0.0142 mg/L) (**Table 1**).

Cobalt was detected at a concentration of 0.000501 mg/L in a surface water sample previously collected from the WBAP on November 4, 2020. Cobalt was also detected in a surface water sample collected on February 28, 2023 from the EBAP at a concentration of 0.0035 mg/L (**Table 1**). Both the WBAP and EBAP have been closed by removal since the samples were collected (AEP 2023a, AEP 2023b). As discussed in Section 2.1, the EBAP and WBAP had historically received the same process water, with the use of each pond dependent on available freeboard and cleaning schedule; thus, there is a basis for the equivalency between these two surface water samples. These concentrations are lower than the reported cobalt concentrations for downgradient network wells from the most recent sampling event (**Figure 2**). Additionally, both pond surface water samples were over an order of magnitude lower than the average concentration observed at AD-28 (**Table 1**). Thus, the former WBAP is not the likely source of cobalt at AD-28.

As noted in the previous ASDs, soil samples collected across the site, including from locations near the former WBAP, identified cobalt in the aquifer solids at concentrations ranging from non-detect to 23.5 milligrams per kilogram (mg/kg) with the highest value reported at AD-41, which is upgradient of the WBAP and EBAP (**Figure 3**). SB-28 was advanced in the vicinity of AD-28

in April 2020 to re-log the geology at AD-28 and collect samples for laboratory analysis of total metals and mineralogy. The SB-28 field boring log, which was generated by Auckland Consulting LLC, is provided as **Attachment B**. Cobalt was identified at SB-28 at concentrations of 4.53 mg/kg at 15.5-16 ft bgs and 8.70 mg/kg at 40-41 ft bgs (**Table 2**). The 15.5-16 ft bgs interval at SB-28 correlates to the depth of the monitoring well screen of AD-28 (15-35 ft bgs), indicating that naturally occurring cobalt is present in aquifer solids within the AD-28 screened interval.

In addition to the analysis of total cobalt, soil samples were submitted for mineralogical analysis to evaluate the presence of cobalt-containing minerals. X-ray diffraction (XRD) analysis of soils from SB-28 identified pyrite (an iron sulfide mineral) in samples collected at 25-30 ft bgs and 40-41 ft bgs at concentrations up to 3% by weight (**Table 3**). Cobalt is known to undergo isomorphic substitution for iron in crystalline iron minerals such as pyrite due to their similar ionic radii of approximately 1.56 angstrom (Å) for iron vs. 1.52 Å for cobalt (Clementi and Raimondi 1963, Krupka and Serne 2002, Hitzman et al. 2017). The presence of iron-bearing minerals in soil near the former WBAP constitutes a potential source of naturally occurring cobalt.

The aquifer solids at SB-28 are distinctly red in color at shallow depths, as illustrated in the photolog of soil cores provided in **Attachment C**. Red color in soils is often associated with the presence of oxidized iron-bearing minerals such as hematite and goethite. Goethite, an iron oxide mineral (FeOOH), was present at depths up to 16 ft bgs at SB-28 at up to 37% of the total aquifer solids (**Table 3**). The weathering of 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). Pyrite weathering processes likely result in the release of isomorphically substituted cobalt from the pyrite crystal structure as the mineral undergoes oxidative weathering to iron oxide minerals.

As described in previous ASDs for the former WBAP, vertical aquifer profiling (VAP) was completed in May 2019 to collect groundwater samples from upgradient locations B-2 and B-3 during the soil boring and sample collection process (Geosyntec 2019b). A groundwater sample was also collected from AD-30, one of the existing compliance wells within the WBAP groundwater monitoring network. Solid phase materials within these groundwater samples were separated and submitted for analysis of chemical composition and mineralogy. For the VAP samples, separation was completed using a centrifuge due to the high abundance of solids. For the groundwater sample at AD-30, the sample was filtered using a 1.5-micron filter. Based on total metals analysis, cobalt was identified both in the centrifuged solid material collected from upgradient VAP location B-3 [VAP-B3-(40-45)] and in the material retained on the filter after processing groundwater from permanent monitoring wells AD-30, B-2, and B-3 (**Table 2**). The concentrations of cobalt in the solid material retained after filtration were comparable to the bulk soil samples collected from the same locations.

The solid sample [VAP-B3-(40-45)] was submitted for mineralogical analysis via XRD and scanning electron microscopy (SEM) using an energy dispersive spectroscopic analyzer (EDS). The XRD results identified pyrite as approximately 3% of the solid phase (**Table 4**). Pyrite was

identified during SEM/EDS analysis of lignite which is mined immediately adjacent to the site. Logging completed while the VAP boring was advanced identified coal at several intervals, including 45 and 48 ft bgs (**Figure 4**). Furthermore, SEM/EDS of both centrifuged solid samples [VAP-B3-(40-45) and VAP-B3-(50-55)] identified pyrite in backscattered electron micrographs by the distinctive framboidal morphology (Harris et al. 1981, Sawlowicz 2000). Major peaks involving iron and sulfur were identified in the EDS spectrum, which further support the identification of pyrite (**Attachment C**). While cobalt was not identified in the EDS spectrum, it is likely present at concentrations below the detection limit.

The former WBAP was not identified as the source of cobalt at wells in the WBAP monitoring well network based on the low concentrations of cobalt in the pond itself and the ubiquity of naturally occurring cobalt in the aquifer formation, especially in soil and groundwater samples upgradient from the WBAP. Cobalt in the WBAP network groundwater is believed to be a result of natural variability within the aquifer. Naturally occurring cobalt is known to substitute for iron in iron-bearing minerals. The presence of iron sulfide (as pyrite) and iron oxides/hydroxides has been confirmed at AD-28 and across the Site. The presence of these aquifer minerals suggests that weathering of pyritic minerals may be providing a source for aqueous cobalt in groundwater.

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 SSL for cobalt identified at AD-28 during assessment monitoring in April 2024 was not due to a release from the former WBAP. The identified SSL should instead be attributed to natural variation in the underlying geology, including the presence of pyrite and goethite in the solid aquifer material. Therefore, no further action is warranted. Certification of this ASD by a qualified professional engineer is provided in **Attachment E**.

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TABLES

Table 1. Summary of Key Cobalt Analytical Data
Alternative Source Demonstration Report
West Bottom Ash Pond – H.W. Pirkey Plant

Sample	Sample Date	Unit	Cobalt Concentration
Bottom Ash (Solid Material)	2/11/2019	mg/kg	5.8
Texas-Specific Soil Background Concentration			7
SPLP Leachate of Bottom Ash	2/11/2019	mg/L	<0.01
WBAP Pond Water	11/4/2020		0.000501
EBAP Pond Water	2/28/2023		0.0035
AD-28 - Average	May 2016 - April 2024		0.0140
Site-Specific Groundwater Protection Standard			0.00900

Notes:

1. Texas-specific soil background concentration from table in 30 TAC 350.51(m). (30 TAC Chapter 350 covers the Texas Risk Reduction Program rules.)

2. The average value for AD-28 was calculated using all cobalt data collected under 40 CFR 257 Subpart D.

3. Site-specific Groundwater Protection Standard from "Statistical Analysis Summary - 2024 1st Semiannual Event. West Bottom Ash Pond. H.W. Pirkey Plant" (Geosyntec 2024).

EBAP: East Bottom Ash Pond

mg/kg: milligrams per kilogram

mg/L: milligrams per liter

SPLP: synthetic precipitation leaching procedure

WBAP: West Bottom Ash Pond

Table 2. Soil Cobalt Data
Alternative Source Demonstration Report
West Bottom Ash Pond – H.W. Pirkey Plant

Location ID	Location	Sample Depth (ft bgs)	Cobalt (mg/kg)
Bulk Soil Samples			
AD-28	WBAP Network	6-6.5	< 2.38
		15.5-16	4.53
		25-30	< 2.50
		40-41	8.70
AD-30	WBAP Network	7	1.00
		23	15.0
B-2	Upgradient	10	2.36
		16	3.62
		71	10.30
		82	7.21
		87	3.11
B-3	Upgradient	10	1.30
		20	0.59
		97	1.11
AD-41	Upgradient	15	<1.0
		35	23.5
		95	1.90
Solid Material Retained After Filtration			
AD-30	WBAP Network	15-25	9.3 J
B-2	Upgradient	38-48	4.3 J
B-3	Upgradient	29-34	12.0
		VAP 40-45	18.0

Notes:
1. For AD-28 and AD_30, samples were collected from additional boreholes advanced in the immediate area of the location identified by the well ID. Samples were not collected from the cuttings of the borings advanced for well installation.
2. Samples at B-2, B-3, and AD-41 were collected from cores removed from the borehole during well lithology logging.
3. Depths for samples collected after filtration represent the screened interval for the permanent well where the sample was collected.
ft bgs: feet below ground surface
J: Estimated value. Result is less than the reporting limit but greater than or equal to the method detection limit.
mg/kg: milligrams per kilogram
VAP: vertical aquifer profile
WBAP: West Bottom Ash Pond

Table 3. AD-28 Mineralogy Results
Alternative Source Demonstration Report
West Bottom Ash Pond – H. W. Pirkey Plant

Boring ID	**SB-28 (AD-28)**			
Sample Depth Interval	6-6.5	15.5-16	25-30	40-41
Sample Location	Above Screened Interval	Within Screened Interval		Below Screened Interval
Color	Red-brown to yellow-brown	Light gray, light red-brown	Brown, light red-brown	Gray to dark gray
Mineralogy				
Quartz	58%	46%	73%	34%
Pyrite	--	--	3%	3%
K-Feldspar	--	1%	1%	1%
Siderite	--	--	2%	52%
Goethite	37%	15%	--	--
Anhydrite	--	--	--	2%
Clay/Mica	5%	38%	21%	8%

Notes:
1. Sample depths are shown in feet below ground surface (ft bgs)
2. Well AD-28 is screened from 15-35 ft bgs.
3. Mineralogical components are shown in relative percent (%) abundance.

Table 4. B-3 X-Ray Diffraction Results
Alternative Source Demonstration Report
West Bottom Ash Pond – H. W. Pirkey Plant

Constituent	VAP-B3-(40-45)
Quartz	15
Plagioclase Feldspar	0.5
Orthoclase	ND
Calcite	ND
Dolomite	ND
Siderite	0.5
Goethite	ND
Hematite	2
Pyrite	3
Kaolinte	42
Chlorite	4
Illite/Mica	6
Smectite	12
Amorphous	15

Notes:

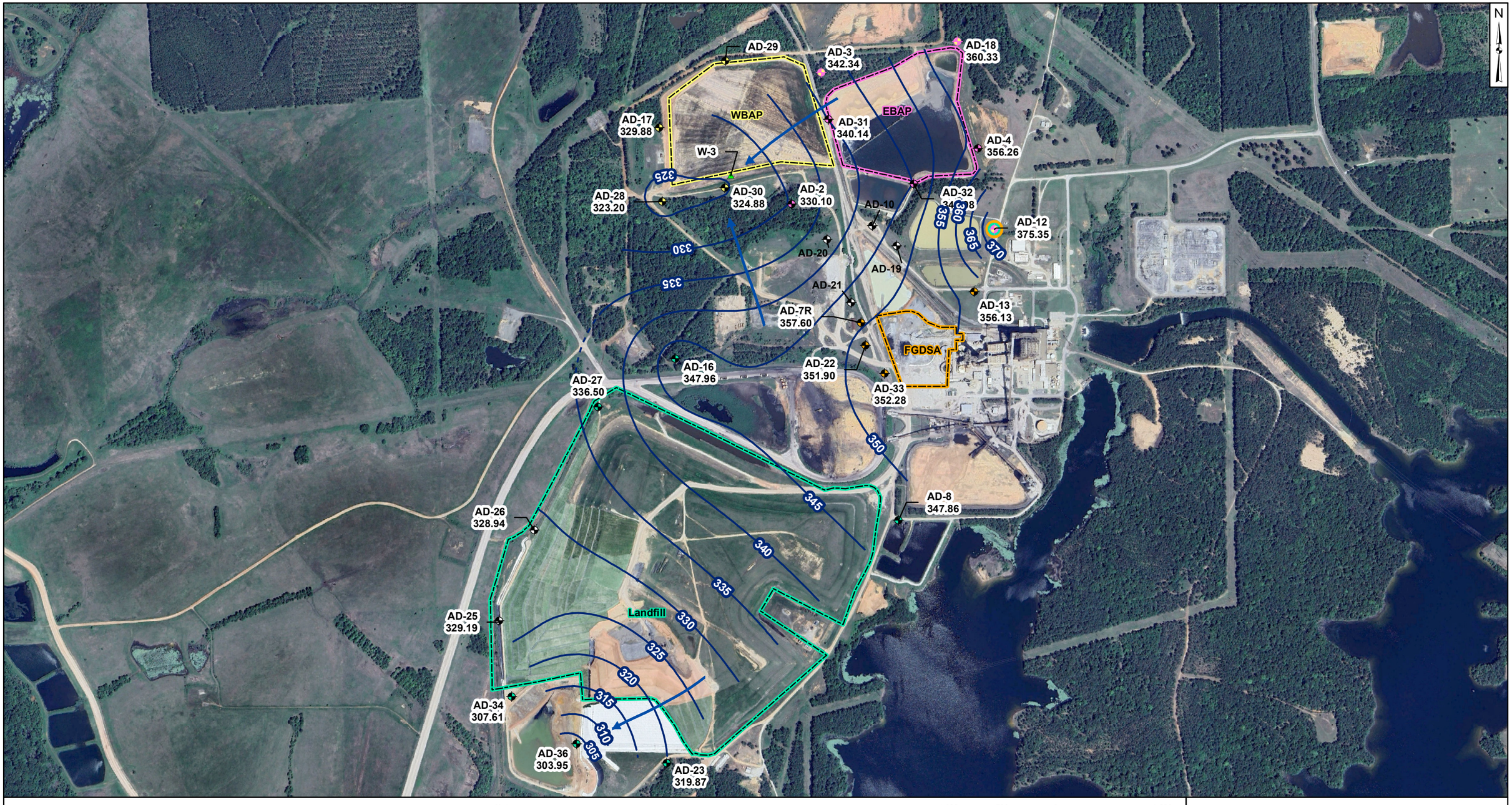
1. Results given in units of relative percent (%) abundance.

2. VAP-B3-(40-45) represents the centrifuged solid material from the groundwater sample collected at that interval.

ND: not detected

VAP: vertical aquifer profiling

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.

1,000 500 0 1,000 Feet

Beth Ann Gross

August 19, 2024
Geosyntec Consultants, Inc.
Texas Firm Registration
No. 1182

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED
PROFESSIONAL ENGINEER

Potentiometric Contours: Uppermost Aquifer April 2024

AEP Pirkey Power Plant
Hallsville, Texas

Geosyntec consultants

Columbus, Ohio | 2024/07/19

Figure 1

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Pirkey\2024\AEP-Pirkey_GW_2024-04Pirkey.mxd. Okiemute.Commander. 7/19/2024. Project/Phase/Task.

WBAP	Results (mg/L)
	0.000501

AD-3	Results (mg/L)
	0.00357

EBAP	Results (mg/L)
	0.00128

B-2	Results (mg/L)
	0.00691

AD-18	Results (mg/L)
	0.000851

AD-17	Results (mg/L)
	0.00199

AD-40*	Results (mg/L)
	0.000799

AD-41*	Results (mg/L)
	0.00801

B-3	Results (mg/L)
	0.00486

AD-30	Results (mg/L)
	0.0033

AD-28	Results (mg/L)
	0.013

AD-12	Results (mg/L)
	0.00108

AD-29, AD-3, AD-18, B-2, AD-40, AD-31, WBAP, EBAP, AD-17, HPT-05, AD-4, AD-41, W-3, B-3, AD-30, Clearwater Pond, AD-32, AD-37, AD-28, AD-2, AD-42, AD-43, AD-10, AD-12, AD-20, AD-19, AD-44, AD-45, HPT-09, AD-15, AD-13, AD-38, AD-21, AD-7R, Stack Out Area

N

Legend

- Out of Network
- EBAP
- WBAP
- Landfill
- Stackout Area
- EBAP and WBAP
- All CCR Unit Networks
- Piezometer
- EBAP
- Stack Out Area
- WBAP

Notes
- Monitoring well coordinates, site features, and data provided by AEP.
- AD-15 location is approximated.
- Samples collected in April 2024.
- * - Well most recently sampled August 2019.
- AD-29 included in the well network for water level measurements only.
- WBAP surface water results shown for November 2020 sample. EBAP surface water results shown for June 2022 sample.

400 200 0 400
Feet

Aqueous Cobalt Distribution

AEP Pirkey Power Plant
Hallsville, Texas

Geosyntec consultants

Columbus, Ohio | September 2024

Figure 2

\\annarbor-01\Data\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Pirkey\2023\20240116_AEP_WBAP_Pirkey_Cobalt.mxd. ASoltero. 1/16/2024. Project/Phase/Task.

Location	AD-31	
Depth (ft bgs)	12	26
Cobalt (mg/kg)	1.9	0.83
Pyrite/Marcasite (%)	2	0

Location	AD-18	
Depth (ft bgs)	8	22
Cobalt (mg/kg)	3.6	2.9
Pyrite/Marcasite (%)	1	0

Location	B-2				
Depth (ft bgs)	10	16	71	82	87
Cobalt (mg/kg)	2.36	3.62	10.30	7.21	3.11
Pyrite/Marcasite (%)	-	-	-	-	-

Location	AD-17	
Depth (ft bgs)	7	15
Cobalt (mg/kg)	3.1	1.5
Pyrite/Marcasite (%)	2	0

Location	AD-41		
Depth (ft bgs)	15	35	95
Cobalt (mg/kg)	< 1.0	23.5	1.9
Pyrite/Marcasite (%)	-	-	-

Location	AD-2	
Depth (ft bgs)	25-27	31-33
Cobalt (mg/kg)	9.45	19.2
Pyrite/Marcasite (%)	7	2

Location	B-3		
Depth (ft bgs)	10	20	97
Cobalt (mg/kg)	1.30	0.59	1.11
Pyrite/Marcasite (%)	-	-	-

Location	AD-28			
Depth (ft bgs)	6 – 6.5	15.5 - 16	25 - 30	40 - 41
Cobalt (mg/kg)	< 2.38	4.53	< 2.50	8.7
Pyrite/Marcasite (%)	0	0	3	3

Location	AD-30	
Depth (ft bgs)	7	23
Cobalt (mg/kg)	1	15
Pyrite/Marcasite (%)	3	1

Location	AD-32	
Depth (ft bgs)	11	20-25
Cobalt (mg/kg)	1.7	9.1
Pyrite/Marcasite (%)	--	--

AD-29 AD-18 B-2 AD-40 AD-17 AD-31 HPT-05 AD-4 AD-41 B-3 W-3 AD-30 AD-37 AD-28 AD-2 Clearwater Pond AD-32 AD-10 AD-12 AD-20 AD-19

WBAP EBAP

N

Legend

- Monitoring Wells
- EBAP
- WBAP

Notes
- Monitoring well coordinates provided by AEP.
- AD-2 and AD-28 samples collected on April 20, 2020
- All other data provided by AEP, 2019.
- ft bgs: feet below ground surface.
- mg/kg: milligrams per kilogram.
- -- not analyzed.
- WBAP: West Bottom Ash Pond
- EBAP: East Bottom Ash Pond

300 150 0 300 Feet

Cobalt Distribution in Soil

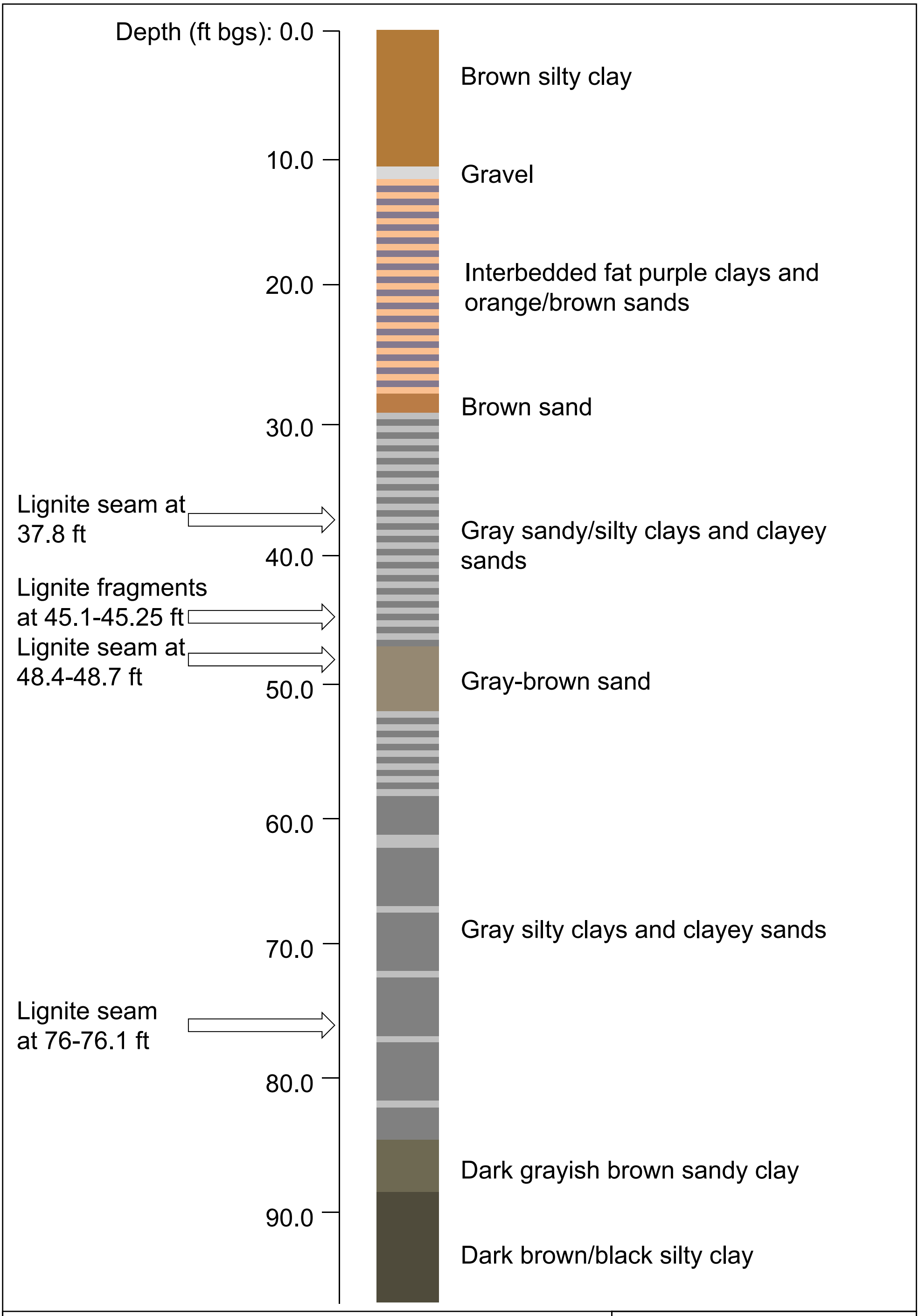
AEP Pirkey Power Plant
Hallsville, Texas

Geosyntec consultants

Columbus, Ohio | September 2024

Figure 3

\\annarbor-01\Data\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Pirkey\2023\20240116 Pirkey_SoilChem_minerals.mxd. ASoltero. 1/16/2024. Project/Phase/Task.



Notes:
- Ft = feet
- Bgs = below ground surface
- Boring completed May 2019
- Total depth of 97.5 ft bgs
- Well installed in offset boring screened at 29-34 ft bgs

B-3 Visual Boring Log

AEP Pirkey Power Plant
Hallsville, TX

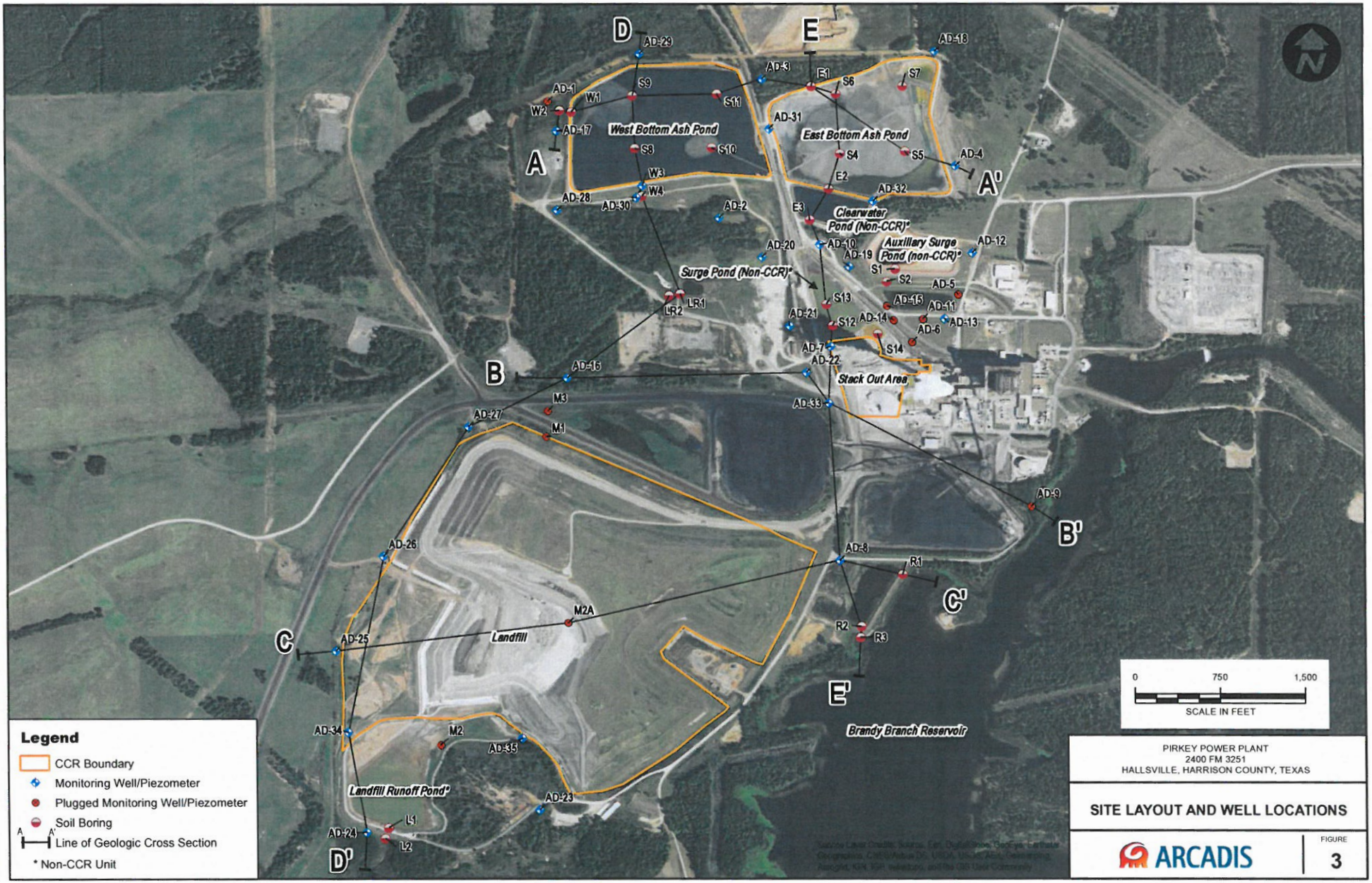
Geosyntec consultants

CHA8495B | September 2024

Figure 4

\\annarbor-01\data\Projects\AEP\Legal Department - ASD Review\Pirkey\2019-05 Field Investigation\Field Forms\Compiled Boring Logs\Visual boring logs

ATTACHMENT A
Geologic Cross Section A-A’



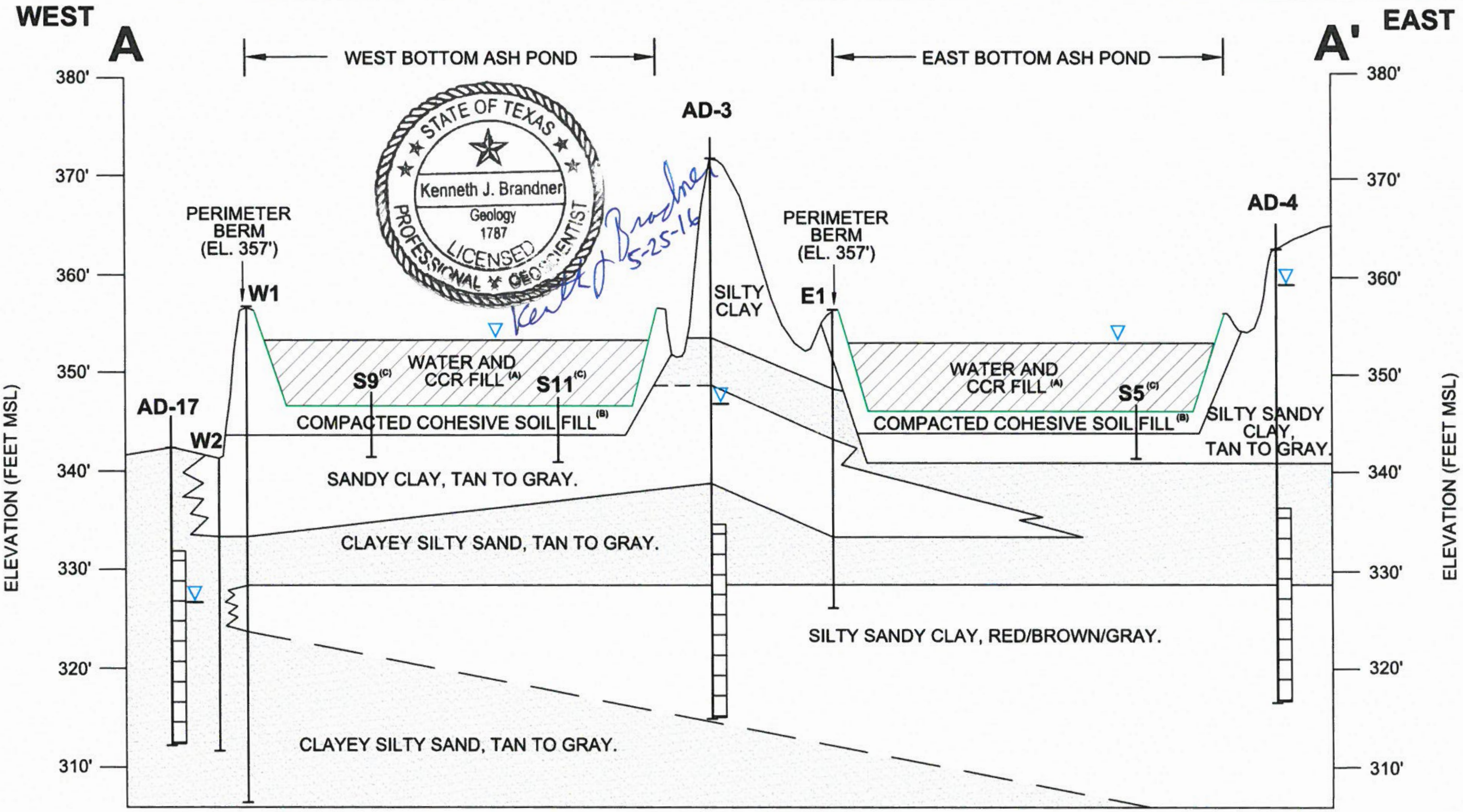
PIRKEY POWER PLANT
2400 FM 3251
HALLSVILLE, HARRISON COUNTY, TEXAS

SITE LAYOUT AND WELL LOCATIONS

ARCADIS

FIGURE 3

Document Path: Z:\GIS\PROJECTS_ENV\AEP\Pirkey Plant\MXD\Figure 3 - Site Layout and Well Locations.mxd



LEGEND

MONITORING WELL SCREENED INTERVAL

WATER LEVEL IN MONITORING WELL (1/20/16)

BASE OF CCR UNIT

0 300'
HORIZONTAL SCALE

NOTES:

A) TOP OF WEST BOTTOM ASH POND AND EAST BOTTOM ASH POND PERIMETER BERM ELEVATION IS 357', OPERATING ELEVATION IS 354'(JOHNSON & PACE, MAY 2011). BASE ELEVATION OF WEST BOTTOM ASH POND AND EAST BOTTOM ASH POND IS 347' (SARGENT & LUNDY, JANUARY 1983).
B) COMPACTED COHESIVE SOIL FROM ELEVATION 344' TO 347' (SARGENT & LUNDY, SEPTEMBER 1984;AMEC, AUGUST 2011).
C) SOIL BORING INSTALLED BY SOUTHWESTERN LABORATORIES DURING ASH POND CONSTRUCTION IN 1983.

PIRKEY POWER PLANT
2400 FM 3251
HALLSVILLE, HARRISON COUNTY, TEXAS

CROSS SECTION
A - A'

ARCADIS

FIGURE
4

ATTACHMENT B
SB-28 Boring Log

PROJECT NO. _____ PROJ. _____ BOR. NO. SB-28

LOCATION AS-28/MW-28 - Pirkey Power Plant ELEV. _____ DATE 4/20/20

SILTS & SANDS CONDITION		COHESIVE SOILS - CLAYS CONSISTENCY	PENETROMETER	N - VALUE
VLo	Very Loose 0-4	Vso.. Very Soft	0 - 0.25	<2
Lo	Loose 4-10	So.... Soft	0.25 - 0.5	2 - 4
MDe	Med. Dense 10-30	Mst.. Stiff	0.5 - 1.0	4 - 8
De	Dense 30-50	St..... Stiff	1.0 - 2.0	8 - 15
VDe	Very Dense >50	VSt.. Very Stiff	2.0 - 4.0	15 - 30
		H..... Hard	> 4.0	>30

COLORS	MATERIALS	SAND ADJ.	CHARACTERTICS
Li .... Light	Cl ..... Clay, Clayer	F.....Fine	Calc ..... Calcareous
Dk .... Dark	Si ..... Silt, Silty	M .....Medium	Lig ..... Lignite
G ..... Grey	Sa .... Sand, Sandy	Co....Coarse	Org ..... Organic
T ..... Tan	Ls .... Limestone	Si.....Silty	Lam ..... Laminate
R ..... Red	Gr .... Gravel		Sls ..... Slickensided
Rdish. Reddish.	SiS ... Siltstone		SL ..... Slightly
Br.....Brown	SS .... Sandstone		Sm(s) ... Seam (s)
Bk .....Black	Sh..... Shale, Shaley		Nod ..... Nodules
Bl .....Blue			
Gr .....Grenn			
Y .....Yellow			
Wh ...White			

Sample Interval - Test Assignment	SAMPLE NO. / Recovery	DEPTH FT.	SAMPLES	STRATUM DESCRIPTION: CONDITION OR CONSISTENCY	COLOR	MINOR MATERIALS OR ADJECTIVES	PREDOMINATE MATERIAL	CHARACTERISTICS OR MODIFICATIONS	STANDARD PENETROMETER: SEAT - 6"	1st - 6"	2nd - 6"	UNIFIED SOIL CLASSIFICATION	N - VALUE OR HAND PENETROMETER
0													
SM	0-5	4'		0-2	Br, Lt. Br, Lt. Rd Br	Si	Sa	Silty sand, trace clay & roots, trace fine iron ore gravel,				moist	(0-2)
2'				2-10'	Rd Br, Yllw Br	Si, Gr	Cl	Clay - some silt, trace v.f. sand, trace coarse iron ore concretions,				moist	(2-5)
CL	5-10	1.5'						- some v.f. sand, ironstone layer @ 6-6.5'				moist	(5-10)
10'								clayey v.f. to f					
	10-15	1'		10'-16'	Rd Br, Lt. Br	Si Cl	Sa	Silty Sand with clay in thin lenses, trace cemented clayey sand				V. Moist	(10-15)
SC-SM	15-20	1.5'			Lt. Gr & Lt. Rd Br			- clay lense @ 15' (6") - ironstone layer @ 15.5' & cemented sand to 16'				v. moist	(15-16)
16'													
SM	20-25	3"		16-40	Br, Lt. Rd Br	Si	Sa	Silty Sand - some ironstone				Saturated @ 16' to 40'	
					Gray			- gray @ 20'					
	25-30	3'						+ some cemented clayey sand (only recovery @ 25-30')					
	30-35	NR											
	35-40	NR											
								B.T. @ 40'					
40'													
SC	40-41	1'		40-41	Gray, Dk Gray	Cl	Sa	* Split Spoon Driven from 40-41 clayey sand w/ lenses of cemented sand @ 41.5-41.75				V. Moist 40-41	
								trace v.f. gypsum crystals @ 40-41'					
								* 6-6.5' collected @ 1140					
								* 15.5-16' collected @ 1215					
								* 25-30' collected @ 1230					
								* 40-41' collected @ 1300					

Type Boring: HSA — Dry Auger ☒ — Rotary Wash ☐

SEEPAGE @ 16' FT. WHILE DRILLING, W.L. @ ___ FT. ON COMPL.
(OR) BAILED TO ___ FT. UPON COMPLETION.
W.L. @ ___ FT AND CAVED TO ___ FT. ON _____.

* GPS: 32.46544°, -94.49432 (18' W-NW of AS-28/MW-28)

ATTACHMENT C
SB-28 Boring Photographic Log

GEOSYNTEC CONSULTANTS
Photographic Record

Geosyntec consultants

Client: American Electric Power	**Project Number: CHA8495/12A/02**
Site Name: H.W. Pirkey Plant WBAP	**Site Location: Hallsville, Texas**

Photograph 1

Date: 4/21/2020

Direction: N/A

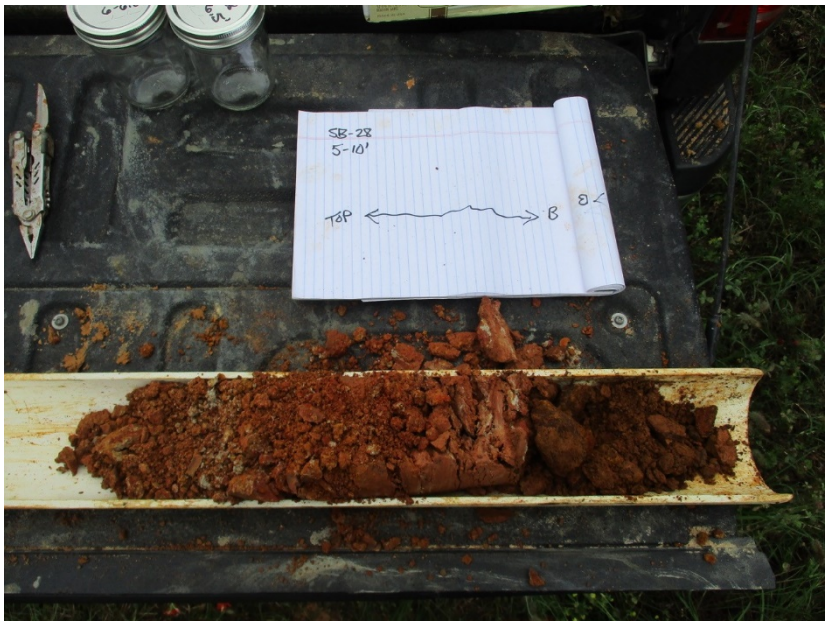
Comments:
Multiple sections of core from soil boring SB-28 advanced near downgradient monitoring well AD-28 within the Western Bottom Ash Pond (WBAP) CCR unit. 5-foot pushes were used. Note the reddish color indicating the presence of oxidized iron-bearing minerals.

Photograph 2

Date: 4/21/2020

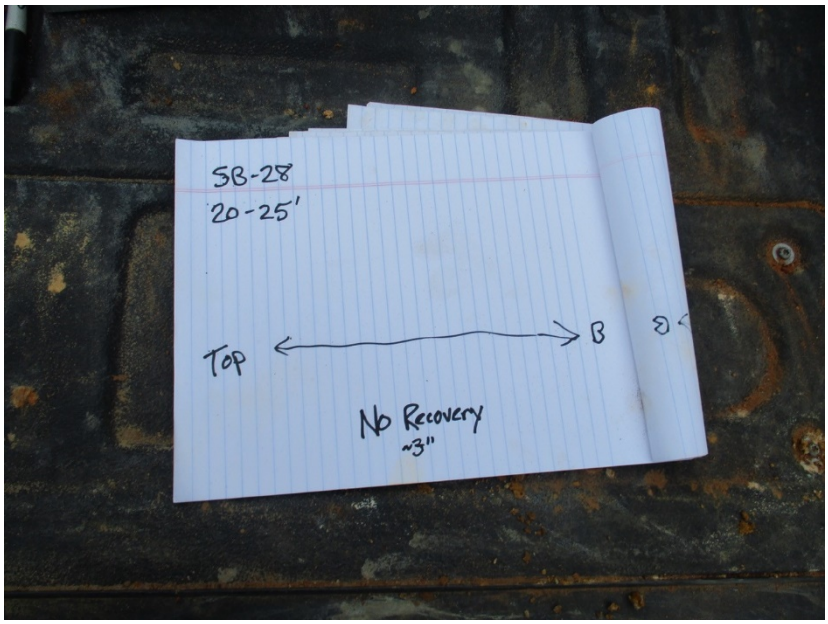
Direction: N/A

Comments:
0-5 foot interval of SB-28.

Photograph 3	
Date: 4/21/2020	
Direction: N/A	
Comments: 5-10 foot interval of SB-28. Recovery of this interval was limited. A sample was collected from this interval from 6-6.5 ft. below ground surface (bgs).	

Photograph 4	
Date: 4/21/2020	
Direction: N/A	
Comments: 10-15 foot interval of SB-28. Recovery of this interval was limited.	

Photograph 5	
Date: 4/21/2020	
Direction: N/A	
Comments: 15-20 foot interval of SB-28. Recovery of this interval was limited. A sample was collected from this interval from 15.5-16 ft. bgs.	

Photograph 6	
Date: 4/21/2020	
Direction: N/A	
Comments: Field geologist's note indicating that very little of the 20-25 foot interval of SB-28 was recovered.	

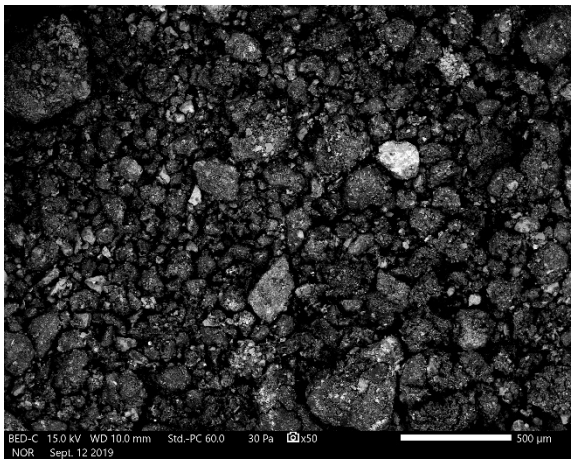
Photograph 7	
Date: 4/21/2020	
Direction: N/A	
Comments: 25-30 foot interval of SB-28. Very little of this interval was recovered. Note the color change of the soil from red to dark brown/black. A sample was collected from this interval.	

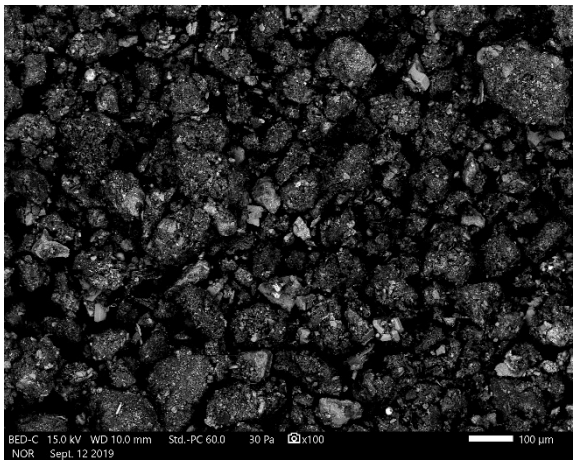
Photograph 8	
Date: 4/21/2020	
Direction: N/A	
Comments: Bottom of SB-28. The boring log indicates no recovery of soil from the 30-40 foot interval. A sample was collected from this interval.	

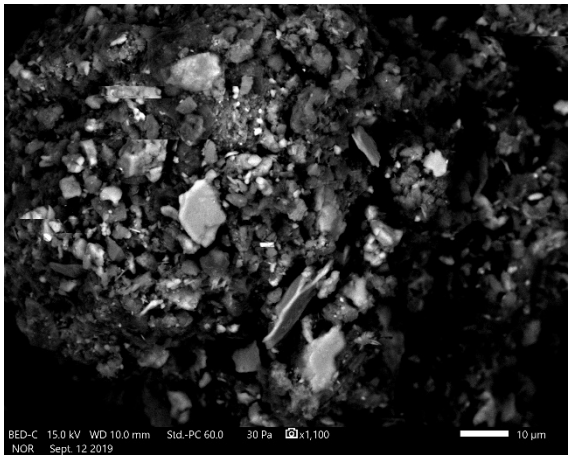
ATTACHMENT D
SEM/EDS Analysis

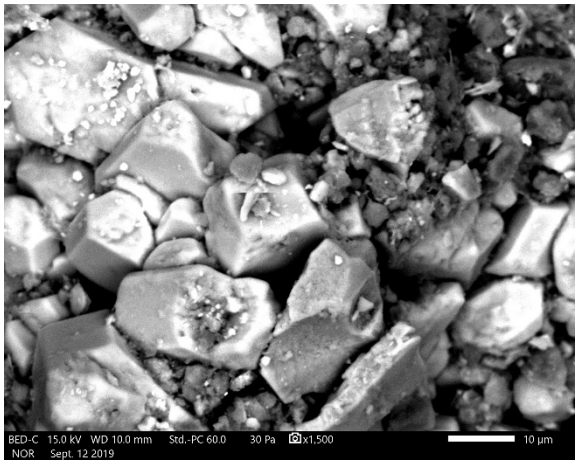
September 16, 2019

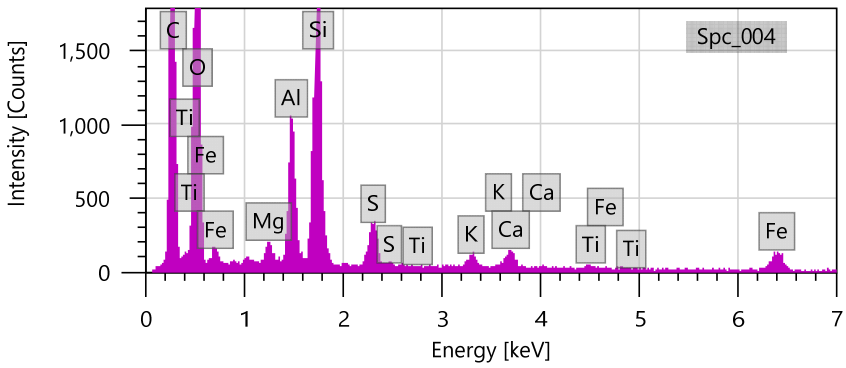
Dr. Bruce Sass
941 Chatham Lane, Suite 103, Columbus, OH 43221
via Email: BSass@geosyntec.com





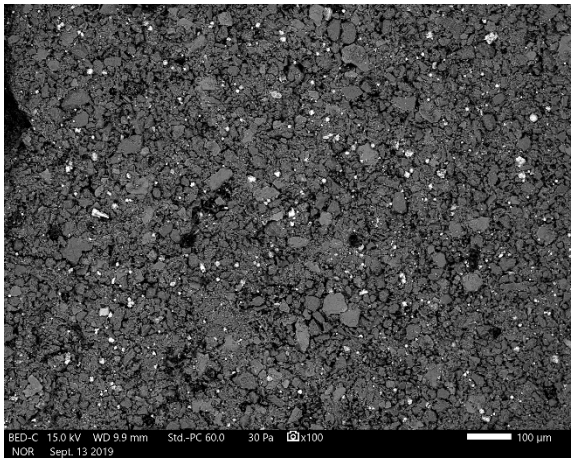


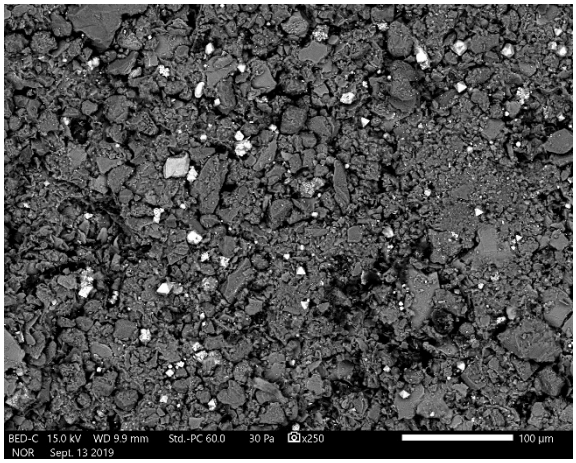


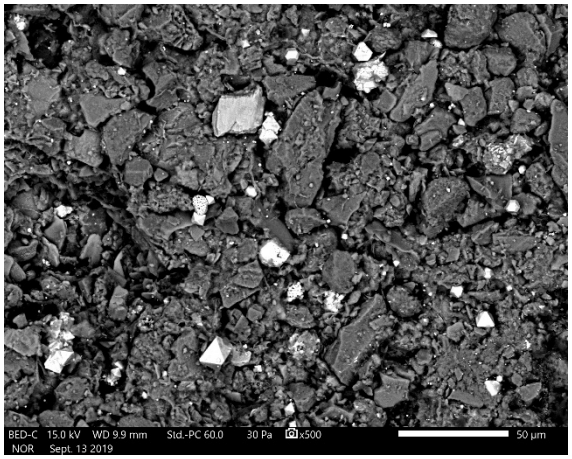


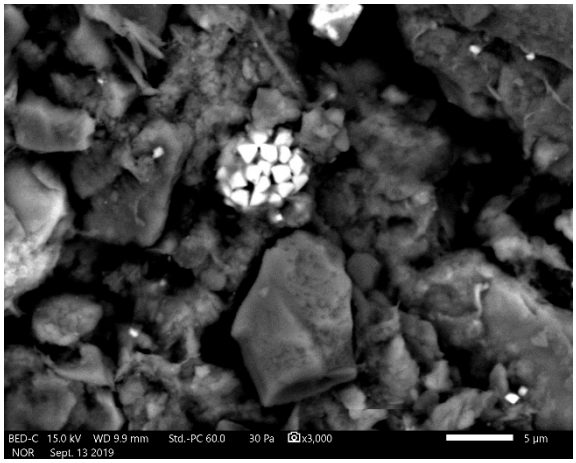
Lignite. Backscattered electron micrographs show the sample at 100X, 1,100X, and 1,500X. EDS spectrum at bottom is an area scan of the region shown in top right micrograph. Bright particles are mostly quartz and feldspar. Major peaks for carbon, oxygen, silicon, and aluminum suggest coal and clay.

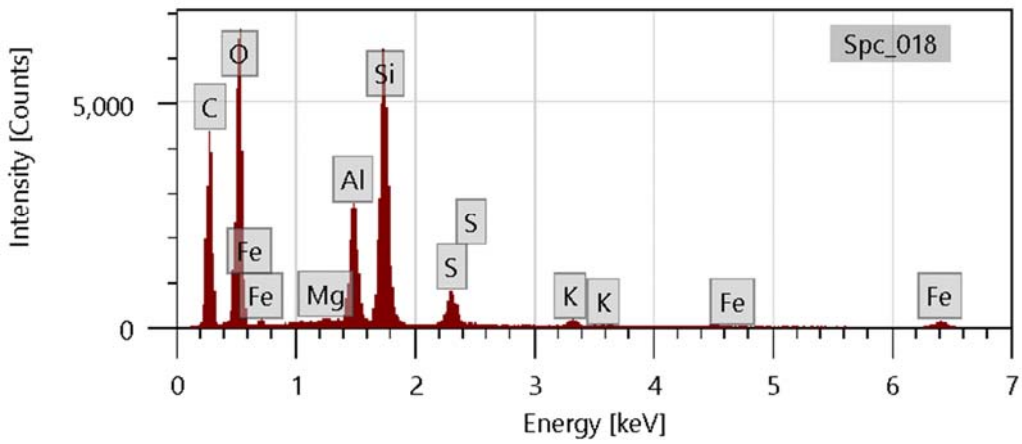
Geosyntec
CTLGroup 150350



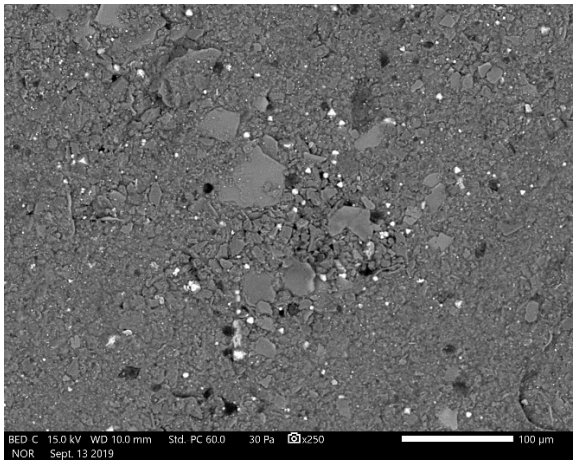


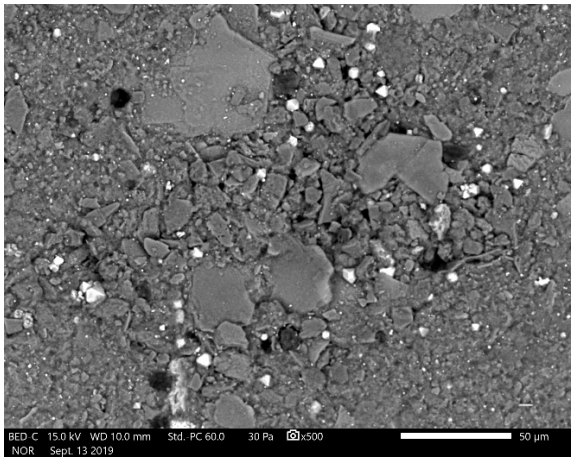


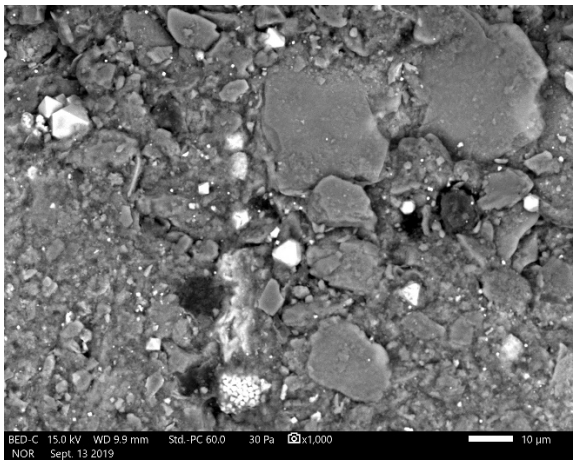


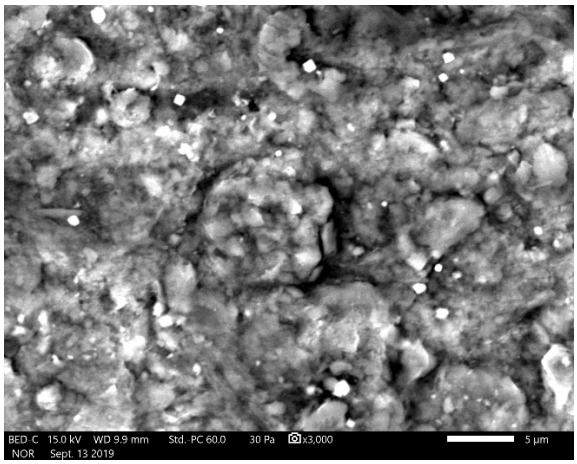


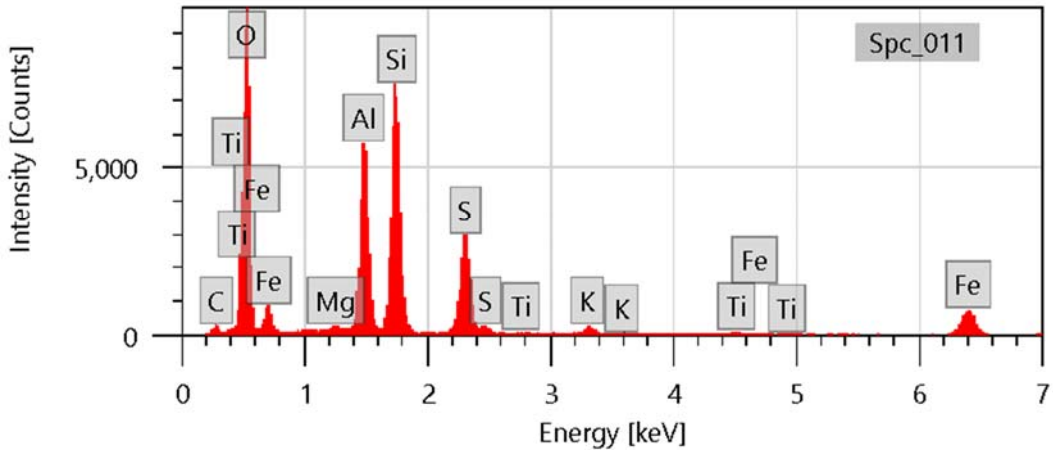
Sample VAP B3 40-45. Backscattered electron micrographs show the sample at 100X, 250X, 500X, and 3000X. EDS spectrum at bottom is an area scan of the region shown at 500X. Bright particles are pyrite (framboid in bottom right micrograph). Major peaks for carbon, oxygen, silicon, and aluminum suggest coal and clay.











Sample VAP B3 50-55. Backscattered electron micrographs show the sample at 250X, 500X, 1000X, and 3000X. EDS spectrum at bottom is an area scan of the region shown at 3000X. Bright particles are mostly pyrite (framboid in bottom left micrograph); occasional particles of Fe-Ti oxide are detected. Major peaks for oxygen, silicon, and aluminum suggest clay. Large blocky particles are mostly quartz, feldspar, and clay.

ATTACHMENT E
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 CCR management area of the former Pirkey West Bottom Ash Pond 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	Texas	December 6, 2024
License Number	Licensing State	Date

APPENDIX 4- Field Reports

CCR Groundwater Monitoring Well Inspection Form

Facility: AEP Pirkey PP

Sampling Period: February 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-33	✓	✓	✓	✓	✓	✓	✓	
AD-22	✓	✓	✓	✓	✓	✓	✓	
AD-7R	✓	✓	✓	✓	✓	✓	✓	
B-3	✓	✓	✓	✓	✓		✓	NO LABEL
AD-18	✓	✓	✓	✓	✓	✓	✓	
AD-4	✓	✓	✓		✓	✓	✓	ACCESS LIMITED ALONG STEEP SLOPE
AD-2	✓	✓	✓	✓	✓	✓	✓	
AD-28	✓	✓	✓	✓	✓	✓	✓	
AD-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: Pirkey

Sampling Period: Feb 2024

Sampling Contractor: E-sk

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
B-2	✓	✓		✓	✓	✓	✓	lid 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	AEP Pinnacle PP
Sample by	Ronny McDonald

Sample Location ID	AO-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	738	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	1042
Sample date	02/20/24

Facility Name	
Sample by	Pitzer / Hamilton

Depth to water, feet (TOC)	34.56
Measured Total Depth, feet (TOC)	57.44

Sample Location ID	AD-3
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)		
1105	34.79	220	4.91	135	>6.7	1.43	414	22.42		
1110	34.85	220	4.87	134	18.5	1.28	3-8	22.35		
1115	34.92	220	4.83	133	18.9	1.20	1.95	22.29		
1120	34.96	200	4.82	130	18.8	1.16	191	22.28		

Total volume purged	
Sample appearance	Clear
Sample time	1125
Sample date	2-20-24

Facility Name	AEP Pirkey PP
Sample by	Kirby McDonald

Sample Location ID	AD-4

Depth to water, feet (TOC)	11.68
Measured Total Depth, feet (TOC)	47.29

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)		
0914	11.81	180	4.84	80	3.7	4.03	450	18.11		
0919	11.83	180	4.86	80	4.2	2.55	449	18.44		
0924	11.88	180	4.90	80	3.1	2.51	447	18.80		
0929	11.92	180	4.92	80	4.0	2.47	444	18.76		

Total volume purged	
Sample appearance	CLEAR
Sample time	0931
Sample date	02/20/24

Facility Name	AEP PICKWAY PP
Sample by	Kimmy McDonald

Sample Location ID	AP-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	Clear
Sample time	1128
Sample date	02/19/24

Facility Name	Dilco
Sample by	M.H. Nemitz

Depth to water, feet (TOC)	8.82
Measured Total Depth, feet (TOC)	52.08

Sample Location ID	AD-12
Depth to water date	2-16-24

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)		
844	9.08	300	3.69	47	13.9	0.20	427	13.44		
849	9.38	300	3.15	44	20.5	0.16	475	15.43		
854	9.42	300	3.17	43	20.6	0.17	481	16.08		
859	9.45	300	3.16	42	20.6	0.16	497	16.17		

Total volume purged	
Sample appearance	clear
Sample time	901
Sample date	2/16/24

Facility Name	AEP Pinlam PP
Sample by	Kenny McDonald

Sample Location ID	AP-13

Depth to water, feet (TOC)	10.33
Measured Total Depth, feet (TOC)	40.70

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)		
0822	10.62	190	5.68	356	147	4.97	152	17.70		
0827	10.69	190	5.69	354	103	3.16	135	18.26		
0832	10.73	190	5.68	353	97.2	2.84	129	18.43		
0837	10.80	190	5.68	352	96.5	2.77	124	18.47		
0842	10.86	190	5.69	352	95.8	2.72	116	18.51		

Total volume purged	
Sample appearance	BROWN TINT
Sample time	0844
Sample date	02/19/24

Facility Name	AEP Pirkey PP
Sample by	Kimmy McDonnell

Sample Location ID	AD-17

Depth to water, feet (TOC)	20.40
Measured Total Depth, feet (TOC)	33.05

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)		
1213	20.71	200	4.70	77	11.4	4.30	398	23.18		
1218	20.73	200	4.81	76	6.12	2.26	395	23.34		
1223	20.78	200	4.84	75	5.9	2.21	395	23.37		
1228	20.80	200	4.86	75	5.3	2.17	393	23.40		

Total volume purged	
Sample appearance	CLEAR
Sample time	1230
Sample date	02/20/24

Facility Name	AMP PLASTICS PP
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 (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°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		LEVEL				

Total volume purged	
Sample appearance	CLEAR
Sample time	0829
Sample date	02/20/24

Facility Name	AEP Pirkey PP
Sample by	Kimmy McDonald

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	17.67		
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	
Sample appearance	Clear
Sample time	1044
Sample date	02/19/24

Facility Name	Parlow
Sample by	M.H / Hamilton

Depth to water, feet (TOC)	9.33
Measured Total Depth, feet (TOC)	27.38

Sample Location ID	AD-25
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)		
901	9.76	125	3.86	1,180	71.9	0.64	509	23.42		
906	9.76	125	4.01	1,100	42.8	1.09	278	22.78		
911	9.86	125	4.14	1,020	33.6	1.17	232	22.51		
916	9.95	125	4.26	1,000	33.5	1.24	221	22.46		
921	10.07	125	4.29	984	33.8	1.27	216	22.37		

Total volume purged	
Sample appearance	clear
Sample time	923
Sample date	2-20-24

Facility Name	Parker
Sample by	M-H / Hamilton

Depth to water, feet (TOC)	16.52
Measured Total Depth, feet (TOC)	42.73

Sample Location ID	AD-26
Depth to water date	7.20.24

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)		
1002	17.05	300	3.50	1,820	6.5	0.04	473	22.81		
1007	17.21	300	3.67	1,846	7.8	0.22	415	22.65		
1012	17.33	300	3.68	1,870	6.2	0.27	399	22.63		
1017	17.48	300	3.70	1,870	5.1	0.28	382	22.58		
1022	17.61	300	3.71	1,880	4.9	0.31	374	22.54		

Total volume purged	
Sample appearance	Clear
Sample time	1024
Sample date	20.7.24

Facility Name	AEP Pinney PP
Sample by	Kenny McDonald

Sample Location ID	AD-28

Depth to water, feet (TOC)	17.90
Measured Total Depth, feet (TOC)	38.59

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)		
1117	18.21	200	4.70	148	13.8	3.21	400	22.54		
1122	18.28	200	4.78	139	6.2	2.08	398	22.49		
1127	18.31	200	4.81	132	6.0	2.01	397	22.45		
1132	18.34	200	4.83	126	5.7	1.93	397	22.44		

Total volume purged	
Sample appearance	Clear
Sample time	1134
Sample date	02/20/24

Facility Name	P. Wey
Sample by	Mott / Hamilton

Depth to water, feet (TOC)	18.06
Measured Total Depth, feet (TOC)	42.71

Sample Location ID	AD-30
Depth to water date	2-14-24

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)		
1114	18.14	300	4.27	343	134	0.08	480	22.37		
1115	18.15	300	4.27	357	51.5	0.08	475	22.39		
1124	18.15	300	4.27	338	21.2	0.07	467	22.25		
1125	18.16	300	4.27	355	21.3	0.07	465	22.26		

Total volume purged	
Sample appearance	Clear
Sample time	1131
Sample date	2-14-24

Facility Name	Pilkey
Sample by	MH, Hamilton

Depth to water, feet (TOC)	21.66
Measured Total Depth, feet (TOC)	37.32

Sample Location ID	AD-31
Depth to water date	2-19-24

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)		
1026	21.94	220	3.18	220	53.7	0.10	429	16.64		
1025	21.96	220	3.37	257	61.8	0.08	444	21.25		
1030	21.97	220	3.36	261	60.4	0.08	446	21.75		
1035	21.98	220	3.35	264	60.1	0.07	447	21.86		
1040	21.99	220	3.35	266	60.3	0.07	448	21.99		

Total volume purged	
Sample appearance	clear
Sample time	1042
Sample date	2-19-24

Facility Name	Pilkey
Sample by	Nate Hamilton

Depth to water, feet (TOC)	15.42
Measured Total Depth, feet (TOC)	34.61

Sample Location ID	AP-32
Depth to water date	2-014-24

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)		
924	15.45	220	4.54	141	118	0.24	484	13.75		
934	16.05	220	4.61	173	124	0.14	463	15.75		
934	16.13	220	4.66	185	88.6	0.16	426	17.30		
944	16.17	220	4.74	188	32.1	0.15	392	17.85		
944	16.20	220	4.76	190	19.8	0.15	376	18.04		
954	16.22	220	4.81	191	14.9	0.14	370	18.12		

Total volume purged	
Sample appearance	clear
Sample time	956
Sample date	2-19-24

Facility Name	ACP Pinhook PP
Sample by	Kinsey McDonald

Sample Location ID	AP-33

Depth to water, feet (TOC)	11.77
Measured Total Depth, feet (TOC)	32.50

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)		
0918	11.81	200	4.05	202	4.7	6.21	236	16.30		
0923	11.81	200	4.10	201	3.2	3.07	299	17.13		
0928	11.83	200	4.12	203	2.9	2.98	311	17.18		
0933	11.85	200	4.13	202	2.5	2.94	318	17.21		

Total volume purged	
Sample appearance	clear
Sample time	0935
Sample date	02/19/24

Duplicate 1400

Facility Name	PMCW
Sample by	Matt / Hamilton

Depth to water, feet (TOC)	6.58
Measured Total Depth, feet (TOC)	17.00

Sample Location ID	AD-36

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	6.91	220	4.45	206	20.0	0.06	457	23.77		
829	6.93	220	4.13	199	18.6	0.06	506	22.53		
834	6.94	220	4.11	79	9.9	0.06	509	22.14		

Total volume purged	
Sample appearance	clear
Sample time	836
Sample date	2-20-24

Facility Name	Pinky
Sample by	Matt Hamilla

Depth to water, feet (TOC)	15.85
Measured Total Depth, feet (TOC)	51.44

Sample Location ID	B-2

Depth to water date	2-19-24

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)		
801	16.26	300	3.45	183	14.6	0.23	486	14.25		
806	16.25	300	3.86	128	14.7	0.22	471	15.24		
811	16.27	300	4.01	123	14.2	0.18	466	15.51		
816	16.28	300	4.05	121	14.2	0.18	463	15.68		

Total volume purged	
Sample appearance	clear
Sample time	8:18
Sample date	2-19-24

Dup - 1330

Facility Name	AKP Pinson PP
Sample by	Kirby McDonald

Sample Location ID	B-3

Depth to water, feet (TOC)	11.37
Measured Total Depth, feet (TOC)	37.49

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)		
1206	12.24	104	4.67	175	4.8	2.93	435	18.21		
1211	13.08	104	4.98	170	3.1	2.08	436	18.06		
				WON'T Hold	WATER LEVEL					

Total volume purged	
Sample appearance	CLEAR
Sample time	0755
Sample date	02/20/24

CCR Groundwater Monitoring Well Inspection Form

Facility: AEP PIKAM 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-72	✓	✓	✓	✓	✓	✓	✓	
AD-33	✓	✓	✓	✓	✓	✓	✓	
AD-02	✓	✓	✓	✓	✓	✓	✓	
AD-36	✓	✓	✓	✓	✓	✓	✓	
AD-08	✓	✓	✓	✓	✓	✓	✓	
AD-18	✓	✓	✓	✓	✓	✓	✓	
B-3	✓	✓	✓	✓	✓		✓	NOLABEL
AD-27	✓	✓	✓	✓	✓	✓	✓	
AD-04	✓	✓	✓		✓	✓	✓	ONLY ACCESS ALONG STEEPSLOPE
AD-16	✓		✓		✓	✓	✓	NEEDS NEW LOCK

RIGHT OF WAY TO WELL NEEDS CLEANING

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 & WEEDWHACKING AROUND WELLS DOESN'T APPEAR TO BE BEING PERFORMED

CCR Groundwater Monitoring Well Inspection Form

Facility: Pirkey

Sampling Contractor: Eagle

Sampling Period: April 2024

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 lid won't close
AD-32	✓	✓	✓	✓	✓	✓	✓	
AD-31	✓	✓	✓	✓	✓	✓	✓	
AD-30	✓	✓	✓	✓	✓	✓	✓	no label
AD-28	✓	✓	✓		✓	✓	✓	
AD-17	✓	✓	✓	✓	✓	✓	✓	Starting to overgrow
AD-3	✓	✓	✓	✓	✓	✓	✓	
AD-26	✓	✓	✓		✓	✓	✓	Starting to over grow
AD-25	✓	✓	✓		✓	✓	✓	overgrown, 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	AEP Pirkey PP
Sample by	Kiana McDonald

Sample Location ID	AP D-02

Depth to water, feet (TOC)	13.94
Measured Total Depth, feet (TOC)	40.36

Depth to water date	04/23/24

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)		
0804	14.02	220	4.09	800	3.6	7.63	360	15.17		
0809	14.04	220	4.08	801	3.3	2.07	411	15.52		
0814	14.08	220	4.07	797	2.9	2.01	415	15.57		
0819	14.12	220	4.07	794	2.7	1.97	415	15.61		

Total volume purged	
Sample appearance	Clear
Sample time	0821
Sample date	04/23/24

Facility Name	Pinney
Sample by	Matt Hamilton

Sample Location ID	MD-3

Depth to water, feet (TOC)	32.96
Measured Total Depth, feet (TOC)	57.45

Depth to water date	4-23-24

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)		
1052	33.38	220	4.38	108	0	3.40	458	21.63		
1057	33.47	220	4.52	107	6	0.57	454	21.06		
1102	33.56	220	4.51	107	0	0.49	448	21.11		

Total volume purged	
Sample appearance	clear
Sample time	1104
Sample date	4-23-24

Facility Name	APP Pinnon PP
Sample by	Kenny McDonald

Sample Location ID	AO-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	
Sample appearance	Clear
Sample time	0931
Sample date	04/24/24

Facility Name	AEP Pinnacle PP
Sample by	Kenny McDonald

Sample Location ID	AD-7R

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		
0913	5.36	224	4.50	258	2.1	2.16	174	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	AEP Pirkey PP
Sample by	Kenny McDonald

Sample Location ID	AD-08

Depth to water, feet (TOC)	11.98
Measured Total Depth, feet (TOC)	31.33

Depth to water date	04/23/24

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)		
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	1011
Sample date	04/23/24

Facility Name	Pinkey
Sample by	M-H Hamilton

Depth to water, feet (TOC)	6.64
Measured Total Depth, feet (TOC)	52.00

Sample Location ID	AD 12
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)		
922	7.22	300	3.56	42	7.9	3.43	382	18.61		
927	7.31	300	3.36	42	16.2	2.66	425	19.68		
932	7.40	300	3.38	42	17.2	2.64	435	19.73		
937	7.50	300	3.34	42	14.2	2.63	445	19.85		
942	7.61	300	3.40	42	14.3	2.62	449	19.92		

Total volume purged	
Sample appearance	Clear
Sample time	944
Sample date	4-22-24

Facility Name	ATP PINNOM PP
Sample by	KINNY MCDONNOU

Sample Location ID	AO-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	
Sample appearance	clear
Sample time	0820
Sample date	04/22/24

Facility Name	AEP Pinnacle PP
Sample by	Kenny McDonald

Sample Location ID	AD-16

Depth to water, feet (TOC)	12.09
Measured Total Depth, feet (TOC)	38.24

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)		
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	04/24/24

Facility Name	Pilkey
Sample by	Matt Hamilton

Depth to water, feet (TOC)	16.21
Measured Total Depth, feet (TOC)	33.05

Sample Location ID	AD-17
Depth to water date	4.23.24

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)		
959	16.79	200	3.61	50	15.9	2.58	522	20.52		
1004	16.82	200	3.61	46	7.5	2.21	516	20.66		
1009	16.83	200	3.62	47	7.6	2.01	514	20.67		
1014	16.84	200	3.62	47	7.5	1.98	512	20.73		

Total volume purged	
Sample appearance	Clear
Sample time	1016
Sample date	4.23.24

Facility Name	AEP Pinkerton PP
Sample by	Kenny McDonald

Sample Location ID	AP-18

Depth to water, feet (TOC)	3.09
Measured Total Depth, feet (TOC)	28.42

Depth to water date	04/23/24

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)		
1041	3.36	120	5.04	56	10.2	1.87	347	22.62		
1046	3.41	120	4.72	52	7.1	1.42	354	22.62		
1051	3.54	120	4.66	52	6.8	1.40	357	22.64		
1056	3.72	120	4.65	51	6.6	1.37	364	22.64		

Total volume purged	
Sample appearance	Clear
Sample time	1058
Sample date	04/23/24

Facility Name	AEP Pinhook PP
Sample by	Kinny McDonald

Sample Location ID	AD-22

Depth to water, feet (TOC)	6.61
Measured Total Depth, feet (TOC)	32.70

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)		
1010	6.75	170	3.96	817	0.0	2.74	283	22.86		
1015	6.78	170	3.95	818	0.0	2.69	284	22.87		
1020	6.81	176	3.95	819	0.0	2.66	286	22.89		

Total volume purged	
Sample appearance	Cream
Sample time	1022
Sample date	04/22/24

Facility Name	Pitcal
Sample by	Matt Hamilton

Sample Location ID	MD-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	3.55	117	78.6	2.17	391	23.24		
1043	30.36	220	3.65	84	55.3	1.66	395	22.94		
1048	30.36	220	3.63	77	42.0	1.44	402	22.80		
1053	30.56	220	3.64	74	21.2	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	22.95		

Total volume purged	
Sample appearance	Clear
Sample time	1105
Sample date	4-24-24

Facility Name	Pinney
Sample by	Matt Hamilton

Depth to water, feet (TOC)	7.90
Measured Total Depth, feet (TOC)	27.38

Sample Location ID	AD-25
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)		
916	8.04	120	3.71	1,340	27.5	1.13	376	22.14		
921	8.11	120	3.78	1,310	12.8	0.62	323	22.04		
926	8.17	120	3.85	1,286	8.6	0.50	301	21.99		
931	8.23	120	3.93	1,250	8.5	0.47	299	21.98		

Total volume purged	
Sample appearance	clear
Sample time	933
Sample date	4.24.24

Facility Name	Pixley
Sample by	M-H Hamilton

Sample Location ID	AD-26

Depth to water, feet (TOC)	16.31
Measured Total Depth, feet (TOC)	42.73

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)		
827	16.65	300	3.19	1,980	48.4	1.35	468	21.93		
832	16.91	300	3.18	2,050	9.9	0.93	478	21.58		
837	17.04	300	3.20	2,040	0	0.74	454	21.52		
842	17.10	300	3.22	2,030	0	0.69	447	21.49		

Total volume purged	
Sample appearance	clear
Sample time	842
Sample date	4.24.24

Facility Name	APP Pinney PP
Sample by	Kenny McDonald

Sample Location ID	AD-27

Depth to water, feet (TOC)	16.12
Measured Total Depth, feet (TOC)	40.07

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)		
0818	16.34	310	3.66	218	6.2	1.97	441	22.75		
0823	16.39	310	3.64	222	5.9	1.93	437	22.65		
0828	16.41	310	3.63	223	5.6	1.88	431	22.51		

Total volume purged	
Sample appearance	Clear
Sample time	0830
Sample date	04/24/24

Facility Name	Pilkey
Sample by	M. Mt / Hamilton

Depth to water, feet (TOC)	16.20
Measured Total Depth, feet (TOC)	38.59

Sample Location ID	AD-28
Depth to water date	4-23-24

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)		
916	16.68	220	3.36	93	0	3.97	553	18.65		
921	16.72	220	3.33	92	0	2.28	547	18.73		
926	16.74	220	3.37	93	0	2.21	543	18.65		

Total volume purged	
Sample appearance	clear
Sample time	928
Sample date	4-23-24

Facility Name	Pillow
Sample by	Matt Hamilton

Sample Location ID	AD-3c

Depth to water, feet (TOC)	17.14
Measured Total Depth, feet (TOC)	27.15

Depth to water date	4-23-24

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)		
816	17.25	220	3.45	306	57.2	2.08	523	17.41		
821	17.25	220	3.84	296	62.9	1.22	527	16.42		
826	17.23	220	3.82	284	37.9	1.16	527	14.22		
831	17.25	220	3.84	295	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	299	7.7	0.91	518	11.57		

Total volume purged	
Sample appearance	clear
Sample time	843
Sample date	4-23-24

Facility Name	P. Riley
Sample by	M-H Hamilton

Depth to water, feet (TOC)	20.61
Measured Total Depth, feet (TOC)	37.32

Sample Location ID	AD-31
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)		
1058	21.08	220	3.43	245	55.1	5.31	392	21.53		
1103	21.15	220	3.38	255	42.4	0.57	377	21.97		
1108	21.19	220	3.41	259	39.1	0.43	373	22.14		
1113	21.23	220	3.43	261	3.2	0.37	374	22.18		
1118	21.26	220	3.44	261	3.4	0.36	376	22.15		

Total volume purged	
Sample appearance	clear
Sample time	1120
Sample date	4-22-24

Facility Name	Pinkey
Sample by	M-M Hamilton

Depth to water, feet (TOC)	14.20
Measured Total Depth, feet (TOC)	34.65

Sample Location ID	AP-32
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	186	125	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	AEP Plant PP
Sample by	Kerry McDonald

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 (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°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	
Sample appearance	CLEAR
Sample time	1113
Sample date	04/22/24

Facility Name	Pillcy
Sample by	M-H Hamilton

Sample Location ID	AP-34

Depth to water, feet (TOC)	TOC
Measured Total Depth, feet (TOC)	26.05

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)		
954	0.76	120	3.52	1,460	99.8	1.22	342	22.16		
959	0.89	120	3.57	1,460	64.6	0.77	344	21.77		
1004	0.97	120	3.64	1,460	17.2	0.65	332	21.50		
1009	1.05	120	3.68	1,460	17.5	0.61	326	21.43		

Total volume purged	
Sample appearance	opaque
Sample time	1011
Sample date	4-24-24

Facility Name	ATP Pinhook PP
Sample by	Kenny McDonald

Sample Location ID	AD-36

Depth to water, feet (TOC)	5.25
Measured Total Depth, feet (TOC)	17.10

Depth to water date	04/23/24

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)		
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	
Sample appearance	Clear
Sample time	0920
Sample date	04/23/24

Facility Name	Pixley
Sample by	IY-MT Hamilton

Depth to water, feet (TOC)	13.89
Measured Total Depth, feet (TOC)	

Sample Location ID	B-2
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	5.53	466	16.88		
830	14.65	300	4.26	113	33.4	0.80	412	18.48		
835	14.68	300	4.36	120	28.7	0.60	344	18.62		
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	clear
Sample time	847
Sample date	4.22.24

Duplicate

1215

Facility Name	ACP Pinnacy PP
Sample by	Kenny McDonald

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		
				WON'T	HOLD	WATER	LOCK			

Total volume purged	
Sample appearance	Clear
Sample time	1002
Sample date	04/24/24

CCR Groundwater Monitoring Well Inspection Form

Facility: Pirkey 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	✓	✓	✓	✓	✓		✓	NO LABEL	
AD-22	✓	✓	✓	✓	✓	✓	✓		
AD-33	✓	✓	✓	✓		✓	✓	WELL PAD STARTING TO FLOAT	
AD-19	✓	✓	✓	✓	✓	✓	✓		17.31
AD-10	✓	✓	✓	✓	✓	✓	✓		22.13
AD-21	✓	✓	✓	✓	✓	✓	✓		8.21
AD-20	✓	✓	✓	✓	✓	✓	✓		21.17
AD-02	✓	✓	✓	✓	✓	✓	✓		
AD-04	✓	✓	✓		✓	✓	✓	NO GOOD ACCESS STEEP HILL OR OVERGROWN MUDDY AREA	
AD-18	✓	✓	✓	✓	✓	✓	✓		
B-3	✓	✓	✓		✓		✓	NEED MOWING NO LABEL	

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: Pirkey 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-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: Pilley

Sampling Contractor: Eagle

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 overgrown
AD-12	–	–	–	–	–	–	–	
AD-32	–	–	–	–	–	–	–	
AD-31	–	–	–	–	–	–	–	
AD-30	–	–	–	–	–	–	–	
AD-28	–	–	–	–	–	–	–	
AD-17	✓	–	–		✓	–	–	overgrown
AD-3	✓	✓	–	–	–	–	–	
AD-36	–	–	–	–	–	–	–	
AD-23	✓	–	–	–	–	✓	✓	
AD-27	–	–	–		–	–	–	-No path to well -need access → Borrowed Kubota
AD-26	–	–	–		–	–	–	No path to well - need access

*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	Plainfield PP
Sample by	Kenny McDonald

Sample Location ID	AO-02

Depth to water, feet (TOC)	16.93
Measured Total Depth, feet (TOC)	40.36

Depth to water date	09/17/24

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)		
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	Clear
Sample time	0758
Sample date	09/17/24

Facility Name	Pilley
Sample by	M+H Hamilton

Sample Location ID	AD-3
Depth to water date	9/7/24

Depth to water, feet (TOC)	36.22
Measured Total Depth, feet (TOC)	57.44

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	3.44	431	24.34		
1044	36.67	220	4.31	130	53.1	0.92	424	22.64		
1049	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	
Sample appearance	Clear
Sample time	1101
Sample date	9-17-24

Facility Name	Pinney PD
Sample by	Kenny McDonald

Sample Location ID	AD-04

Depth to water, feet (TOC)	19.23
Measured Total Depth, feet (TOC)	47.29

Depth to water date	09/17/24

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	19.48	182	5.04	106	47.6	3.28	421	24.27		
0913	19.51	182	4.96	110	51.2	2.41	420	24.31		
0918	19.51	182	4.95	108	55.7	2.37	418	24.34		
0923	19.52	182	4.94	105	54.8	2.35	418	24.37		
0928	19.52	182	4.94	103	55.1	2.35	416	24.35		
0933	19.55	182	4.94	103	55.4	2.33	415	24.33		

Total volume purged	
Sample appearance	Turbid Reddish Brown
Sample time	0935
Sample date	09/17/24

Facility Name	Pinon PP
Sample by	Kenny McDonald

Sample Location ID	AD-7R

Depth to water, feet (TOC)	8.80
Measured Total Depth, feet (TOC)	33.03

Depth to water date	09/16/24

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)		
0848	8.91	226	4.89	265	1.3	3.02	262	25.24		
0853	8.92	226	4.72	204	0.6	2.52	265	25.00		
0858	8.92	226	4.72	206	0.3	2.49	262	24.89		
0903	8.93	226	4.72	207	0.0	2.45	261	24.91		

Total volume purged	
Sample appearance	Clear
Sample time	0905
Sample date	09/16/24

Facility Name	Pinkerton PP
Sample by	K Gray McDonald

Sample Location ID	AD-08

Depth to water, feet (TOC)	12.82
Measured Total Depth, feet (TOC)	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	235	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	Clear
Sample time	1007
Sample date	09/18/24

Facility Name	Pixley
Sample by	Matt 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	2.93	431	24.71		
927	17.21	300	2.99	41	12.6	2.74	446	25.18		
932	17.36	300	2.99	41	12.4	2.66	450	25.07		

Total volume purged	
Sample appearance	clear
Sample time	934
Sample date	9-16-24

Facility Name	Pinon PP
Sample by	Kerry McDonald

Sample Location ID	AD-13

Depth to water, feet (TOC)	13.29
Measured Total Depth, feet (TOC)	40.70

Depth to water date	09/16/24

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)		
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	PLANT PP
Sample by	KENNY McDONALD

Sample Location ID	AD-16

Depth to water, feet (TOC)	18.05
Measured Total Depth, feet (TOC)	38.24

Depth to water date	09/17/24

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)		
1102	18.61	194	4.82	242	14.2	2.17	332	24.21		
1107	18.62	196	4.84	245	11.1	1.20	336	24.17		
1112	18.66	196	4.86	249	10.9	1.17	335	24.11		
1117	18.68	196	4.87	251	10.7	1.14	338	24.18		

Total volume purged	
Sample appearance	CLEAR
Sample time	1119
Sample date	09/17/27

Facility Name	Pixley
Sample by	Matt Hamilton

Depth to water, feet (TOC)	22.50
Measured Total Depth, feet (TOC)	33.05

Sample Location ID	AD-17
Depth to water date	9-17-24

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)		
938	22.62	200	3.19	1.5	17.9	8.49	496	23.74		
943	22.65	200	3.07	108	24.4	1.08	465	23.24		
948	22.67	200	3.04	111	15.0	1.00	493	23.2-		
953	22.67	200	3.11	112	4.9	0.97	490	23.15		

Total volume purged	
Sample appearance	clear
Sample time	955
Sample date	9-17-24

Facility Name	Pirkey AD
Sample by	Kevin McDonald

Sample Location ID	AD-18

Depth to water, feet (TOC)	8.76
Measured Total Depth, feet (TOC)	28.42

Depth to water date	09/17/24

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)		
1015	9.93	108	4.27	59	13.9	3.26	367	24.74		
1020	11.06	108	4.17	61	18.4	2.89	374	23.51		
				Won't Hold						

Total volume purged	
Sample appearance	Turbid
Sample time	0744
Sample date	09/18/24

Facility Name	Pigeon PP
Sample by	Kenny McDonald

Sample Location ID	AD-22

Depth to water, feet (TOC)	10.96
Measured Total Depth, feet (TOC)	32.70

Depth to water date	09/06/24

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)		
0942	11.37	180	4.21	712	0.0	3.07	336	25.38		
0947	11.41	180	4.24	715	0.0	2.56	335	25.17		
0952	11.43	180	4.25	716	0.0	2.53	331	25.11		
0957	11.49	180	4.25	718	0.0	2.54	328	25.08		

Total volume purged	
Sample appearance	Clear
Sample time	0959
Sample date	09/10/24

Duplicate-1 1100

Facility Name	P. Illey
Sample by	M-M / Hamilton

Sample Location ID	AD-23

Depth to water, feet (TOC)	29.28
Measured Total Depth, feet (TOC)	38.20

Depth to water date	9-18-24

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)		
921	29.69	220	3.10	70	100	3.16	493	24.42		
926	29.69	220	3.09	73	69.0	2.07	494	23.56		
931	29.69	220	3.07	74	52.3	1.63	492	23.14		
936	29.69	220	3.04	75	23.1	1.61	493	23.05		
941	29.69	220	3.04	76	23.2	1.60	493	22.94		
946	29.69	220	3.03	76	23.2	1.55	494	22.89		

Total volume purged	
Sample appearance	clear
Sample time	948
Sample date	9-18-24

Facility Name	Plainfield PP
Sample by	Kenny McDonald

Sample Location ID	AD-25

Depth to water, feet (TOC)	9.89
Measured Total Depth, feet (TOC)	27.38

Depth to water date	9/18/24

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)		
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	324	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	Pixley
Sample by	Matt Hamilton

Sample Location ID	AD-26

Depth to water, feet (TOC)	15.78
Measured Total Depth, feet (TOC)	42.73

Depth to water date	9-18-24

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)		
1121	16.05	300	3.37	1,920	8.6	1.80	437	26.10		
1126	16.24	300	3.40	1,940	0	1.01	433	25.58		
1131	16.35	300	3.41	1,960	0	0.98	426	25.32		

Total volume purged	
Sample appearance	clear
Sample time	1133
Sample date	9-18-24

Facility Name	Pilley
Sample by	Matt Hamilton

Sample Location ID	AD.27

Depth to water, feet (TOC)	22.75
Measured Total Depth, feet (TOC)	4.07

Depth to water date	9-18-24

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)		
1046	22.96	300	3.06	216	17.1	2.25	457	29.15		
1051	23.05	300	3.19	218	6.5	2.07	452	24.48		
1056	23.11	300	3.23	220	6.4	2.03	446	24.09		

Total volume purged	
Sample appearance	clear
Sample time	1058
Sample date	9-18-24

Facility Name	Pixley
Sample by	Mott / Hamilton

Depth to water, feet (TOC)	19.19
Measured Total Depth, feet (TOC)	38.54

Sample Location ID	AD-28
Depth to water date	9.17.24

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)		
854	19.43	220	3.24	117	1.7	9.66	502	23.4		
855	19.52	220	3.09	112	2.5	1.87	502	23.09		
9.04	19.53	220	3.12	113	3.0	1.73	504	23.17		

Total volume purged	
Sample appearance	clear
Sample time	906
Sample date	9-17-24

Facility Name	Pixley
Sample by	Matt Hamilton

Sample Location ID	AD-30

Depth to water, feet (TOC)	20.60
Measured Total Depth, feet (TOC)	27.15

Depth to water date	9-17-24

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)		
803	21.09	220	3.88	351	37.7	1.97	473	24.14		
808	21.11	220	3.69	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	0.78	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	825
Sample date	9-17-24

Facility Name	Pillcy
Sample by	Matt Hamilton

Sample Location ID	AD-31
Depth to water date	9.11.24

Depth to water, feet (TOC)	23.23
Measured Total Depth, feet (TOC)	37.32

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	23.49	220	3.15	241	39	10.52	383	25.76		
1104	23.55	220	3.01	259	20.6	0.43	328	24.47		
1109	23.60	220	2.99	262	18.5	0.76	350	24.40		
1114	23.62	220	2.98	264	85.6	0.68	345	24.41		
1119	23.63	220	3.02	265	73.6	0.57	334	25.00		
1124	23.64	220	3.03	266	64.5	0.54	336	24.74		
1129	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	9-16.24

Facility Name	Pinkey
Sample by	M. M / H. Miller

Sample Location ID	MW-32

Depth to water, feet (TOC)	17.16
Measured Total Depth, feet (TOC)	34.65

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)		
1005	17.65	220	4.57	236	258	1.30	421	24.76		
1010	17.85	220	4.73	244	114	0.77	271	24.07		
1015	17.91	220	4.74	246	79.9	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	Pipham PP
Sample by	Kevin McDonald

Sample Location ID	AD-33

Depth to water, feet (TOC)	12.64
Measured Total Depth, feet (TOC)	32.50

Depth to water date	09/16/24

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)		
1113	12.68	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		
[illegible]										

Total volume purged	
Sample appearance	Clean
Sample time	1125
Sample date	09/16/24

Facility Name	Pratum PP
Sample by	Kenny McDonald

Sample Location ID	AD-34

Depth to water, feet (TOC)	TOC
Measured Total Depth, feet (TOC)	26.05

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)		
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	clear
Sample time	0915
Sample date	09/18/24

Facility Name	Pillcy
Sample by	Moff / Hamilton

Depth to water, feet (TOC)	5.83
Measured Total Depth, feet (TOC)	17.16

Sample Location ID	AD-36
Depth to water date	9.18.24

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)		
848	6.16	200	4.19	91	1.7	8.27	442	25.38		
853	6.17	200	3.52	89	13.1	0.77	462	26.41		
858	6.18	200	3.55	87	11.0	0.58	459	26.47		
903	6.18	200	3.55	87	6.0	0.56	451	27.06		
908	6.19	200	3.60	87	6.1	0.53	446	26.98		

Total volume purged	
Sample appearance	clear
Sample time	910
Sample date	9-18-24

Facility Name	Pillar
Sample by	M.M Hamilton

Depth to water, feet (TOC)	26.30
Measured Total Depth, feet (TOC)	51.44

Sample Location ID	B-2
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)		
816	26.71	300	3.75	234	7.1	2.55	355	22.19		
821	26.79	300	3.94	146	1.1	1.52	319	21.36		
826	26.84	300	3.93	121	2.1	0.99	278	21.16		
831	26.88	300	3.94	119	2.0	0.92	263	21.09		

Total volume purged	
Sample appearance	Clear
Sample time	833
Sample date	9-16-24

Duplicate

1217

Facility Name	Pinon PP
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 (µS/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		
				won't hold						

Total volume purged	
Sample appearance	Clear
Sample time	0816
Sample date	09/18/24

APPENDIX 5- Analytical Laboratory Reports

Water Analysis Report

Reissued

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 240666 **Customer: Pirkey Power Station** **Date Reported: 08/12/2024**

Customer Sample ID: AD-2
Lab Number: 240666-001
Date Collected: 02/20/2024 11:42 EST

Customer Description:
Preparation:
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.

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 240666 **Customer: Pirkey Power Station** **Date Reported: 08/12/2024**

Customer Sample ID: AD-3
Lab Number: 240666-002
Date Collected: 02/20/2024 12:25 EST

Customer Description:
Preparation:
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.

Dolan Chemical Laboratory
4001 Bixby Road
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Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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

AMERICAN ELECTRIC POWER

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Water Analysis Report

Reissued

Job ID: 240666 **Customer: Pirkey Power Station** **Date Reported: 08/12/2024**

Customer Sample ID: AD-4
Lab Number: 240666-003
Date Collected: 02/20/2024 10:31 EST

Customer Description:
Preparation:
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.

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Water Analysis Report

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

AMERICAN ELECTRIC POWER

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Water Analysis Report

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.

AMERICAN ELECTRIC POWER

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Water Analysis Report

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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 240666 **Customer: Pirkey Power Station** **Date Reported: 08/12/2024**

Customer Sample ID: AD-12
Lab Number: 240666-005
Date Collected: 02/19/2024 10:01 EST

Customer Description:
Preparation:
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.

Dolan Chemical Laboratory
4001 Bixby Road
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Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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

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Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 240666 **Customer: Pirkey Power Station** **Date Reported: 08/12/2024**

Customer Sample ID: AD-13
Lab Number: 240666-006
Date Collected: 02/19/2024 09:44 EST

Customer Description:
Preparation:
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.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
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Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
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Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 240666 **Customer: Pirkey Power Station** **Date Reported: 08/12/2024**

Customer Sample ID: AD-17
Lab Number: 240666-007
Date Collected: 02/20/2024 13:30 EST

Customer Description:
Preparation:
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.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
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Audinet: 210-4221

Water Analysis Report

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

Dolan Chemical Laboratory
4001 Bixby Road
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Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 240666 **Customer: Pirkey Power Station** **Date Reported: 08/12/2024**

Customer Sample ID: AD-18
Lab Number: 240666-008
Date Collected: 02/20/2024 09:29 EST

Customer Description:
Preparation:
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.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
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Audinet: 210-4221

Water Analysis Report

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

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Water Analysis Report

Reissued

Job ID: 240666 **Customer: Pirkey Power Station** **Date Reported: 08/12/2024**

Customer Sample ID: AD-22
Lab Number: 240666-009
Date Collected: 02/19/2024 11:44 EST

Customer Description:
Preparation:
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.

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Water Analysis Report

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

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Water Analysis Report

Reissued

Job ID: 240666 **Customer: Pirkey Power Station** **Date Reported: 08/12/2024**

Customer Sample ID: AD-28
Lab Number: 240666-010
Date Collected: 02/20/2024 12:34 EST

Customer Description:
Preparation:
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.

Dolan Chemical Laboratory
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Water Analysis Report

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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 240666 **Customer: Pirkey Power Station** **Date Reported: 08/12/2024**

Customer Sample ID: AD-30
Lab Number: 240666-011
Date Collected: 02/19/2024 12:31 EST

Customer Description:
Preparation:
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.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 240666 **Customer: Pirkey Power Station** **Date Reported: 08/12/2024**

Customer Sample ID: AD-31
Lab Number: 240666-012
Date Collected: 02/19/2024 11:42 EST

Customer Description:
Preparation:
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.

Dolan Chemical Laboratory
4001 Bixby Road
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Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 240666 **Customer: Pirkey Power Station** **Date Reported: 08/12/2024**

Customer Sample ID: AD-32
Lab Number: 240666-013
Date Collected: 02/19/2024 10:56 EST

Customer Description:
Preparation:
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.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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

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Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 240666 **Customer: Pirkey Power Station** **Date Reported: 08/12/2024**

Customer Sample ID: AD-33
Lab Number: 240666-014
Date Collected: 02/19/2024 10:35 EST

Customer Description:
Preparation:
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.

AMERICAN ELECTRIC POWER

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Water Analysis Report

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

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Water Analysis Report

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

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Water Analysis Report

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

AMERICAN ELECTRIC POWER

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Water Analysis Report

Reissued

Job ID: 240666 **Customer: Pirkey Power Station** **Date Reported: 08/12/2024**

Customer Sample ID: Equipment Blank
Lab Number: 240666-016
Date Collected: 02/19/2024 12:11 EST

Customer Description:
Preparation:
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

AMERICAN ELECTRIC POWER

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Water Analysis Report

Reissued

Job ID: 240666 **Customer: Pirkey Power Station** **Date Reported: 08/12/2024**

Customer Sample ID: Field Blank
Lab Number: 240666-017
Date Collected: 02/20/2024 12:32 EST

Customer Description:
Preparation:
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

240666-001-01
Comments:

TG-32

240666-002
Comments:

TG-32

240666-002-01
Comments:

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240666-003
Comments:

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240666-003-01
Comments:

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240666-004
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240666-004-01
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240666-005
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240666-005-01
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240666-006
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240666-006-01
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240666-007
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240666-007-01
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240666-008
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240666-008-01
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240666-009
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240666-009-01
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240666-010
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240666-010-01
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240666-011
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240666-011-01
Comments:

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240666-012
Comments:

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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

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

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

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

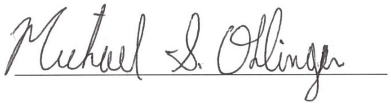
Water Analysis Report

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

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.

P1 - The precision between duplicate results was above acceptance limits.

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

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)

Site Contact: 18 2

Date:

For Lab Use Only:
COC/Order #: 240666

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 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 B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Fe, Mn, Mo, Pb, Se, Tl and Na, K, Mg, Sr	1 L bottle, Cool, 0-6°C TDS, F, Cl, SO_4, and Br, Alkalinity	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	Field-Filter 250 mL PTFE lined bottle, HCL**, pH<2 Hg	250 mL PTFE lined bottle, HCL**, pH<2 Hg		Sample Specific Notes:
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							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:	Company:	Date/Time:	Received by:	Date/Time:
Matt Hamilton	Ensr	2-21-24 1600		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: Michael Ohly	Date/Time: 2/23/24 1000

Form COC-04, AEP Chain of Custody (COC) Record for Coal Combustion Residual (CCR) Sampling - Shreveport, Rev. 1, 1/10/17

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

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)

Site Contact:

Date:

For Lab Use Only:
COC/Order #:

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 — 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 — B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Fe, Mn, Mo, Pb, Se, TL and Na, K, Mg, Sr	1 L bottle, Cool, 0-6°C — TDS, F, Cl, SO_4, and Br, Alkalinity	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 — Ra-226, Ra-228	Field-Filter 250 mL PTFE lined bottle, HCL**, pH<2 — Hg	250 mL PTFE lined bottle, HCL**, pH<2 — Hg		Sample Specific Notes:
AD-31	2/19/2024	1042	G	GW	7		X	X		X	X	X		
AD-32	2/19/2024	956	G	GW	7		X	X		X	X	X		
AD-33	2/19/2024	935	G	GW	10		X	X		X	X	X		
DUPLICATE	2/29/2024	1400	G	GW	4		X	X			X	X		
EQUIPMENT BLANK	2/19/2024	1111	G	GW	2		X					X		
FIELD BLANK	2/20/2024	1132	G	GW	2		X					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:	Company:	Date/Time:	Received by:	Date/Time:
[signature]	Eagle	1600 2-21-24		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Date/Time: 2/23/24 1000

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY (UPS) (FedEX) USPS
	Other _____

Plant/Customer Pirkey **Number of Plastic Containers:** 77

Opened By WLG / MSD ~~MGH~~ **Number of Glass Containers:** —

Date/Time 2/23/24 1000 **Number of Mercury Containers:** 32

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial:** _____ on ice / no ice

(IR Gun Ser# 2213689000, *Expir.* 03/24/2024) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: Routine 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:** MGH / 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 : _____

Comments: _____

Logged by MSD _____

_____

Reviewed by MGH _____

_____

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.

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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	Timsina	Chemist Associate	03/14/2024
Name (printed)	Signature	Official Title	Date

Radium Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: 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	

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	

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	

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	

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."

Municipal Solid Waste Laboratory Review Checklist

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- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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	Tamisha T. Palmer	Chemical Technician, Principal	03/05/2024
Name (printed)	Signature	Official Title	Date

Radium Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: 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	

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."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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

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	

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	

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."

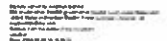
Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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	

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	

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

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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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

AMERICAN ELECTRIC POWER

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Phone: 614-836-4221
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Water Analysis Report

Job ID: 240640 **Customer: Pirkey Power Station** **Date Reported: 03/08/2024**

Customer Sample ID: AD-17
Lab Number: 240640-007
Date Collected: 02/20/2024 13:30 EST
Customer Description:
Preparation:
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
Lab Number: 240640-008
Date Collected: 02/20/2024 09:29 EST
Customer Description:
Preparation:
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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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

Dolan Chemical Laboratory
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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

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

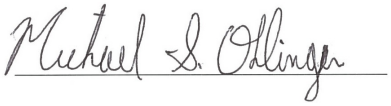
Water Analysis Report

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

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 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: Pirkey - CCR
Contact Name: Leslie Fuerschbach
Contact Phone: 318-423-3805
Sampler(s): Matt Hamilton Kenny McDonald

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 240640

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 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 B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Fe, Mn, Mo, Pb, Se, TL and Na, K, Mg, Sr	1 L bottle, Cool, 0-6°C TDS, F, Cl, SO_4, Br, and Alkalinity	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	40 mL Glass vial or 250 mL PTFE lined bottle, HCL**, pH<2 Hg	40 mL Glass vial or 250 mL PTFE lined bottle, HCL**, pH<2 Hg		Sample Specific Notes
AD-2	2/20/2024	1042	G	GW	1				X					
AD-3	2/20/2024	1125	G	GW	1				X					
AD-4	2/20/2024	931	G	GW	1				X					
AD-7R	2/19/2024	1128	G	GW	1				X					
AD-12	2/19/2024	901	G	GW	1				X					
AD-13	2/19/2024	844	G	GW	1				X					
AD-17	2/20/2024	1230	G	GW	1				X					
AD-18	2/20/2024	829	G	GW	1				X					
AD-22	2/19/2024	1044	G	GW	1				X					
AD-28	2/20/2024	1134	G	GW	1				X					
AD-30	2/19/2024	1131	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	2	2		

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

TG-32

Relinquished by: Matt Hamilton	Company: Eagle	Date/Time: 2-21-24 16:00	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time: 2/22/24 0956

Form COC-04, AEP Chain of Custody (COC) Record for Coal Combustion Residual (CCR) Sampling - Shreveport, Rev. 1, 1/10/17

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

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)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 240640

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Mo, Se, TL and Na, K, Mg, Sr (250 mL bottle, pH<2, HNO_3)	B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Fe, Mn, Mo, Pb, Se, TL and Na, K, Mg, Sr (Field-filter 250 mL bottle, then pH<2, HNO_3)	TDS, F, Cl, SO_4, Br, and Alkalinity (1 L bottle, Cool, 0-6°C)	Ra-226, Ra-228 (Three (six every 10th*) 1 L bottles, pH<2, HNO_3)	Hg (40 mL Glass vial or 250 mL PTFE lined bottle, HCL**, pH<2)	Hg (40 mL Glass vial or 250 mL PTFE lined bottle, HCL**, pH<2)		Sample Specific Notes:
AD-31	2/19/2024	1042	G	GW	1				X					
AD-32	2/19/2024	956	G	GW	1				X					
AD-33	2/19/2024	935	G	GW	1				X					
DUPLICATE	2/20/2024	1400	G	GW	1				X					
FIELD BLANK	2/20/2024	1132	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	2	2		

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

TG-32

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
[signature]	Eagle	2-21-24 1600		
Relinquished by:	Company:	Date/Time:	Received by: [signature]	Date/Time: 2/22/24 0950
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time:

Form COC-04, AEP Chain of Custody (COC) Record for Coal Combustion Residual (CCR) Sampling - Shreveport, Rev. 1, 1/10/17

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Pirkey Power Station **Number of Plastic Containers:** 16

Opened By Misgha Williams **Number of Glass Containers:** _____

Date/Time 02/22/24 9:50 Am **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? (Y) / N or N/A **Initial:** mgh (on ice) / no ice

(IR Gun Ser# 2213689000, *Expir.* 03/24/2024) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: 28 days 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:** mgh 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 : _____

Comments: _____

Logged by NCG _____

_____

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.

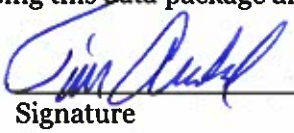
Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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)
- [x] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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		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	

Table 3. Exception Reports.

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

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."

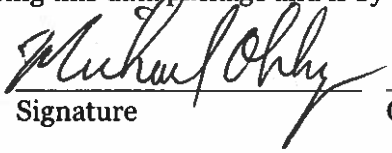
Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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		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	

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	

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	

Table 3. Exception Reports.

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

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."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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	Michael Ohlinger	Chemist	3/8/2024
Name (printed)	Signature	Official Title	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	

Alkalinity Laboratory Review Checklist

Table 3. Exception Reports.

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

Exception Report No.	Description
ER1	CCB acceptance criteria is CCB<0.5*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."

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
Lab Number: 241410-001
Date Collected: 04/23/2024 09:21 EDT

Customer Description:
Preparation:
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.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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
Lab Number: 241410-003
Date Collected: 04/24/2024 10:31 EDT

Customer Description:
Preparation:
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.

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
Lab Number: 241410-004-01
Date Collected: 04/22/2024 10:25 EDT

Customer Description:
Preparation: Dissolved
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
Lab Number: 241410-005
Date Collected: 04/23/2024 11:11 EDT

Customer Description:
Preparation:
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
Lab Number: 241410-006
Date Collected: 04/22/2024 10:44 EDT

Customer Description:
Preparation:
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
Lab Number: 241410-006-01
Date Collected: 04/22/2024 10:44 EDT

Customer Description:
Preparation: Dissolved
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
Lab Number: 241410-007
Date Collected: 04/22/2024 09:20 EDT

Customer Description:
Preparation:
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.

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
Lab Number: 241410-009
Date Collected: 04/23/2024 12:16 EDT

Customer Description:
Preparation:
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.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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
Lab Number: 241410-010
Date Collected: 04/23/2024 11:58 EDT

Customer Description:
Preparation:
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.

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
Lab Number: 241410-011
Date Collected: 04/22/2024 11:22 EDT

Customer Description:
Preparation:
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.

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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

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Water Analysis Report

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

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Job ID: 241410 **Customer: Pirkey Power Station** **Date Reported: 06/11/2024**

Customer Sample ID: AD-28
Lab Number: 241410-014
Date Collected: 04/23/2024 10:28 EDT

Customer Description:
Preparation:
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	O2, 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.

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Water Analysis Report

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

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Job ID: 241410 **Customer: Pirkey Power Station** **Date Reported: 06/11/2024**

Customer Sample ID: AD-30
Lab Number: 241410-015
Date Collected: 04/23/2024 09:43 EDT

Customer Description:
Preparation:
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	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.

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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
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Job ID: 241410 **Customer: Pirkey Power Station** **Date Reported: 06/11/2024**

Customer Sample ID: AD-31
Lab Number: 241410-016
Date Collected: 04/22/2024 12:20 EDT

Customer Description:
Preparation:
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	O2, 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.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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
Lab Number: 241410-017
Date Collected: 04/22/2024 11:33 EDT

Customer Description:
Preparation:
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.

Dolan Chemical Laboratory
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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
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Phone: 614-836-4221
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Job ID: 241410 **Customer: Pirkey Power Station** **Date Reported: 06/11/2024**

Customer Sample ID: AD-33
Lab Number: 241410-018
Date Collected: 04/22/2024 12:13 EDT

Customer Description:
Preparation:
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	O2, 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.

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Audinet: 210-4221

Job ID: 241410 **Customer: Pirkey Power Station** **Date Reported: 06/11/2024**

Customer Sample ID: AD-33
Lab Number: 241410-018-01
Date Collected: 04/22/2024 12:13 EDT
Customer Description:
Preparation: Dissolved
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
Lab Number: 241410-019
Date Collected: 04/24/2024 11:11 EDT
Customer Description:
Preparation:
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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 241410 **Customer: Pirkey Power Station** **Date Reported: 06/11/2024**

Customer Sample ID: AD-36
Lab Number: 241410-020
Date Collected: 04/23/2024 10:20 EDT
Customer Description:
Preparation:
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
Lab Number: 241410-021
Date Collected: 04/22/2024 15:00 EDT
Customer Description:
Preparation:
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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
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Audinet: 210-4221

Water Analysis Report

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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 241410 **Customer: Pirkey Power Station** **Date Reported: 06/11/2024**

Customer Sample ID: Equipment Blank
Lab Number: 241410-022
Date Collected: 04/23/2024 10:53 EDT

Customer Description:
Preparation:
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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 241410 **Customer: Pirkey Power Station** **Date Reported: 06/11/2024**

Customer Sample ID: Field Blank
Lab Number: 241410-023
Date Collected: 04/23/2024 10:56 EDT

Customer Description:
Preparation:
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

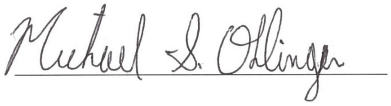
Water Analysis Report

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

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.
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

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

Analysis Turnaround Time (in Calendar Days)
◉ Routine (28 days for Monitoring Wells)

Site Contact: Date:

For Lab Use Only:
COC/Order #: 241410

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 Sb, As, B, Ba, Be, Ca Cd, Cr, Co, K, Li, Mg, Mo, Na, Pb, Se, Sr, Tl	Field-filter 250 mL bottle, then pH<2, HNO_3 Dissolved Sb, As, Ba, Be, Cd, Cr, Co, Fe, Li, Mn, Mo, Pb, Se, Tl	Three (six every 10th*) 1 L bottles, pH<2, HNO3 Ra-226, Ra-228	250 mL Glass bottle, HCL**, pH<2 Mercury	250 mL Glass bottle, HCL**, pH<2 Dissolved Mercury	250 mL bottle, pH<2, HNO_3 B, Ca, K, Mg, Na, Sr		Sample Specific Notes:
AD-27	4/24/2024	830	G	GW	1							X		
AD-28	4/23/2024	928	G	GW	7		X	X	X	X	X			
AD-30	4/23/2024	843	G	GW	7		X	X	X	X	X			
AD-31	4/22/2024	1120	G	GW	7		X	X	X	X	X			
AD-32	4/22/2024	1033	G	GW	7		X	X	X	X	X			
AD-33	4/22/2024	1113	G	GW	7		X	X	X	X	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	X		X	X			
Equipment Blank	4/23/2024	953	G	GW	2		X			X				
Field Blank	4/23/2024	956	G	GW	2		X			X				
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	4	2	F2	4		

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

TG-32 needed

Relinquished by: [signature]	Company: Engle	Date/Time: 4-25-24 1500	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Date/Time: 4/29/24

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

Analysis Turnaround Time (in Calendar Days)
◉ Routine (28 days for Monitoring Wells)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 24140

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 Sb, As, B, Ba, Be, Ca Cd, Cr, Co, K, Li, Mg, Mo, Na, Pb, Se, Sr, Tl	Field-filter 250 mL bottle, then pH<2, HNO_3 Dissolved Sb, As, Ba, Be, Cd, Cr, Co, Fe, Li, Mn, Mo, Pb, Se, Tl	Three (six every 10th*) 1 L bottles, pH<2, HNO3 Ra-226, Ra-228	250 mL Glass bottle, HCL**, pH<2 Mercury	250 mL Glass bottle, HCL**, pH<2 Dissolved Mercury	250 mL bottle, pH<2, HNO_3 B, Ca, K, Mg, Na, Sr		Sample Specific Notes:
AD-2	4/23/2024	821	G	GW	7		X	X	X	X	X			
AD-3	4/23/2024	1104	G	GW	7		X	X	X	X	X			
AD-4	4/24/2024	931	G	GW	7		X	X	X	X	X			
AD-7R	4/22/2024	925	G	GW	10		X	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	X			
AD-13	4/22/2024	820	G	GW	7		X	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	X			
AD-18	4/23/2024	1058	G	GW	7		X	X	X	X	X			
AD-22	4/22/2024	1022	G	GW	7		X	X	X	X	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							4	F4	4	2	F2			

** 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:
[signature]	Eagle	4-25-24 1500		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Date/Time: 4/29/24

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type: (Cooler) Box Bag Envelope

Delivery Type: PONY UPS (FedEX) USPS

Other ____________ MSO 4/29

Plant/Customer Pirkey

Number of Plastic Containers: ~~99~~ 84

Opened By MGH/MSO

Number of Glass Containers: —

Date/Time 4/29/24

Number of Mercury Containers: 32

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial:** ________ on ice / (no ice)

(IR Gun Ser# 240009843, *Expir.* 01/03/2026) - If No, specify each deviation: ________

Was container in good condition? (Y) / N Comments ________

Was Chain of Custody received? (Y) / N Comments ________

Requested turnaround: Routine 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 ________ JHM, SS 4-30-24

Was pH checked & Color Coding done? (Y) N or N/A **Initial & Date:** ~~MGH 4/29/24~~ SS 4-30-24

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: ________

Initial & Date & Time : ________

Lab ID# 241410

Comments: ________

Logged by MSO

Reviewed by [signature] 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.

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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 Technician , Principal	06/10/2024
Name (printed)	Signature	Official Title	Date

Radium Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: 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	

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	

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	

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	

Table 3. Exception Reports.

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

Exception Report No.	Description
ER1	No duplicate was available for sample batch

[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."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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	Tamisha T. Palmer	Chemical Technician, Prinicipal	06/05/2024
Name (printed)	Signature	Official Title	Date

Radium Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: 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	

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	

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	

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	

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 reprepped 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."

Municipal Solid Waste Laboratory Review Checklist

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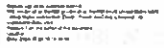
- [x] R2 Sample identification cross-reference
- [x] R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - (a) Items specified in NELAC Chapter 5 for reporting results, e.g., Section 5.5.10 in 2003 NELAC Standard
  - (b) Dilution factors
  - (c) Preparation methods
  - (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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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	05/29/2024
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: 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	

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	

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."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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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- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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	

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 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	

Table 3. Exception Reports.

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

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."

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

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

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

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

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

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

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

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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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
Lab Number: 241393-021
Date Collected: 04/22/2024 15:00 EDT

Customer Description:
Preparation:
Date Received: 04/26/2024 10:00 EDT

Ion Chromatography

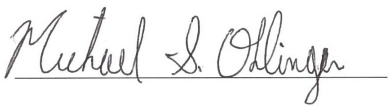
Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.61	mg/L	2	0.10	0.02		CRJ	05/10/2024 18:20	EPA 300.1 -1997, Rev. 1.0
Chloride	20.8	mg/L	2	0.06	0.02		CRJ	05/10/2024 18:20	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.15	mg/L	2	0.06	0.02		CRJ	05/10/2024 18:20	EPA 300.1 -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

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 Bixby Road
Groveport, Ohio 43125
Contacts: Michael Ohlinger (614-836-4184)
Dave Conover (614-836-4219)

Project Name: Pirkey PP Semi-Annual CCR
Contact Name: Leslie Fuerschbach
Contact Phone: 318-673-2744
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (In Calendar Days)
◉ Routine (28 days for Monitoring Wells)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 241393

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) initials	Mercury (250 mL bottle, pH<2, HNO3)	Dissolved Mercury (Field-filter 250 mL bottle, then pH<2, HNO3)	F, Cl, SO4, Br, TDS, Alkalinity (1 L bottle, Cool, 0-6C)	Ra-226, Ra-228 (Three (six every 10th*) 1 L bottles, pH<2, HNO3)				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							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:
[signature]	Eagle	4-25-24 1500		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time: 4/26/24 1000
			[signature]	

Form COC-04, AEP Chain of Custody (COC) Record for Coal Combustion Residual (CCR) Sampling - Shreveport, Rev. 1, 1/10/17

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

Analysis Turnaround Time (In Calendar Days)
◉ Routine (28 days for Monitoring Wells)

Site Contact:

Date:

For Lab Use Only:
COC/Order #:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	Mercury (250 mL bottle, pH<2, HNO3)	Dissolved Mercury (Field-filter 250 mL bottle, then pH<2, HNO3)	F, Cl, SO4, Br, TDS, Alkalinity (1 L bottle, Cool, 0-6C)	Ra-226, Ra-228 (Three (six every 10th*) 1 L bottles, pH<2, HNO3)				Sample Specific Notes:
AD-27	4/24/2024	830	G	GW	1				X					
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							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:
[signature]	Enz	4-25-24 1540		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Date/Time: 4/26/24 1000

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Pitney **Number of Plastic Containers:** 21

Opened By MGK/MSO **Number of Glass Containers:** -

Date/Time 4/26/24 1000 **Number of Mercury Containers:** -

Were all temperatures within 0-6°C? (Y) N or N/A **Initial:** MGK on (ice) / no ice

(IR Gun Ser# 240009843, *Expir.* 01/03/2026) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: Routine 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.

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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)
- [x] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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		Principle Chemist	05/13/2024
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: 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	

Table 3. Exception Reports.

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

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."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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	Sandra D. Williams	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	

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	

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	

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	

Table 3. Exception Reports.

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

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."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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	Michael Ohlinger	Chemist	06/05/2024
Name (printed)	Signature	Official Title	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	

Alkalinity Laboratory Review Checklist

Table 3. Exception Reports.

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

Exception Report No.	Description
ER1	CCB acceptance criteria is CCB<0.5*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."

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
Lab Number: 242840-001
Date Collected: 09/17/2024 08:58 EDT

Customer Description:
Preparation:
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	RLP	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.

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
Lab Number: 242840-004-01
Date Collected: 09/16/2024 10:05 EDT

Customer Description:
Preparation: Dissolved
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
Lab Number: 242840-005
Date Collected: 09/18/2024 11:07 EDT

Customer Description:
Preparation:
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.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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
Lab Number: 242840-007
Date Collected: 09/16/2024 09:13 EDT

Customer Description:
Preparation:
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.

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
Lab Number: 242840-009
Date Collected: 09/17/2024 10:55 EDT

Customer Description:
Preparation:
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		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 20:35	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.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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	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 20:55	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
Lab Number: 242840-011
Date Collected: 09/16/2024 10:59 EDT

Customer Description:
Preparation:
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.

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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 242840 **Customer: Pirkey Power Station** **Date Reported: 11/07/2024**

Customer Sample ID: AD-27
Lab Number: 242840-013
Date Collected: 09/18/2024 11:58 EDT

Customer Description:
Preparation:
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
Lab Number: 242840-014
Date Collected: 09/17/2024 10:06 EDT

Customer Description:
Preparation:
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.

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		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 16:55	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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 242840 **Customer: Pirkey Power Station** **Date Reported: 11/07/2024**

Customer Sample ID: AD-30
Lab Number: 242840-015
Date Collected: 09/17/2024 10:25 EDT

Customer Description:
Preparation:
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.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
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Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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		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 17:06	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
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Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242840 **Customer: Pirkey Power Station** **Date Reported: 11/07/2024**

Customer Sample ID: AD-31
Lab Number: 242840-016
Date Collected: 09/16/2024 12:36 EDT

Customer Description:
Preparation:
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.

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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
Lab Number: 242840-017
Date Collected: 09/16/2024 11:32 EDT

Customer Description:
Preparation:
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.

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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	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 18:28	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.

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
Lab Number: 242840-018-01
Date Collected: 09/16/2024 12:25 EDT
Customer Description:
Preparation: Dissolved
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
Lab Number: 242840-019
Date Collected: 09/18/2024 10:15 EDT
Customer Description:
Preparation:
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

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
Lab Number: 242840-020
Date Collected: 09/18/2024 10:10 EDT
Customer Description:
Preparation:
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
Lab Number: 242840-021
Date Collected: 09/16/2024 12:00 EDT
Customer Description:
Preparation:
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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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		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 18:58	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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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

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.

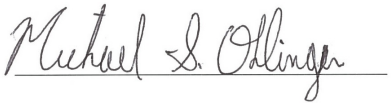
Water Analysis Report

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

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.
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

Analysis Turnaround Time (In Calendar Days)
◉ Routine (28 days for Monitoring Wells)

Site Contact: 18 14 2 1
Date: 1 6

For Lab Use Only:
COC/Order #: 242810

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 Sb, As, B, Ba, Be, Ca Cd, Cr, Co, K, Li, Mg, Mo, Na, Pb, Se, Sr, Tl	Field-filter 250 mL bottle, then pH<2, HNO_3 Dissolved Sb, As, Ba, Be, Cd, Cr, Co, Fe, Li, Mn, Mo, Pb, Se, Tl	Three (six every 10th*) 1 L bottles, pH<2, HNO3 Ra-226, Ra-228	250 mL Glass bottle, HCL**, pH<2 Mercury	250 mL Glass bottle, HCL**, pH<2 Dissolved Mercury	250 mL bottle, pH<2, HNO_3 B, Ca, K, Mg, Na, Sr		Sample Specific Notes:
AD-2	9/17/2024	758	G	GW	7		X	X	X	X	X			
AD-3	9/17/2024	1101	G	GW	7		X	X	X	X	X			
AD-4	9/17/2024	935	G	GW	7		X	X	X	X	X			
AD-7R	9/16/2024	905	G	GW	7		X	X	X	X	X			
AD-8	9/18/2024	1007	G	GW	1							X		
AD-12	9/16/2024	934	G	GW	7		X	X	X	X	X			
AD-13	9/16/2024	813	G	GW	7		X	X	X	X	X			
AD-16	9/17/2024	1119	G	GW	1							X		
AD-17	9/17/2024	955	G	GW	7		X	X	X	X	X			
AD-18	9/18/2024	744	G	GW	7		X	X	X	X	X			
AD-22	9/16/2024	959	G	GW	10		X	X	X	X	X			
AD-23	9/18/2024	948	G	GW	1							X		
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	4	2	F2			

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

TG-32 needed

Relinquished by: [signature]	Company: Eagle	Date/Time: 9-18-24 1400	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Date/Time: 9/23/24 1500

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

Analysis Turnaround Time (in Calendar Days)
◉ Routine (28 days for Monitoring Wells)

Site Contact: 18 14 2 1
Date: 1 6

For Lab Use Only:
COC/Order #: 242840

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 Sb, As, B, Ba, Be, Ca Cd, Cr, Co, K, Li, Mg, Mo, Na, Pb, Se, Sr, Tl	Field-filter 250 mL bottle, then pH<2, HNO_3 Dissolved Sb, As, Ba, Be, Cd, Cr, Co, Fe, Li, Mn, Mo, Pb, Se, Tl	Three (six every 10th*) 1 L bottles, pH<2, HNO3 Ra-226, Ra-228	250 mL Glass bottle, HCL**, pH<2 Mercury	250 mL Glass bottle, HCL**, pH<2 Dissolved Mercury	250 mL bottle, pH<2, HNO_3 B, Ca, K, Mg, Na, Sr		Sample Specific Notes:
AD-27	9/18/2024	1058	G	GW	1							X		
AD-28	9/17/2024	906	G	GW	7		X	X	X	X	X			
AD-30	9/17/2024	825	G	GW	7		X	X	X	X	X			
AD-31	9/16/2024	1136	G	GW	7		X	X	X	X	X			
AD-32	9/16/2024	1032	G	GW	7		X	X	X	X	X			
AD-33	9/16/2024	1125	G	GW	7		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	9/16/2024	1100	G	GW	4		X	X		X	X			
Equipment Blank	9/17/2024	850	G	GW	2		X			X				
Field Blank	9/17/2024	851	G	GW	2		X			X				
Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	4	2	F2	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
[signature]	Eagle	9-19-24 1400		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Date/Time: 9/23/24 1500

WATER & WASTE SAMPLE RECEIPT FORM

Form SOP-7102 Sample Receipt Form Rev.8, 08 23 24

Package Type: (Cooler) Box Bag Envelope

Delivery Type: UPS (FedEX) USPS Other _____

Plant/Customer PirKey PPCCR **Total # of Containers RECEIVED in Job:** 115

Opened By BLB

Date/Time 9.23.24 3:30pm

Were all temperatures within 0-6°C? Y / N or (N/A) (Temps) **Initial:** BLB 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 Suspect AD-30 label is unreadable

Was Chain of Custody received? (Y) / N Comments

Requested turnaround: Routine 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 TTP 9.23.24

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# 242840

Comments: _____

Logged by MSD

(Record Test Count on back of form)

Total # of Containers LISTED on COC: 115

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 -1 Initial/ Date: MJD 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		TP 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

TP 9/24/24

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:** MSJ 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 - 015	3rd Rad bottle label unreadable	21
15	- 015-01		15
21	- 016		21
15	- 016-01		15
21	- 017		21
15	- 017-01		15
21	- 018		21
15	- 018-01		15
6	- 019		6
6	- 020		6
19	- 021		19
15	- 021-01		15
19	- 022		19
19	- 023		19

TP 9/24/24

See previous page 2 of 2

WATER & WASTE SAMPLE RECEIPT FORM

Form SOP-7102 Sample Receipt Form Rev.8, 05 23 24

Package Type	Delivery Type
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: _____

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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	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~~ TB 10/17/24 Birkey 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~~ TB 10/17/24 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

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: ~~Welsh Power~~ TB 10/17/24 Pirkey Power

Reviewer Name: Tamisha Palmer

LRC Date: 10/16/2024

Laboratory Job Number: 242840

Prep Batch Number(s): PB24092408, PB24092409

Exception Report No.	Description
ER1	RPD greater than 25%; Both the sample and duplicate were below report limit
	for batch PB24092409

[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."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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		Chemist Associate	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: 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	

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	

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	

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	

Table 3. Exception Reports.

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

Exception Report No.	Description
ER1	Analyte detected in method blank (MB) at or above the method criteria.

[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."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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		Chemist Associate	10/23/2024
Name (printed)	Signature	Official Title	Date

Radium Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: 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	

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	

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	

Table 3. Exception Reports.

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

Exception Report No.	Description
ER1	Analyte detected in method blank (MB) at or above the method criteria.

[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."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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 Digitally signed by Elizabeth L Tinapple Date: 2024.10.14 09:02:09 -04'00'	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."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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	

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	

Table 3. Exception Reports.

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

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."

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

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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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

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

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

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

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

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

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

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

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
Lab Number: 242807-021
Date Collected: 09/16/2024 12:00 EDT

Customer Description:
Preparation:
Date Received: 09/20/2024 10:00 EDT

Ion Chromatography

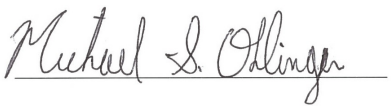
Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.72	mg/L	2	0.10	0.02		CRJ	09/25/2024 21:19	EPA 300.1 -1997, Rev. 1.0
Chloride	106	mg/L	25	0.8	0.3		CRJ	09/25/2024 20:46	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.21	mg/L	2	0.06	0.02		CRJ	09/25/2024 21:19	EPA 300.1 -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

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 Bixby Road
Groveport, Ohio 43125
Contacts: Michael Ohlinger (614-836-4184)
Dave Conover (614-836-4219)

Project Name: Pirkey PP Semi-Annual CCR
Contact Name: Leslie Fuerschbach
Contact Phone: 318-673-2744
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
◉ Routine (28 days for Monitoring Wells)

Site Contact: 6
Date:

For Lab Use Only:
COC/Order #: 242807

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO3 — Mercury	Field-filter 250 mL bottle, then pH<2, HNO3 — Dissolved Mercury	1 L bottle, Cool, 0-6C — F, Cl, SO4, Br, TDS, Alkalinity	Three (six every 10th*) 1 L bottles, pH<2, HNO3 — Ra-226, Ra-228				Sample Specific Notes:
AD-2	9/17/2024	758	G	GW	1				X					
AD-3	9/17/2024	1101	G	GW	1				X					
AD-4	9/17/2024	935	G	GW	1				X					
AD-7R	9/16/2024	905	G	GW	1				X					
AD-8	9/18/2024	1007	G	GW	1				X					
AD-12	9/16/2024	934	G	GW	1				X					
AD-13	9/16/2024	813	G	GW	1				X					
AD-16	9/17/2024	1119	G	GW	1				X					
AD-17	9/17/2024	955	G	GW	1				X					
AD-18	9/18/2024	744	G	GW	1				X					
AD-22	9/16/2024	959	G	GW	1				X					
AD-23	9/18/2024	948	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: Matt Hamilton	Company: Eagle	Date/Time: 9.19.24 1400	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: Michael Ohlinger	Date/Time: 9/20/24 10:00

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

Analysis Turnaround Time (In Calendar Days)
◉ Routine (28 days for Monitoring Wells)

Site Contact: **Date:**

For Lab Use Only:
COC/Order #:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO3 — Mercury	Field-filter 250 mL bottle, then pH<2, HNO3 — Dissolved Mercury	1 L bottle, Cool, 0-6C — F, Cl, SO4, Br, TDS, Alkalinity	Three (six every 10th*) 1 L bottles, pH<2, HNO3 — Ra-226, Ra-228				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	9/16/2024	1136	G	GW	1				X					
AD-32	9/16/2024	1032	G	GW	1				X					
AD-33	9/16/2024	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	9/16/2024	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:
Matt Hamilton	Eagle	9-19-24 1400		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: Michael Ohlinger	Date/Time: 9/20/24 10:20

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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	Michael Ohlinger	Chemist	10/23/2024
Name (printed)	Signature	Official Title	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	

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	

Table 3. Exception Reports.

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

Exception Report No.	Description
ER1	CCB acceptance criteria is CCB<0.5*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."

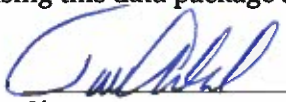
Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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)
- [x] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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		Prin. Chemist	10/23/2024
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: 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	

Table 3. Exception Reports.

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

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."

Municipal Solid Waste Laboratory Review Checklist

This data package consists of:

- [x] 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.
- [x] R1 Field chain-of-custody documentation
- [x] R2 Sample identification cross-reference
- [x] 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
- [x] R5 Test reports/summary forms for blank samples
- [x] 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
- [x] 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
- [x] 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
- [x] R9 List of method quantitation limits (MQLs) for each analyte for each method and matrix
- [x] R10 Other problems or anomalies
- [x] 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	Sandra D. Williams	Chemist	10-23-2024
Name (printed)	Signature	Official Title	Date

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	

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	

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	

Table 3. Exception Reports.

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

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."