Annual Groundwater Monitoring Report

Southwestern Electric Power Company

Welsh Power Plant

Bottom Ash Storage Pond

CN 602843245; RN100213370

Registration No: CCR 110

1187 Country Road 4865

Titus County

Pittsburg, Texas

January 2024

Prepared by:
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SOUTHWESTERN ELECTRIC POWER COMPANY℠

An AEP Company

BOUNDLESS ENERGY℠

Table of Contents

Abbreviations:
ASD - Alternate Source Demonstration
BASP – Bottom Ash Storage Pond
CCR – Coal Combustion Residual
GWPS - Groundwater protection standards
SSI - Statistically Significant Increase
SSL - Statistically Significant Level
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 for an existing Coal Combustion Residual (CCR) unit at Southwestern Electric Power Company's (SWEPCO's), a wholly owned subsidiary of American Electric Power Company (AEP), Welsh Power Plant (CCR No.: 110). 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, 2024.

In general, the following activities were completed:

- At the start of the current annual reporting period, the BASP was operating under the Detection Monitoring program;
- At the end of the current annual reporting period, the BASP was operating under the Detection Monitoring program;
- Groundwater samples and elevations were collected for AD-1, AD-5, AD-17, AD-3, AD-4C, and AD-16R and analyzed for Appendix III constituents, as specified in 30 TAC §352.941 and AEP's *Groundwater Sampling and Analysis Plan (2021)*.
- The background data was re-established on January 15, 2024. The Statistical Analysis Summary, Background Update certified January 16, 2024 is included in Appendix 2.
- Data not included with the previous annual report, the 2nd semi-annual groundwater sampling event conducted in November 2022 with confirmation sampling conducted in February 2023:
    - Potential Statistically Significant increases (SSIs) were identified for:
        - Boron in AD-4C
        - Calcium in AD-4C
        - Sulfate in AD-4C
        - TDS in AD-4C
- The 1st semi-annual groundwater sampling event was conducted in June 2023 with confirmation sampling conducted in July 2023:
    - Potential Statistically Significant increases (SSIs) were identified for:
        - Boron in AD-4C
        - Chloride in AD-4C
- The 2nd semi-annual groundwater sampling event was conducted in October 2023 with confirmation sampling conducted in December 2023:
    - Potential Statistically Significant increases (SSIs) were identified for:
        - Boron in AD-4C

- ASD for the 1st semi-annual 2022 potential SSI for Sulfate was certified January 17, 2023, and submitted to TCEQ January 17, 2023, for approval.
- ASD for the 2nd semi-annual 2022 potential Sulfate SSI for Boron, Calcium, Sulfate, and TDS was certified September 5, 2023, and submitted to TCEQ September 5, 2023, for approval.

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 BASP CCR management unit(s), all groundwater monitoring wells and monitoring well identification numbers (Attached as **Appendix 1**, where applicable);
- Statistical comparison of monitoring data to determine if there have been SSI(s) or SSL(s) (Attached as **Appendix 2**, where applicable);
- A discussion of whether any alternate source demonstrations (ASDs) were performed, and the conclusions (Attached as **Appendix 3**, where applicable);
- 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 (Notices Attached as **Appendix 4**, 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 5**, where applicable); and
- Other information required to be included in the annual report, field sheets, analytical reports, etc. (Attached as **Appendix 6**)

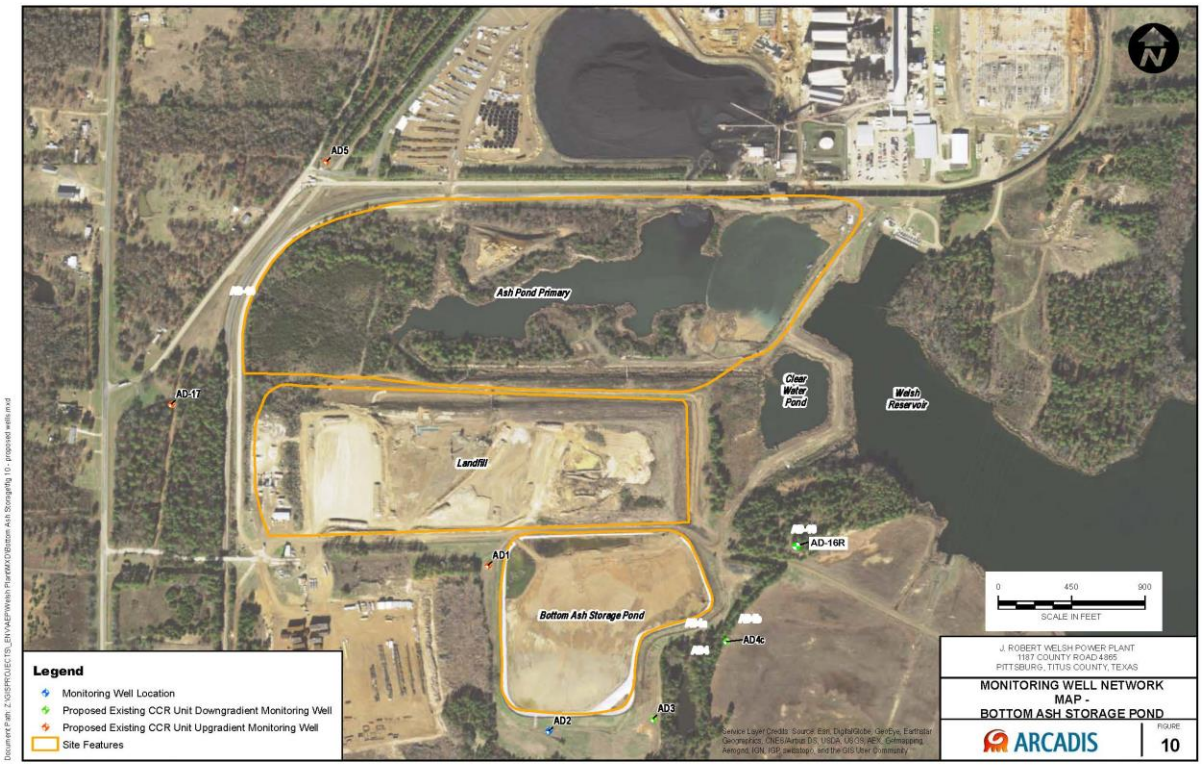
In addition, this report summarizes key actions completed, and where applicable, describes any problems encountered and actions taken to resolve those problems. The report includes a projection of key activities for the upcoming year.

II. Groundwater Monitoring Well Locations and Identification Numbers

The figure that follows depicts the PE-certified groundwater monitoring network for the Bottom Ash Storage Pond (BASP), the monitoring well locations, and their corresponding identification numbers is provided below.

BASP Monitoring Wells	
Background	Down Gradient
AD-1	AD-3
AD-5	AD-4C
AD-17	AD-16R

Note: AD-2 is used for gauging purposes



III. Monitoring Wells Installed or Decommissioned

There were no groundwater monitoring wells installed or decommissioned during this reporting period.

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

Groundwater samples and elevations were collected for AD-1, AD-5, AD-17, AD-3, AD-4C, and AD-16R and analyzed for Appendix III constituents, as specified in 30 TAC §352.941 and AEP's *Groundwater Sampling and Analysis Plan (2021)*.

Appendix 1 contains potentiometric maps with the static water elevation, groundwater flow direction for each monitoring event, tables showing groundwater velocity, and the groundwater quality data collected under 30 TAC 352.941.

The groundwater flow rate and direction for the confirmatory sampling events reflect that seen during the semi-annual sampling events.

V. Groundwater Quality Data Statistical Analysis

Appendix 2 contains the statistical analysis reports available for this reporting period. The Statistical Analysis Summary, Background Update certified January 16, 2024 is included in Appendix 2.

- Data and statistical analysis completed for the 2nd semi-annual groundwater sampling event, held November 1, 2022, with confirmatory sampling February 7, 2023, was certified June 7, 2023, and indicated:

  A potential SSI was identified for:
  - Boron in AD-4C
  - Calcium in AD-4C
  - Sulfate in AD-4C
  - TDS in AD-4C

- Data and statistical analysis completed for the 1st semi-annual groundwater sampling event, held June 5-6, 2023, with confirmatory sampling July 27, 2023, was certified November 14, 2023, and indicated:

  A potential SSI was identified for:
  - Boron in AD-4C
  - Chloride in AD-4C

- Data and statistical analysis completed for the 2nd semi-annual groundwater sampling event, held October 4, 2023, with confirmatory sampling December 14, 2023, was certified January 24, 2024, and indicated:

  A potential SSI was identified for:
  - Boron in AD-4C

VI. Alternate Source Demonstrations Completed

An alternate source demonstration (ASD) has been completed for:

- ASD for the 1st semi-annual 2022 potential Sulfate SSI was certified January 17, 2023 and included in Appendix 3.
- ASDs for the 2nd semi-annual 2022 potential Boron, Calcium, Sulfate, and TDS SSIs were certified September 5, 2023 and are included in Appendix 3.

An ASD is being conducted for:

- 1st semi-annual 2023 groundwater sampling event (June/July 2023):
    - Boron in AD-4C
    - Chloride in AD-4C

An ASD is being conducted for:

- 2nd semi-annual 2023 groundwater sampling event (October/December 2023):
    - Boron in AD-4C

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

Since an ASD is being completed for the potential SSI(s), no transition was made during the reporting period and the CCR Unit remained in detection monitoring.

VIII. Other Information Require

Field sheets and laboratory reports for this reporting period are in Appendix 6.

IX. Description of Any Problems Encountered and Actions Taken

No significant problems were encountered.

X. A Projection of Key Activities for the Upcoming Year

- Detection monitoring on a semi-annual schedule for 30 TAC 352 Appendix III constituents;
- Evaluation of the detection monitoring results from a statistical analysis viewpoint, looking for SSIs;
- Conduct ASDs, if needed;
- Responding to any new data received in light of TCEQ's CCR rule requirements;
- Preparation of the next annual groundwater report;

APPENDIX 1

Potentiometric maps and Tables that follow show 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.

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

1. Monitoring well coordinates and water level data (collected on June 6, 2023) provided by AEP.
2. AD-12 was not gauged during the June 2023 event.
3. Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2022).
4. Groundwater elevation units are feet above mean sea level.
5 Satellite imagery provided by ESRI.

500 250 0 500 Feet

STATE OF TEXAS
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Beth Ann Gross

November 30, 2023

Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Groundwater Potentiometric Map
June 2023

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2023/11/30

Figure 1

\\annarbor-01\Data\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2023\AEP-Welsh_GW_2023-06June.mxd. ASoltero. 11/30/2023. CHA8423/14/08.

AD-5
336.62

AD-6
332.30

AD-7
333.83

AD-8
325.44

AD-15
320.82

AD-18
339.89

AD-17
333.95

AD-9
328.98

AD-13
330.46

AD-10
323.77

AD-12
347.93

AD-11
327.03

AD-14
329.12

AD-1
338.51

AD-16R
326.72

AD-4C
323.27

AD-3
322.97

AD-2
330.60

Primary
Bottom
Ash Pond

Clear
Water Pond

Landfill

Bottom Ash
Storage Pond

Welsh
Reservoir

345
340
335
330
325
335
325

N

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

1. Monitoring well coordinates and water level data (collected on October 3 and 4, 2023) provided by AEP.
2. Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2022).
3. Groundwater elevation units are feet above mean sea level.
4. Satellite imagery provided by ESRI.

500 250 0 500
Feet

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November 30, 2023

Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Groundwater Potentiometric Map
October 2023

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2023/11/30

Figure
2

\\annarbor-01\Data\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2023\AEP-Welsh_GW_2023-10Oct.mxd. ASoltero. 11/30/2023. CHA8423/14/08.

Table 1. Groundwater Elevation Data Summary
Welsh Power Plant

Geosyntec Consultants

Unit	All Units			Bottom Ash Storage Pond			Primary Bottom Ash Pond			Landfill		
Gradient	Background			Downgradient			Downgradient			Downgradient		
Well	AD-1	AD-5	AD-17	AD-3	AD-4C	AD-16R*	AD-8	AD-9	AD-15	AD-11	AD-13	AD-14
Mar-2016	342.83	338.04	334.64	325.12	326.19	337.09	325.70	329.74	322.14	328.13	334.76	334.83
May-2016	344.89	337.62	334.26	312.97	325.89	335.84	325.68	329.28	321.93	328.39	334.54	334.51
Jul-2016	342.89	337.24	334.30	323.70	324.01	332.14	325.05	329.53	321.28	328.14	332.93	331.71
Sep-2016	341.42	337.51	334.45	323.63	324.00	326.52	325.49	329.11	321.42	327.99	332.65	331.17
Oct-2016	341.23	337.74	334.64	323.47	323.76	331.43	325.29	328.92	321.71	327.87	332.39	330.94
Dec-2016	340.58	337.01	334.05	323.78	325.07	330.96	325.92	329.31	321.64	328.20	332.84	330.79
Jan-2017	341.18	338.34	333.94	325.04	326.39	330.71	326.76	330.50	322.81	328.90	334.54	332.63
Feb-2017	339.74	336.17	333.94	324.92	324.89	--	324.27	328.05	321.93	328.25	331.83	330.87
May-2018	340.31	335.56	332.85	321.79	324.54	328.72	325.72	329.32	320.26	326.36	330.38	330.57
Aug-2018	339.16	336.37	333.95	323.02	323.43	326.91	325.84	329.58	321.57	327.67	331.01	329.38
Nov-2018	--	--	--	325.51	326.24	327.20	--	--	--	--	--	--
Feb-2019	341.95	338.15	334.86	325.97	326.50	331.39	326.37	330.03	322.60	328.80	333.60	334.25
Apr-2019	--	--	--	325.37	326.28	335.76	326.20	330.00	--	328.16	333.29	334.59
May-2019	345.68	337.54	335.13	325.65	326.15	339.02	326.09	329.83	322.03	328.08	333.46	334.77
Jul-2019	343.95	336.89	334.94	324.72	324.73	332.17	325.80	329.57	321.43	327.97	332.23	331.85
Feb-2020	341.88	338.56	334.94	--	--	--	326.04	329.58	322.12	328.10	333.38	333.44
May-2020	344.09	337.79	335.10	325.38	326.20	330.42	326.32	329.75	322.17	328.33	333.29	333.97
Oct-2020	340.56	337.35	334.69	323.57	324.19	327.67	325.36	328.60	321.12	327.49	330.97	330.04
Dec-2020	340.04	337.61	334.63	323.51	325.17	327.12	--	--	--	--	--	--
Feb-2021	341.68	338.16	334.72	--	--	--	326.38	329.55	322.20	328.46	333.35	333.73
Jun-2021	345.82	337.15	334.93	326.36	326.87	330.59	326.77	329.92	322.45	328.70	334.69	335.88
Jul-2021	--	--	--	--	325.45	--	--	--	--	--	--	--
Oct-2021	340.54	336.75	334.53	322.86	323.58	327.58	325.23	328.51	320.33	327.08	330.94	329.73
Mar-2022	339.58	337.12	333.92	323.80	325.62	326.17	DRY	DRY	DRY	DRY	DRY	DRY
Jun-2022	338.86	335.94	333.48	323.11	323.46	326.44	324.65	328.45	320.27	327.03	330.56	329.18
Aug-2022	339.01	336.02	333.48	322.80	324.21	325.87	--	--	--	--	--	--
Oct-2022	--	--	--	--	--	--	324.90	328.75	321.19	327.16	330.50	329.17
Nov-2022	338.17	336.41	333.31	323.12	324.46	325.74	--	--	--	--	--	--
Feb-2023	--	--	--	325.80	325.52	327.52	326.20	329.95	322.28	327.97	333.00	332.79
Jun-2023	339.19	336.58	333.87	324.06	324.44	327.57	325.51	328.86	321.42	327.60	330.98	330.04
Jul-2023	--	--	--	--	324.76	--	--	--	--	--	--	--
Oct-2023	338.51	336.62	333.95	322.97	323.28	326.78	325.44	328.98	320.82	327.03	330.46	329.12
Dec-2023	--	--	--	323.85	325.01	326.04	--	--	--	--	--	--

Notes:

1. Groundwater elevation measured in feet above mean sea level.

*AD-16 prior to February 2017.

Table 1: Residence Time Calculation Summary
Welsh Bottom Ash Storage Pond

Geosyntec Consultants, Inc.

			2023-02		2023-06		2023-07[3]		2023-10		2023-12[3]	
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)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Bottom Ash Storage Pond	AD-1 [1]	2.0	2.6	23.2	3.1	19.8	NC	NC	3.1	19.3	NC	NC
	AD-3 [2]	2.0	4.4	13.9	4.3	14.2	NC	NC	5.2	11.8	4.0	15.2
	AD-4C [2]	2.0	3.6	16.7	2.9	21.1	3.1	19.6	3.2	18.8	2.8	22.1
	AD-5 [1]	2.0	2.5	24.6	4.4	13.8	NC	NC	1.7	35.5	NC	NC
	AD-16R [2]	2.0	3.1	19.8	2.0	30.9	NC	NC	1.9	31.9	2.4	25.7
	AD-17 [1]	2.0	8.6	7.1	3.8	15.9	NC	NC	7.6	8.0	NC	NC

Notes:
[1] - Upgradient Well
[2] - Downgradient Well
[3] - Two-of-two verification sampling
NC - Not Calculated

Table 1. Groundwater Data Summary: AD-1
Welsh - BASP
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
5/26/2016	Background	0.346	36.5	5	< 0.083 U1	5.9	42	252
7/27/2016	Background	0.35	39.6	4	< 0.083 U1	5.3	36	239
9/30/2016	Background	0.332	15	5	< 0.083 U1	5.4	35	173
10/19/2016	Background	0.398	19.1	4	< 0.083 U1	5.2	42	192
12/12/2016	Background	0.394	8.74	4	< 0.083 U1	5.2	40	200
1/17/2017	Background	0.656	129	4	< 0.083 U1	7.1	68	538
2/23/2017	Background	0.7	147	9	< 0.083 U1	6.9	68	612
6/7/2017	Background	0.449	15.1	4	< 0.083 U1	5.1	42	176
10/6/2017	Detection	0.453	14.3	4	< 0.083 U1	5.3	40	160
5/24/2018	Detection	0.345	10.2	4	< 0.083 U1	5.2	43	150
8/14/2018	Detection	0.443	5.95	5	< 0.083 U1	5.2	44	160
2/20/2019	Detection	0.504	142	2.82	0.24	7.3	49.2	522
5/30/2019	*	0.689	138	1.59	0.29	6.7	43.3	588
7/24/2019	Detection	0.644	62.7	2	0.106 J1	6.0	58	180
2/17/2020	*	0.626	115	3.41	0.31	5.8	56.3	488
5/20/2020	Detection	0.801	126	1.83	0.20	7.2	51.4	508
10/14/2020	Detection	0.670	3.88	2.16	0.25	4.5	66.9	183
2/23/2021	*	0.617	113	--	0.31	6.6	--	--
6/2/2021	Detection	0.786	97.1	2.26	0.30	6.2	61.4	400
10/20/2021	Detection	0.732	4.8	2.21	0.22	4.4	72.4	190
6/28/2022	Detection	0.768	6.76	2.32	0.22	4.9	74.7	180
11/1/2022	Detection	0.586	7.87	2.70	0.14	4.8	61.3	170
6/6/2023	Detection	0.729	6.59	3.03	0.24	4.9	91.1	210
10/4/2023	Detection	0.901	6.56	3.03	0.20	5.3	80.7	200

Table 1. Groundwater Data Summary: AD-1
Welsh - BASP
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
5/26/2016	Background	< 0.93 U1	1.39361 J1	191	0.271453 J1	0.213294 J1	0.240267 J1	1.15339 J1	1.184	< 0.083 U1	< 0.68 U1	0.01	0.033	0.53149 J1	1.74922 J1	0.959865 J1
7/27/2016	Background	< 0.93 U1	< 1.05 U1	191	0.315631 J1	0.0940357 J1	< 0.23 U1	0.615933 J1	0.9952	< 0.083 U1	< 0.68 U1	0.019	0.00793 J1	< 0.29 U1	1.81763 J1	< 0.86 U1
9/30/2016	Background	< 0.93 U1	2.96797 J1	141	0.382874 J1	< 0.07 U1	5	0.850408 J1	1.38	< 0.083 U1	3.38434 J1	0.014	0.01773 J1	< 0.29 U1	1.02629 J1	< 0.86 U1
10/19/2016	Background	< 0.93 U1	< 1.05 U1	114	0.311247 J1	< 0.07 U1	0.412131 J1	0.649606 J1	1.141	< 0.083 U1	< 0.68 U1	0.008	0.00534 J1	1.39872 J1	2.03168 J1	1.25062 J1
12/12/2016	Background	< 0.93 U1	< 1.05 U1	72	0.34133 J1	< 0.07 U1	< 0.23 U1	0.424105 J1	0.719	< 0.083 U1	< 0.68 U1	0.008	0.01521 J1	< 0.29 U1	1.85825 J1	< 0.86 U1
1/17/2017	Background	< 0.93 U1	< 1.05 U1	410	0.0366913 J1	< 0.07 U1	< 0.23 U1	0.480125 J1	3.009	< 0.083 U1	< 0.68 U1	0.000275956 J1	< 0.005 U1	< 0.29 U1	4.04737 J1	< 0.86 U1
2/23/2017	Background	< 0.93 U1	< 1.05 U1	488	< 0.02 U1	< 0.07 U1	< 0.23 U1	0.765099 J1	4.309	< 0.083 U1	< 0.68 U1	0.001	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/7/2017	Background	< 0.93 U1	1.14 J1	93.46	0.37 J1	< 0.07 U1	0.66 J1	0.77 J1	0.676	< 0.083 U1	< 0.68 U1	0.00902	0.007 J1	< 0.29 U1	2.1 J1	< 0.86 U1

Table 1. Groundwater Data Summary: AD-3
Welsh - BASP
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
5/31/2016	Background	0.02	1.41	9	< 0.083 U1	6.6	4	106
7/27/2016	Background	0.02	0.706	8	< 0.083 U1	6.7	5	118
9/30/2016	Background	0.02	0.5	9	< 0.083 U1	4.8	6	127
10/19/2016	Background	0.06	0.794	8	< 0.083 U1	3.7	9	112
12/12/2016	Background	0.02	1.05	8	< 0.083 U1	4.7	11	138
1/19/2017	Background	0.02	0.746	9	< 0.083 U1	4.6	4	76
2/23/2017	Background	0.02	0.573	9	< 0.083 U1	4.7	5	104
6/7/2017	Background	0.03326	0.543	9	0.2625 J1	4.5	5	104
10/6/2017	Detection	0.02055	0.908	9	< 0.083 U1	5.2	7	114
5/24/2018	Detection	0.0069 J1	0.545	8	< 0.083 U1	4.4	3	98
11/13/2018	Detection	0.009 J1	0.684	8	< 0.083 U1	5.2	4.05	114
2/20/2019	Detection	0.01 J1	0.817	9.4	0.13	4.8	1.9	110
4/30/2019	Detection	0.007	--	9.34	--	4.1	--	--
5/30/2019	*	< 0.02 U1	3.02	9.03	0.18	4.3	2.3	110
7/24/2019	Detection	< 0.02 U1	1.35	7	0.09 J1	4.6	6	116
11/25/2019	Detection	--	0.734	--	--	--	--	--
5/20/2020	Detection	< 0.02 U1	0.724	7.99	0.11	4.6	2.7	236
7/22/2020	Detection	--	--	--	--	4.7	--	114
10/14/2020	Detection	< 0.02 U1	0.705	7.31	0.16	4.6	3.5	116
6/2/2021	Detection	0.036 J1	0.7	7.98	0.18	4.4	3.38	110
10/20/2021	Detection	< 0.009 U1	0.9	7.16	0.15	4.2	6.02	130
6/28/2022	Detection	0.016 J1	0.68	8.01	0.14	3.9	2.55	120
11/1/2022	Detection	< 0.009 U1	1.57	8.04	0.14	4.4	13.0	110
2/7/2023	Detection	--	0.57	--	--	4.7	3.39	--
6/6/2023	Detection	0.007 J1	0.65	9.14	0.11	4.3	2.4	100
10/4/2023	Detection	0.019 J1	1.16	8.65	0.12	4.5	9.5	100
12/14/2023	Detection	--	--	--	--	4.6	--	--

Table 1. Groundwater Data Summary: AD-3
Welsh - BASP
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
5/31/2016	Background	< 0.93 U1	1.56793 J1	53	0.286352 J1	< 0.07 U1	0.464721 J1	1.49214 J1	1.018	< 0.083 U1	< 0.68 U1	0.01	0.85	< 0.29 U1	0.995807 J1	1.31537 J1
7/27/2016	Background	3.21106 J1	< 1.05 U1	36	0.349485 J1	< 0.07 U1	0.515023 J1	1.19046 J1	0.183	< 0.083 U1	< 0.68 U1	0.024	0.589	1.43134 J1	2.40188 J1	< 0.86 U1
9/30/2016	Background	2.70729 J1	2.61987 J1	43	0.188596 J1	0.0802799 J1	0.659763 J1	1.44845 J1	0.552	< 0.083 U1	< 0.68 U1	0.019	0.39	< 0.29 U1	1.79734 J1	< 0.86 U1
10/19/2016	Background	2.47184 J1	1.97572 J1	41	0.451723 J1	0.277085 J1	0.818782 J1	1.53187 J1	1.589	< 0.083 U1	< 0.68 U1	0.018	0.351	6	< 0.99 U1	< 0.86 U1
12/12/2016	Background	< 0.93 U1	< 1.05 U1	45	0.262387 J1	< 0.07 U1	0.627352 J1	1.34901 J1	0.546	< 0.083 U1	< 0.68 U1	0.017	0.321	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/19/2017	Background	< 0.93 U1	2.13113 J1	41	0.235263 J1	< 0.07 U1	0.647294 J1	1.6345 J1	0.35	< 0.083 U1	< 0.68 U1	0.014	0.504	< 0.29 U1	< 0.99 U1	< 0.86 U1
2/23/2017	Background	< 0.93 U1	< 1.05 U1	37	0.209151 J1	< 0.07 U1	< 0.23 U1	1.1537 J1	0.4592	< 0.083 U1	< 0.68 U1	0.014	0.501	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/7/2017	Background	< 0.93 U1	1.91 J1	38	0.24 J1	0.08 J1	0.75 J1	1.28 J1	0.459	0.2625 J1	< 0.68 U1	0.01503	0.365	< 0.29 U1	< 0.99 U1	< 0.86 U1

Table 1. Groundwater Data Summary: AD-4C
Welsh - BASP
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
5/31/2016	Background	0.05	0.798	10	< 0.083 U1	5.4	32	204
7/27/2016	Background	0.03	0.666	12	< 0.083 U1	5.5	35	208
9/30/2016	Background	0.02	0.5	11	< 0.083 U1	5.0	45	212
10/19/2016	Background	0.04	0.578	10	< 0.083 U1	4.3	35	212
12/12/2016	Background	0.02	0.341	11	< 0.083 U1	4.6	36	252
1/19/2017	Background	0.02	0.761	10	< 0.083 U1	4.7	43	184
2/23/2017	Background	0.02	0.467	9	< 0.083 U1	5.1	40	196
6/7/2017	Background	0.03331	0.573	10	< 0.083 U1	4.9	39	228
10/6/2017	Detection	0.02565	0.654	11	< 0.083 U1	5.4	44	226
5/24/2018	Detection	0.02505	0.434	14	< 0.083 U1	5.2	42	224
8/14/2018	Detection	--	--	15	--	5.0	--	--
11/13/2018	Detection	0.01 J1	0.609	7.5	< 0.083 U1	5.8	56	220
12/18/2018	Detection	--	--	--	--	4.9	58	--
2/20/2019	Detection	0.01 J1	0.931	9.18	0.1 J1	5.2	60.1	242
4/30/2019	Detection	0.014	--	--	--	4.8	56.2	--
5/30/2019	*	< 0.02 U1	0.564	14.8	0.16	4.6	52.8	208
7/24/2019	Detection	< 0.02 U1	0.586	13	< 0.083 U1	3.9	52	284
12/19/2019	Detection	--	--	--	--	--	--	226
5/20/2020	Detection	< 0.02 U1	0.679	15.1	0.11	5.1	69.0	268
7/22/2020	Detection	--	--	--	--	4.7	71.8	280
10/13/2020	Detection	< 0.02 U1	0.613	13.1	0.18	4.9	76.1	278
12/10/2020	Detection	--	--	--	--	4.9	78.2	288
6/2/2021	Detection	0.038 J1	1.1	13.3	0.16	4.6	82.4	280
7/26/2021	Detection	--	1.4	--	--	4.6	71.9	280
10/20/2021	Detection	0.021 J1	0.8	14.3	0.15	4.3	76.8	280
6/28/2022	Detection	0.043 J1	1.08	14.1	0.12	4.8	83.6	280
8/26/2022	Detection	--	--	--	--	3.6	160	--
11/1/2022	Detection	0.068	1.42	19.1	0.1	4.9	142	370
2/7/2023	Detection	0.120	1.65	10.9	--	4.9	111	320
6/5/2023	Detection	0.061	0.93	18.7	0.13	5.1	87.9	290
7/27/2023	Detection	0.099	--	19.2	--	5.1	77.4	--
10/4/2023	Detection	0.207	1.67	13.0	0.13	5.0	115	320
12/14/2023	Detection	0.137	1.08	--	--	4.6	106	330

Table 1. Groundwater Data Summary: AD-4C
Welsh - BASP
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
5/31/2016	Background	< 0.93 U1	< 1.05 U1	88	0.407928 J1	< 0.07 U1	9	1.19093 J1	1.289	< 0.083 U1	< 0.68 U1	0.004	0.191	< 0.29 U1	1.12526 J1	< 0.86 U1
7/27/2016	Background	< 0.93 U1	< 1.05 U1	59	0.335947 J1	< 0.07 U1	4	0.852951 J1	0.571	< 0.083 U1	< 0.68 U1	0.015	0.185	1.09296 J1	2.52271 J1	< 0.86 U1
9/30/2016	Background	< 0.93 U1	1.51249 J1	74	0.274296 J1	< 0.07 U1	8	0.986752 J1	2.572	< 0.083 U1	< 0.68 U1	0.006	0.16	< 0.29 U1	1.95938 J1	< 0.86 U1
10/19/2016	Background	< 0.93 U1	1.74748 J1	69	0.347477 J1	0.0809157 J1	9	1.08565 J1	1.657	< 0.083 U1	< 0.68 U1	0.006	0.141	3.20217 J1	1.18291 J1	< 0.86 U1
12/12/2016	Background	< 0.93 U1	2.24683 J1	21	0.133622 J1	< 0.07 U1	0.944028 J1	0.305391 J1	0.685	< 0.083 U1	< 0.68 U1	0.004	0.143	< 0.29 U1	1.27423 J1	< 0.86 U1
1/19/2017	Background	< 0.93 U1	1.85604 J1	75	0.221609 J1	< 0.07 U1	4	1.02773 J1	2.045	< 0.083 U1	< 0.68 U1	0.005	0.125	< 0.29 U1	< 0.99 U1	< 0.86 U1
2/23/2017	Background	< 0.93 U1	< 1.05 U1	30	0.102645 J1	< 0.07 U1	0.421354 J1	0.364739 J1	0.517	< 0.083 U1	< 0.68 U1	0.004	0.098	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/7/2017	Background	< 0.93 U1	1.19 J1	51.42	0.19 J1	0.08 J1	4.03	0.75 J1	0.953	< 0.083 U1	< 0.68 U1	0.00482	0.147	< 0.29 U1	< 0.99 U1	< 0.86 U1

Table 1. Groundwater Data Summary: AD-5
Welsh - BASP
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
5/31/2016	Background	0.03	36.9	15	0.3469 J1	6.4	123	337
7/28/2016	Background	0.04	44.7	16	< 0.083 U1	5.4	163	360
9/30/2016	Background	0.04	46.3	15	0.2436 J1	5.3	190	416
10/20/2016	Background	0.05	50.7	14	< 0.083 U1	5.9	267	448
12/13/2016	Background	0.05	49.6	13	< 0.083 U1	6.2	233	484
1/17/2017	Background	0.04	49.8	14	< 0.083 U1	6.3	234	438
2/23/2017	Background	0.04	33	15	< 0.083 U1	5.5	127	286
6/7/2017	Background	0.05281	49.7	14	< 0.083 U1	6.0	82	300
10/6/2017	Detection	0.04322	33.1	16	< 0.083 U1	5.6	82	258
5/24/2018	Detection	0.05007	28.1	22	< 0.083 U1	6.2	60	242
8/15/2018	Detection	0.050	40.5	19	< 0.083 U1	6.2	240	428
2/21/2019	Detection	0.033	33.9	24.7	0.21	5.4	46.5	220
5/30/2019	*	0.03 J1	30.0	22.3	0.29	6.3	51.3	238
7/24/2019	Detection	0.04 J1	41.1	18	0.112 J1	6.3	90	354
2/17/2020	*	0.03 J1	39.8	19.8	0.22	5.5	43.7	248
5/20/2020	Detection	0.03 J1	40.2	22.3	0.18	6.8	55.5	264
10/14/2020	Detection	0.04 J1	36.6	18.8	0.18	6.5	148	338
2/23/2021	*	0.03 J1	30.9	--	0.23	6.0	--	--
6/2/2021	Detection	0.027 J1	24.4	19.6	0.21	5.8	53.8	220
10/20/2021	Detection	0.038 J1	38.4	17.4	0.17	5.6	155	370
6/28/2022	Detection	0.048 J1	32.9	15.3	0.15	5.9	146	310
11/1/2022	Detection	0.041 J1	38.6	16.9	0.16	5.9	185	380
6/6/2023	Detection	0.030 J1	26.5	16.1	0.15	5.8	114	280
10/4/2023	Detection	0.042 J1	35.2	17.5	0.17	6.6	132	290

Table 1. Groundwater Data Summary: AD-5
Welsh - BASP
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
5/31/2016	Background	< 0.93 U1	< 1.05 U1	57	0.149801 J1	0.0765156 J1	0.555038 J1	14	1.634	0.3469 J1	< 0.68 U1	0.135	0.01135 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
7/28/2016	Background	2.05116 J1	2.90819 J1	93	0.518653 J1	0.502155 J1	0.411466 J1	15	4.75	< 0.083 U1	< 0.68 U1	0.191	0.01516 J1	< 0.29 U1	1.08901 J1	< 0.86 U1
9/30/2016	Background	< 0.93 U1	4.7609 J1	87	0.251584 J1	< 0.07 U1	0.90676 J1	14	3.33	0.2436 J1	< 0.68 U1	0.186	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
10/20/2016	Background	< 0.93 U1	< 1.05 U1	70	0.08781 J1	0.107488 J1	0.248085 J1	9	2.319	< 0.083 U1	< 0.68 U1	0.225	< 0.005 U1	1.36984 J1	< 0.99 U1	< 0.86 U1
12/13/2016	Background	< 0.93 U1	1.15381 J1	53	0.164529 J1	0.203546 J1	0.747921 J1	13	2.182	< 0.083 U1	< 0.68 U1	0.199	0.00802 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/17/2017	Background	< 0.93 U1	< 1.05 U1	47	0.0574718 J1	0.180502 J1	< 0.23 U1	12	1.023	< 0.083 U1	< 0.68 U1	0.239	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
2/23/2017	Background	< 0.93 U1	< 1.05 U1	42	0.0306858 J1	< 0.07 U1	< 0.23 U1	13	1.788	< 0.083 U1	< 0.68 U1	0.166	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/7/2017	Background	< 0.93 U1	3.85 J1	87.7	0.08 J1	0.39 J1	0.28 J1	11.93	2.32	< 0.083 U1	< 0.68 U1	0.124	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1

Table 1. Groundwater Data Summary: AD-16R
Welsh - BASP
Appendix III Constituents

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
6/6/2017	Background	0.04198	2.75	7	0.3438 J1	3.7	54	204
6/28/2017	Background	0.06398	1.24	6	0.2512 J1	3.9	55	200
7/7/2017	Background	0.02699	2.07	36	< 0.083 U1	3.4	52	184
7/14/2017	Background	0.04415	2.39	6	0.2516 J1	3.5	44	160
7/21/2017	Background	0.03237	2.5	7	0.2615 J1	3.5	54	180
7/28/2017	Background	0.02841	1.92	7	< 0.083 U1	2.8	48	162
8/2/2017	Background	0.03177	1.86	7	< 0.083 U1	3.0	49	174
8/11/2017	Background	0.06192	1.83	8	< 0.083 U1	4.1	44	164
8/18/2017	Background	0.0304	1.44	7	< 0.083 U1	3.4	46	160
8/31/2017	Background	0.02841	1.33	7	< 0.083 U1	3.9	63	152
10/6/2017	Detection	0.04672	0.896	7	< 0.083 U1	3.3	82	152
1/18/2018	Detection	--	--	--	--	4.0	58.6	--
5/23/2018	Detection	0.03202	2.53	6	< 0.083 U1	3.8	67	204
8/14/2018	Detection	--	--	--	--	3.9	44	--
11/13/2018	Detection	0.02 J1	0.467	6.5	< 0.083 U1	5.6	54	186
2/20/2019	Detection	0.03 J1	2	6.78	0.2	4.7	52.8	200
4/30/2019	Detection	0.015	--	--	--	3.9	--	--
5/29/2019	*	< 0.02 U1	1.36	5.43	0.19	3.9	41.6	80
7/24/2019	Detection	0.03 J1	1.50	7	0.13 J1	3.6	70	250
12/19/2019	Detection	--	--	--	--	--	--	134
5/20/2020	Detection	0.02 J1	1.54	7.09	0.16	3.4	71.4	242
7/22/2020	Detection	--	--	--	--	3.2	--	224
10/14/2020	Detection	0.02 J1	0.550	6.50	0.14	3.3	53.1	183
6/2/2021	Detection	0.028 J1	1.0	7.02	0.28	3.7	65.4	190
10/20/2021	Detection	0.019 J1	0.4	7.12	0.11	3.6	39.0	170
6/27/2022	Detection	0.026 J1	0.34	7.21	0.10	3.2	46.5	170
11/1/2022	Detection	0.019 J1	0.32	7.96	0.10	3.4	48.1	150
2/7/2023	Detection	--	--	6.85	--	3.7	--	--
6/6/2023	Detection	0.019 J1	0.35	6.90	0.06	3.4	50.4	170
10/4/2023	Detection	0.021 J1	0.29	6.85	0.08	3.6	50.6	170
12/14/2023	Detection	--	--	--	--	3.7	--	--

Table 1. Groundwater Data Summary: AD-16R
Welsh - BASP
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
6/6/2017	Background	< 0.93 U1	7.07	46.4	2.21	1.03	1.76	41.74	6.66	0.3438 J1	< 0.68 U1	0.0293	< 0.005 U1	< 0.29 U1	1.98 J1	< 0.86 U1
6/28/2017	Background	< 0.93 U1	5.28	41.43	2.16	0.92 J1	0.95 J1	40.87	12.11	0.2512 J1	< 0.68 U1	0.02932	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
7/7/2017	Background	< 0.93 U1	4.13 J1	44.56	2.08	0.97 J1	1.44	41.75	25.16	< 0.083 U1	< 0.68 U1	0.02846	< 0.005 U1	< 0.29 U1	2.09 J1	1.2 J1
7/14/2017	Background	< 0.93 U1	6.31	54.35	2.01	1.09	0.84 J1	37.88	9.12	0.2516 J1	< 0.68 U1	0.02391	0.009 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
7/21/2017	Background	< 0.93 U1	3.88 J1	51.06	2.09	1.02	1.43	40.86	9.81	0.2615 J1	< 0.68 U1	0.02653	< 0.005 U1	< 0.29 U1	1 J1	< 0.86 U1
7/28/2017	Background	< 0.93 U1	3.7	48.51	2.17	1.28	1.07	45.33	8.52	< 0.083 U1	< 0.68 U1	0.02617	0.006 J1	< 0.29 U1	1.27 J1	1.43 J1
8/2/2017	Background	< 0.93 U1	4.46 J1	49.61	2.06	1.22	0.95 J1	43.11	5.45	< 0.083 U1	< 0.68 U1	0.02498	< 0.005 U1	< 0.29 U1	1.74	2.02
8/11/2017	Background	< 0.93 U1	4.93 J1	47.52	1.89	1.13	0.96 J1	40.37	--	< 0.083 U1	< 0.68 U1	0.02347	0.008 J1	< 0.29 U1	1.36 J1	< 0.86 U1
8/18/2017	Background	< 0.93 U1	2.35 J1	43.85	1.91	1.08	0.8 J1	40.05	5.56	< 0.083 U1	< 0.68 U1	0.02466	0.009 J1	< 0.29 U1	< 0.99 U1	0.92 J1
8/31/2017	Background	< 0.93 U1	2.12 J1	44.14	1.75	1.04	1.18	37.56	6.68	< 0.083 U1	< 0.68 U1	0.02429	0.006 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1

Table 1. Groundwater Data Summary: AD-17
Welsh - BASP
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
5/26/2016	Background	0.121	200	43	0.4023 J1	7.2	1,166	1,810
7/27/2016	Background	0.119	195	32	0.4135 J1	5.7	1,005	1,576
9/30/2016	Background	0.111	191	36	0.3055 J1	6.2	1,055	1,663
10/20/2016	Background	0.124	194	32	0.583 J1	6.1	1,163	1,612
12/13/2016	Background	0.135	196	31	0.5399 J1	6.0	1,096	1,560
1/17/2017	Background	0.101	196	33	< 0.083 U1	5.9	1,445	1,686
2/22/2017	Background	0.135	189	30	< 0.083 U1	5.7	1,055	1,628
6/6/2017	Background	0.121	188	30	< 0.083 U1	5.8	1,105	1,578
10/5/2017	Detection	0.183	183	31	< 0.083 U1	5.9	1,090	1,548
5/24/2018	Detection	0.239	193	39	< 0.083 U1	6.3	1,067	1,836
8/15/2018	Detection	0.118	187	40	< 0.083 U1	5.6	1,168	1,748
2/21/2019	Detection	0.151	207	43.2	0.18	6.9	1,060	1,722
5/30/2019	*	0.158	202	41.7	< 0.04 U1	6.1	1,120	1,546
7/24/2019	Detection	0.113	216	37	0.085 J1	6.0	1,127	1,864
2/17/2020	*	0.104	184	36.0	0.16	5.9	1,070	1,750
5/20/2020	Detection	0.115	250	47.7	0.15	5.7	1,190	1,890
10/14/2020	Detection	0.100	185	35.7	0.17	5.4	1,060	1,720
2/23/2021	*	0.098	168	--	0.17	5.6	--	--
6/2/2021	Detection	0.124	233	44.9	0.31	5.7	1,210	1,890
10/20/2021	Detection	0.104	164	37.3	0.16	5.1	1,040	1,710
6/28/2022	Detection	0.112	167	37.0	0.09 J1	5.2	1,050	1,740
11/1/2022	Detection	0.097	165	40.3	0.09 J1	5.7	1,110	1,690
6/6/2023	Detection	0.10 J1	150	35.6	< 0.05 U1	5.3	1,190	1,510
10/4/2023	Detection	0.14 J1	176 M1	37.9	0.06 J1	5.8	1,180	1,520

Table 1. Groundwater Data Summary: AD-17
Welsh - BASP
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
5/26/2016	Background	< 0.93 U1	1.37501 J1	21	0.173275 J1	2	1	63	1.525	0.4023 J1	< 0.68 U1	0.37	0.032	< 0.29 U1	< 0.99 U1	< 0.86 U1
7/27/2016	Background	1.13716 J1	< 1.05 U1	20	0.307264 J1	4	1	68	2.78	0.4135 J1	< 0.68 U1	0.374	0.02133 J1	1.04115 J1	4.56733 J1	< 0.86 U1
9/30/2016	Background	< 0.93 U1	< 1.05 U1	31	0.175474 J1	0.848199 J1	3	58	2.358	0.3055 J1	< 0.68 U1	0.354	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
10/20/2016	Background	< 0.93 U1	< 1.05 U1	34	0.200656 J1	2	4	65	2.224	0.583 J1	< 0.68 U1	0.394	< 0.005 U1	0.322249 J1	3.34422 J1	< 0.86 U1
12/13/2016	Background	< 0.93 U1	< 1.05 U1	17	0.0498325 J1	3	0.816224 J1	68	2.384	0.5399 J1	< 0.68 U1	0.323	0.01485 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
1/17/2017	Background	< 0.93 U1	< 1.05 U1	14	0.0319852 J1	3	68	68	2.436	< 0.083 U1	< 0.68 U1	0.341	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
2/22/2017	Background	< 0.93 U1	< 1.05 U1	20	0.0665729 J1	2	1	73	2.288	< 0.083 U1	< 0.68 U1	0.331	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/6/2017	Background	< 0.93 U1	< 1.05 U1	10.33	< 0.02 U1	6.06	< 0.23 U1	74.8	1.598	< 0.083 U1	< 0.68 U1	0.329	0.013 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1

Notes:
- -: Not analyzed
*: Sample is not associated with a specific monitoring program.
<: 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.
M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.
mg/L: milligrams per liter
pCi/L: picocuries per liter
SU: standard unit
µg/L: micrograms per liter

APPENDIX 2

Where applicable, shown in this appendix the are results from statistical analyses, and a description of the statistical analysis method chosen. These statistical analyses are conducted separately for each constituent in each monitoring well.

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Memorandum

Date:	June 5, 2023
To:	David Miller (AEP)
Copies to:	Rebecca Jones (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Evaluation of Detection Monitoring Data at Welsh Plant's Bottom Ash Storage Pond (BASP)

In accordance with the Texas Commission on Environmental Quality (TCEQ) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (30 TAC 352, "CCR rule"), the second semiannual detection monitoring event of 2022 at the Bottom Ash Storage Pond (BASP), an existing CCR unit at the Welsh Power Plant located in Pittsburg, Texas, was completed on November 1, 2022. Based on the results, a two-of-two verification sampling was completed on February 7, 2023.

A data quality review was completed to assess if the data collected for this semiannual detection monitoring event met the objectives outlined in TCEQ Draft Technical Guidance No. 32 related to groundwater sampling and analysis[1]. The data were determined usable for supporting project objectives, as documented in the review memoranda provided in Attachment A.

Background values for the BASP were originally calculated in January 2018. After a minimum of four detection monitoring events, the results of those events were compared to the existing background and the dataset was updated as appropriate. Revised upper prediction limits (UPLs) were calculated for each Appendix III parameter to represent background values. Lower prediction limits (LPLs) were also calculated for pH. Details on the calculation of these revised background values are described in Geosyntec's *Statistical Analysis Summary* report, dated December 8, 2021.

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

To achieve an acceptably high statistical power while maintaining a site-wide false-positive rate (SWFPR) of 10% per year or less, prediction limits were calculated based on a one-of-two retesting procedure. With this procedure, a statistically significant increase (SSI) is only concluded if both samples in a series of two exceeds the UPL (or are below the LPL for pH). In practice, if the initial result did not exceed the UPL, a second sample was not collected or analyzed.

Detection monitoring results and the relevant background values are compared in Table 1 and noted exceedances are described in the list below.

- Boron concentrations exceeded the intrawell UPL of 0.0481 mg/L in both the initial (0.068 mg/L) and second (0.120 mg/L) samples collected at AD-4C. Thus, an SSI over background is concluded for boron at AD-4C.

- Calcium concentrations exceeded the intrawell UPL of 1.19 mg/L in both the initial (1.42 mg/L) and second (1.65 mg/L) samples collected at AD-4C. Thus, an SSI over background is concluded for calcium at AD-4C.

- Sulfate concentrations exceeded the intrawell UPL of 82.8 mg/L in both the initial (142 mg/L) and second (111 mg/L) samples collected at AD-4C. Thus, an SSI over background is concluded for sulfate at AD-4C.

- Total dissolved solids (TDS) concentrations exceeded the intrawell UPL of 301 mg/L in both the initial (370 mg/L) and second (320 mg/L) samples collected at AD-4C. Thus, an SSI over background is concluded for TDS at AD-4C.

In response to the exceedances noted above, the Welsh BASP CCR unit will either transition to assessment monitoring or an alternative source demonstration (ASD) for boron, calcium, sulfate, and TDS will be conducted in accordance with 30 TAC 352.941(c). If the ASD is successful, the Welsh BASP will remain in detection monitoring.

The statistical analysis was conducted in accordance with 30 TAC 352.931 and completed within 90 days of sampling and analysis. A certification of these statistics by a qualified professional engineer is provided in Attachment B.

Table 1. Detection Monitoring Data Evaluation
Detection Summary Memorandum
Welsh Plant, Bottom Ash Storage Pond

Analyte	Unit	Description	AD-3		AD-4C		AD-16R	
			11/1/2022	2/7/2023	11/1/2022	2/7/2023	11/1/2022	2/7/2023
Boron	mg/L	Intrawell Background Value (UPL)	0.0444		0.0481		0.0595	
		Analytical Result	0.009	--	**0.068**	**0.120**	0.019	--
Calcium	mg/L	Intrawell Background Value (UPL)	1.31		1.19		2.95	
		Analytical Result	**1.57**	0.57	**1.42**	**1.65**	0.32	--
Chloride	mg/L	Intrawell Background Value (UPL)	9.83		16.0		7.79	
		Analytical Result	8.04	--	**19.1**	10.9	**7.96**	6.85
Fluoride	mg/L	Intrawell Background Value (UPL)	1.00		1.00		1.00	
		Analytical Result	0.14	--	0.1	--	0.10	--
pH	SU	Intrawell Background Value (UPL)	5.3		5.7		4.8	
		Intrawell Background Value (LPL)	3.9		4.1		2.7	
		Analytical Result	4.4	--	4.9	--	3.4	--
Sulfate	mg/L	Intrawell Background Value (UPL)	9.54		82.8		75.7	
		Analytical Result	**13.0**	3.39	**142**	**111**	48.1	--
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	136		301		251	
		Analytical Result	110	--	**370**	**320**	150	--

Notes:
Bold values exceed the background value.
Background values are shaded gray.
LPL: Lower prediction limit
mg/L: milligrams per liter
SU: standard units
UPL: Upper prediction limit
--: not measured

ATTACHMENT A
Data Quality Review Memoranda

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Memorandum

Date:	January 18, 2023
To:	David Miller (AEP)
Copies to:	Jill Parker-Witt (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Data Quality Review – Welsh Power Plant October-November 2022 Sampling Event

This memorandum summarizes the findings of a data quality review for groundwater samples collected at the Welsh Power Plant, located in Pittsburg, Texas in October and November 2022. 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 twenty-one (21) groundwater samples collected during the October and November 2022 sampling event and are reviewed in this memorandum:

- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223477
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223481
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223483
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223484
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223509
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223510
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223511
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 223515

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 223509, chromium and cobalt were detected in the equipment blank sample "EQUIPMENT BLANK - BASP" collected on 11/1/2022. The detected chromium concentration in the equipment blank (0.53 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias for all groundwater chromium results. The detected cobalt concentration in the equipment blank (0.145 µg/L) was more than 10% of the detected value in sample AD-4C (0.757 µg/L), which could result in high bias in the AD-4C cobalt results.

- As reported in SDG 222510, barium, boron, chromium, cobalt, lithium, and molybdenum were detected in the equipment blank sample "EB - Background" collected on 11/1/2022. The detected boron concentration in the equipment blank (0.01 mg/L) was more than 10% of the detected value in samples AD-5 (0.041 mg/L) and AD-17 (0.097 mg/L), which could result in high bias in the AD-5 and AD-17 boron results. Likewise, the detected chromium concentration in the equipment blank (0.52 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias for all groundwater chromium results. The detected cobalt concentration in the equipment blank (0.161 µg/L) was more than 10% of the detected value in samples AD-1 (1.17 µg/L) and "Dup-Background" (1.17 µg/L), which could result in high bias in the AD-1 and duplicate cobalt results. All other equipment blank detections were less than 10% of the detected values in groundwater and would not result in a high bias.

- As reported in SDG 223511, chromium, cobalt, lithium, and molybdenum were detected in the equipment blank sample "EQUIPMENT BLANK – PBAP" collected on 10/31/2022. The detected chromium concentration in the equipment blank (0.53 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias for all groundwater chromium results. The estimated molybdenum concentration in the equipment blank (0.2 µg/L) was more than 10% of the estimated value in sample AD-8 (0.2 µg/L), which could result in high bias in the AD-8 molybdenum results. All other equipment blank detections were less than 10% of the detected values in groundwater and would not result in a high bias.

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

- As reported in SDG 223513, chromium, cobalt, lithium, and molybdenum were detected in the equipment blank sample "EQUIPMENT BLANK – LF" collected on 10/31/2022. The detected chromium concentration in the equipment blank (0.7 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias for all groundwater chromium results. The estimated molybdenum concentration in the equipment blank (0.3 µg/L) was more than 10% of the estimated value in samples AD-13 (0.2 µg/L) and AD-14 (0.4 µg/L), which could result in high bias in the AD-13 and AD-14 molybdenum results. All other equipment blank detections were less than 10% of the detected values in groundwater and would not result in a high bias.

- As reported in SDG 223510, the relative percent difference (RPD) for chromium concentrations from parent sample "AD-1" and duplicate sample "Dup Background" was 41%. The AD-1 chromium results should be considered estimated.

- As reported in SDG 223510, the RPD for radium-226 (77.1%) in the laboratory duplicate was above the acceptable limit of 25%. The "AD-1" radium-226 results should be considered estimated.

- As reported in SDG 223509, the matrix spike (MS) recovery (47.8%) and matrix spike duplicate (MSD) recovery (35.3%) for lithium were below the acceptable range of 75-125%. The associated sample (AD-3) was flagged M1: the associated MS or MSD recovery was outside acceptance limits. The AD-3 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.

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Memorandum

Date:	April 12, 2023
To:	David Miller (AEP)
Copies to:	Jill Parker-Witt (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Data Quality Review – Welsh Power Plant February 2023 Sampling Event

This memorandum summarizes the findings of a data quality review for groundwater samples collected at the Welsh Power Plant, located in Pittsburg, Texas in February 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"). These samples were analyzed for select 40 CFR 257 Appendix III constituents.

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

- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 230437
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 230438

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.

No data quality issues were identified. Based on these findings, the data reported in these SDGs are considered accurate and complete and the data are considered usable for supporting project objectives.

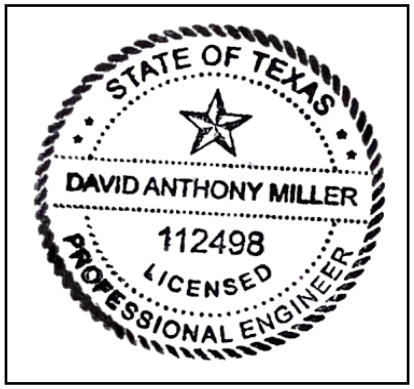
[1] TCEQ. Topic: Coal Combustion Residuals (CCR) Groundwater Monitoring and Corrective Action: Technical Guidance No. 32. May 2020.

ATTACHMENT B

Certification by a Qualified Professional Engineer

CERTIFICATION BY QUALIFIED PROFESSIONAL ENGINEER

I certify that the selected statistical method, described above and in the December 8, 2021 *Statistical Analysis Summary* report, is appropriate for evaluating the groundwater monitoring data for the Welsh BASP CCR management area and that the requirements of 30 TAC 352.931(a) have been met.



David Anthony Miller

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature

112498	Texas	06.07.2023
License Number	Licensing State	Date

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Memorandum

Date:	November 14, 2023
To:	David Miller (AEP)
Copies to:	Rebecca Jones (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Evaluation of Detection Monitoring Data at Welsh Plant's Bottom Ash Storage Pond (BASP)

In accordance with the Texas Commission on Environmental Quality (TCEQ) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (30 TAC 352, "CCR rule"), the first semiannual detection monitoring event of 2023 at the Bottom Ash Storage Pond (BASP), an existing CCR unit at the Welsh Power Plant in Pittsburg, Texas, was completed on June 5-6, 2023. Based on the results, a two-of-two verification sampling was completed on July 27, 2023.

A data quality review was completed to assess if the data collected for this semiannual detection monitoring event met the objectives outlined in TCEQ Draft Technical Guidance No. 32 related to groundwater sampling and analysis[1]. The data were determined usable for supporting project objectives, as documented in the review memoranda provided in Attachment A.

Background values for the BASP were originally calculated in January 2018. After a minimum of four detection monitoring events, the results of those events were compared to the existing background and the dataset was updated as appropriate. Revised upper prediction limits (UPLs) were calculated for each Appendix III parameter to represent background values. Lower prediction limits (LPLs) were also calculated for pH. Details on the calculation of these revised background values are described in Geosyntec's *Statistical Analysis Summary* report, dated December 8, 2021.

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

To achieve an acceptably high statistical power while maintaining a site-wide false-positive rate (SWFPR) of 10% per year or less, prediction limits were calculated based on a one-of-two retesting procedure. With this procedure, a statistically significant increase (SSI) is only concluded if both samples in a series of two exceeds the UPL (or are below the LPL for pH). In practice, if the initial result did not exceed the UPL, a second sample was not collected or analyzed.

Detection monitoring results and the relevant background values are compared in Table 1 and noted exceedances are described in the list below.

- Boron concentrations were above the intrawell UPL of 0.0481 mg/L in both the initial (0.061 mg/L) and second (0.099 mg/L) samples collected at AD-4C. Thus, an SSI over background is concluded for boron at AD-4C.

- Chloride concentrations were above the intrawell UPL of 16.0 mg/L in both the initial (18.7 mg/L) and second (19.2 mg/L) samples collected at AD-4C. Thus, an SSI over background is concluded for chloride at AD-4C.

In response to the exceedances noted above, the Welsh BASP CCR unit will either transition to assessment monitoring or an alternative source demonstration (ASD) for boron and chloride will be conducted in accordance with 30 TAC 352.941(c). If the ASD is successful, the Welsh BASP will remain in detection monitoring.

The statistical analysis was conducted in accordance with 30 TAC 352.931 and completed within 90 days of sampling and analysis. A certification of these statistics by a qualified professional engineer is provided in Attachment B.

Table 1. Detection Monitoring Data Evaluation
Detection Summary Memorandum
Welsh Plant - Bottom Ash Storage Pond

Analyte	Unit	Description	AD-3	AD-4C		AD-16R
			6/6/2023	6/5/2023	7/27/2023	6/6/2023
Boron	mg/L	Intrawell Background Value (UPL)	0.0444	0.0481		0.0595
		Analytical Result	0.007	**0.061**	**0.099**	0.019
Calcium	mg/L	Intrawell Background Value (UPL)	1.31	1.19		2.95
		Analytical Result	0.65	0.93	--	0.35
Chloride	mg/L	Intrawell Background Value (UPL)	9.83	16.0		7.79
		Analytical Result	9.14	**18.7**	**19.2**	6.90
Fluoride	mg/L	Intrawell Background Value (UPL)	1.00	1.00		1.00
		Analytical Result	0.11	0.13	--	0.06
pH	SU	Intrawell Background Value (UPL)	5.3	5.7		4.8
		Intrawell Background Value (LPL)	3.9	4.1		2.7
		Analytical Result	4.3	5.1	--	3.4
Sulfate	mg/L	Intrawell Background Value (UPL)	9.54	82.8		75.7
		Analytical Result	2.4	**87.9**	77.4	50.4
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	136	301		251
		Analytical Result	100	290	--	170

Notes:
1. Bold values exceed the background value.
2. Background values are shaded gray.
--: not measured
LPL: Lower prediction limit
mg/L: milligrams per liter
SU: standard units
UPL: Upper prediction limit

ATTACHMENT A
Data Quality Review Memoranda

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Memorandum

Date:	September 18, 2023
To:	David Miller (AEP)
Copies to:	Rebecca Jones (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Data Quality Review – Welsh Power Plant June 2023 Sampling Event

This memorandum summarizes the findings of a data quality review for groundwater samples collected at the Welsh Power Plant, located in Pittsburg, Texas in June 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"). These samples were analyzed for select 40 CFR 257 Appendix III and Appendix IV constituents.

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

- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 231692
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 231717

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 231692, chloride and total dissolved solids (TDS) were detected in the field blank sample "Field Blank-BASP" collected on 6/6/2023. The detected TDS concentration in the field blank (50 milligrams per liter [mg/L]) was more than 10% of the

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

detected value in all groundwater samples, which could result in high bias for all groundwater TDS results.

- As reported in SDG 231717, beryllium, calcium, chromium, cobalt, and lead were detected in the field blank sample "Field Blank - BASP" collected on 6/6/2023. The estimated calcium concentration in the field blank (0.04 mg/L) was more than 10% of the detected value in the "AD-16R" groundwater sample (0.35 mg/L), which could result in high bias for the "AD-16R" calcium results. The estimated chromium concentration in the field blank (0.36 µ/L) was more than 10% of the detected value in all groundwater samples, which could result in high bias for all groundwater chromium results. The estimated lead concentration in the field blank (0.06 µg/L) was more than 10% of the detected value in the "AD-16R" groundwater sample (0.29 µg/L), which could result in high bias for the "AD-16R" lead results.

- As reported in SDG 231717, beryllium, calcium, chromium, and cobalt were detected in the equipment blank sample "Equipment Blank - BASP" collected on 6/6/2023. The estimated chromium concentration in the equipment blank (0.25 µ/L) was more than 10% of the detected value in all groundwater samples, which could result in high bias for all groundwater chromium results.

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.

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Memorandum

Date:	September 18, 2023
To:	David Miller (AEP)
Copies to:	Rebecca Jones (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Data Quality Review – Welsh Power Plant July 2023 Sampling Event

This memorandum summarizes the findings of a data quality review for a groundwater sample collected at the Welsh Power Plant, located in Pittsburg, Texas in July 2023. The groundwater sample was 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"). The sample was analyzed for select 40 CFR 257 Appendix III constituents.

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

- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 232326

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.

No data quality issues were identified. Based on these findings, the data reported in these SDGs are considered accurate and complete and the data are considered usable for supporting project objectives.

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

ATTACHMENT B

Certification by a Qualified Professional Engineer

CERTIFICATION BY QUALIFIED PROFESSIONAL ENGINEER

I certify that the selected statistical method, described above and in the December 8, 2021 *Statistical Analysis Summary* report, is appropriate for evaluating the groundwater monitoring data for the Welsh BASP CCR management area and that the requirements of 30 TAC 352.931(a) have been met.

David Anthony Miller

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature

112498	Texas	11.14.2023
License Number	Licensing State	Date

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Memorandum

Date:	January 23, 2024
To:	David Miller (AEP)
Copies to:	Rebecca Jones (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Evaluation of Detection Monitoring Data at Welsh Plant's Bottom Ash Storage Pond (BASP)

In accordance with the Texas Commission on Environmental Quality (TCEQ) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (30 TAC 352, "CCR rule"), the second semiannual detection monitoring event of 2023 at the Bottom Ash Storage Pond (BASP), an existing CCR unit at the Welsh Power Plant in Pittsburg, Texas, was completed on October 4, 2023. Based on the results, a two-of-two verification sampling was completed on December 14, 2023.

A data quality review was completed to assess if the data collected for this semiannual detection monitoring event met the objectives outlined in TCEQ Draft Technical Guidance No. 32 related to groundwater sampling and analysis[1]. The data were determined usable for supporting project objectives, as documented in the review memoranda provided in Attachment A.

Background values for the BASP were originally calculated in January 2018 and have been periodically updated as sufficient data becomes available. After a minimum of four additional detection monitoring events, the results of those events were compared to the existing background and the dataset was updated as appropriate. Revised upper prediction limits (UPLs) were calculated for each Appendix III parameter to represent background values. Lower prediction limits (LPLs) were also calculated for pH. Details on the most recent calculation of the revised background values are described in Geosyntec's *Statistical Analysis Summary* report, dated January 15, 2024.

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

To achieve an acceptably high statistical power while maintaining a site-wide false-positive rate (SWFPR) of 10% per year or less, prediction limits were calculated based on a one-of-two retesting procedure. With this procedure, a statistically significant increase (SSI) is only concluded if both samples in a series of two exceeds the UPL (or are below the LPL for pH). In practice, if the initial result did not exceed the UPL, a second sample was not collected or analyzed.

Detection monitoring results and the relevant background values are compared in Table 1 and noted exceedances are described in the list below.

- Boron concentrations were above the intrawell UPL of 0.0882 mg/L in both the initial (0.207 mg/L) and second (0.137 mg/L) samples collected at AD-4C. Thus, an SSI over background is concluded for boron at AD-4C.

In response to the exceedances noted above, the Welsh BASP CCR unit will either transition to assessment monitoring or an alternative source demonstration (ASD) for boron will be conducted in accordance with 30 TAC 352.941(c). If the ASD is successful, the Welsh BASP will remain in detection monitoring.

The statistical analysis was conducted in accordance with 30 TAC 352.931 and completed within 90 days of sampling and analysis. A certification of these statistics by a qualified professional engineer is provided in Attachment B.

Table 1. Detection Monitoring Data Evaluation
Detection Summary Memorandum
Welsh Plant - Bottom Ash Storage Pond

Analyte	Unit	Description	AD-3	AD-4C		AD-16R
			10/4/2023	10/4/2023	12/14/2023	10/4/2023
Boron	mg/L	Intrawell Background Value (UPL)	0.0407	0.0882		0.0577
		Analytical Result	0.019	**0.207**	**0.137**	0.021
Calcium	mg/L	Intrawell Background Value (UPL)	1.38	1.44		2.90
		Analytical Result	1.16	**1.67**	1.08	0.29
Chloride	mg/L	Intrawell Background Value (UPL)	9.40	18.6		8.00
		Analytical Result	8.65	13.0	--	6.85
Fluoride	mg/L	Intrawell Background Value (UPL)	0.263	0.180		0.296
		Analytical Result	0.12	0.13	--	0.08
pH	SU	Intrawell Background Value (UPL)	5.2	5.7		4.6
		Intrawell Background Value (LPL)	3.8	4.0		2.8
		Analytical Result	4.5	5.0	4.6	3.6
Sulfate	mg/L	Intrawell Background Value (UPL)	10.6	123		73.4
		Analytical Result	9.5	115	106	50.6
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	136	332		242
		Analytical Result	100	320	330	170

Notes:
1. Bold values exceed the background value.
2. Background values are shaded gray.
--: not measured
LPL: Lower prediction limit
mg/L: milligrams per liter
SU: standard units
UPL: Upper prediction limit

ATTACHMENT A
Data Quality Review Memoranda

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Memorandum

Date:	December 18, 2023
To:	David Miller (AEP)
Copies to:	Rebecca Jones (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Data Quality Review – Welsh Power Plant October 2023 BASP Sampling Event

This memorandum summarizes the findings of a data quality review for groundwater samples collected at the Welsh Power Plant, located in Pittsburg, 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"). 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 October 2023 sampling event and are reviewed in this memorandum:

- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 233094
- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 233116

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 233116, chromium and cobalt were detected in the equipment blank sample "EB-BACKGROUND" collected on 10/4/2023. The detected chromium concentration in the equipment blank (0.3 µg/L) was more than 10% of the detected values

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

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

- As reported in SDG 233116, chromium and cobalt were detected in the field blank sample "FIELD BLANK - BASP" collected on 10/4/2023. The detected chromium concentration in the field blank (estimated concentration of 0.27 µg/L) was more than 10% of the detected values for chromium in all groundwater samples, which could result in high bias for all groundwater chromium results.

- The quality control data provided with SDG 233116 noted that the recovery on the laboratory control sample (LCS) for radium-228 had a high recovery, which resulted in poor precision for the LCS/LCS duplicate (LCSD) pair. The radium-228 result for all samples was qualified with "L1: the associated LCS or LCSD recovery was outside acceptance limits" and "P2: the precision on the LCSD was above 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 or have elevated reporting limits, the data are considered usable for supporting project objectives.

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Memorandum

Date:	January 18, 2024
To:	David Miller (AEP)
Copies to:	Rebecca Jones (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Data Quality Review – Welsh Power Plant December 2023 Sampling Event

This memorandum summarizes the findings of a data quality review for three groundwater samples collected at the Welsh Power Plant, located in Pittsburg, Texas in December 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"). The samples were analyzed for select 40 CFR 257 Appendix III and Appendix IV constituents.

The following sample data group (SDG) was associated with the groundwater samples collected during the December 2023 sampling event and is reviewed in this memorandum:

- Dolan Chemical Laboratory (Groveport, Ohio) Job ID # 233797

The data included in this SDG was 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 issue was identified:

- The quality control data provided with SDG 233797 noted that the recovery on the laboratory control sample duplicate (LCSD) for radium-228 had a high recovery, which resulted in poor precision for the LCSD. The radium-228 result for all samples was qualified with "P2: the precision on the LCSD was above acceptance limits".

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

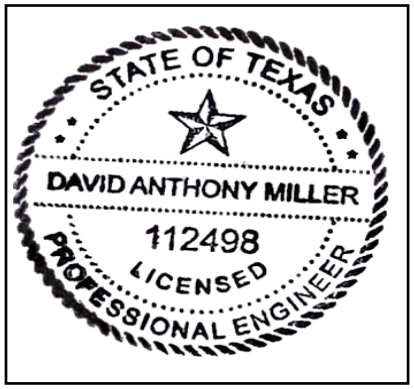
Based on these findings, the majority of the data reported in these SDGs are considered accurate and complete. Although the QC failures mentioned above will result in some limitations of data use since the affected results are considered estimated or have elevated reporting limits, the data are considered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

ATTACHMENT B

Certification by a Qualified Professional Engineer

CERTIFICATION BY QUALIFIED PROFESSIONAL ENGINEER

I certify that the selected statistical method, described above and in the January 15, 2024 *Statistical Analysis Summary* report, is appropriate for evaluating the groundwater monitoring data for the Welsh BASP CCR management area and that the requirements of 30 TAC 352.931(a) have been met.



David Anthony Miller

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature

112498	Texas	01.24.2024
License Number	Licensing State	Date

Geosyntec consultants

engineers | scientists | innovators

STATISTICAL ANALYSIS SUMMARY, BACKGROUND UPDATE CALCULATIONS

Bottom Ash Storage Pond

J. Robert Welsh Plant

Pittsburg, Texas

Prepared for

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

Prepared by

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Project Number: CHA8500B

January 15, 2024

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

ANOVA	analysis of variance
BASP	Bottom Ash Storage Pond
CCR	coal combustion residuals
LPL	lower prediction limit
QA/QC	quality assurance and quality control
TCEQ	Texas Commission on Environmental Quality
TDS	total dissolved solids
UPL	upper prediction limit
USEPA	United States Environmental Protection Agency

1. INTRODUCTION

Groundwater monitoring has been conducted at the Bottom Ash Storage Pond (BASP), an existing coal combustions residuals (CCR) unit at the J. Robert Welsh Power Plant in Pittsburg, Texas, in accordance with Texas Commission on Environmental Quality (TCEQ) regulations regarding the disposal of CCR in landfills and surface impoundments (Texas Administrative Code, Title 30, Chapter 352). It is required under the CCR rule to establish background concentrations for Appendix III parameters in groundwater. These background concentrations are used to calculate prediction limits for future detection monitoring events.

Background concentration values for Appendix III parameters were last calculated for the BASP in December 2021. Since then, four semiannual detection monitoring events were conducted. This report details how data from these recent groundwater monitoring results were analyzed and incorporated into the BASP background dataset and provides updated prediction limits.

1.1 Previous Monitoring Events and Background Calculations

Before October 2017, at least eight monitoring events were completed to establish background concentrations and calculate prediction limits for Appendix III and Appendix IV parameters under the CCR rule. The data were reviewed for outliers and trends before upper prediction limits (UPLs) were calculated for each Appendix III parameter and lower prediction limits (LPLs) were established for pH. Intrawell prediction limits were selected for boron, calcium, chloride, fluoride, sulfate, and total dissolved solids (TDS) with a one-of-two resampling plan. Interwell prediction limits were selected for pH with a one-of-two resampling plan; however, the pH prediction limits were revised to intrawell tests based on an alternative source demonstration certified on April 13, 2018 (Geosyntec 2018a). The statistical analyses completed to establish background levels are detailed in the January 2018 *Statistical Analysis Summary* report (Geosyntec 2018b).

Calculated background values should be updated every four to eight measurements, as recommended in the United States Environmental Protection Agency (USEPA) *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance* (USEPA 2009). These updated background concentration values are used to revise the site-specific prediction limits. The prediction limits have previously been updated twice.

In December 2019, prediction limits for Appendix III parameters were updated with data collected up to May 2019 (Geosyntec 2019). Intrawell testing (using a one-of-two retesting procedure) was selected as the method of analysis and these prediction limits were used for detection monitoring events completed between July 2019 and June 2021.

In December 2021, prediction limits for Appendix III parameters were again updated, this time with data collected up to June 2021 (Geosyntec 2021a). At this time, intrawell testing (using a one-of-two retesting procedure) was selected as the method of analysis, and these prediction limits were used for detection monitoring events completed between October 2021 and July 2023.

2. STATISTICAL ANALYSIS AND BACKGROUND DATA UPDATE

Four semiannual detection monitoring events were conducted since the last background update (Table 1). Verification sampling was completed (on an individual well or parameter basis) if the initial results for each detection monitoring event identified possible exceedances. Therefore, a minimum of four samples have been collected from each compliance well since the previous background update.

Data from the four semiannual detection monitoring events conducted at the BASP between October 2021 and July 2023, including both initial and verification results, have been evaluated for inclusion in the background dataset. The detection monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. The data were reviewed for outliers, with no new values removed from the dataset before the UPLs for each Appendix III parameter and the LPL for pH were updated to represent background values. The selected statistical methods have been certified by a qualified professional engineer (Attachment A).

2.1 Data Validation and QA/QC

Chemical analysis was completed by an analytical laboratory certified by the National Environmental Laboratory Accreditation Program. Quality assurance and quality control (QA/QC) samples used by the analytical laboratory included laboratory reagent blanks, continuing calibration verification samples, and laboratory fortified blanks.

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. No QA/QC issues that would impact data usability were noted.

2.2 Statistical Analysis

Statistical analyses for the BASP were conducted in accordance with the *Statistical Analysis Plan* (Geosyntec 2021b). These statistical analyses incorporated data from the four semiannual detection monitoring events and associated verification sampling events conducted between October 2021 and July 2023 (Table 1). The complete statistical analysis results are included in Attachment B.

Time series plots of Appendix III parameters (Appendix B) were used to evaluate concentrations over time and to provide an initial screening of suspected outliers and trends. Box plots were also compiled to provide visual representation of variations between wells and within individual wells (Attachment B).

2.2.1 Outlier Evaluation

Potential outliers were evaluated using Tukey's outlier test. That is, data points were considered potential outliers if they met one of the following criteria:

$$x_i < \tilde{x}_{0.25} - 3 \times IQR \quad (1)$$

or

$$x_i > \tilde{x}_{0.75} + 3 \times IQR \quad (2)$$

where:

$x_i =$ individual data point
$\tilde{x}_{0.25} =$ first quartile
$\tilde{x}_{0.75} =$ third quartile
$IQR =$ the interquartile range $= \tilde{x}_{0.75} - \tilde{x}_{0.25}$

Data that were evaluated as potential outliers are summarized in Attachment B. Two potential outliers were identified in the data collected for the four most recent detection monitoring events: a low fluoride value of 0.11 milligrams per liter (mg/L) at downgradient well AD-3 on June 6, 2023 and a low fluoride value of 0.10 mg/L at downgradient well AD-4C on November 1, 2022. These outliers were not removed from the dataset as they are generally consistent with values reported within the same well.

2.2.2 Establishment of Updated Background Dataset

Analysis of variance (ANOVA) was conducted during the initial background screening to assist in evaluating whether intrawell testing is the most appropriate statistical approach for assessing Appendix III parameters. Intrawell tests, which compare compliance data from a single well to background data within the same well, are most appropriate 1) when upgradient wells exhibit spatial variation; 2) when statistical limits constructed from upgradient wells would not be conservative from a regulatory perspective; or 3) when downgradient water quality is not impacted compared to upgradient water quality for the same parameter. It is necessary to update background statistical limits (calculated prediction limits) periodically because natural systems change continuously with physical changes to the environment. For intrawell analyses, data for all wells and constituents are reevaluated when a minimum of four new data points are available. These four (or more) new data points are used to determine whether earlier concentrations are representative of present-day groundwater quality.

Mann-Whitney (Wilcoxon rank-sum) tests were used to compare the medians of historical data (May 2016–June 2021) to the new compliance samples (October 2021–July 2023). Results (Appendix B) were evaluated to determine whether the medians of the two groups were similar at the 99% confidence level. Where no significant difference was found, the new compliance data were added to the background dataset. Where a statistically significant difference was found, the data were reviewed to evaluate the cause of the difference and to assess which was most appropriate: adding newer data to the background dataset, replacing the background dataset with the newer data, or continuing to use the existing background dataset. If the differences appeared to have been caused by a release, then the previous background dataset would continue to be used.

Significant differences were found between the two groups for the following upgradient well/parameter pairs:

- A decrease was found for calcium at AD-17
- Decreases were found for pH at AD-1 and AD-17.

- An increase was found for sulfate at AD-1

The background datasets for all upgradient wells were updated because the magnitudes of the differences were minimal, and these data represent naturally occurring groundwater quality not impacted by a release.

Statistically significant differences were found between the two groups for the following downgradient well/parameter pairs:

- A decrease was found for boron at AD-16R.
- A decrease was found for calcium at AD-16R.
- An increase was found for calcium at AD-4.
- Decreases were found for fluoride at AD-4C and AD-16R.
- An increase was found for sulfate at AD-4C.
- An increase was found for TDS at AD-4C.

For downgradient well/parameter pairs with statistically significant increases or decreases, the magnitude of the difference was small or similar to those observed in upgradient wells; therefore, the background dataset was updated to include the compliance dataset. For sulfate in downgradient well AD-4C, a steady increase in concentration was observed in recent measurements. However, previous alternative source demonstrations attributed the increase in concentrations to natural variability because similar patterns were observed in upgradient wells, and so the background dataset was updated with the new data. The significant decreases for fluoride resulted from concentrations reported at or below the current reporting limit. Initial results were reported with a higher reporting limit prior to a change in the selected analytical laboratory for analysis. All fluoride non-detect results were updated to reflect recent reporting limits from the current analytical laboratory.

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 less than the practical quantitation limit (PQL)—that is, "J-flagged" data—were considered detections, and the estimated results were used in the statistical analyses. Nonparametric analyses were selected for datasets with at least 50% nondetect data or datasets that could not be normalized. Parametric analyses were selected for datasets (either transformed or untransformed) that passed the Shapiro-Wilk/Shapiro-Francía test for normality. The Kaplan-Meier nondetect adjustment was applied to datasets with between 15% and 50% nondetect data. For datasets 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 dataset are shown in Attachment B.

2.2.3 Updated Prediction Limits

All historical data through July 2023 were used to update the intrawell UPLs (and intrawell LPLs, for pH) and to represent background values (Table 2).

The intrawell UPLs and LPLs were calculated for a one-of-two retesting procedure; that is, if at least one sample in a series of two has no measurement greater than the UPL and if the pH result is greater than or equal to the LPL, then it can be concluded that a statistically significant increase has not occurred. In practice, where the initial result is not greater than the UPL and where the pH result is greater than or equal to the LPL, a second sample will not be collected. The retesting procedures allow an acceptably high statistical power to detect changes at downgradient wells for constituents evaluated with intrawell prediction limits.

2.3 Conclusions

Four detection monitoring events were completed between October 2021 and July 2023 in accordance with the CCR rule. The laboratory and field data from these events were reviewed prior to statistical analysis, and no QA/QC issues that impacted data usability were identified. Mann-Whitney tests were completed to evaluate whether data from the detection monitoring events could be added to the existing background dataset. Where appropriate, the background datasets were updated, and UPLs and LPLs were recalculated. Intrawell testing (using a one-of-two retesting procedure) was selected as the method of analysis, and prediction limits were updated for all Appendix III parameters.

3. REFERENCES

Geosyntec. 2018a. *Alternative Source Demonstration Report – Federal CCR Rule. J. Robert Welsh Plant*. Geosyntec Consultants, Inc. April.

Geosyntec. 2018b. *Statistical Analysis Summary. Bottom Ash Storage Pond – J. Robert Welsh Plant*. Geosyntec Consultants, Inc. January.

Geosyntec. 2019. *Statistical Analysis Summary. Bottom Ash Storage Pond – J. Robert Welsh Plant*. Geosyntec Consultants, Inc. December.

Geosyntec. 2021a. *Statistical Analysis Summary – Background Update Calculations. Bottom Ash Storage Pond – J. Robert Welsh Plant*. Geosyntec Consultants, Inc. December.

Geosyntec. 2021b. *Statistical Analysis Plan – J. Robert Welsh Plant*. Geosyntec Consultants, Inc. September.

USEPA. 2009. *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance*. United States Environmental Protection Agency. EPA 530/R-09-007. March

TABLES

Table 1. Groundwater Data Summary
Statistical Analysis Summary - Background Update Calculations
Welsh Plant - Bottom Ash Storage Pond

Parameter	Unit	AD-1				AD-16R				
		10/20/2021	6/28/2022	11/1/2022	6/6/2023	10/20/2021	6/27/2022	11/1/2022	2/7/2023	6/6/2023
		2021-D2	2022-D1	2022-D2	2023-D1	2021-D2	2022-D1	2022-D2	2022-D2-R1	2023-D1
Boron	mg/L	0.732	0.768	0.586	0.729	0.019 J1	0.026 J1	0.019 J1	-	0.019 J1
Calcium	mg/L	4.8	6.76	7.87	6.59	0.4	0.34	0.32	-	0.35
Chloride	mg/L	2.21	2.32	2.70	3.03	7.12	7.21	7.96	6.85	6.90
Fluoride	mg/L	0.22	0.22	0.14	0.24	0.11	0.10	0.10	-	0.06
Sulfate	mg/L	72.4	74.7	61.3	91.1	39.0	46.5	48.1	-	50.4
Total Dissolved Solids	mg/L	190	180	170	210	170	170	150	-	170
pH	SU	4.4	4.9	4.8	4.9	3.6	3.2	3.4	3.7	3.4

Parameter	Unit	AD-17				AD-3				
		10/20/2021	6/28/2022	11/1/2022	6/6/2023	10/20/2021	6/28/2022	11/1/2022	2/7/2023	6/6/2023
		2021-D2	2022-D1	2022-D2	2023-D1	2021-D2	2022-D1	2022-D2	2022-D1-R1	2023-D1
Boron	mg/L	0.104	0.112	0.097	0.1 J1	0.05 U1	0.016 J1	0.05 U1	-	0.007 J1
Calcium	mg/L	164	167	165	150	0.9	0.68	1.57	0.57	0.65
Chloride	mg/L	37.3	37.0	40.3	35.6	7.16	8.01	8.04	-	9.14
Fluoride	mg/L	0.16	0.09 J1	0.09 J1	0.15 U1	0.15	0.14	0.14	-	0.11
Sulfate	mg/L	1,040	1,050	1,110	1,190	6.02	2.55	13.0	3.39	2.4
Total Dissolved Solids	mg/L	1,710	1,740	1,690	1,510	130	120	110	-	100
pH	SU	5.1	5.2	5.7	5.3	4.2	3.9	4.4	4.7	4.3

Parameter	Unit	AD-4C						
		10/20/2021	6/28/2022	8/26/2022	11/1/2022	2/7/2023	6/5/2023	7/27/2023
		2021-D2	2022-D1	2022-D1-R1	2022-D2	2022-D2-R1	2023-D1	2023-D1-R1
Boron	mg/L	0.021 J1	0.043 J1	-	0.068	0.120	0.061	0.099
Calcium	mg/L	0.8	1.08	-	1.42	1.65	0.93	-
Chloride	mg/L	14.3	14.1	-	19.1	10.9	18.7	19.2
Fluoride	mg/L	0.15	0.12	-	0.1	-	0.13	-
Sulfate	mg/L	76.8	83.6	160	142	111	87.9	77.4
Total Dissolved Solids	mg/L	280	280	-	370	320	290	-
pH	SU	4.3	4.8	3.6	4.9	4.9	5.1	5.1

Parameter	Unit	AD-5			
		10/20/2021	6/28/2022	11/1/2022	6/6/2023
		2021-D2	2022-D1	2022-D2	2023-D1
Boron	mg/L	0.038 J1	0.048 J1	0.041 J1	0.03 J1
Calcium	mg/L	38.4	32.9	38.6	26.5
Chloride	mg/L	17.4	15.3	16.9	16.1
Fluoride	mg/L	0.17	0.15	0.16	0.15
Sulfate	mg/L	155	146	185	114
Total Dissolved Solids	mg/L	370	310	380	280
pH	SU	5.6	5.9	5.9	5.8

Notes:
--: not measured
mg/L: milligrams per liter
SU: standard unit
U1: Parameter was not present in concentrations above the method detection limit and is reported as the reporting limit
J1: Estimated value. Parameter was detected in concentrations below the reporting limit
D1: First semiannual detection monitoring event of the year
D2: Second semiannual detection monitoring event of the year
R1: First verification event associated with detection monitoring round

Table 2. Background Level Summary
Statistical Analysis Summary – Background Update Calculations
Welsh Plant – Bottom Ash Storage Pond

Analyte	Unit	Description	AD-3	AD-4C	AD-16R
Boron	mg/L	Intrawell Background Value (UPL)	0.0407	0.0882	0.0577
Calcium	mg/L	Intrawell Background Value (UPL)	1.38	1.44	2.90
Chloride	mg/L	Intrawell Background Value (UPL)	9.40	18.6	8.00
Fluoride	mg/L	Intrawell Background Value (UPL)	0.263	0.180	0.296
pH	SU	Intrawell Background Value (UPL)	5.2	5.7	4.6
		Intrawell Background Value (LPL)	3.8	4.0	2.8
Sulfate	mg/L	Intrawell Background Value (UPL)	10.6	123	73.4
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	136	332	242

Notes:
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 Welsh Primary 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	01.16.2024
License Number	Licensing State	Date

ATTACHMENT B
Statistical Analysis Output

GROUNDWATER STATS CONSULTING

December 18, 2023

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

Re: Welsh Bottom Ash Storage Pond (BASP)
Background Update - 2023

Dear Ms. Kreinberg,

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the screening for the proposed background update of groundwater data through June/July 2023 for American Electric Power's Welsh BASP. The analysis complies with the Texas Commission of Environmental Quality rule 30 TAC 352 for the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities (CCR Rule, 2015) as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

Sampling began at Welsh BASP for the CCR program in 2016, and 8 background samples have been collected at each of the groundwater monitoring wells. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** AD-1, AD-5, and AD-17
- **Downgradient wells:** AD-3, AD-4C, and AD-16R

Data were sent electronically to Groundwater Stats Consulting, 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 Groundwater Stats Consulting. The analysis was reviewed by Andrew Collins, Project Manager for Groundwater Stats Consulting.

The following CCR Detection Monitoring constituents were evaluated:

- **Appendix III Parameters**: boron, calcium, chloride, fluoride, pH, sulfate, and TDS

Time series plots are provided for all wells and constituents, and are used to evaluate concentrations over time as well as for the purpose of updating statistical limits (Figure A). Additionally, box plots are included for all constituents at upgradient and downgradient wells (Figure B). The time series plots are used to initially screen for suspected outliers and trends, while the box plots provide visual representation of variation within individual wells and between all wells. Values in background which have been flagged as outliers may be seen in a lighter font and as a disconnected symbol on the graph. A summary of these 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. 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 reporting limits were replaced by the most recent reporting limit of 0.15 mg/L and was substituted across all non-detects for all wells.

During the background screening conducted in December 2017 data at all wells were evaluated for the following: 1) outliers; 2) trends; 3) most appropriate statistical method for Appendix III parameters based on site characteristics of groundwater data upgradient of the facility; and 4) eligibility of downgradient wells when intrawell statistical methods are recommended. Power curves were provided with the initial 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 Method:

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

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 false positive rate

associated with the parametric limits is based on an annual 10% as recommended by the EPA Unified Guidance (2009), the false positive rate associated with the nonparametric limits is dependent 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.

- 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 in background, simple substitution of one-half the reporting limit is utilized in the statistical analysis. The reporting limit utilized for non-detects is the most recent 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.

In the event of an initial exceedance of compliance well data, the 1-of-2 resample plan allows for collection of an additional sample to determine whether the initial exceedance is confirmed. When the resample confirms the initial exceedance, a statistically significant increase (SSI) is identified and further research would be required to identify the cause of the exceedance (i.e., impact from the site, natural variation, or an off-site source). If the resample falls within the statistical limit, the initial exceedance is considered to be a false positive result and, therefore, no further action is necessary.

Natural systems continuously evolve due to physical changes made to the environment. Examples include capping a landfill, paving areas near a well, or lining a drainage channel to prevent erosion. Periodic updating of background statistical limits will be necessary to accommodate these types of changes. In the intrawell case, data for all wells and constituents are re-evaluated when a minimum of 4 new data points are available to determine whether earlier concentrations are representative of present-day groundwater quality. In some cases, the earlier portion of data are deselected prior to construction of limits in order to provide sensitive limits that will rapidly detect changes in groundwater quality. Even though the data are excluded from the calculation, the values will continue to be reported and shown in tables and graphs.

Summary of Historical Background Screening – December 2017

Outlier Evaluation

Time series plots were used to identify suspected outliers, or extreme values that would result in limits that are not conservative from a regulatory perspective, in proposed background data. Suspected outliers at all wells for Appendix III parameters were formally tested using Tukey's box plot method and, when identified, flagged in the computer database with "o" and deselected prior to construction of statistical limits.

Tukey's outlier test noted a high value for chloride in well AD-16R, and this value was flagged in the database. The results of Tukey's test were submitted with the previous background screening report.

Seasonality

No seasonal patterns were observed on the time series plots for any of the detected data; therefore, no deseasonalizing adjustments were made to the data. When seasonal patterns are observed, data may be deseasonalized so that the resulting limits will correctly account for the seasonality as a predictable pattern rather than random variation or a release.

Trend Tests

While trends may be visual, a quantification of the trend and its significance is needed. The Sen's Slope/Mann Kendall trend test was used to evaluate all data at each well to identify statistically significant increasing or decreasing trends. In the absence of suspected contamination, significant trending data are typically not included as part of the background data used for construction of prediction limits. This step serves to eliminate the trend and, thus, reduce variation in background. When statistically significant decreasing trends are present, earlier data are evaluated to determine whether earlier concentration levels are significantly different than current reported concentrations and will be deselected as necessary. When the historical records of data are truncated for the reasons above, a summary report will be provided to show the date ranges used in construction of the statistical limits.

The results of the trend analyses showed concentrations were stable over time with no statistically significant increasing or decreasing trends, except for one decreasing trend for TDS in well AD-16R. This trend was relatively low in magnitude when compared to average concentrations; therefore, no adjustments were required at that time.

Appendix III – Determination of Spatial Variation

The Analysis of Variance (ANOVA) is typically used to statistically evaluate differences in average concentrations among upgradient wells, which assists in identifying the most appropriate statistical approach. Interwell tests, which compare downgradient well data to statistical limits constructed from pooled upgradient well data, are appropriate when average concentrations are similar across upgradient wells. Intrawell tests, which compare compliance data from a single well to screened historical data within the same well, are appropriate when upgradient wells exhibit spatial variation and when statistical limits constructed from upgradient wells would not be conservative from a regulatory perspective.

The ANOVA identified variation for all Appendix III parameters except for pH. Therefore, intrawell prediction limits were recommended for boron, calcium, chloride, fluoride, sulfate, and TDS. While interwell prediction limits would typically be recommended for pH, due to the variation in groundwater quality upgradient of the facility, evidence provided by Geosyntec Consultants supported the use of intrawell testing to accommodate groundwater quality and spatial variability for all parameters.

Background Update – Conducted in November 2023

Background data sets were evaluated during this analysis for the appropriateness of consolidating new measurements through June/July 2023 with screened historical data for construction of updated intrawell prediction limits. This process requires a minimum of four new measurements, as mentioned above. Time series graphs and Tukey's outlier test were used to identify potential outliers. The Mann-Whitney test for equality of medians was used to determine whether background data sets were eligible for updating with newer measurements as discussed below.

Intrawell limits constructed from carefully screened background data from within each well serve to provide statistical limits that are conservative (i.e., lower) from a regulatory perspective, and that will rapidly identify a change in more recent compliance data from within a given well. This statistical method removes the element of variation from across wells and eliminates the chance of mistaking spatial variation for a release from the facility. Intrawell prediction limits, which compare the most recent compliance sample from a given well to historical data from the same well, are updated by testing for the appropriateness of consolidating new sampling observations with the screened background data.

Outlier Analysis

Prior to updating background data sets, samples were re-evaluated for all well/constituent pairs using Tukey's outlier test and visual screening on data through the June/July 2023 sample event. The last background update was performed in 2021 and the results were submitted at that time. In previous reports, Tukey's outlier test and visual screening noted high values that were flagged as outliers for chloride in wells AD-1 and AD-16R, and for sulfate in well AD-17.

In this background update, Tukey's outlier test identified potential outliers for chloride at well AD-16R and for pH and TDS in well AD-3. The high values remain flagged as outliers in order to construct statistical limits that are conservative from a regulatory perspective and represent present-day groundwater quality. Any values identified by Tukey's test but not flagged in the database, such as those identified for fluoride, appeared to be similar to other concentrations within their respective wells. Although not identified by Tukey's test, a low value for pH at AD-1 was also flagged during this analysis in order to construct statistical limits that are conservative from a regulatory perspective. Tukey's outlier test and visual screening confirmed previously flagged outliers; therefore, no changes to previously flagged outliers were made. As mentioned above, 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. An updated summary of Tukey's test results and flagged observations follows this letter.

Mann-Whitney Evaluation

For constituents requiring intrawell prediction limits, the Mann-Whitney (Wilcoxon Rank Sum) test was used to compare the medians of historical data through July 2021 to the new compliance samples at each well through June/July 2023 to evaluate whether the groups are statistically different at the 99% confidence level, in which case background data may be updated with compliance data (Figure D). Statistically significant differences (either an increase or decrease in median concentrations) were found between the two groups for the following well/constituent pairs:

Increase:

- Calcium: AD-4C
- Sulfate: AD-1 (upgradient) and AD-4C
- TDS: AD-4C

Decrease:

- Boron: AD-16R
- Calcium: AD-17 (upgradient) and AD-16R
- Fluoride: AD-4C and AD-16R
- pH: AD-1 and AD-17 (both upgradient)

Typically, when the test concludes that the medians of the two groups are statistically significantly different, particularly in the downgradient wells, the background data sets 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 at least one of the segments being compared is of short duration, the comparison is complicated by the fact that normal short-term variation may be mistaken for long-term change in medians.

For upgradient well/constituent pairs with statistically significant differences (both increases and decreases) in median concentrations between background and compliance samples, the differences were minimal and reflective of changing groundwater quality upgradient of the facility.

Additionally, concentrations at downgradient well/constituent pairs with statistically significant differences (both increases and decreases) in median concentrations in all cases were comparable to historic measurements within their respective wells or were comparable to or less than measurements in upgradient wells. In the case of sulfate at well AD-4C, an alternative source demonstration reportedly attributed the increase in concentrations to natural variability since similar patterns were observed in upgradient wells. The significant differences noted for fluoride resulted from current concentrations reported at or below the current reporting limit. Therefore, all records were updated with compliance data through June/July 2023 for construction of statistical limits reflective of present-day groundwater quality.

Statistical Limits

Intrawell prediction limits using all historical data through June/July 2023, combined with a 1-of-2 resample plan, were constructed and a summary of the updated limits follows this letter (Figure E).

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

For Groundwater Stats Consulting,

Abdul Diane
Groundwater Analyst

Andrew T. Collins
Project Manager

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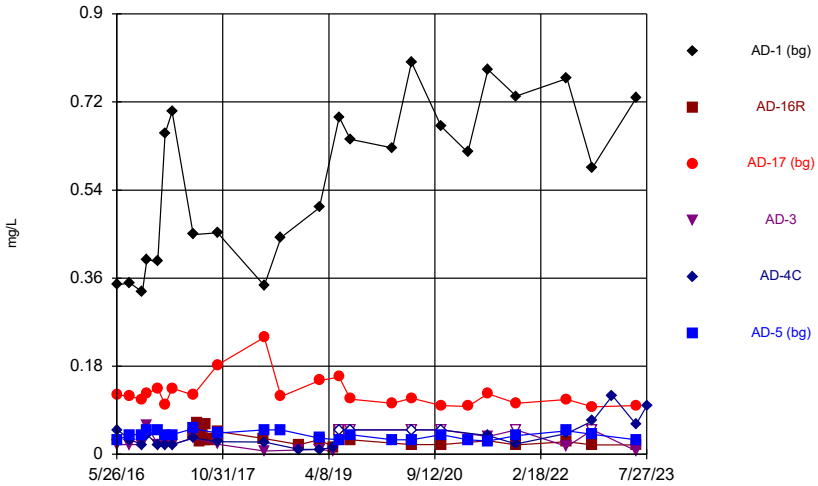
Hollow symbols indicate censored values.

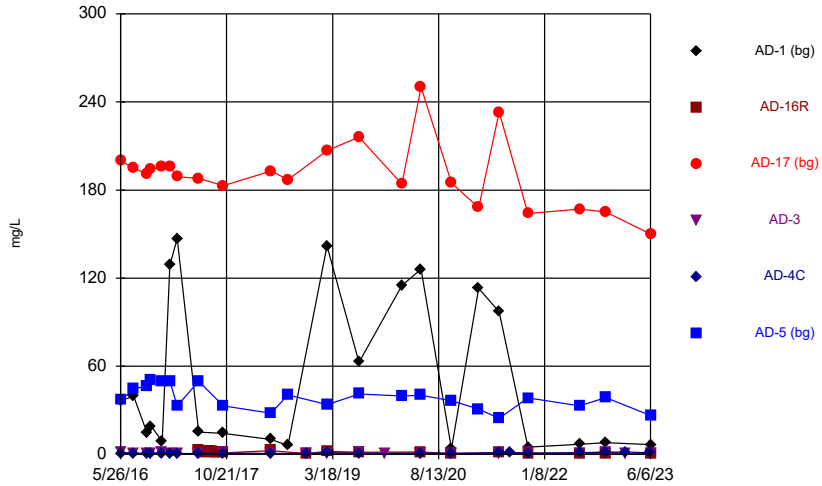
Time Series



Constituent: Boron Analysis Run 12/7/2023 3:37 PM
Welsh BASP Data: Welsh BASP

Sanitas™ v.10.0.15 Software licensed to . UG

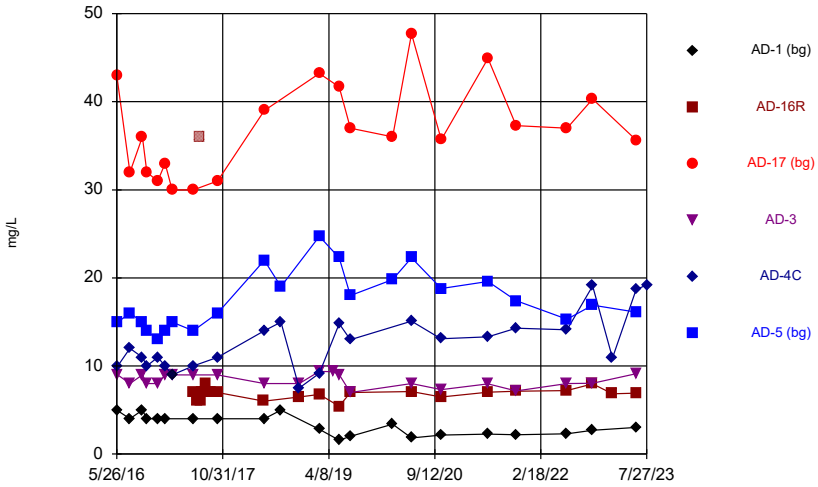
Time Series



Constituent: Calcium Analysis Run 12/7/2023 3:37 PM
Welsh BASP Data: Welsh BASP

Sanitas™ v.10.0.15 Software licensed to . UG

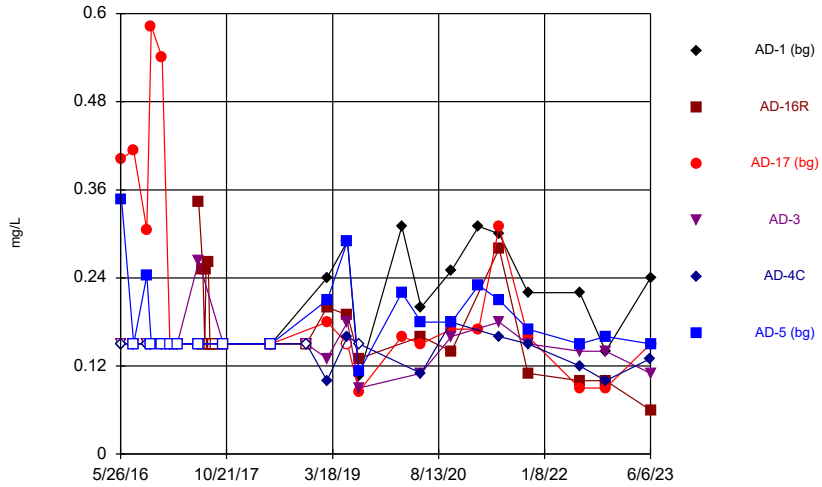
Time Series



Constituent: Chloride Analysis Run 12/7/2023 3:37 PM
Welsh BASP Data: Welsh BASP

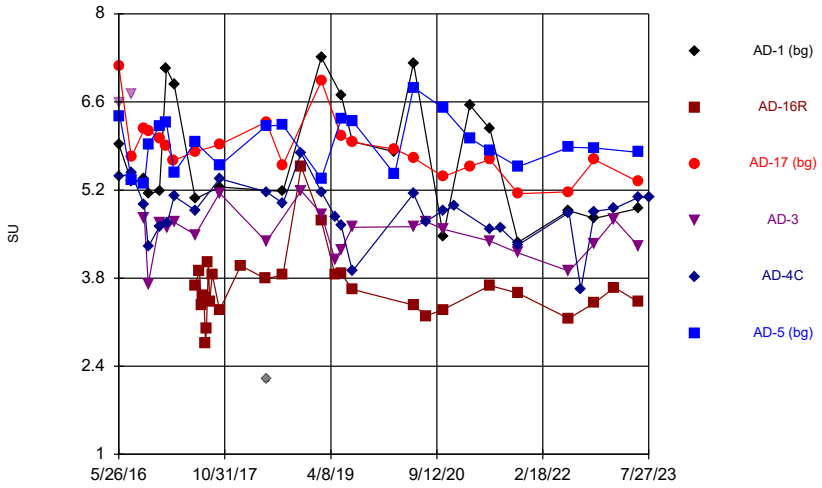
Sanitas™ v.10.0.15 Software licensed to . UG
Hollow symbols indicate censored values.

Time Series



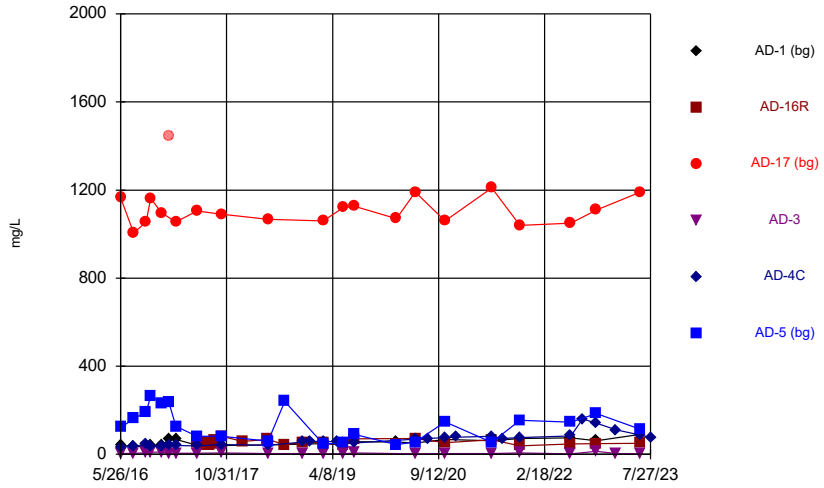
Constituent: Fluoride Analysis Run 12/7/2023 3:37 PM
Welsh BASP Data: Welsh BASP

Time Series



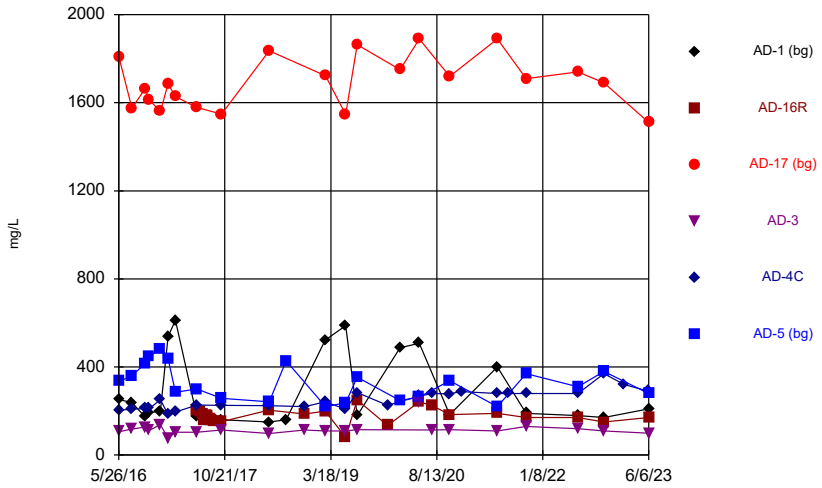
Constituent: pH, field Analysis Run 12/7/2023 3:37 PM
Welsh BASP Data: Welsh BASP

Time Series



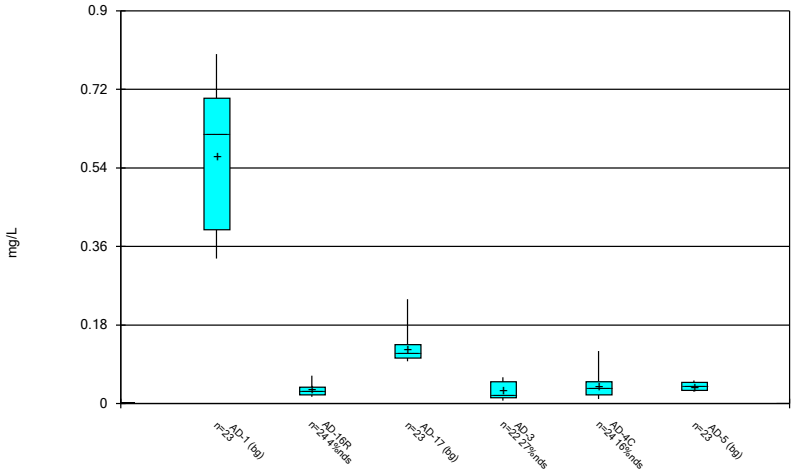
Constituent: Sulfate Analysis Run 12/7/2023 3:37 PM
Welsh BASP Data: Welsh BASP

Time Series



Constituent: Total Dissolved Solids Analysis Run 12/7/2023 3:37 PM
Welsh BASP Data: Welsh BASP

Box & Whiskers Plot



Constituent: Boron Analysis Run 12/7/2023 3:38 PM
Welsh BASP Data: Welsh BASP

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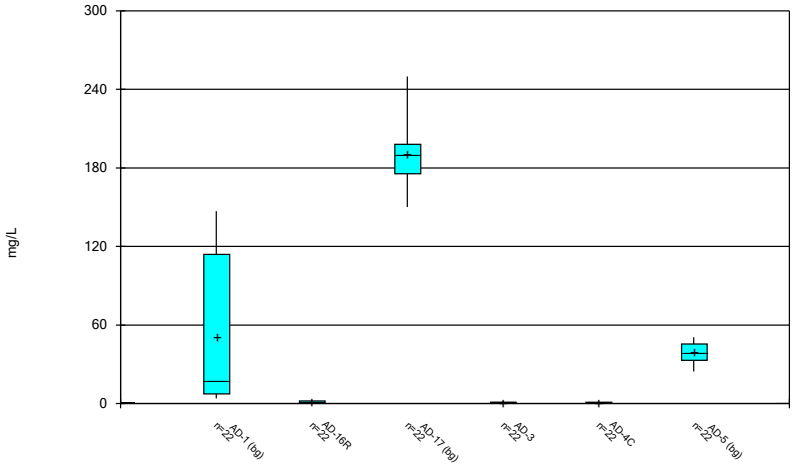
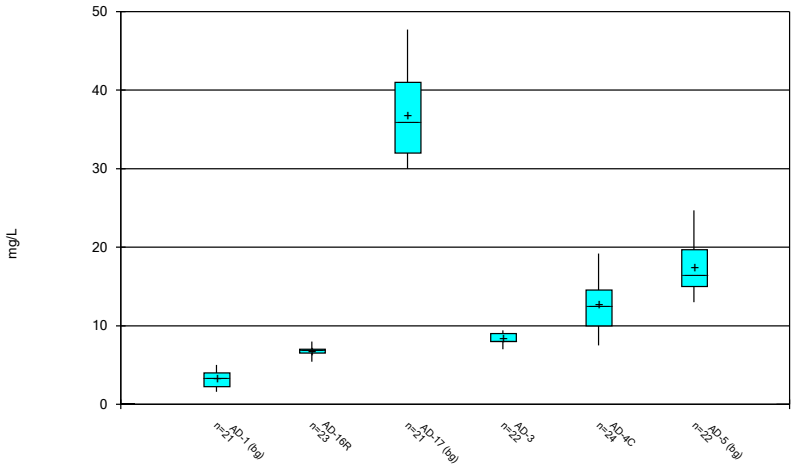
Box & Whiskers Plot



Constituent: Calcium Analysis Run 12/7/2023 3:38 PM
Welsh BASP Data: Welsh BASP

Sanitas™ v.10.0.15 Software licensed to . UG

Box & Whiskers Plot



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Welsh BASP Data: Welsh BASP

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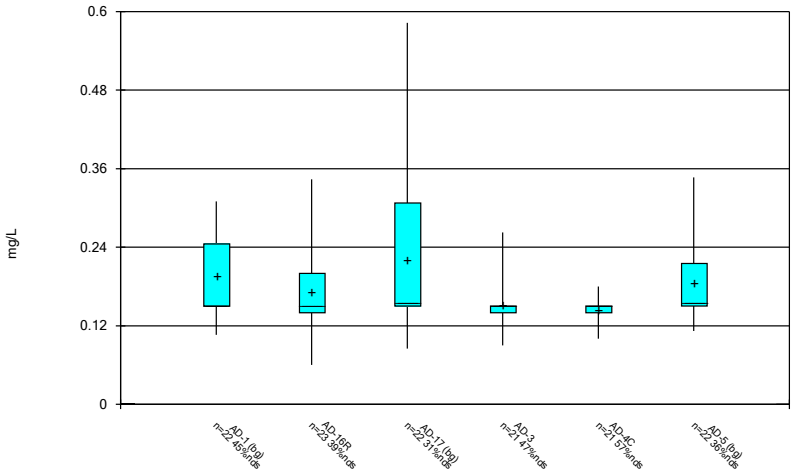
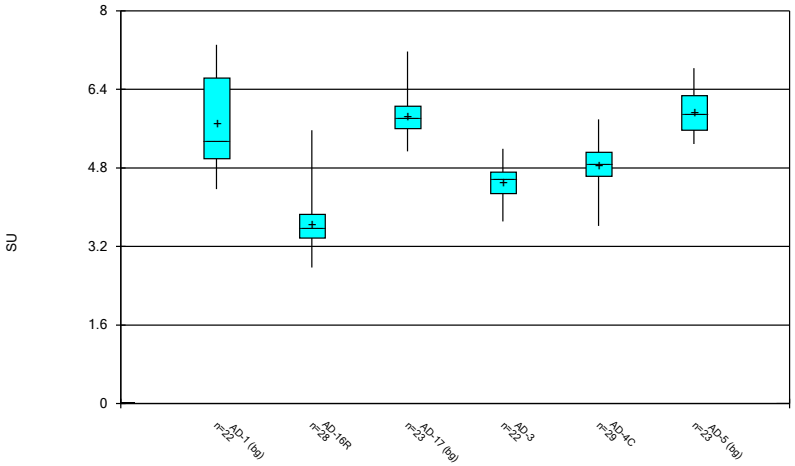
Box & Whiskers Plot



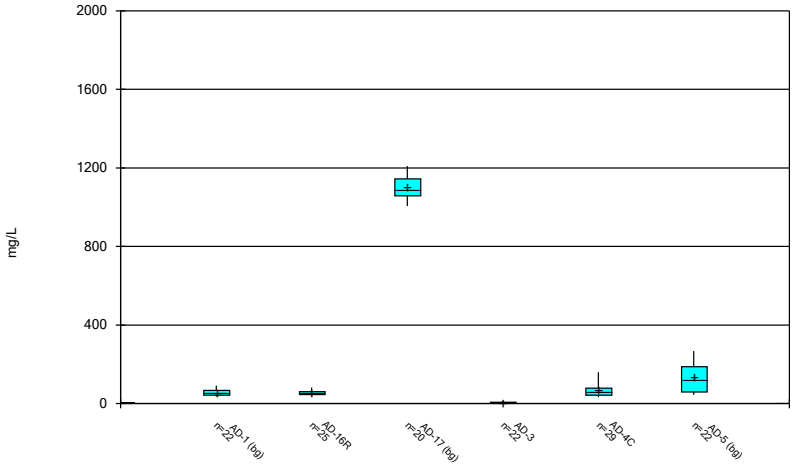
Constituent: Fluoride Analysis Run 12/7/2023 3:38 PM
Welsh BASP Data: Welsh BASP

Box & Whiskers Plot



Constituent: pH, field Analysis Run 12/7/2023 3:38 PM
Welsh BASP Data: Welsh BASP

Box & Whiskers Plot



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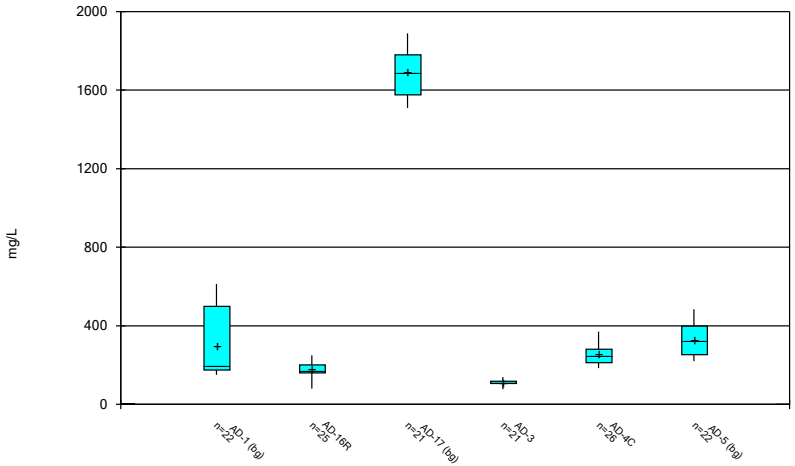
Box & Whiskers Plot



Constituent: Total Dissolved Solids Analysis Run 12/7/2023 3:38 PM
Welsh BASP Data: Welsh BASP

Outlier Summary

Welsh BASP Data: Welsh BASP Printed 12/7/2023, 4:05 PM

	AD-1 Chloride (mg/L)	AD-16R Chloride (mg/L)	AD-1 pH, field (SU)	AD-3 pH, field (SU)	AD-17 Sulfate (mg/L)	AD-3 Total Dissolved Solids (mg/L)
5/31/2016				6.58 (o)		
7/27/2016				6.73 (o)		
1/20/2017					1445 (o)	
2/24/2017	9 (o)					
7/7/2017		36 (o)				
5/24/2018			2.19 (o)			
5/20/2020						236 (o)

Tukey's Outlier Test - Significant Results

Welsh BASP Data: Welsh BASP Printed 12/7/2023, 3:35 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Chloride (mg/L)	**AD-16R**	**Yes**	**36,5.43**	**NP**	**NaN**	**24**	**8.057**	**5.979**	**ln(x)**	**ShapiroWilk**
Fluoride (mg/L)	**AD-3**	**Yes**	**0.2625,0.09,0.11,0.11**	**NP**	**NaN**	**21**	**0.1501**	**0.03313**	**ln(x)**	**ShapiroWilk**
Fluoride (mg/L)	**AD-4C**	**Yes**	**0.1,0.1,0.18**	**NP**	**NaN**	**21**	**0.1433**	**0.02008**	**x^3**	**ShapiroWilk**
pH, field (SU)	**AD-3**	**Yes**	**6.58,6.73**	**NP**	**NaN**	**24**	**4.688**	**0.6946**	**ln(x)**	**ShapiroWilk**
Total Dissolved Solids (mg/L)	**AD-3**	**Yes**	**236**	**NP**	**NaN**	**22**	**117.4**	**29.21**	**ln(x)**	**ShapiroWilk**

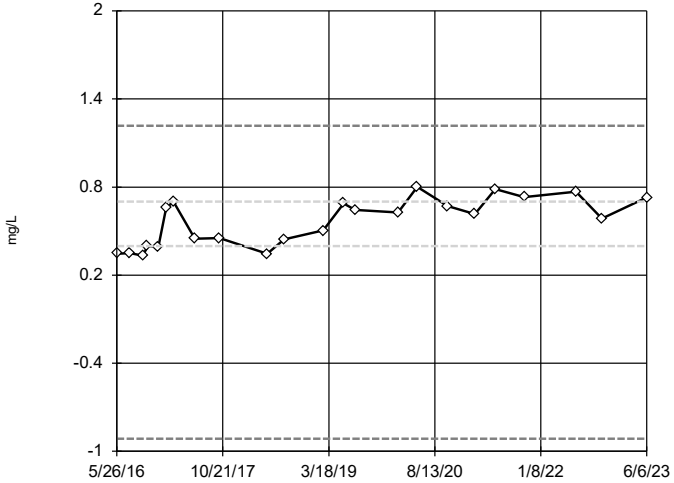
Tukey's Outlier Test - All Results

Welsh BASP Data: Welsh BASP Printed 12/7/2023, 3:35 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Boron (mg/L)	AD-1 (bg)	No	n/a	NP	NaN	23	0.566	0.1603	x^2	ShapiroWilk
Boron (mg/L)	AD-16R	No	n/a	NP	NaN	24	0.03188	0.01327	ln(x)	ShapiroWilk
Boron (mg/L)	AD-17 (bg)	No	n/a	NP	NaN	23	0.1253	0.03252	ln(x)	ShapiroWilk
Boron (mg/L)	AD-3	No	n/a	NP	NaN	22	0.02844	0.01774	x^(1/3)	ShapiroWilk
Boron (mg/L)	AD-4C	No	n/a	NP	NaN	24	0.04033	0.02689	ln(x)	ShapiroWilk
Boron (mg/L)	AD-5 (bg)	No	n/a	NP	NaN	23	0.03927	0.00812	sqrt(x)	ShapiroWilk
Calcium (mg/L)	AD-1 (bg)	No	n/a	NP	NaN	22	51.19	53.6	ln(x)	ShapiroWilk
Calcium (mg/L)	AD-16R	No	n/a	NP	NaN	22	1.419	0.7934	normal	ShapiroWilk
Calcium (mg/L)	AD-17 (bg)	No	n/a	NP	NaN	22	191	22.53	ln(x)	ShapiroWilk
Calcium (mg/L)	AD-3	No	n/a	NP	NaN	22	0.8118	0.29	ln(x)	ShapiroWilk
Calcium (mg/L)	AD-4C	No	n/a	NP	NaN	22	0.7986	0.3442	ln(x)	ShapiroWilk
Calcium (mg/L)	AD-5 (bg)	No	n/a	NP	NaN	22	38.44	7.766	sqrt(x)	ShapiroWilk
Chloride (mg/L)	AD-1 (bg)	No	n/a	NP	NaN	22	3.56	1.619	ln(x)	ShapiroWilk
Chloride (mg/L)	**AD-16R**	**Yes**	**36,5.43**	**NP**	**NaN**	**24**	**8.057**	**5.979**	**ln(x)**	**ShapiroWilk**
Chloride (mg/L)	AD-17 (bg)	No	n/a	NP	NaN	21	36.83	5.145	ln(x)	ShapiroWilk
Chloride (mg/L)	AD-3	No	n/a	NP	NaN	22	8.382	0.7268	x^2	ShapiroWilk
Chloride (mg/L)	AD-4C	No	n/a	NP	NaN	24	12.72	3.204	ln(x)	ShapiroWilk
Chloride (mg/L)	AD-5 (bg)	No	n/a	NP	NaN	22	17.46	3.233	ln(x)	ShapiroWilk
Fluoride (mg/L)	AD-1 (bg)	No	n/a	NP	NaN	22	0.1966	0.06399	ln(x)	ShapiroWilk
Fluoride (mg/L)	AD-16R	No	n/a	NP	NaN	23	0.1708	0.06637	x^(1/3)	ShapiroWilk
Fluoride (mg/L)	AD-17 (bg)	No	n/a	NP	NaN	22	0.2209	0.1423	ln(x)	ShapiroWilk
Fluoride (mg/L)	**AD-3**	**Yes**	**0.2625,0.09,0.11,0.11**	**NP**	**NaN**	**21**	**0.1501**	**0.03313**	**ln(x)**	**ShapiroWilk**
Fluoride (mg/L)	**AD-4C**	**Yes**	**0.1,0.1,0.18**	**NP**	**NaN**	**21**	**0.1433**	**0.02008**	**x^3**	**ShapiroWilk**
Fluoride (mg/L)	AD-5 (bg)	No	n/a	NP	NaN	22	0.1842	0.05505	ln(x)	ShapiroWilk
pH, field (SU)	AD-1 (bg)	No	n/a	NP	NaN	23	5.555	1.157	x^2	ShapiroWilk
pH, field (SU)	AD-16R	No	n/a	NP	NaN	28	3.656	0.5311	ln(x)	ShapiroWilk
pH, field (SU)	AD-17 (bg)	No	n/a	NP	NaN	23	5.866	0.4798	ln(x)	ShapiroWilk
pH, field (SU)	**AD-3**	**Yes**	**6.58,6.73**	**NP**	**NaN**	**24**	**4.688**	**0.6946**	**ln(x)**	**ShapiroWilk**
pH, field (SU)	AD-4C	No	n/a	NP	NaN	29	4.854	0.4487	x^3	ShapiroWilk
pH, field (SU)	AD-5 (bg)	No	n/a	NP	NaN	23	5.942	0.4132	sqrt(x)	ShapiroWilk
Sulfate (mg/L)	AD-1 (bg)	No	n/a	NP	NaN	22	53.91	14.97	ln(x)	ShapiroWilk
Sulfate (mg/L)	AD-16R	No	n/a	NP	NaN	25	54.12	10.52	ln(x)	ShapiroWilk
Sulfate (mg/L)	AD-17 (bg)	No	n/a	NP	NaN	21	1118	93.47	ln(x)	ShapiroWilk
Sulfate (mg/L)	AD-3	No	n/a	NP	NaN	22	5.009	2.865	ln(x)	ShapiroWilk
Sulfate (mg/L)	AD-4C	No	n/a	NP	NaN	29	66.01	30.68	ln(x)	ShapiroWilk
Sulfate (mg/L)	AD-5 (bg)	No	n/a	NP	NaN	22	131.4	70.56	sqrt(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	AD-1 (bg)	No	n/a	NP	NaN	22	294.1	165.4	ln(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	AD-16R	No	n/a	NP	NaN	25	177.8	34.74	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	AD-17 (bg)	No	n/a	NP	NaN	21	1692	118.5	ln(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	**AD-3**	**Yes**	**236**	**NP**	**NaN**	**22**	**117.4**	**29.21**	**ln(x)**	**ShapiroWilk**
Total Dissolved Solids (mg/L)	AD-4C	No	n/a	NP	NaN	26	251.5	43.88	ln(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	AD-5 (bg)	No	n/a	NP	NaN	22	328.1	79.98	ln(x)	ShapiroWilk

Tukey's Outlier Screening

AD-1 (bg)



n = 23

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 = 1.219, low cutoff = -0.9145, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 12/7/2023 3:32 PM

Welsh BASP Data: Welsh BASP

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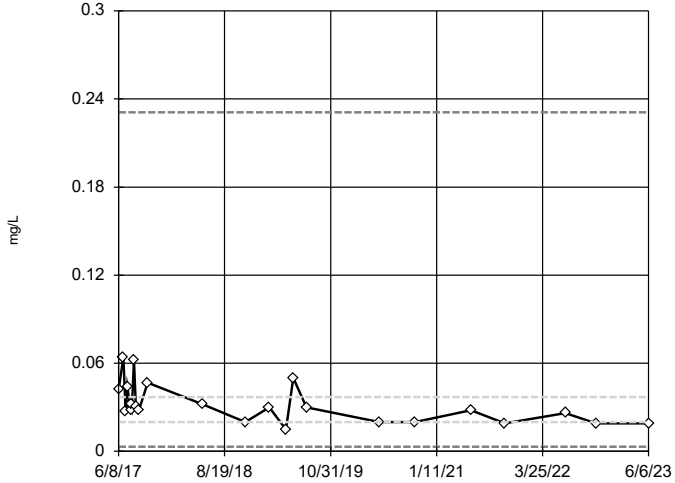
Tukey's Outlier Screening

AD-16R



n = 24

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 = 0.2308, low cutoff = 0.003194, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 12/7/2023 3:32 PM

Welsh BASP Data: Welsh BASP

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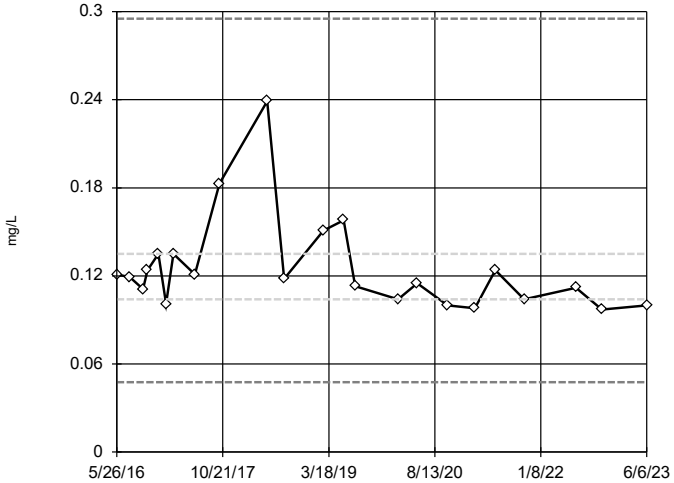
Tukey's Outlier Screening

AD-17 (bg)



n = 23

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 = 0.2953, low cutoff = 0.04755, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 12/7/2023 3:32 PM

Welsh BASP Data: Welsh BASP

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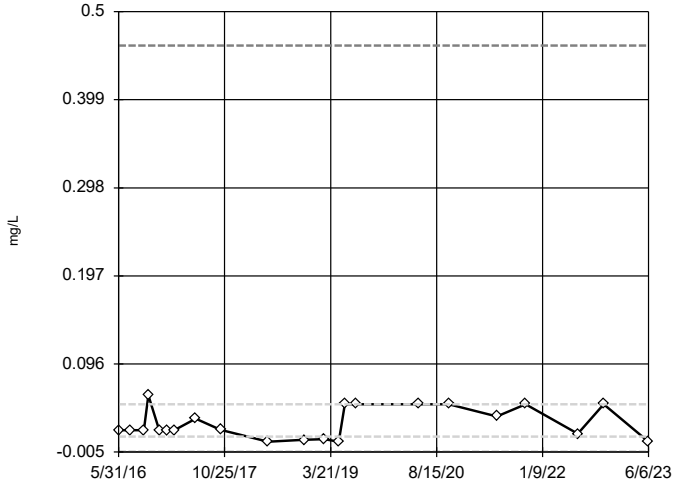
Tukey's Outlier Screening

AD-3



n = 22

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

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

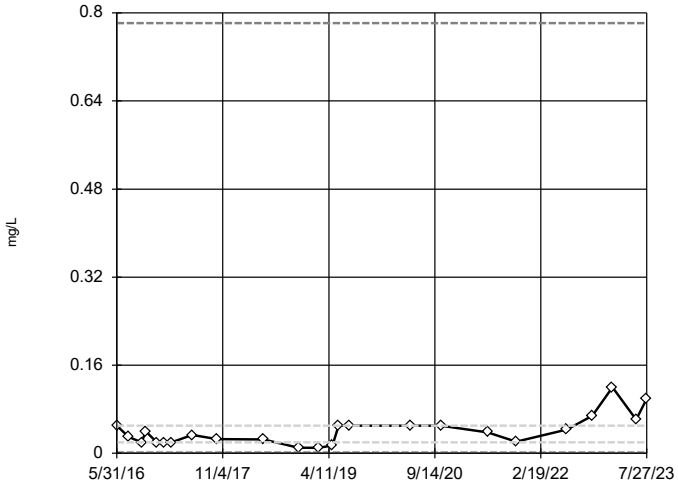
High cutoff = 0.4609, low cutoff = -0.004944, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 12/7/2023 3:32 PM

Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-4C



n = 24

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 = 0.7813, low cutoff = 0.00128, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 12/7/2023 3:32 PM

Welsh BASP Data: Welsh BASP

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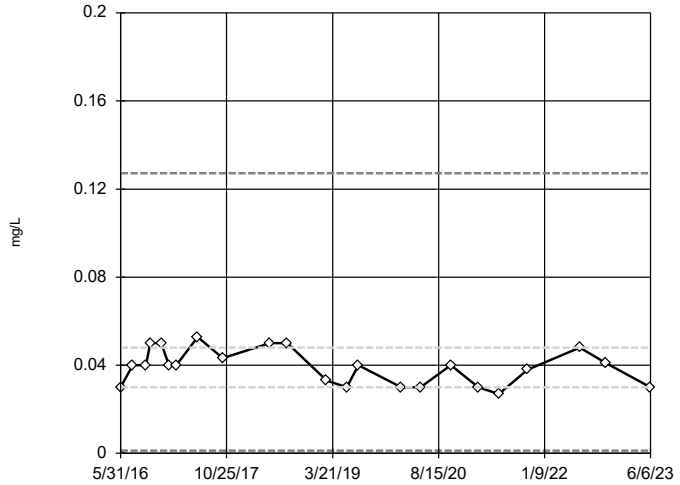
Tukey's Outlier Screening

AD-5 (bg)



n = 23

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 = 0.1273, low cutoff = 0.001264, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 12/7/2023 3:32 PM

Welsh BASP Data: Welsh BASP

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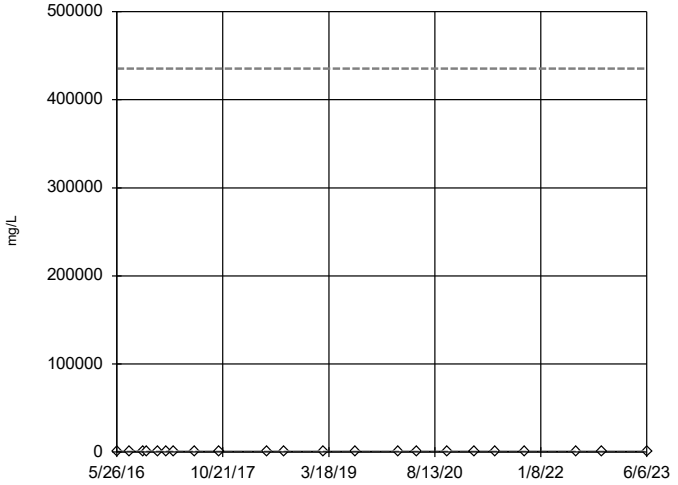
Tukey's Outlier Screening

AD-1 (bg)



n = 22

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 = 435182, low cutoff = 0.001911, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 12/7/2023 3:32 PM

Welsh BASP Data: Welsh BASP

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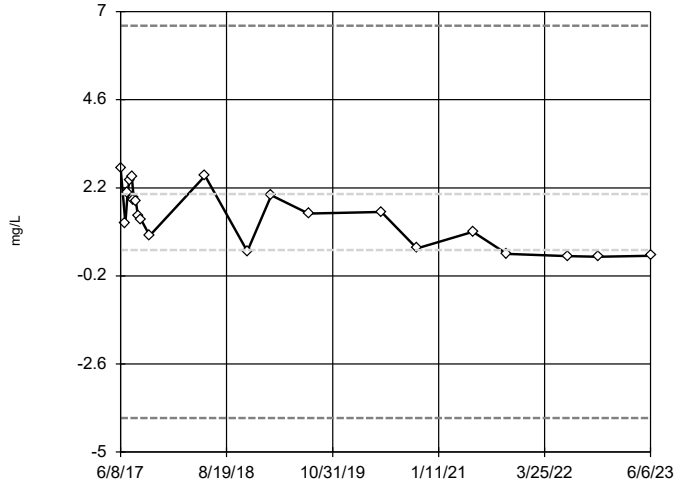
Tukey's Outlier Screening

AD-16R



n = 22

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

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

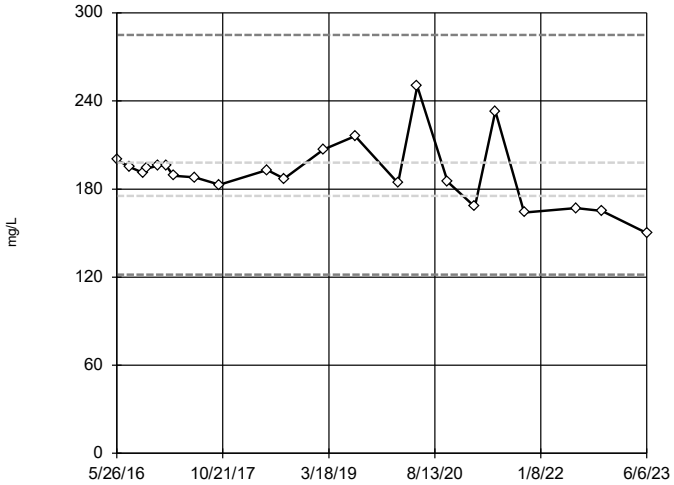
High cutoff = 6.615, low cutoff = -4.071, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 12/7/2023 3:32 PM

Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-17 (bg)



n = 22

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 = 285.1, low cutoff = 121.8, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 12/7/2023 3:32 PM

Welsh BASP Data: Welsh BASP

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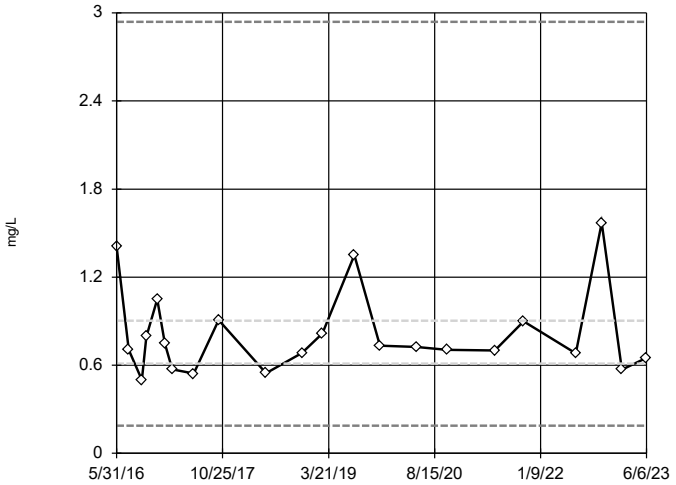
Tukey's Outlier Screening

AD-3



n = 22

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 = 2.938, low cutoff = 0.1878, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 12/7/2023 3:32 PM

Welsh BASP Data: Welsh BASP

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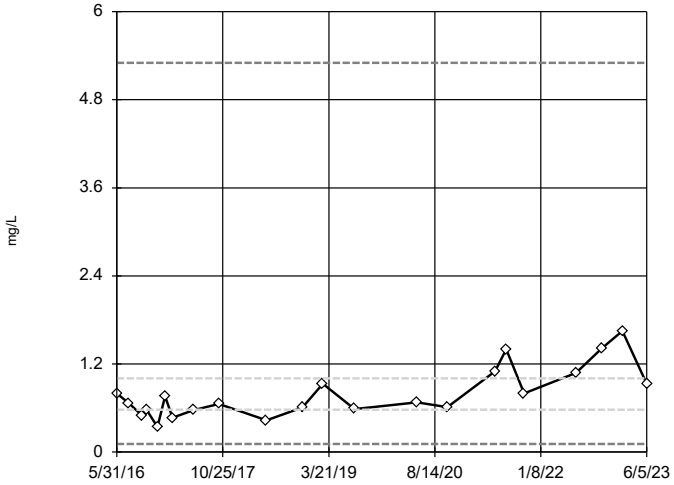
Tukey's Outlier Screening

AD-4C



n = 22

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 = 5.304, low cutoff = 0.1088, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 12/7/2023 3:32 PM

Welsh BASP Data: Welsh BASP

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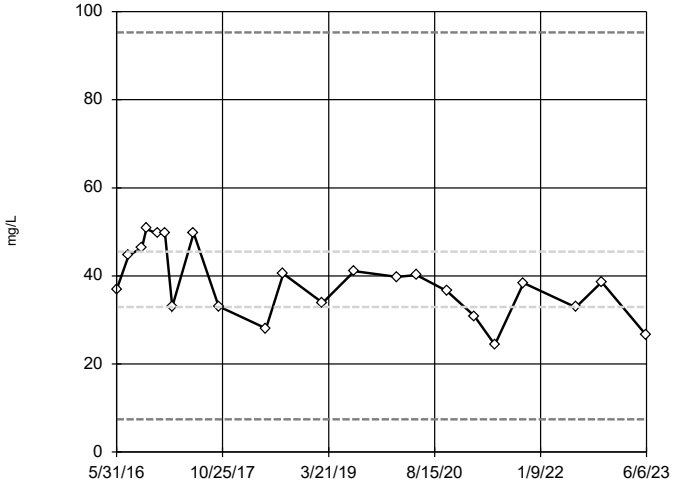
Tukey's Outlier Screening

AD-5 (bg)



n = 22

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

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

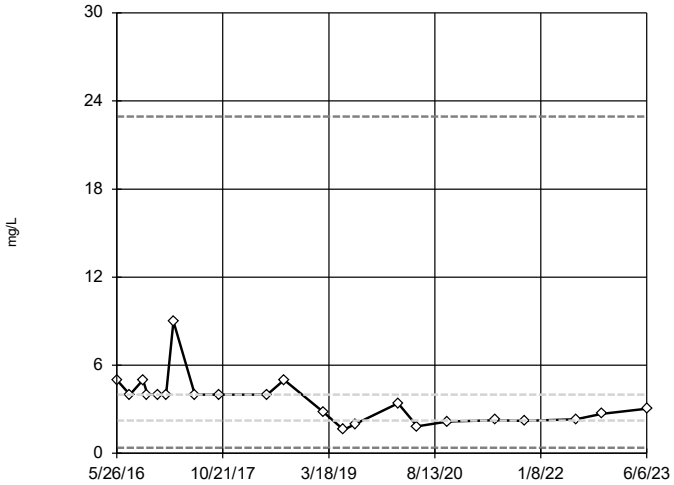
High cutoff = 95.25, low cutoff = 7.428, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 12/7/2023 3:32 PM

Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-1 (bg)



n = 22

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 = 22.93, low cutoff = 0.3898, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 12/7/2023 3:32 PM
Welsh BASP Data: Welsh BASP

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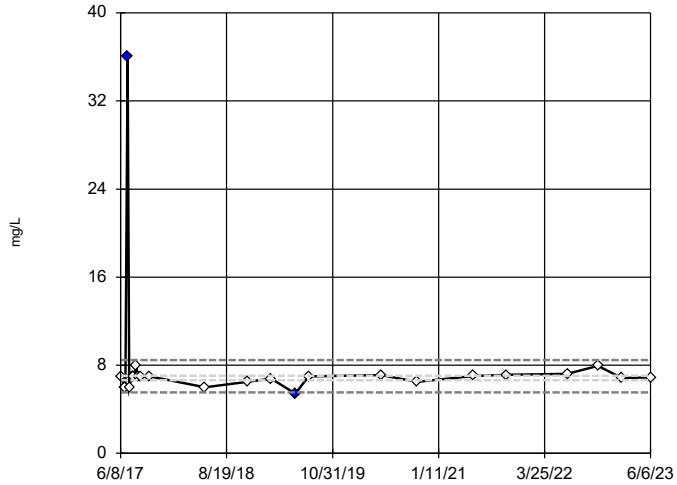
Tukey's Outlier Screening

AD-16R



n = 24

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 = 8.467, low cutoff = 5.531, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 12/7/2023 3:32 PM
Welsh BASP Data: Welsh BASP

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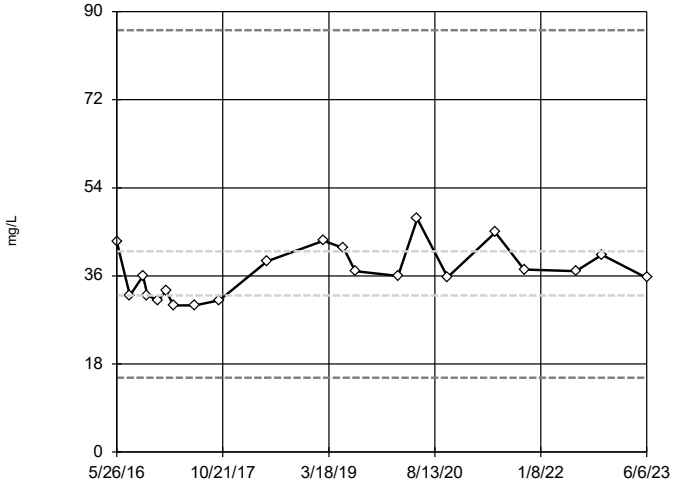
Tukey's Outlier Screening

AD-17 (bg)



n = 21

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 = 86.19, low cutoff = 15.22, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 12/7/2023 3:32 PM
Welsh BASP Data: Welsh BASP

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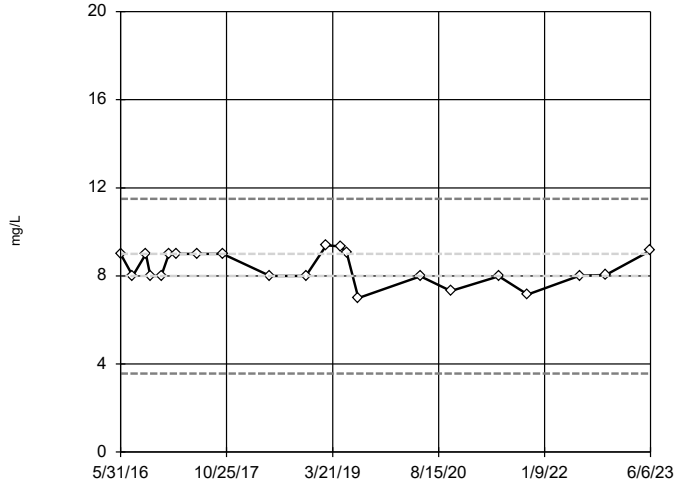
Tukey's Outlier Screening

AD-3



n = 22

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 = 11.5, low cutoff = 3.561, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 12/7/2023 3:32 PM
Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-4C

n = 24

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

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

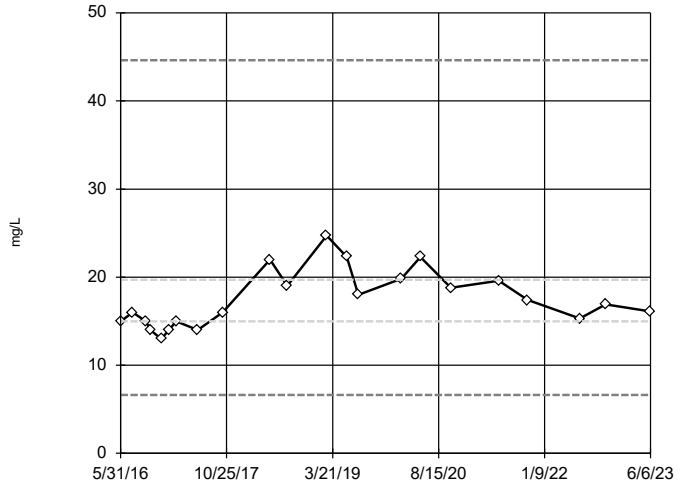
High cutoff = 44.79, low cutoff = 3.248, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 12/7/2023 3:32 PM

Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-5 (bg)



n = 22

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

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

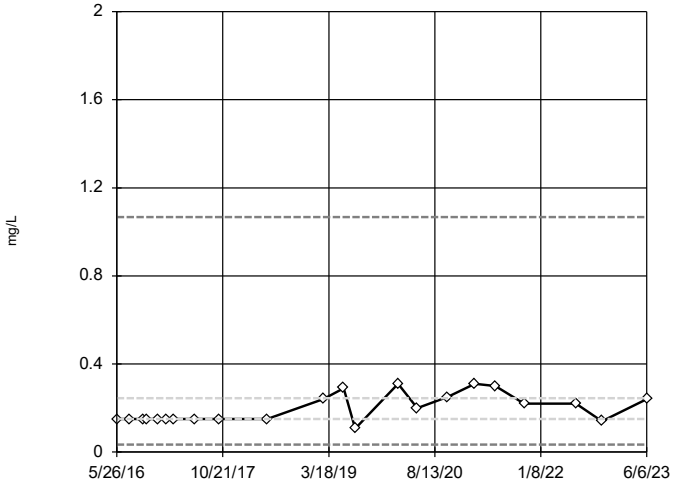
High cutoff = 44.62, low cutoff = 6.622, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 12/7/2023 3:32 PM

Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-1 (bg)



n = 22

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

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

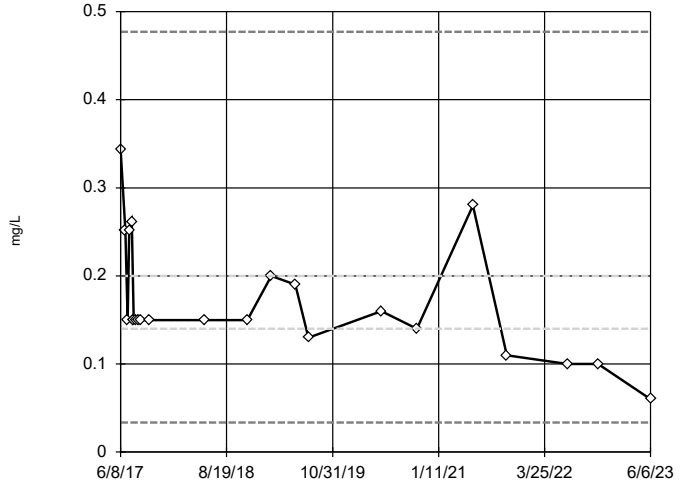
High cutoff = 1.067, low cutoff = 0.03445, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 12/7/2023 3:32 PM

Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-16R



n = 23

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

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

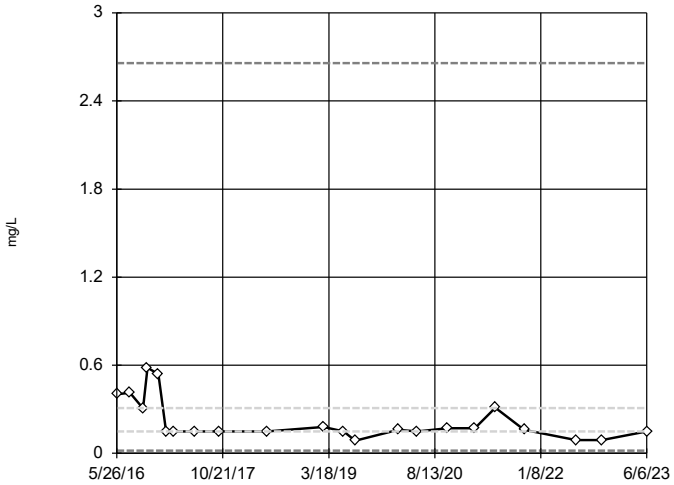
High cutoff = 0.4772, low cutoff = 0.03357, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 12/7/2023 3:32 PM

Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-17 (bg)



n = 22

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 = 2.657, low cutoff = 0.01737, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 12/7/2023 3:32 PM
Welsh BASP Data: Welsh BASP

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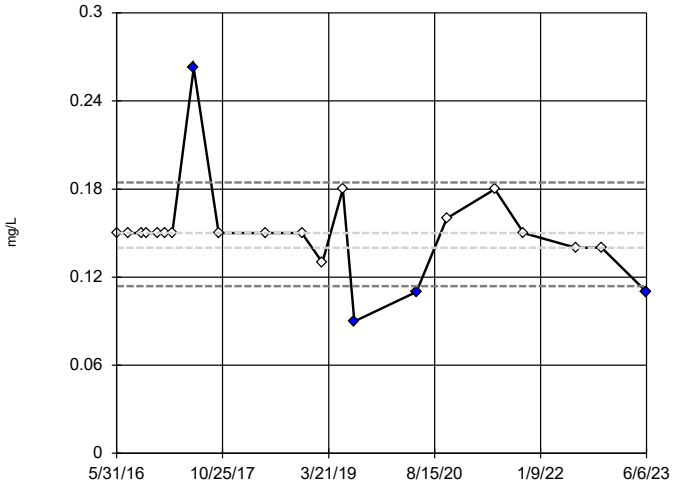
Tukey's Outlier Screening

AD-3



n = 21

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 = 0.1845, low cutoff = 0.1138, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 12/7/2023 3:32 PM
Welsh BASP Data: Welsh BASP

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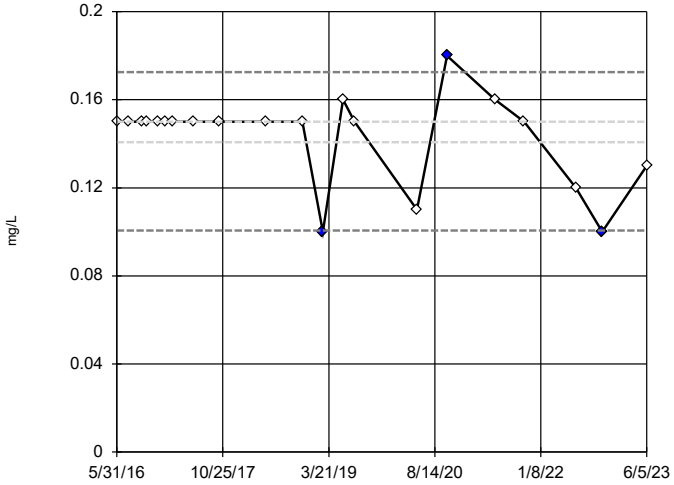
Tukey's Outlier Screening

AD-4C



n = 21

Outliers are drawn as solid.
Tukey's method selected by user.

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

High cutoff = 0.1726, low cutoff = 0.1006, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 12/7/2023 3:32 PM
Welsh BASP Data: Welsh BASP

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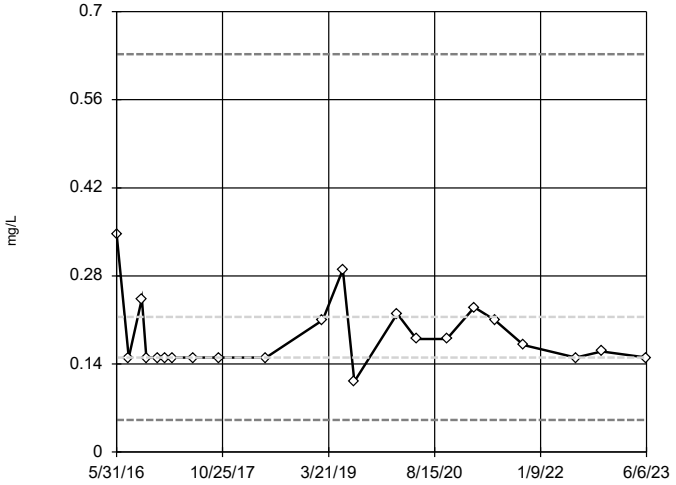
Tukey's Outlier Screening

AD-5 (bg)



n = 22

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

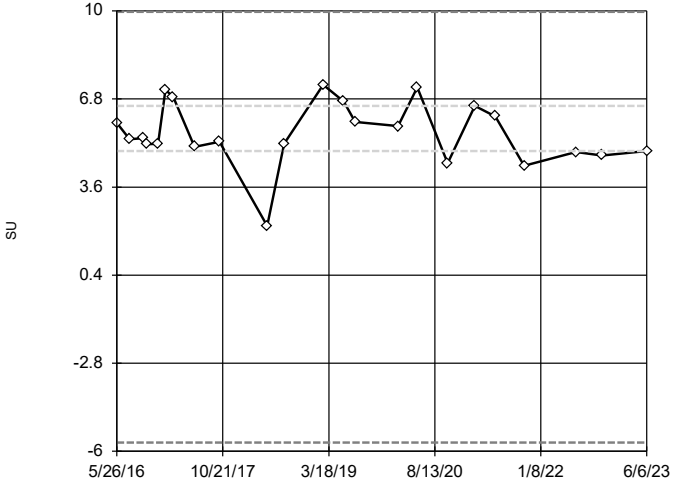
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.6324, low cutoff = 0.05098, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 12/7/2023 3:32 PM
Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-1 (bg)



n = 23

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

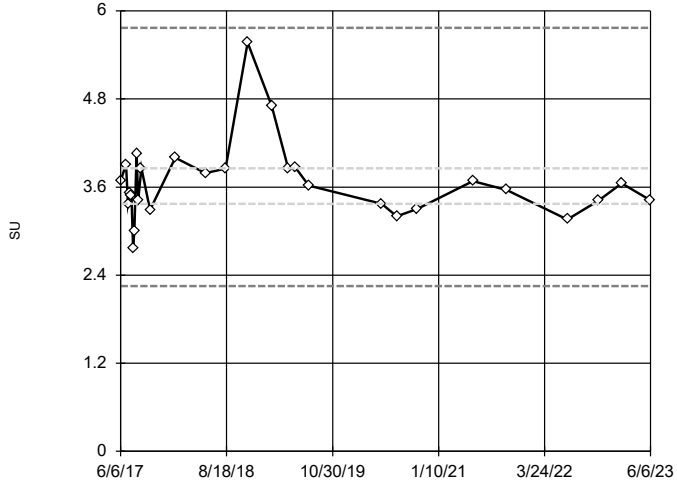
Data were square transformed to achieve best W statistic (graph shown in original units).

High cutoff = 9.964, low cutoff = -5.681, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/7/2023 3:32 PM
Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-16R



n = 28

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

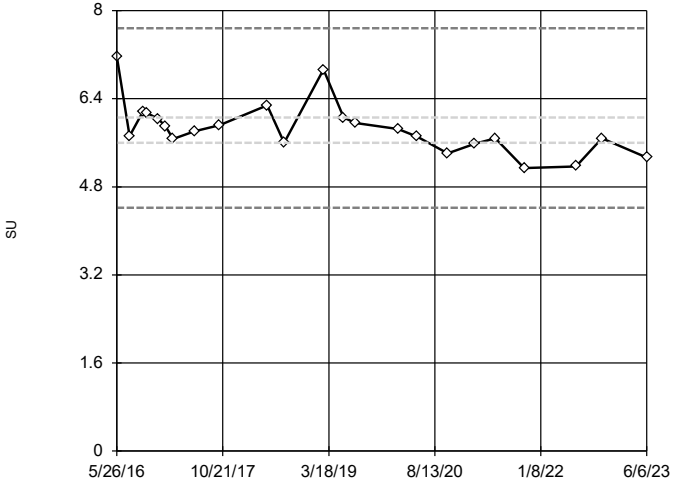
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 5.77, low cutoff = 2.251, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/7/2023 3:33 PM
Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-17 (bg)



n = 23

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

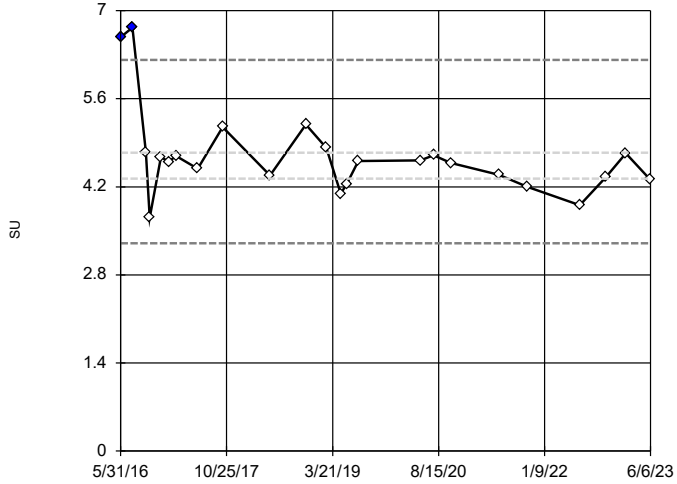
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 7.679, low cutoff = 4.419, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/7/2023 3:33 PM
Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-3



n = 24

Outliers are drawn as solid.
Tukey's method selected by user.

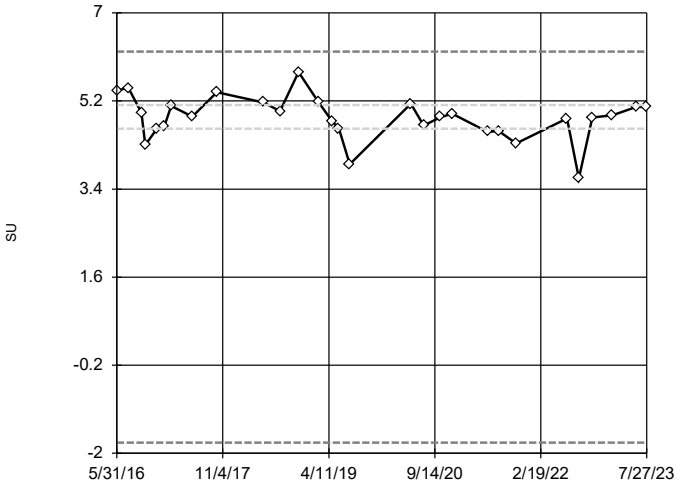
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 6.218, low cutoff = 3.301, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/7/2023 3:33 PM
Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-4C



n = 29

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 = 6.207, low cutoff = -1.782, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/7/2023 3:33 PM

Welsh BASP Data: Welsh BASP

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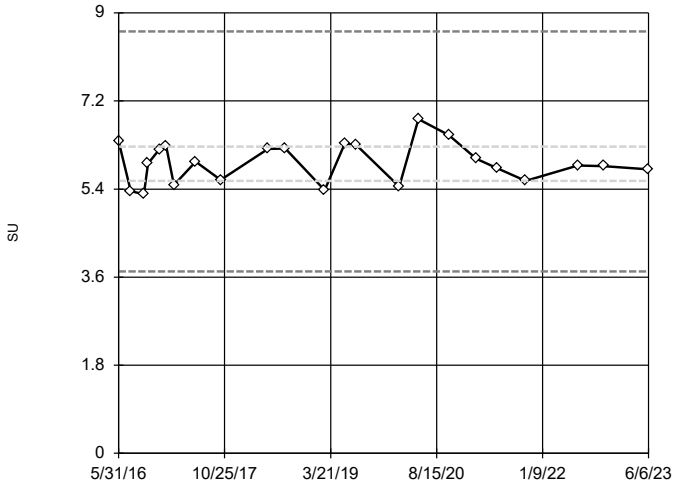
Tukey's Outlier Screening

AD-5 (bg)



n = 23

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 = 8.619, low cutoff = 3.719, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/7/2023 3:33 PM

Welsh BASP Data: Welsh BASP

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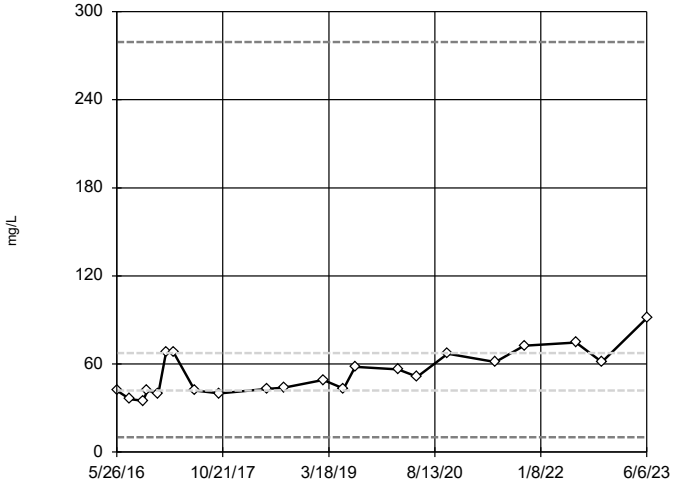
Tukey's Outlier Screening

AD-1 (bg)



n = 22

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 = 279.3, low cutoff = 10.14, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 12/7/2023 3:33 PM

Welsh BASP Data: Welsh BASP

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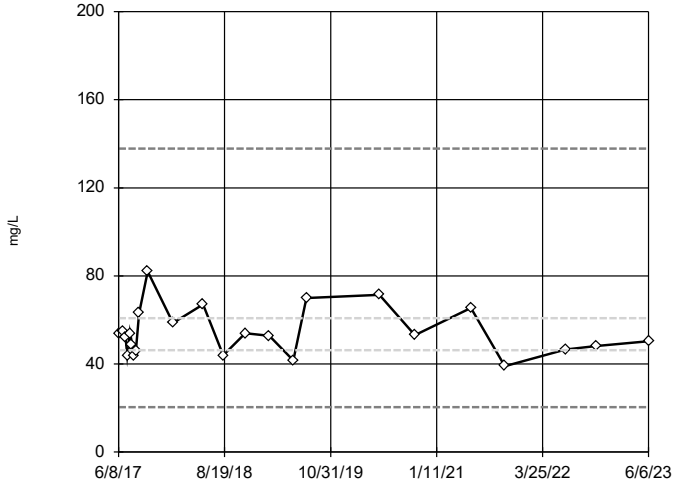
Tukey's Outlier Screening

AD-16R



n = 25

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

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

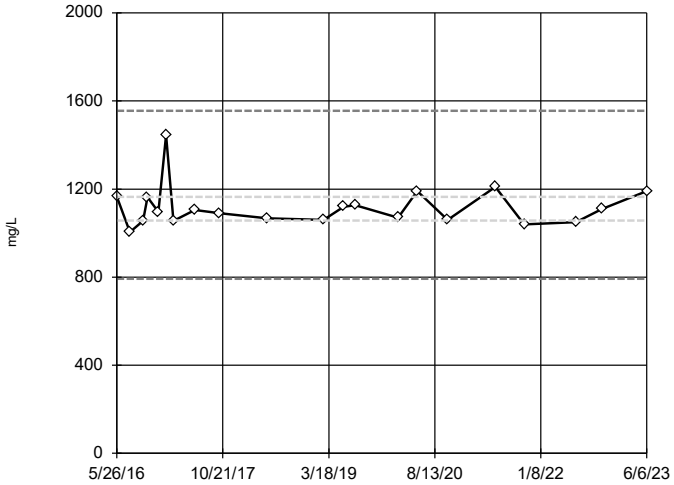
High cutoff = 137.8, low cutoff = 20.4, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 12/7/2023 3:33 PM

Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-17 (bg)



n = 21

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

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

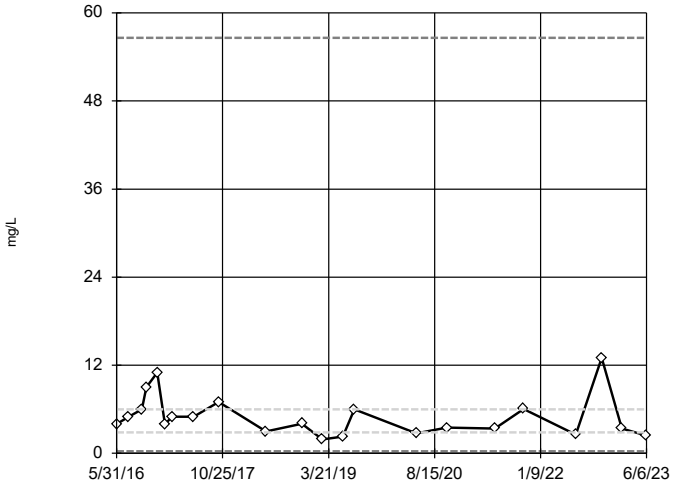
High cutoff = 1555, low cutoff = 792, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 12/7/2023 3:33 PM

Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-3



n = 22

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 = 56.59, low cutoff = 0.3022, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 12/7/2023 3:33 PM

Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-4C

n = 29

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

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

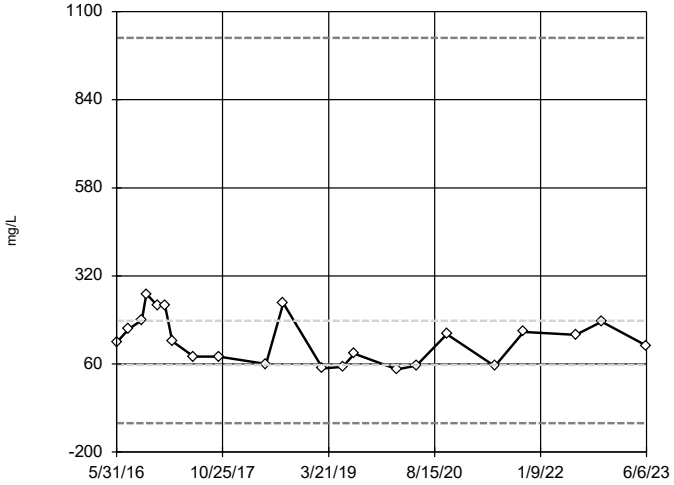
High cutoff = 477.3, low cutoff = 6.927, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 12/7/2023 3:33 PM

Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-5 (bg)



n = 22

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

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

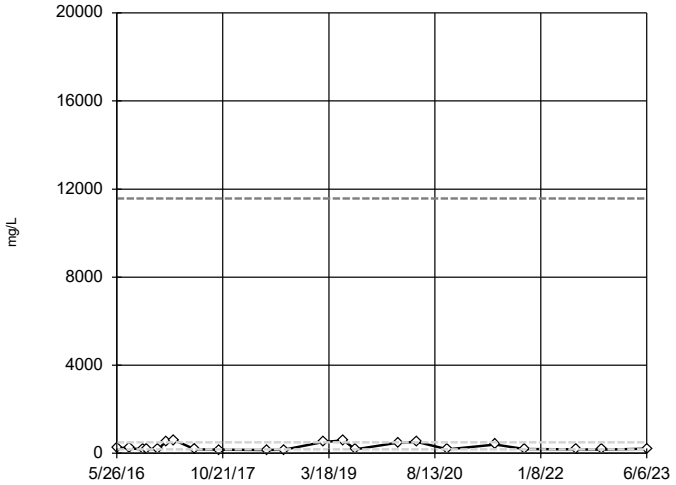
High cutoff = 1023, low cutoff = -114.2, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 12/7/2023 3:33 PM

Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-1 (bg)



n = 22

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 = 11567, low cutoff = 7.511, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 12/7/2023 3:33 PM

Welsh BASP Data: Welsh BASP

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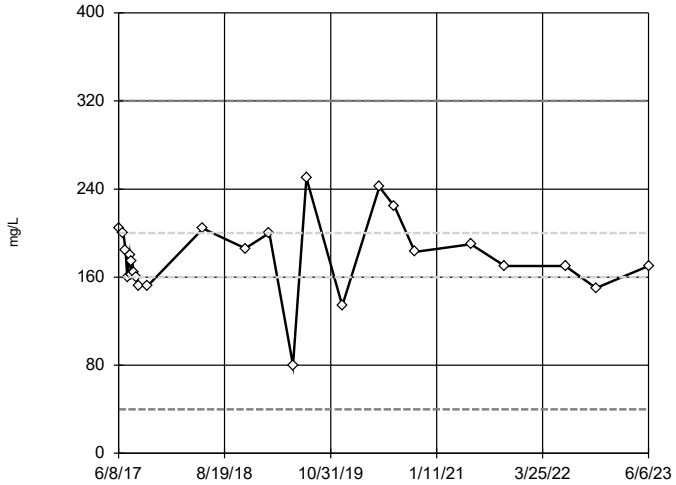
Tukey's Outlier Screening

AD-16R



n = 25

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

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

High cutoff = 320, low cutoff = 40, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 12/7/2023 3:33 PM

Welsh BASP Data: Welsh BASP

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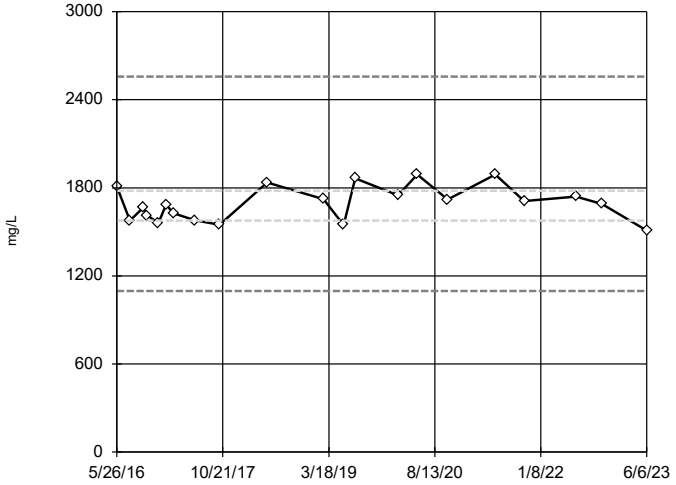
Tukey's Outlier Screening

AD-17 (bg)



n = 21

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 = 2558, low cutoff = 1097, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 12/7/2023 3:33 PM

Welsh BASP Data: Welsh BASP

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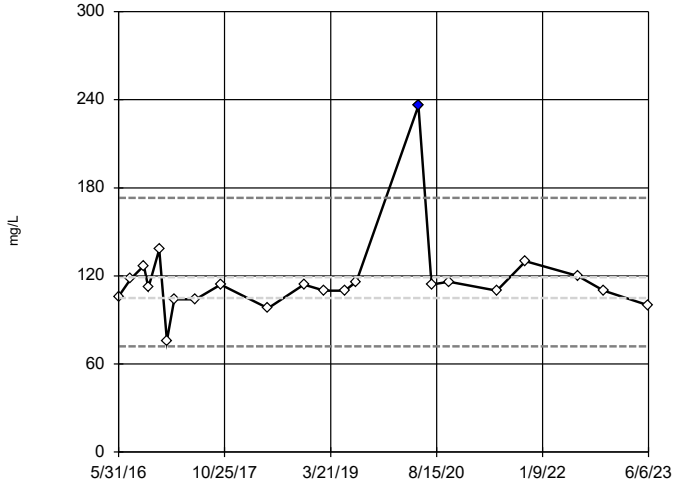
Tukey's Outlier Screening

AD-3



n = 22

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).

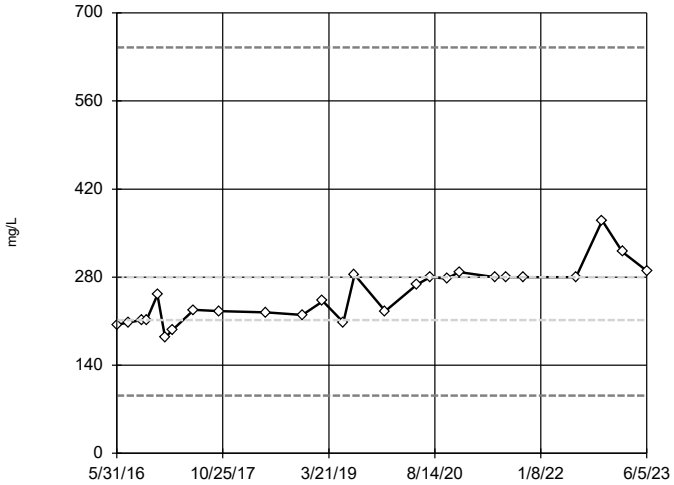
High cutoff = 173.2, low cutoff = 72.12, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 12/7/2023 3:33 PM

Welsh BASP Data: Welsh BASP

Tukey's Outlier Screening

AD-4C



n = 26

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 = 645.1, low cutoff = 92.02, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 12/7/2023 3:33 PM

Welsh BASP Data: Welsh BASP

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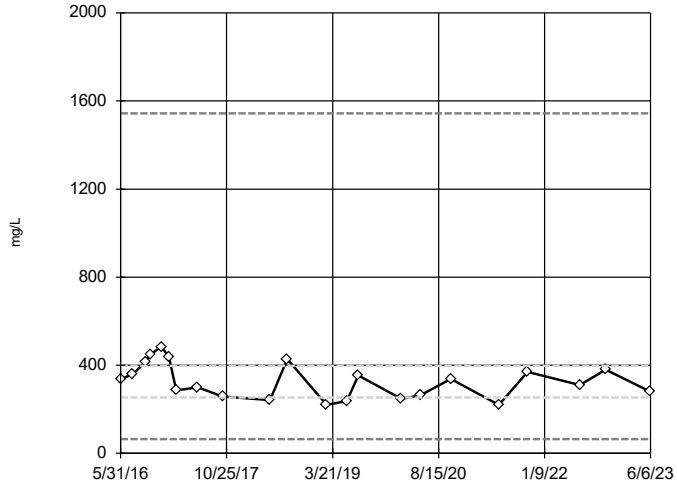
Tukey's Outlier Screening

AD-5 (bg)



n = 22

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 = 1544, low cutoff = 65.14, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 12/7/2023 3:33 PM

Welsh BASP Data: Welsh BASP

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

Welsh BASP Data: Welsh BASP Printed 12/7/2023, 3:42 PM

Constituent	Well	Calc.	0.01	Alpha	Sig.	Method
Boron (mg/L)	**AD-16R**	**-2.601**	**Yes**	**0.01**	**Yes**	**Mann-W**
Calcium (mg/L)	**AD-16R**	**-3.107**	**Yes**	**0.01**	**Yes**	**Mann-W**
Calcium (mg/L)	**AD-17 (bg)**	**-3.108**	**Yes**	**0.01**	**Yes**	**Mann-W**
Calcium (mg/L)	**AD-4C**	**2.664**	**Yes**	**0.01**	**Yes**	**Mann-W**
Fluoride (mg/L)	**AD-16R**	**-3.221**	**Yes**	**0.01**	**Yes**	**Mann-W**
Fluoride (mg/L)	**AD-4C**	**-2.781**	**Yes**	**0.01**	**Yes**	**Mann-W**
pH, field (SU)	**AD-1 (bg)**	**-2.853**	**Yes**	**0.01**	**Yes**	**Mann-W**
pH, field (SU)	**AD-17 (bg)**	**-2.758**	**Yes**	**0.01**	**Yes**	**Mann-W**
Sulfate (mg/L)	**AD-1 (bg)**	**2.686**	**Yes**	**0.01**	**Yes**	**Mann-W**
Sulfate (mg/L)	**AD-4C**	**3.695**	**Yes**	**0.01**	**Yes**	**Mann-W**
Total Dissolved Solids (mg/L)	**AD-4C**	**2.939**	**Yes**	**0.01**	**Yes**	**Mann-W**

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

Welsh BASP Data: Welsh BASP Printed 12/7/2023, 3:42 PM

Constituent	Well	Calc.	0.01	Alpha	Sig.	Method
Boron (mg/L)	AD-1 (bg)	1.825	No	0.01	No	Mann-W
Boron (mg/L)	**AD-16R**	**-2.601**	**Yes**	**0.01**	**Yes**	**Mann-W**
Boron (mg/L)	AD-17 (bg)	-2.315	No	0.01	No	Mann-W
Boron (mg/L)	AD-3	-0.08689	No	0.01	No	Mann-W
Boron (mg/L)	AD-4C	2.511	No	0.01	No	Mann-W
Boron (mg/L)	AD-5 (bg)	-0.08264	No	0.01	No	Mann-W
Calcium (mg/L)	AD-1 (bg)	-2.511	No	0.01	No	Mann-W
Calcium (mg/L)	**AD-16R**	**-3.107**	**Yes**	**0.01**	**Yes**	**Mann-W**
Calcium (mg/L)	**AD-17 (bg)**	**-3.108**	**Yes**	**0.01**	**Yes**	**Mann-W**
Calcium (mg/L)	AD-3	-0.1567	No	0.01	No	Mann-W
Calcium (mg/L)	**AD-4C**	**2.664**	**Yes**	**0.01**	**Yes**	**Mann-W**
Calcium (mg/L)	AD-5 (bg)	-1.405	No	0.01	No	Mann-W
Chloride (mg/L)	AD-1 (bg)	-1.325	No	0.01	No	Mann-W
Chloride (mg/L)	AD-16R	1.486	No	0.01	No	Mann-W
Chloride (mg/L)	AD-17 (bg)	0.5382	No	0.01	No	Mann-W
Chloride (mg/L)	AD-3	-0.1297	No	0.01	No	Mann-W
Chloride (mg/L)	AD-4C	2.441	No	0.01	No	Mann-W
Chloride (mg/L)	AD-5 (bg)	-0.2134	No	0.01	No	Mann-W
Fluoride (mg/L)	AD-1 (bg)	0.08948	No	0.01	No	Mann-W
Fluoride (mg/L)	**AD-16R**	**-3.221**	**Yes**	**0.01**	**Yes**	**Mann-W**
Fluoride (mg/L)	AD-17 (bg)	-1.818	No	0.01	No	Mann-W
Fluoride (mg/L)	AD-3	-2.277	No	0.01	No	Mann-W
Fluoride (mg/L)	**AD-4C**	**-2.781**	**Yes**	**0.01**	**Yes**	**Mann-W**
Fluoride (mg/L)	AD-5 (bg)	-1.44	No	0.01	No	Mann-W
pH, field (SU)	**AD-1 (bg)**	**-2.853**	**Yes**	**0.01**	**Yes**	**Mann-W**
pH, field (SU)	AD-16R	-1.23	No	0.01	No	Mann-W
pH, field (SU)	**AD-17 (bg)**	**-2.758**	**Yes**	**0.01**	**Yes**	**Mann-W**
pH, field (SU)	AD-3	-1.645	No	0.01	No	Mann-W
pH, field (SU)	AD-4C	-0.9431	No	0.01	No	Mann-W
pH, field (SU)	AD-5 (bg)	-1.095	No	0.01	No	Mann-W
Sulfate (mg/L)	**AD-1 (bg)**	**2.686**	**Yes**	**0.01**	**Yes**	**Mann-W**
Sulfate (mg/L)	AD-16R	-1.819	No	0.01	No	Mann-W
Sulfate (mg/L)	AD-17 (bg)	-0.5676	No	0.01	No	Mann-W
Sulfate (mg/L)	AD-3	-0.2354	No	0.01	No	Mann-W
Sulfate (mg/L)	**AD-4C**	**3.695**	**Yes**	**0.01**	**Yes**	**Mann-W**
Sulfate (mg/L)	AD-5 (bg)	0.7238	No	0.01	No	Mann-W
Total Dissolved Solids (mg/L)	AD-1 (bg)	-1.022	No	0.01	No	Mann-W
Total Dissolved Solids (mg/L)	AD-16R	-1.225	No	0.01	No	Mann-W
Total Dissolved Solids (mg/L)	AD-17 (bg)	-0.4928	No	0.01	No	Mann-W
Total Dissolved Solids (mg/L)	AD-3	0.4502	No	0.01	No	Mann-W
Total Dissolved Solids (mg/L)	**AD-4C**	**2.939**	**Yes**	**0.01**	**Yes**	**Mann-W**
Total Dissolved Solids (mg/L)	AD-5 (bg)	0.4683	No	0.01	No	Mann-W

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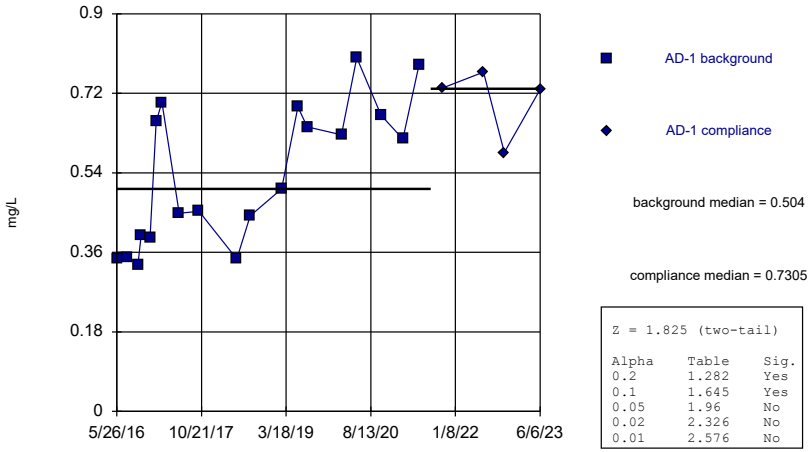
Mann-Whitney (Wilcoxon Rank Sum)

AD-1 (bg)



background median = 0.504

compliance median = 0.7305

Z = 1.825 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Boron Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

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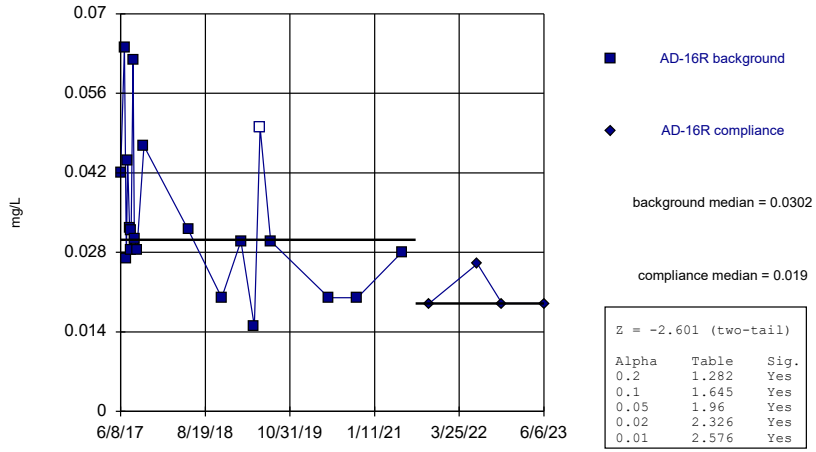
Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-16R



background median = 0.0302

compliance median = 0.019

Z = -2.601 (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: Boron Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

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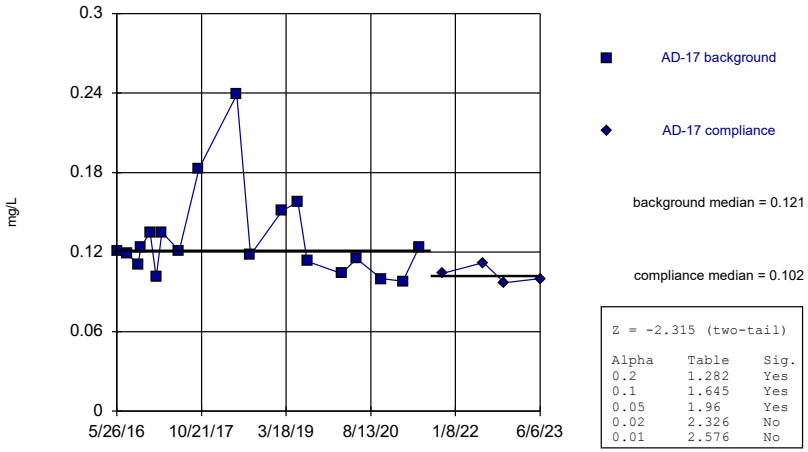
Mann-Whitney (Wilcoxon Rank Sum)

AD-17 (bg)



background median = 0.121

compliance median = 0.102

Z = -2.315 (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: Boron Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

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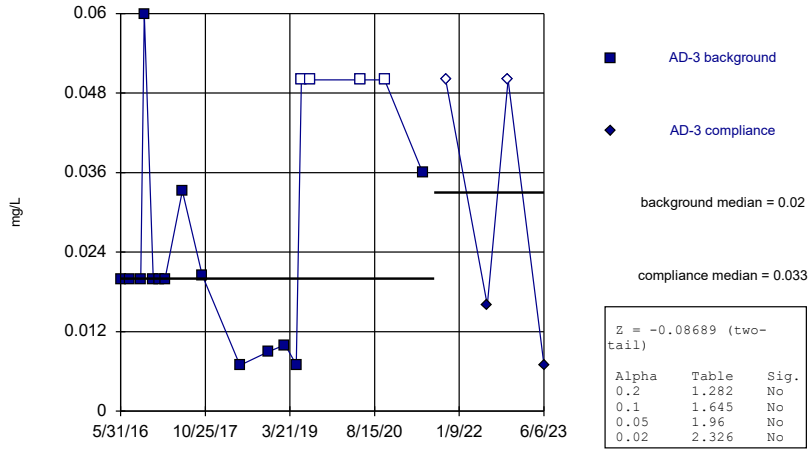
Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-3



background median = 0.02

compliance median = 0.033

Z = -0.08689 (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

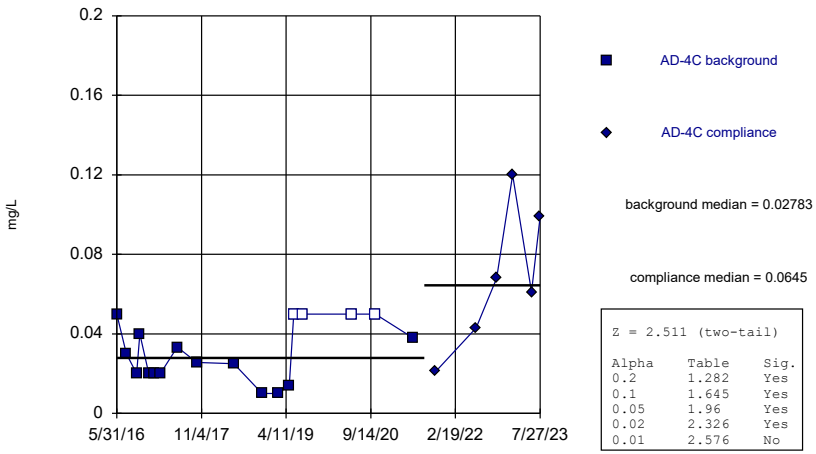
Constituent: Boron Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-4C



background median = 0.02783

compliance median = 0.0645

Z = 2.511 (two-tail)

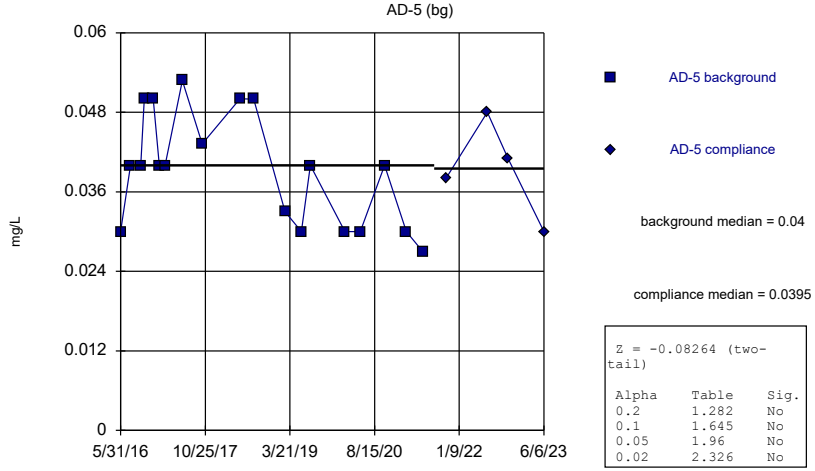
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	No

Constituent: Boron Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-5 (bg)



background median = 0.04

compliance median = 0.0395

Z = -0.08264 (two-tail)

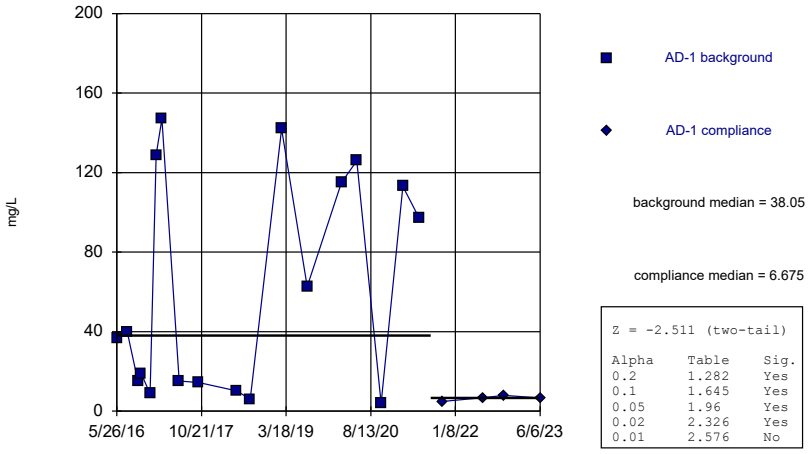
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No

Constituent: Boron Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-1 (bg)



background median = 38.05

compliance median = 6.675

Z = -2.511 (two-tail)

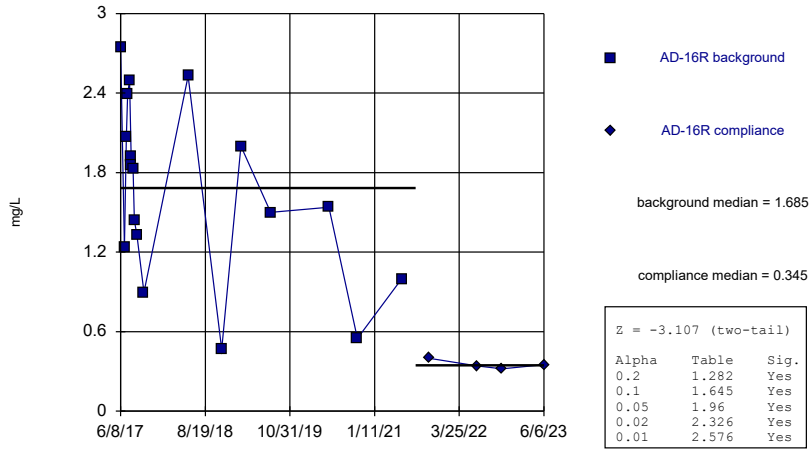
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	No

Constituent: Calcium Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-16R



background median = 1.685

compliance median = 0.345

Z = -3.107 (two-tail)

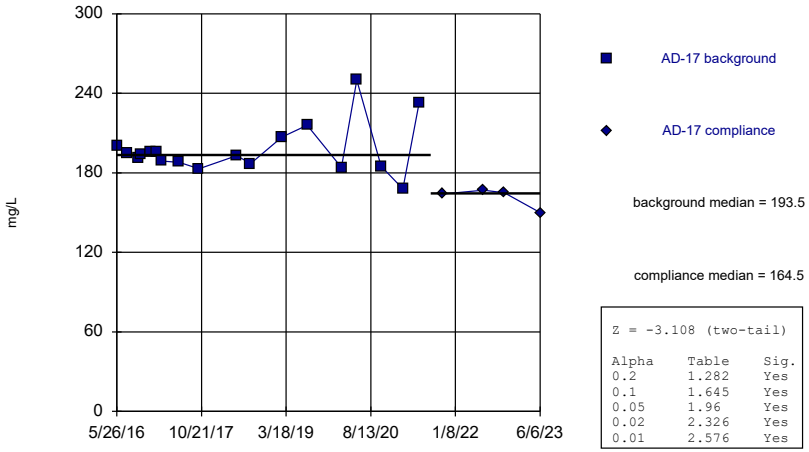
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	Yes

Constituent: Calcium Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-17 (bg)



background median = 193.5

compliance median = 164.5

Z = -3.108 (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: Calcium Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

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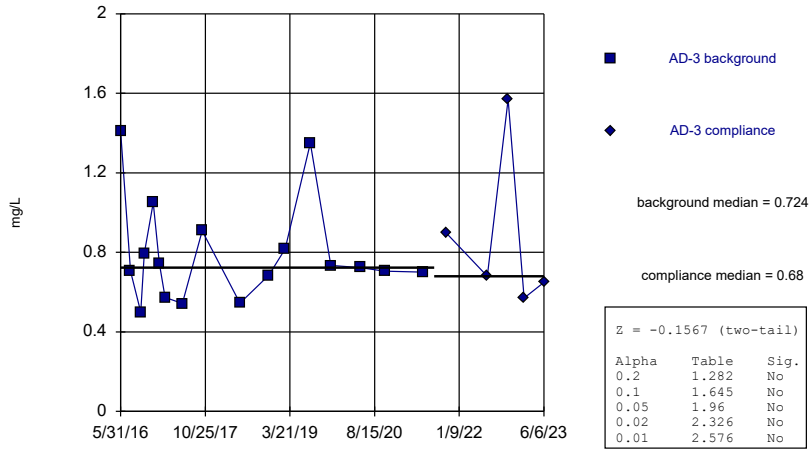
Mann-Whitney (Wilcoxon Rank Sum)

AD-3



background median = 0.724

compliance median = 0.68

Z = -0.1567 (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 Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

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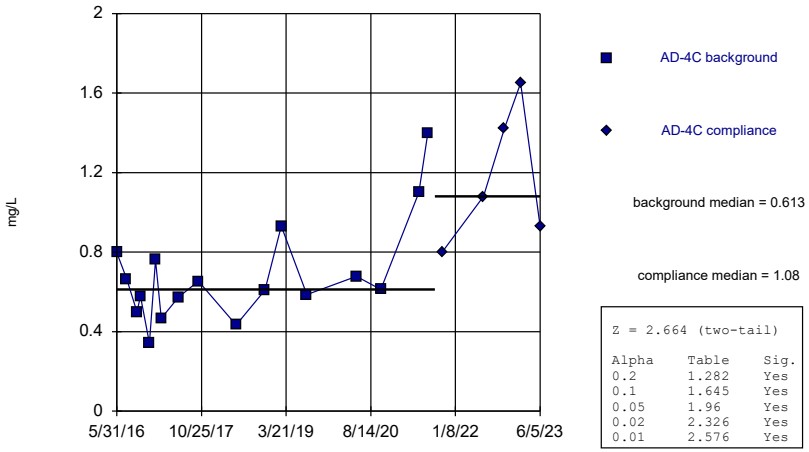
Mann-Whitney (Wilcoxon Rank Sum)

AD-4C



background median = 0.613

compliance median = 1.08

Z = 2.664 (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: Calcium Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

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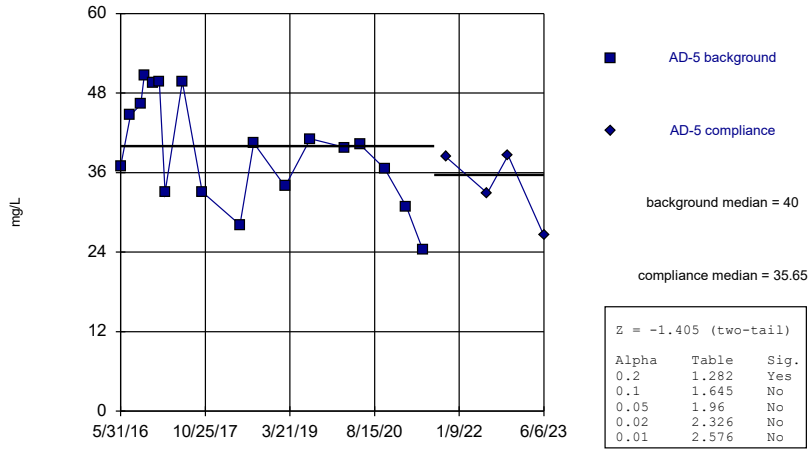
Mann-Whitney (Wilcoxon Rank Sum)

AD-5 (bg)



background median = 40

compliance median = 35.65

Z = -1.405 (two-tail)

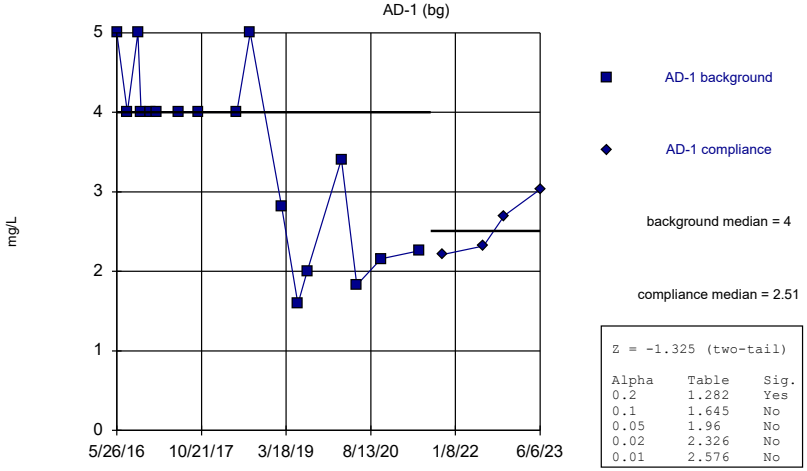
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Calcium Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-1 (bg)



background median = 4

compliance median = 2.51

Z = -1.325 (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: Chloride Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

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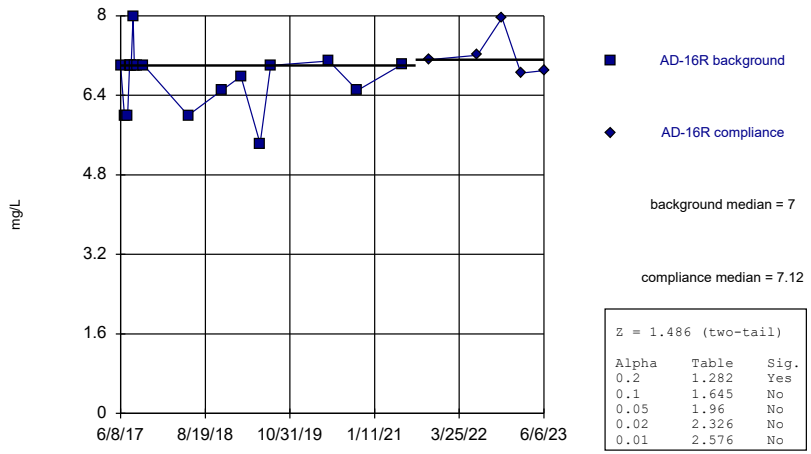
Mann-Whitney (Wilcoxon Rank Sum)

AD-16R



background median = 7

compliance median = 7.12

Z = 1.486 (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: Chloride Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

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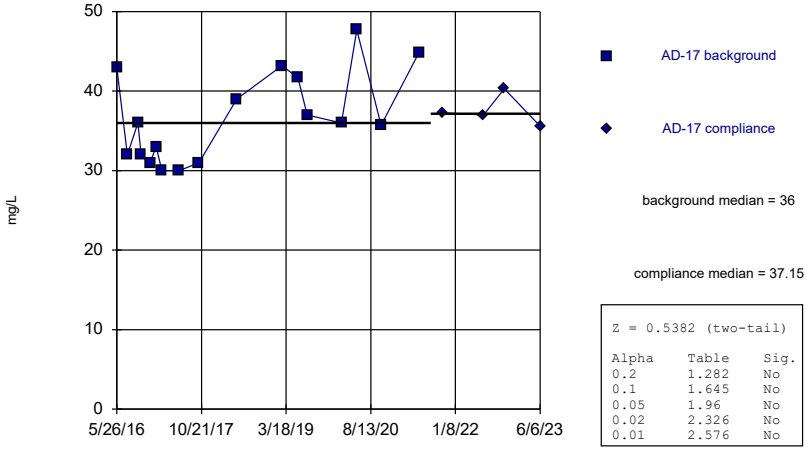
Mann-Whitney (Wilcoxon Rank Sum)

AD-17 (bg)



background median = 36

compliance median = 37.15

Z = 0.5382 (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: Chloride Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

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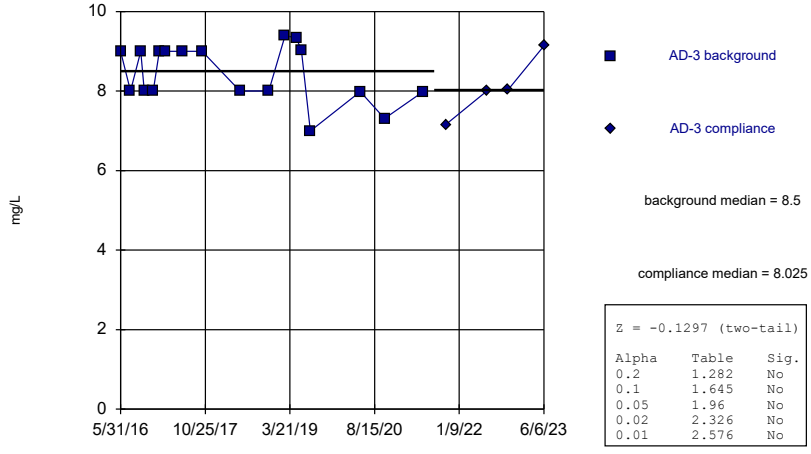
Mann-Whitney (Wilcoxon Rank Sum)

AD-3



background median = 8.5

compliance median = 8.025

Z = -0.1297 (two-tail)

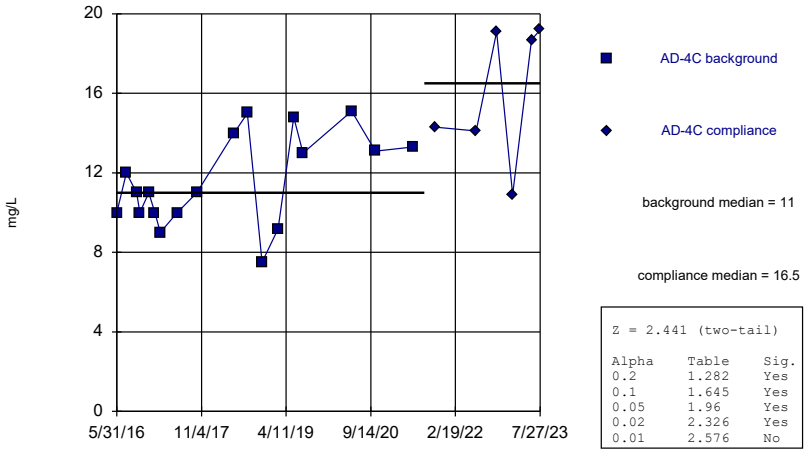
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Chloride Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-4C



Z = 2.441 (two-tail)

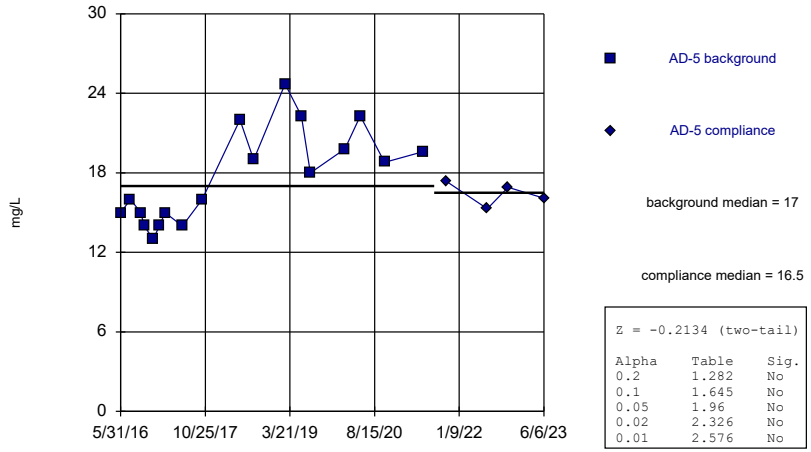
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	No

Constituent: Chloride Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-5 (bg)



Z = -0.2134 (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

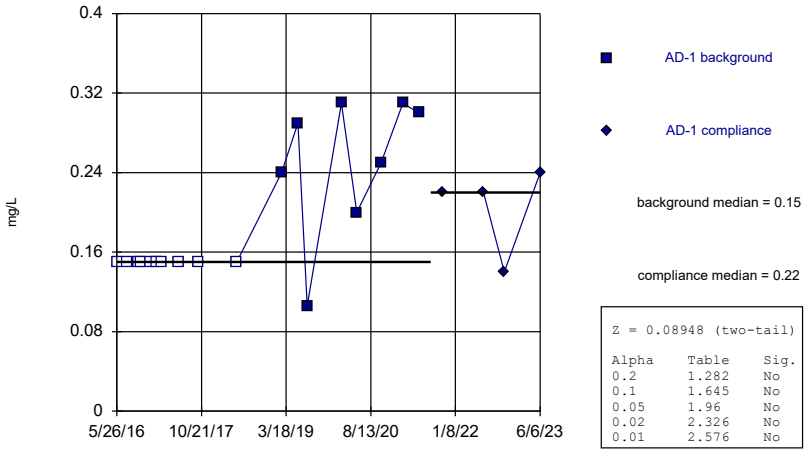
Constituent: Chloride Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-1 (bg)



Z = 0.08948 (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

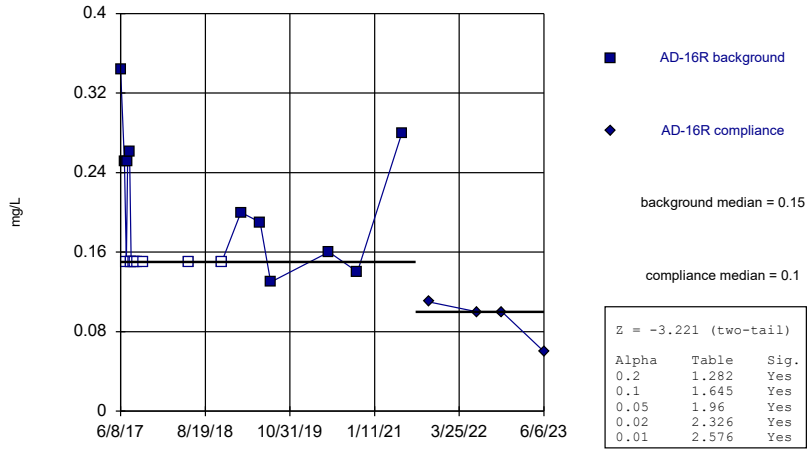
Constituent: Fluoride Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-16R



Z = -3.221 (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: Fluoride Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

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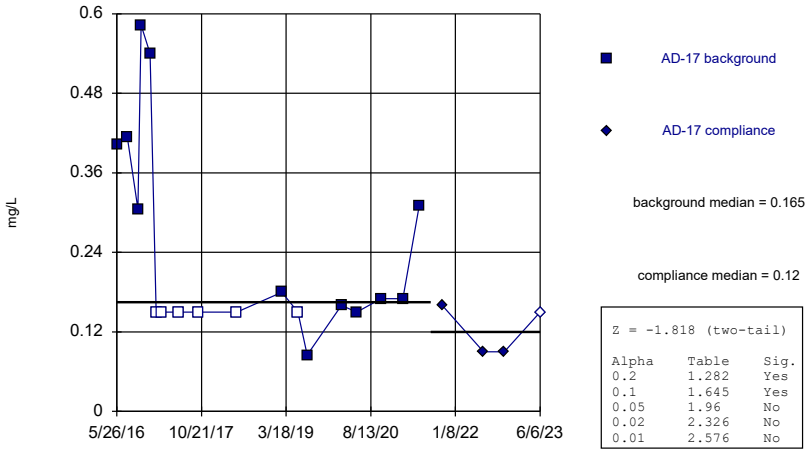
Mann-Whitney (Wilcoxon Rank Sum)

AD-17 (bg)



Z = -1.818 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Fluoride Analysis Run 12/7/2023 3:40 PM
Welsh BASP Data: Welsh BASP

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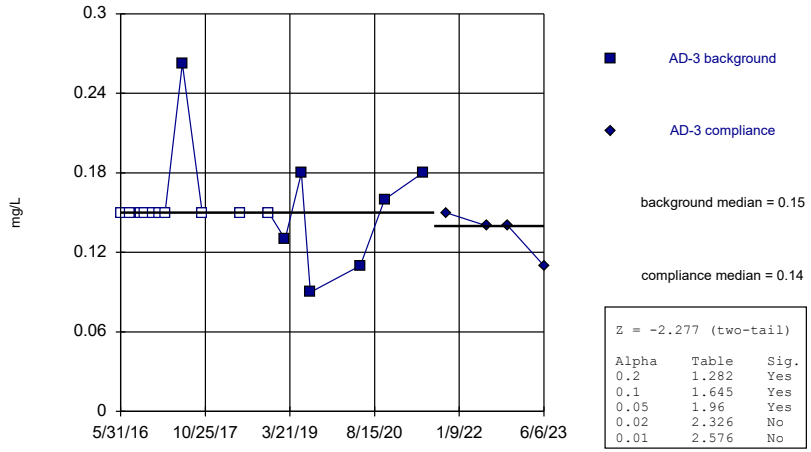
Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-3



Z = -2.277 (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: Fluoride Analysis Run 12/7/2023 3:40 PM
Welsh BASP Data: Welsh BASP

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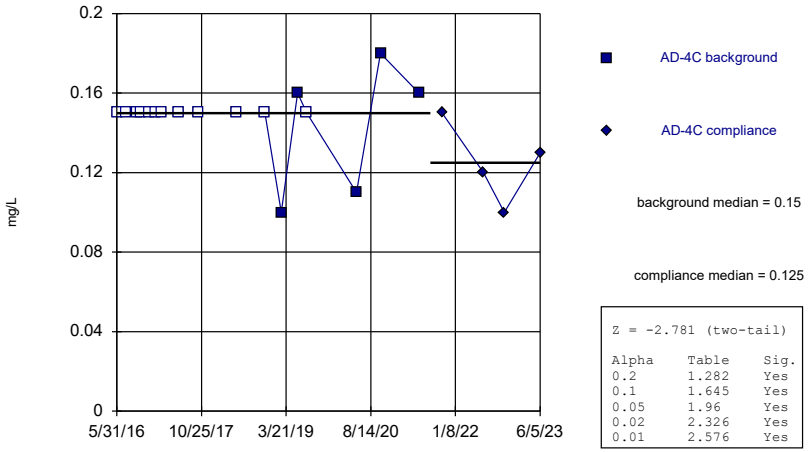
Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-4C



Z = -2.781 (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: Fluoride Analysis Run 12/7/2023 3:40 PM
Welsh BASP Data: Welsh BASP

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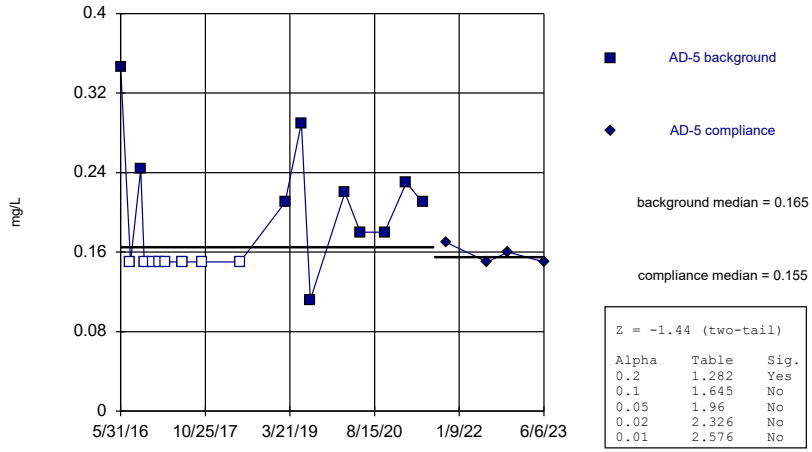
Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)

AD-5 (bg)



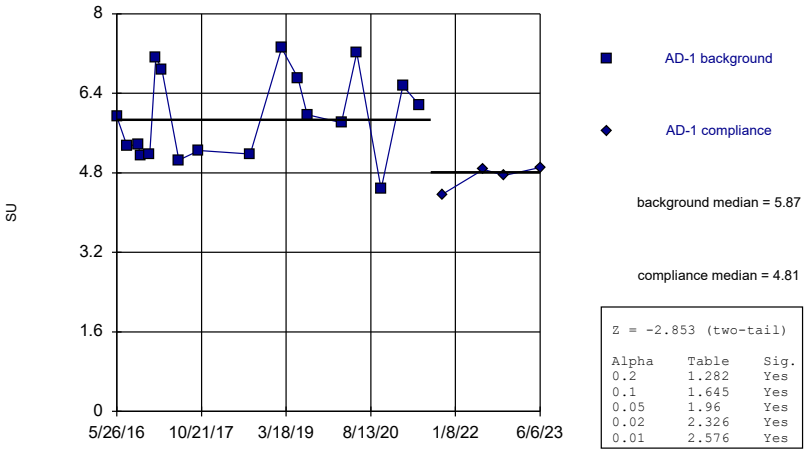
Z = -1.44 (two-tail)

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: Fluoride Analysis Run 12/7/2023 3:40 PM
Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-1 (bg)



background median = 5.87

compliance median = 4.81

Z = -2.853 (two-tail)

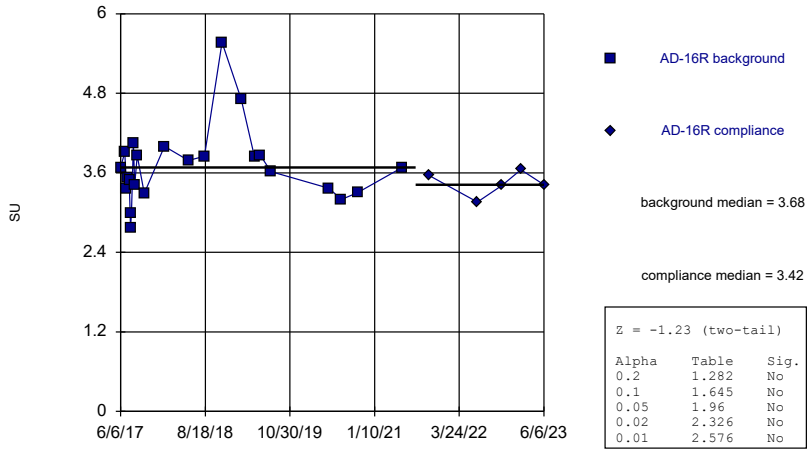
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	Yes

Constituent: pH, field Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-16R



background median = 3.68

compliance median = 3.42

Z = -1.23 (two-tail)

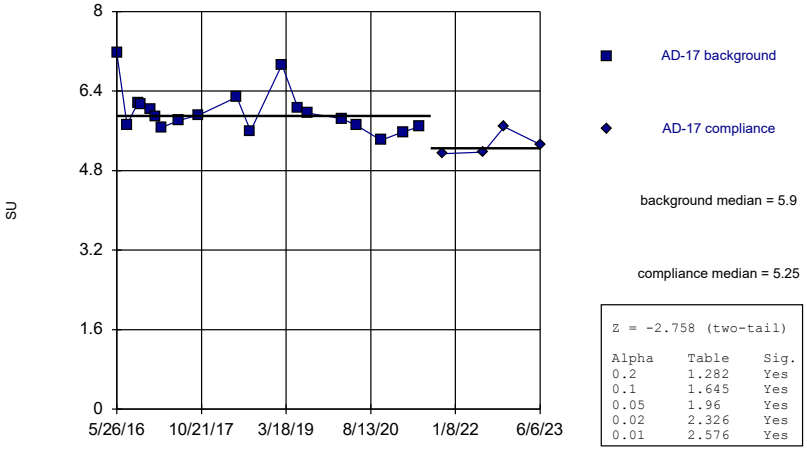
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-17 (bg)



background median = 5.9

compliance median = 5.25

Z = -2.758 (two-tail)

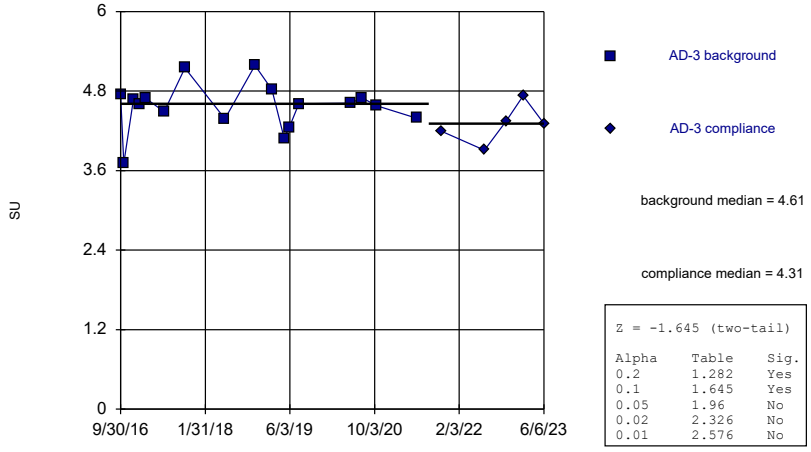
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	Yes

Constituent: pH, field Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-3



background median = 4.61

compliance median = 4.31

Z = -1.645 (two-tail)

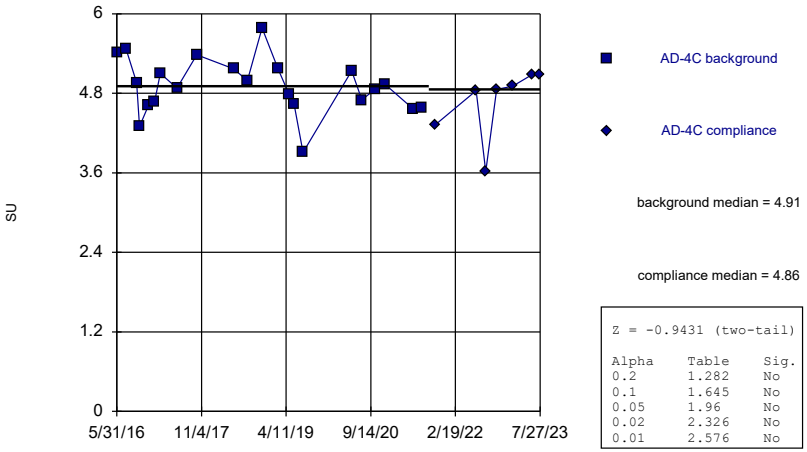
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-4C



background median = 4.91

compliance median = 4.86

Z = -0.9431 (two-tail)

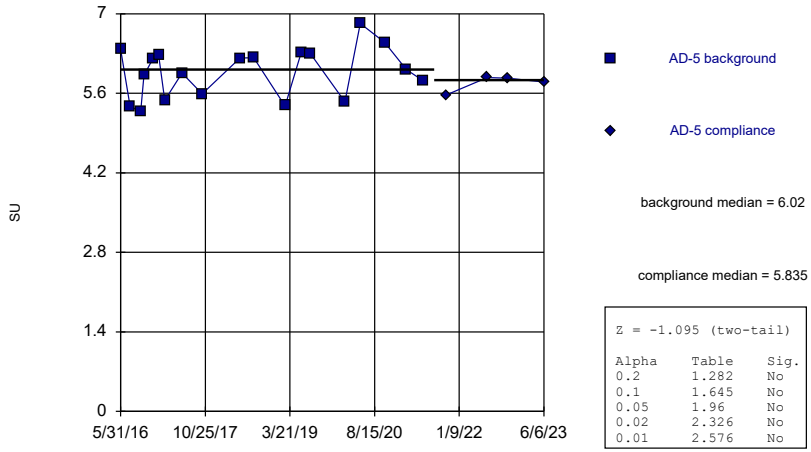
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-5 (bg)



background median = 6.02

compliance median = 5.835

Z = -1.095 (two-tail)

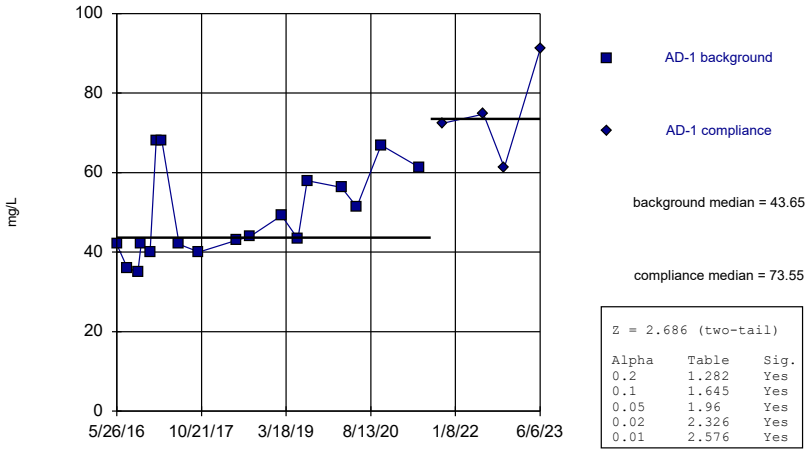
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: pH, field Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-1 (bg)



background median = 43.65

compliance median = 73.55

Z = 2.686 (two-tail)

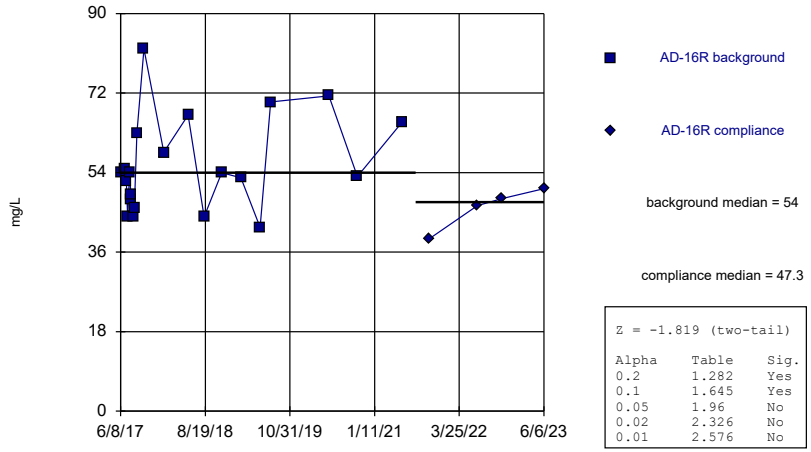
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	Yes

Constituent: Sulfate Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-16R



background median = 54

compliance median = 47.3

Z = -1.819 (two-tail)

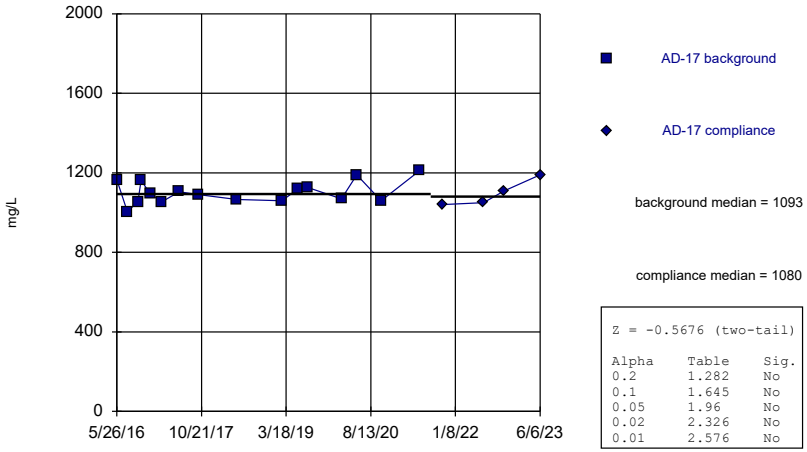
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Sulfate Analysis Run 12/7/2023 3:40 PM

Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-17 (bg)



Z = -0.5676 (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 Analysis Run 12/7/2023 3:40 PM
Welsh BASP Data: Welsh BASP

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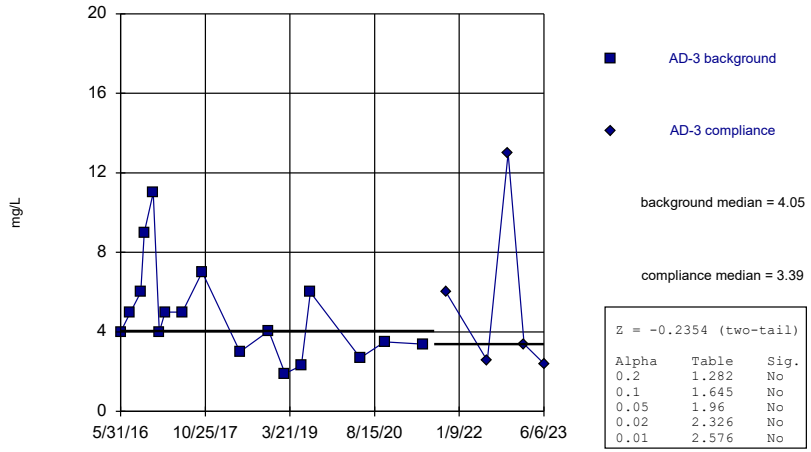
Mann-Whitney (Wilcoxon Rank Sum)

AD-3



Z = -0.2354 (two-tail)

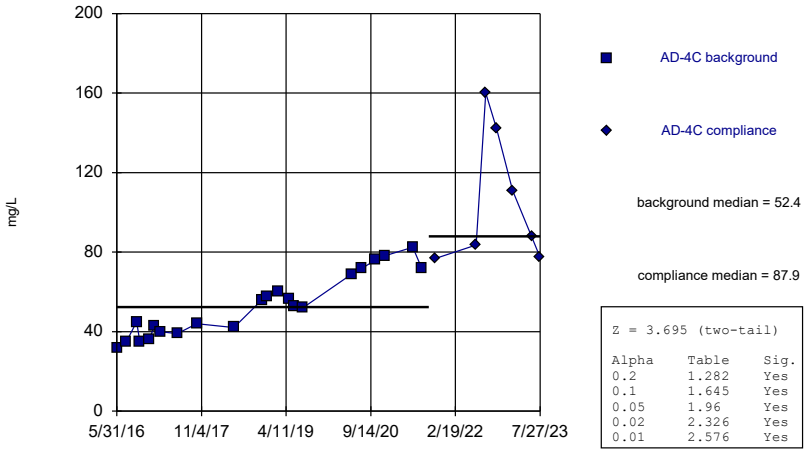
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Sulfate Analysis Run 12/7/2023 3:40 PM
Welsh BASP Data: Welsh BASP

Sanitas™ v.10.0.15 Software licensed to . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-4C



Z = 3.695 (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 Analysis Run 12/7/2023 3:40 PM
Welsh BASP Data: Welsh BASP

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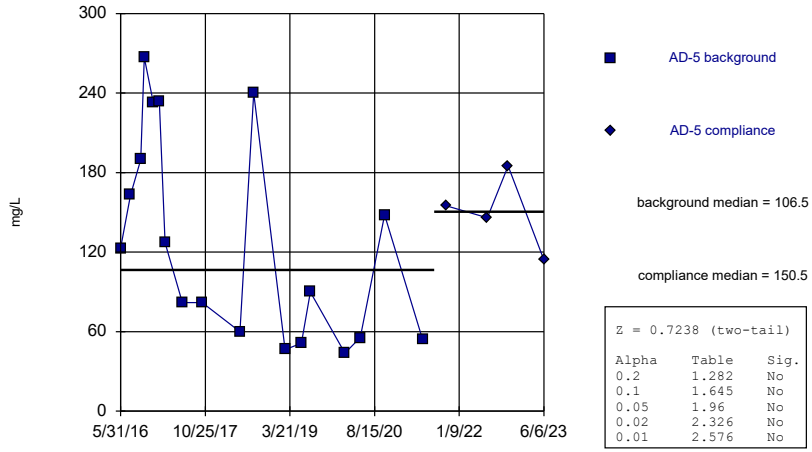
Mann-Whitney (Wilcoxon Rank Sum)

AD-5 (bg)



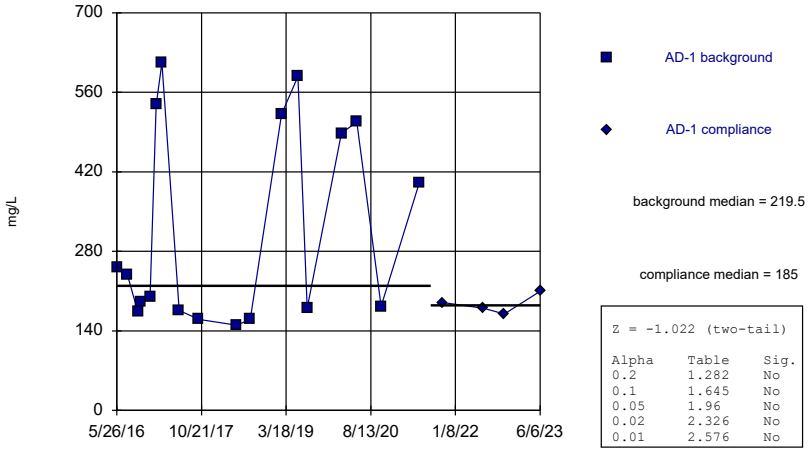
Z = 0.7238 (two-tail)

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 Analysis Run 12/7/2023 3:41 PM
Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-1 (bg)



Z = -1.022 (two-tail)

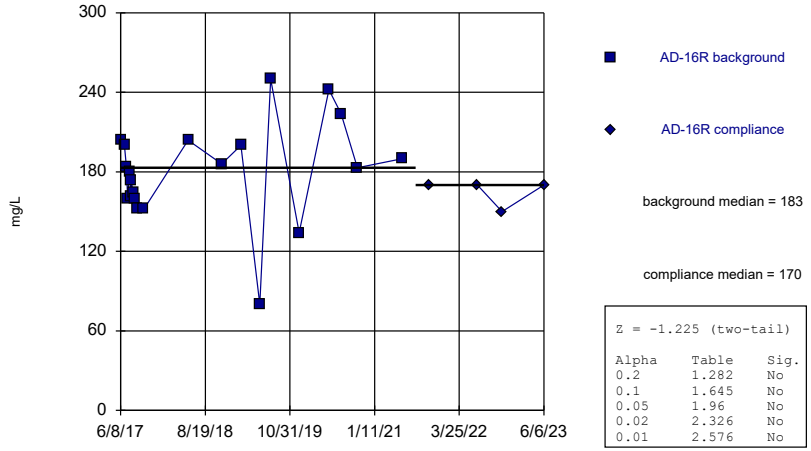
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Total Dissolved Solids Analysis Run 12/7/2023 3:41 PM
Welsh BASP Data: Welsh BASP

Sanitas™ v.10.0.15 Software licensed to . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-16R



Z = -1.225 (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 Analysis Run 12/7/2023 3:41 PM
Welsh BASP Data: Welsh BASP

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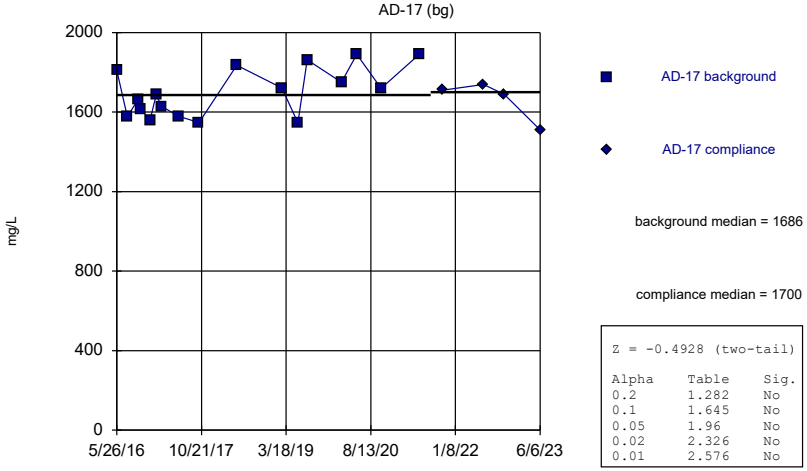
Mann-Whitney (Wilcoxon Rank Sum)

AD-17 (bg)



Z = -0.4928 (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 Analysis Run 12/7/2023 3:41 PM
Welsh BASP Data: Welsh BASP

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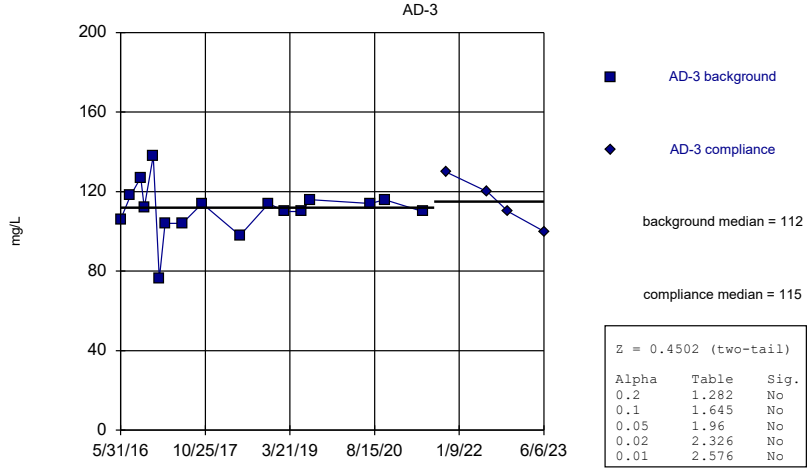
Mann-Whitney (Wilcoxon Rank Sum)

AD-3



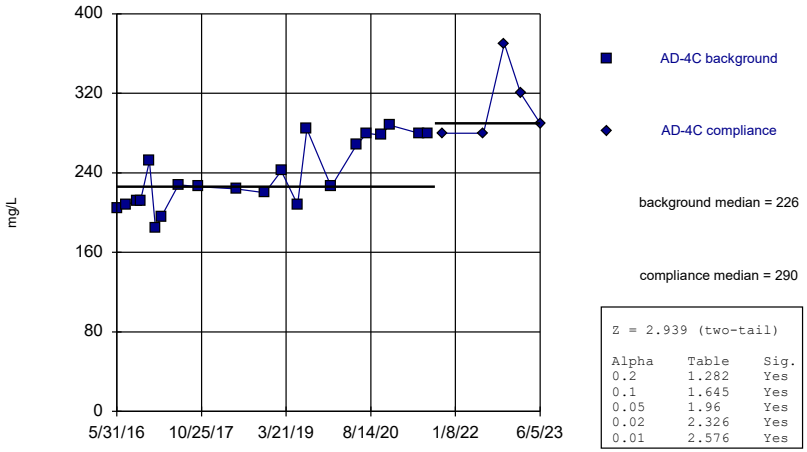
Z = 0.4502 (two-tail)

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 Analysis Run 12/7/2023 3:41 PM
Welsh BASP Data: Welsh BASP

Mann-Whitney (Wilcoxon Rank Sum)

AD-4C



Z = 2.939 (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 Analysis Run 12/7/2023 3:41 PM

Welsh BASP Data: Welsh BASP

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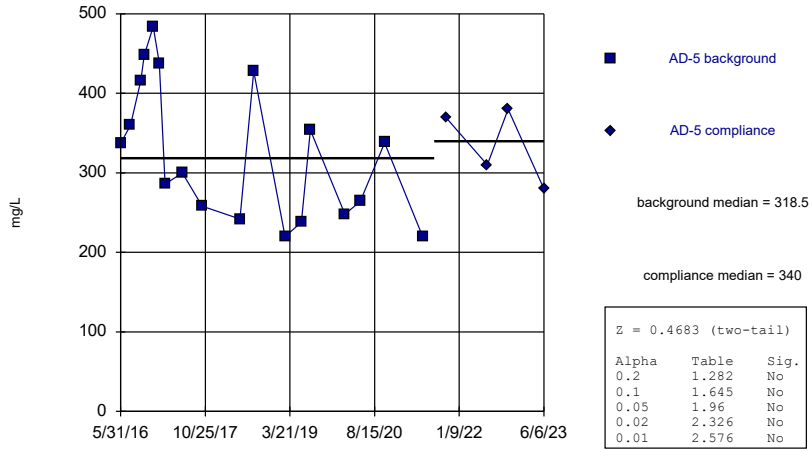
Mann-Whitney (Wilcoxon Rank Sum)

AD-5 (bg)



Z = 0.4683 (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 Analysis Run 12/7/2023 3:41 PM

Welsh BASP Data: Welsh BASP

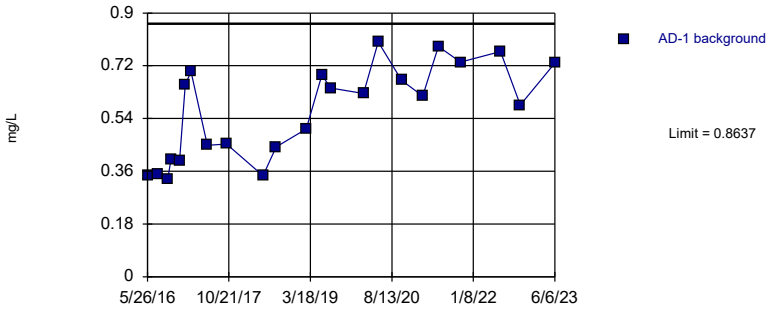
Appendix III - Intrawell Prediction Limits - All Results

Welsh BASP Data: Welsh BASP Printed 12/7/2023, 3:47 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (mg/L)	AD-1	0.8637	n/a	n/a	1 future	n/a	23	0.566	0.1603	0	None	No	0.002505	Param Intra 1 of 2
Boron (mg/L)	AD-16R	0.05767	n/a	n/a	1 future	n/a	24	0.1752	0.0352	4.167	None	sqrt(x)	0.002505	Param Intra 1 of 2
Boron (mg/L)	AD-17	0.239	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
Boron (mg/L)	AD-3	0.04065	n/a	n/a	1 future	n/a	22	0.1196	0.04391	27.27	Kaplan-Meier	sqrt(x)	0.002505	Param Intra 1 of 2
Boron (mg/L)	AD-4C	0.08817	n/a	n/a	1 future	n/a	24	0.1741	0.06655	16.67	Kaplan-Meier	sqrt(x)	0.002505	Param Intra 1 of 2
Boron (mg/L)	AD-5	0.05435	n/a	n/a	1 future	n/a	23	0.03927	0.00812	0	None	No	0.002505	Param Intra 1 of 2
Calcium (mg/L)	AD-1	283.8	n/a	n/a	1 future	n/a	22	3.236	1.291	0	None	ln(x)	0.002505	Param Intra 1 of 2
Calcium (mg/L)	AD-16R	2.902	n/a	n/a	1 future	n/a	22	1.419	0.7934	0	None	No	0.002505	Param Intra 1 of 2
Calcium (mg/L)	AD-17	233	n/a	n/a	1 future	n/a	22	191	22.53	0	None	No	0.002505	Param Intra 1 of 2
Calcium (mg/L)	AD-3	1.381	n/a	n/a	1 future	n/a	22	-0.2589	0.3114	0	None	ln(x)	0.002505	Param Intra 1 of 2
Calcium (mg/L)	AD-4C	1.442	n/a	n/a	1 future	n/a	22	0.7986	0.3442	0	None	No	0.002505	Param Intra 1 of 2
Calcium (mg/L)	AD-5	52.95	n/a	n/a	1 future	n/a	22	38.44	7.766	0	None	No	0.002505	Param Intra 1 of 2
Chloride (mg/L)	AD-1	5.365	n/a	n/a	1 future	n/a	21	3.301	1.097	0	None	No	0.002505	Param Intra 1 of 2
Chloride (mg/L)	AD-16R	8	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
Chloride (mg/L)	AD-17	46.5	n/a	n/a	1 future	n/a	21	36.83	5.145	0	None	No	0.002505	Param Intra 1 of 2
Chloride (mg/L)	AD-3	9.4	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
Chloride (mg/L)	AD-4C	18.63	n/a	n/a	1 future	n/a	24	12.72	3.204	0	None	No	0.002505	Param Intra 1 of 2
Chloride (mg/L)	AD-5	23.5	n/a	n/a	1 future	n/a	22	17.46	3.233	0	None	No	0.002505	Param Intra 1 of 2
Fluoride (mg/L)	AD-1	0.31	n/a	n/a	1 future	n/a	22	n/a	n/a	45.45	n/a	n/a	0.003707	NP Intra (normality) 1 of 2
Fluoride (mg/L)	AD-16R	0.2963	n/a	n/a	1 future	n/a	23	0.1495	0.07903	39.13	Kaplan-Meier	No	0.002505	Param Intra 1 of 2
Fluoride (mg/L)	AD-17	0.583	n/a	n/a	1 future	n/a	22	n/a	n/a	31.82	n/a	n/a	0.003707	NP Intra (normality) 1 of 2
Fluoride (mg/L)	AD-3	0.2625	n/a	n/a	1 future	n/a	21	n/a	n/a	47.62	n/a	n/a	0.003999	NP Intra (normality) 1 of 2
Fluoride (mg/L)	AD-4C	0.18	n/a	n/a	1 future	n/a	21	n/a	n/a	57.14	n/a	n/a	0.003999	NP Intra (NDs) 1 of 2
Fluoride (mg/L)	AD-5	0.3469	n/a	n/a	1 future	n/a	22	n/a	n/a	36.36	n/a	n/a	0.003707	NP Intra (normality) 1 of 2
pH, field (SU)	AD-1	7.421	3.996	n/a	1 future	n/a	22	5.708	0.9163	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-16R	4.614	2.803	n/a	1 future	n/a	28	1.537	0.07028	0	None	x^(1/3)	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-17	6.757	4.975	n/a	1 future	n/a	23	5.866	0.4798	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-3	5.171	3.846	n/a	1 future	n/a	22	4.509	0.3546	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-4C	5.665	4.043	n/a	1 future	n/a	29	4.854	0.4487	0	None	No	0.001253	Param Intra 1 of 2
pH, field (SU)	AD-5	6.71	5.175	n/a	1 future	n/a	23	5.942	0.4132	0	None	No	0.001253	Param Intra 1 of 2
Sulfate (mg/L)	AD-1	81.88	n/a	n/a	1 future	n/a	22	53.91	14.97	0	None	No	0.002505	Param Intra 1 of 2
Sulfate (mg/L)	AD-16R	73.42	n/a	n/a	1 future	n/a	25	54.12	10.52	0	None	No	0.002505	Param Intra 1 of 2
Sulfate (mg/L)	AD-17	1210	n/a	n/a	1 future	n/a	20	1101	57.27	0	None	No	0.002505	Param Intra 1 of 2
Sulfate (mg/L)	AD-3	10.6	n/a	n/a	1 future	n/a	22	2.164	0.5842	0	None	sqrt(x)	0.002505	Param Intra 1 of 2
Sulfate (mg/L)	AD-4C	122.8	n/a	n/a	1 future	n/a	29	7.943	1.737	0	None	sqrt(x)	0.002505	Param Intra 1 of 2
Sulfate (mg/L)	AD-5	263.2	n/a	n/a	1 future	n/a	22	131.4	70.56	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	AD-1	612	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
Total Dissolved Solids (mg/L)	AD-16R	241.5	n/a	n/a	1 future	n/a	25	177.8	34.74	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	AD-17	1915	n/a	n/a	1 future	n/a	21	1692	118.5	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	AD-3	135.5	n/a	n/a	1 future	n/a	21	111.8	12.62	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	AD-4C	331.7	n/a	n/a	1 future	n/a	26	251.5	43.88	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	AD-5	477.6	n/a	n/a	1 future	n/a	22	328.1	79.98	0	None	No	0.002505	Param Intra 1 of 2

Prediction Limit

Intrawell Parametric, AD-1 (bg)



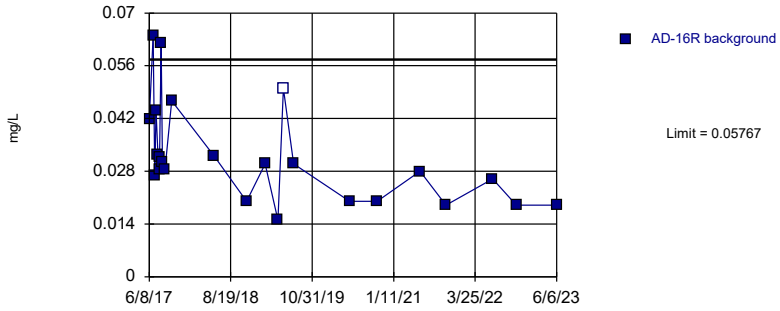
Background Data Summary: Mean=0.566, Std. Dev.=0.1603, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.91, critical = 0.881. Kappa = 1.857 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Boron Analysis Run 12/7/2023 3:43 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-16R



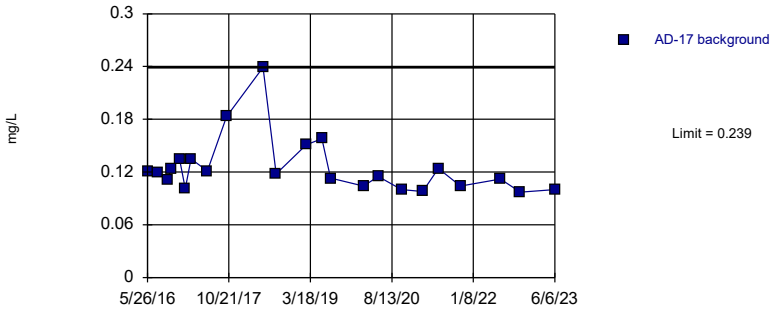
Background Data Summary (based on square root transformation): Mean=0.1752, Std. Dev.=0.0352, n=24, 4.167% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9201, critical = 0.884. Kappa = 1.846 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Boron Analysis Run 12/7/2023 3:43 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Non-parametric, AD-17 (bg)



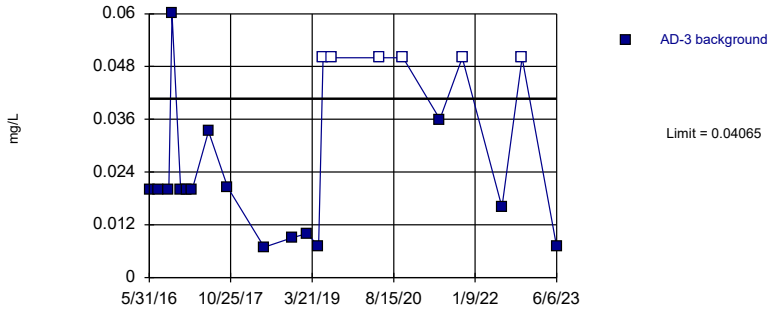
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 23 background values. Well-constituent pair annual alpha = 0.006819. Individual comparison alpha = 0.003415 (1 of 2). Assumes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

Constituent: Boron Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-3



Background Data Summary (based on square root transformation) (after Kaplan-Meier Adjustment): Mean=0.1196, Std. Dev.=0.04391, n=22, 27.27% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8865, 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.

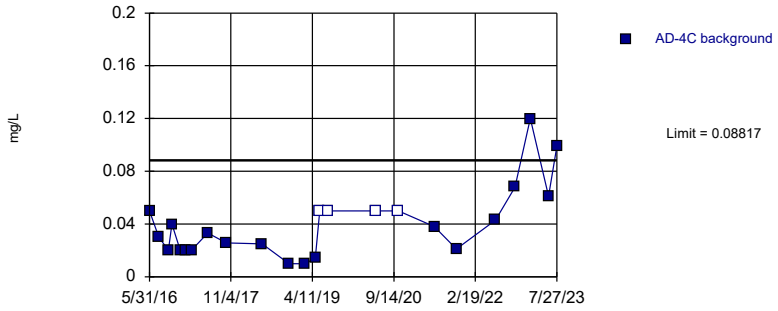
Constituent: Boron Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Hollow symbols indicate censored values.

Prediction Limit

Intrawell Parametric, AD-4C



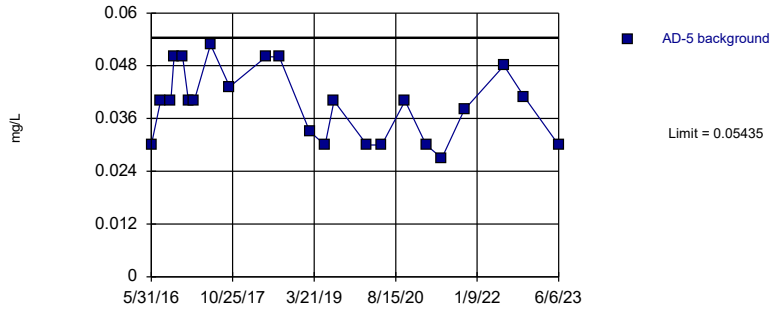
Background Data Summary (based on square root transformation) (after Kaplan-Meier Adjustment): Mean=0.1741, Std. Dev.=0.06655, n=24, 16.67% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9422, critical = 0.884. Kappa = 1.846 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Boron Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-5 (bg)



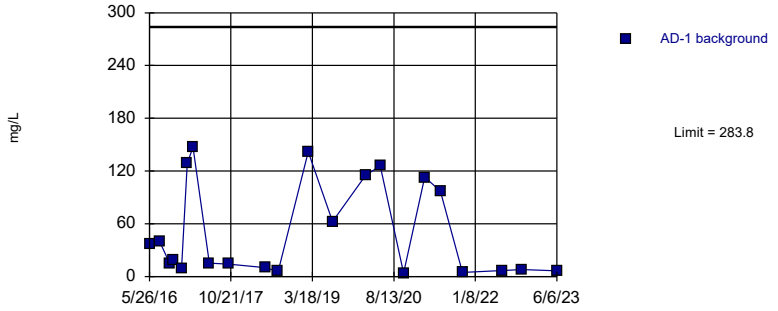
Background Data Summary: Mean=0.03927, Std. Dev.=0.00812, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8994, critical = 0.881. Kappa = 1.857 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Boron Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-1 (bg)



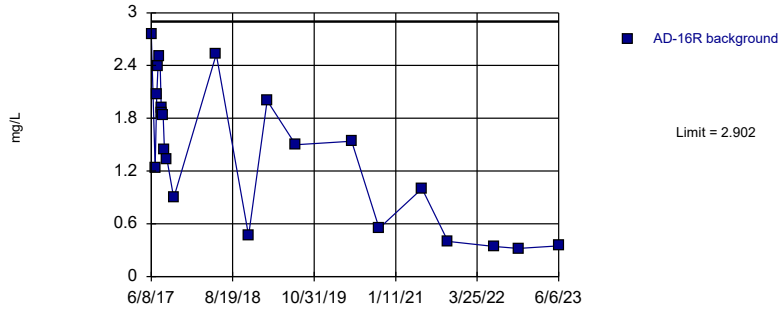
Background Data Summary (based on natural log transformation): Mean=3.236, Std. Dev.=1.291, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8887, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-16R



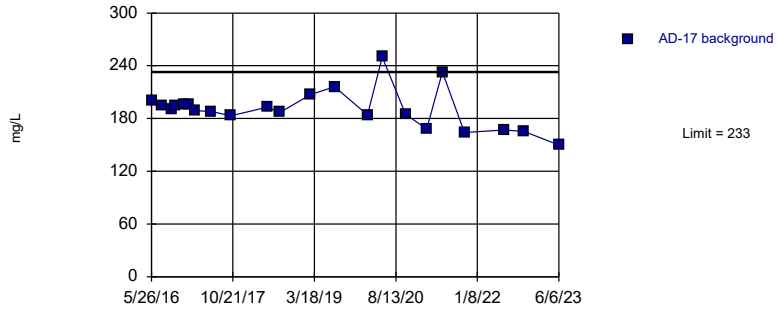
Background Data Summary: Mean=1.419, Std. Dev.=0.7934, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9339, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-17 (bg)



Background Data Summary: Mean=191, Std. Dev.=22.53, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9335, 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 Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

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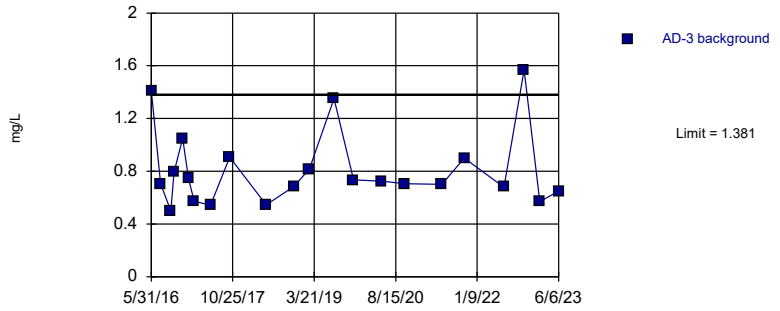
Prediction Limit

Intrawell Parametric, AD-3



Background Data Summary (based on natural log transformation): Mean=-0.2589, Std. Dev.=0.3114, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9055, 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 Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

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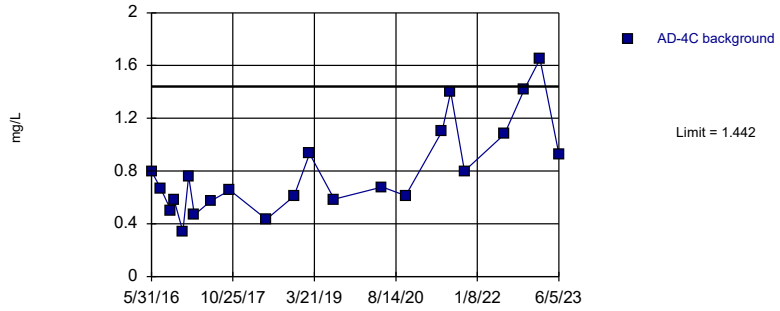
Prediction Limit

Intrawell Parametric, AD-4C



Background Data Summary: Mean=0.7986, Std. Dev.=0.3442, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8946, 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 Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

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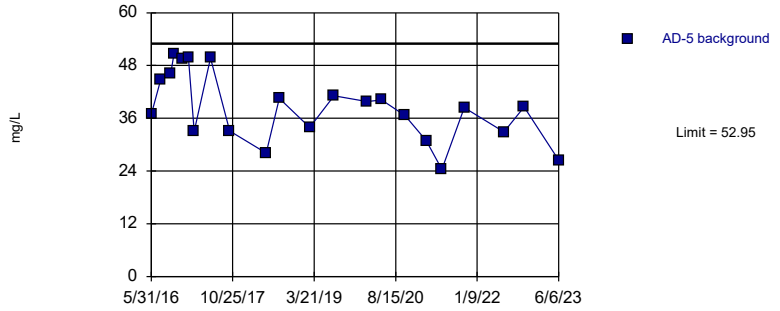
Prediction Limit

Intrawell Parametric, AD-5 (bg)



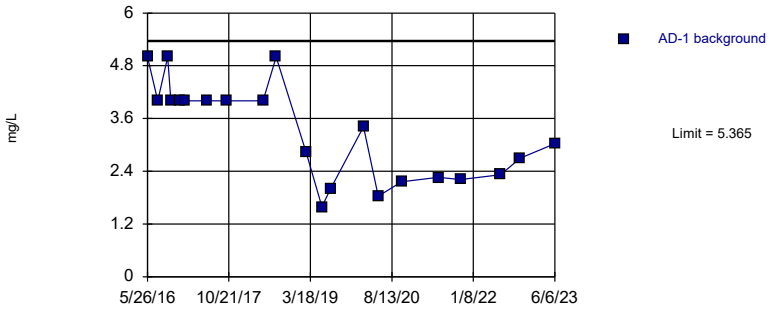
Background Data Summary: Mean=38.44, Std. Dev.=7.766, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9587, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-1 (bg)



Background Data Summary: Mean=3.301, Std. Dev.=1.097, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9121, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

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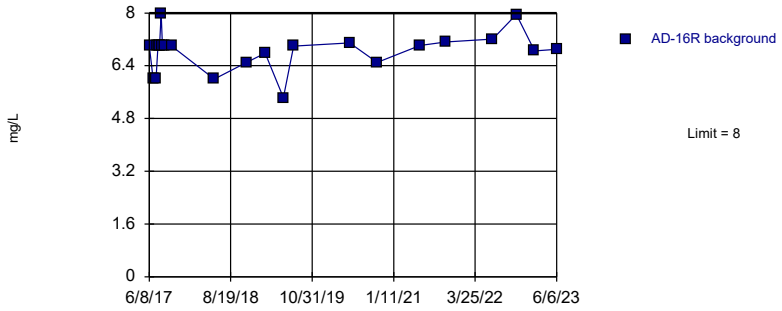
Prediction Limit

Intrawell Non-parametric, AD-16R



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: Chloride Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

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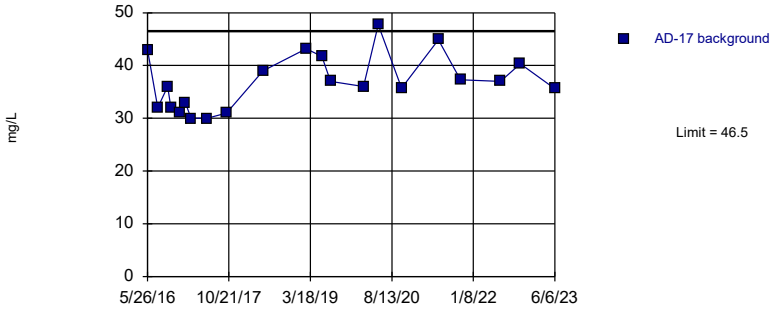
Prediction Limit

Intrawell Parametric, AD-17 (bg)



Background Data Summary: Mean=36.83, Std. Dev.=5.145, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9464, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

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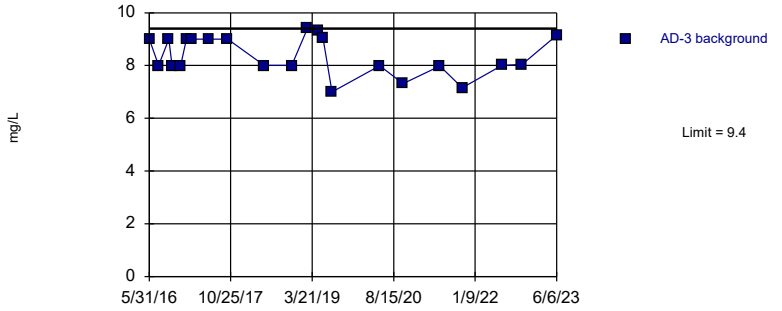
Prediction Limit

Intrawell Non-parametric, AD-3



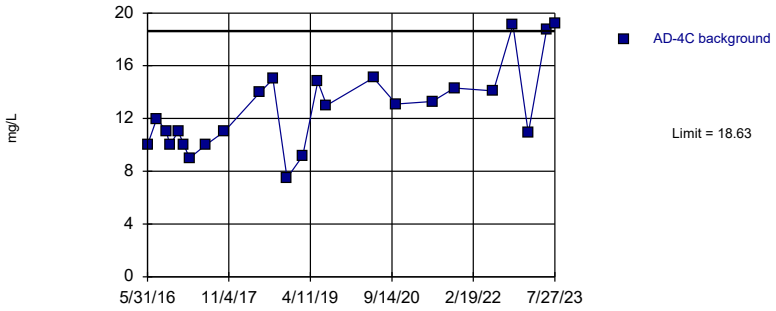
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 22 background values. Well-constituent pair annual alpha = 0.007401. Individual comparison alpha = 0.003707 (1 of 2). Assumes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

Constituent: Chloride Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-4C



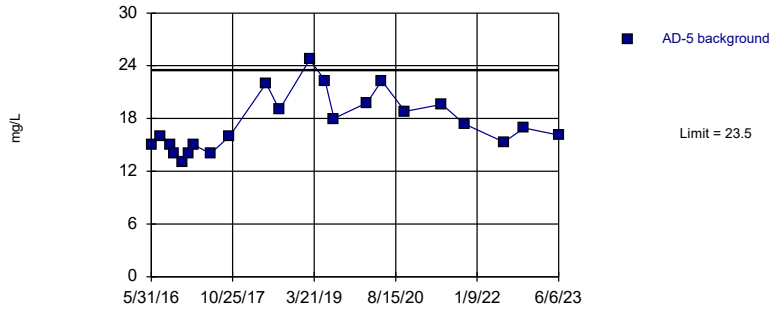
Background Data Summary: Mean=12.72, Std. Dev.=3.204, n=24. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9308, critical = 0.884. Kappa = 1.846 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-5 (bg)



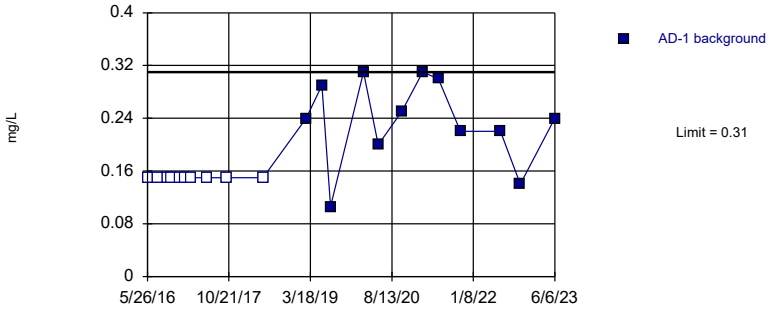
Background Data Summary: Mean=17.46, Std. Dev.=3.233, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9307, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Non-parametric, AD-1 (bg)



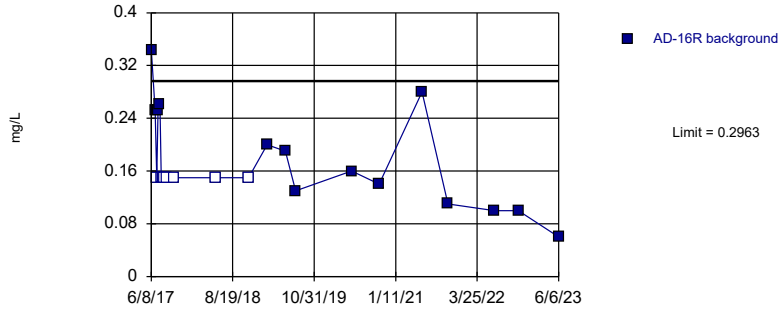
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 22 background values. 45.45% NDs. Well-constituent pair annual alpha = 0.007401. Individual comparison alpha = 0.003707 (1 of 2). Assumes 1 future value.

Constituent: Fluoride Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-16R



Background Data Summary (after Kaplan-Meier Adjustment): Mean=0.1495, Std. Dev.=0.07903, n=23, 39.13% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8866, 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: Fluoride Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

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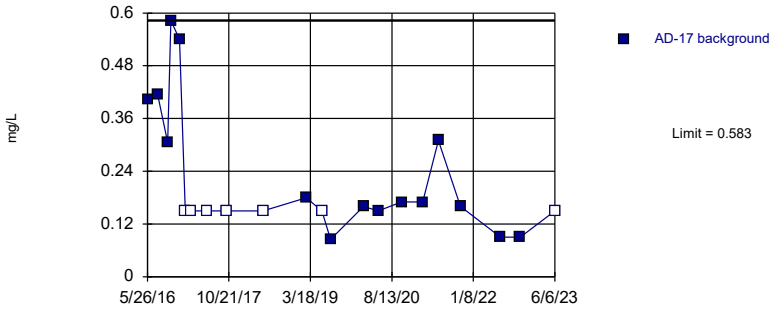
Hollow symbols indicate censored values.

Prediction Limit

Intrawell Non-parametric, AD-17 (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. 31.82% NDs. Well-constituent pair annual alpha = 0.007401. Individual comparison alpha = 0.003707 (1 of 2). Assumes 1 future value.

Constituent: Fluoride Analysis Run 12/7/2023 3:44 PM
Welsh BASP Data: Welsh BASP

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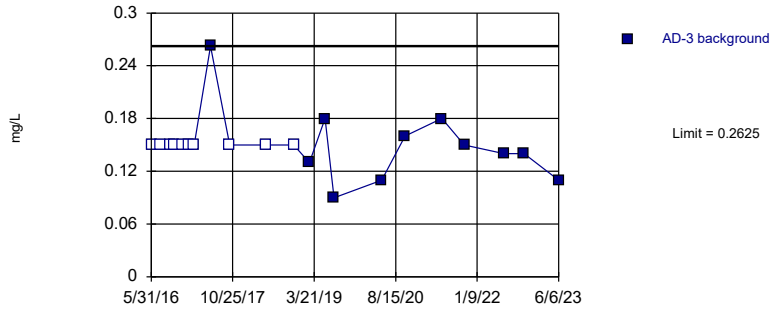
Hollow symbols indicate censored values.

Prediction Limit

Intrawell Non-parametric, AD-3



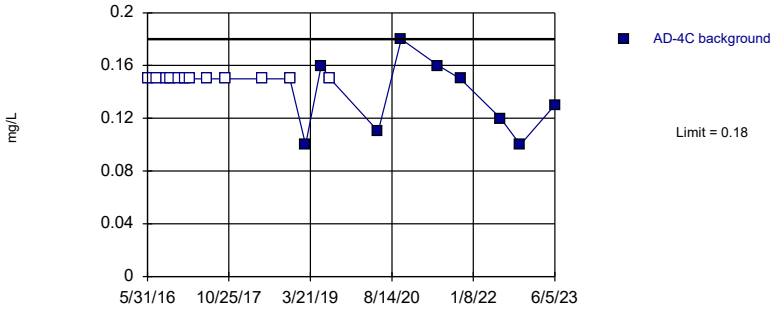
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 21 background values. 47.62% NDs. Well-constituent pair annual alpha = 0.007982. Individual comparison alpha = 0.003999 (1 of 2). Assumes 1 future value.

Constituent: Fluoride Analysis Run 12/7/2023 3:44 PM
Welsh BASP Data: Welsh BASP

Sanitas™ v.10.0.15 Software licensed to . UG
Hollow symbols indicate censored values.

Prediction Limit

Intrawell Non-parametric, AD-4C



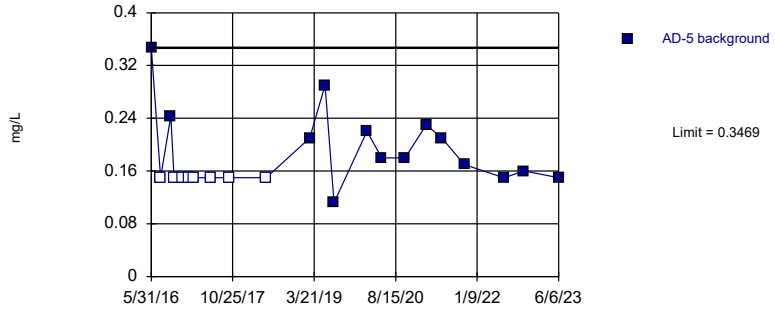
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 21 background values. 57.14% NDs. Well-constituent pair annual alpha = 0.007982. Individual comparison alpha = 0.003999 (1 of 2). Assumes 1 future value.

Constituent: Fluoride Analysis Run 12/7/2023 3:44 PM
Welsh BASP Data: Welsh BASP

Sanitas™ v.10.0.15 Software licensed to . UG
Hollow symbols indicate censored values.

Prediction Limit

Intrawell Non-parametric, AD-5 (bg)

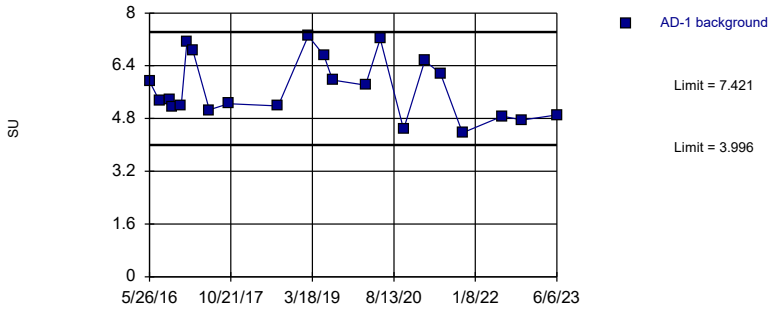


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 22 background values. 36.36% NDs. Well-constituent pair annual alpha = 0.007401. Individual comparison alpha = 0.003707 (1 of 2). Assumes 1 future value.

Constituent: Fluoride Analysis Run 12/7/2023 3:44 PM
Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-1 (bg)



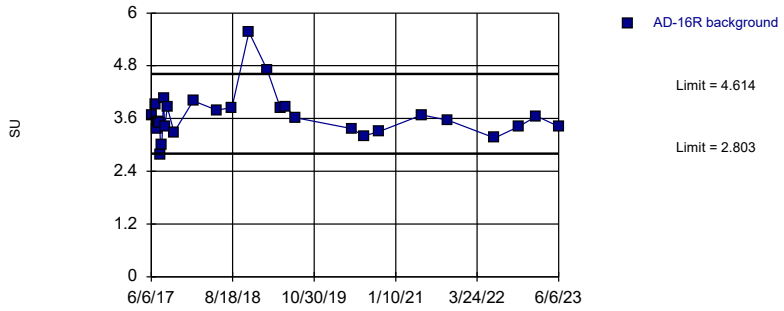
Background Data Summary: Mean=5.708, Std. Dev.=0.9163, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9276, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-16R



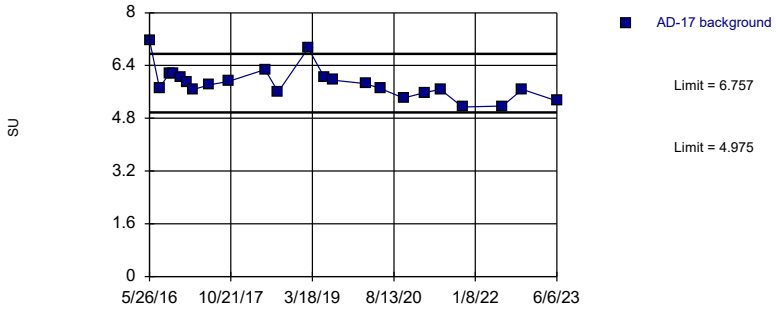
Background Data Summary (based on cube root transformation): Mean=1.537, Std. Dev.=0.07028, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8997, critical = 0.896. Kappa = 1.814 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-17 (bg)



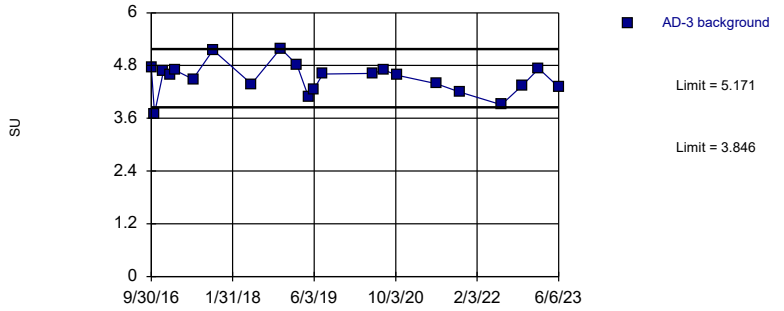
Background Data Summary: Mean=5.866, Std. Dev.=0.4798, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9079, critical = 0.881. Kappa = 1.857 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-3



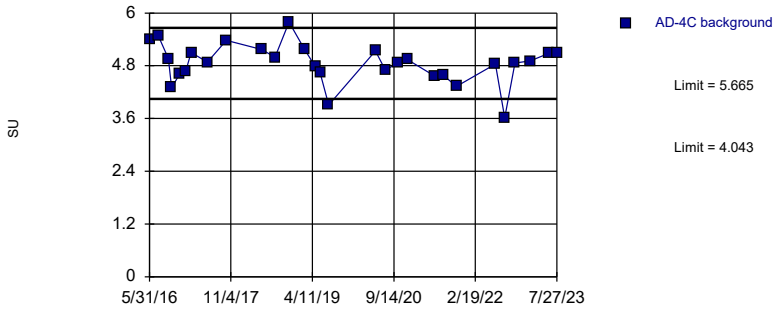
Background Data Summary: Mean=4.509, Std. Dev.=0.3546, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9694, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-4C



Background Data Summary: Mean=4.854, Std. Dev.=0.4487, n=29. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9592, critical = 0.898. Kappa = 1.807 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: pH, field Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

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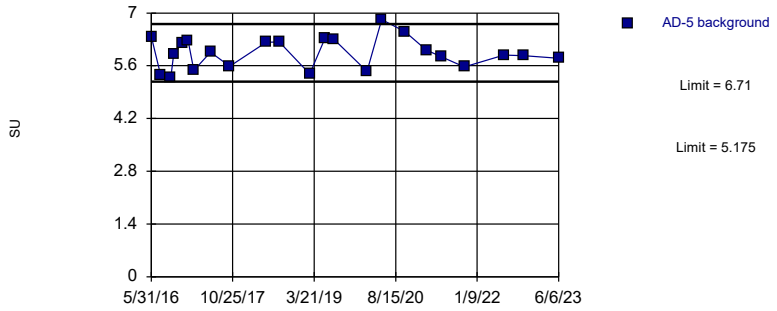
Prediction Limit

Intrawell Parametric, AD-5 (bg)



Background Data Summary: Mean=5.942, Std. Dev.=0.4132, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9631, 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: pH, field Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

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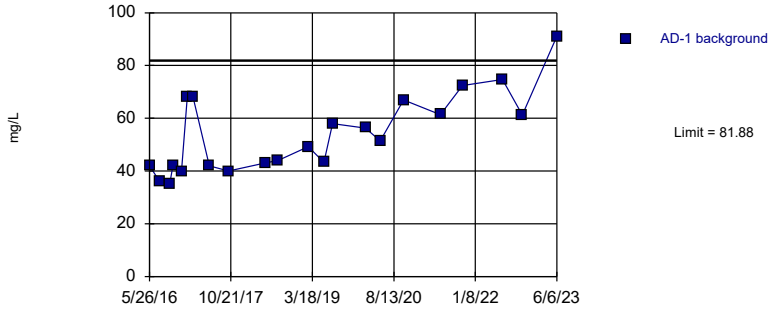
Prediction Limit

Intrawell Parametric, AD-1 (bg)



Background Data Summary: Mean=53.91, Std. Dev.=14.97, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9164, 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 Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

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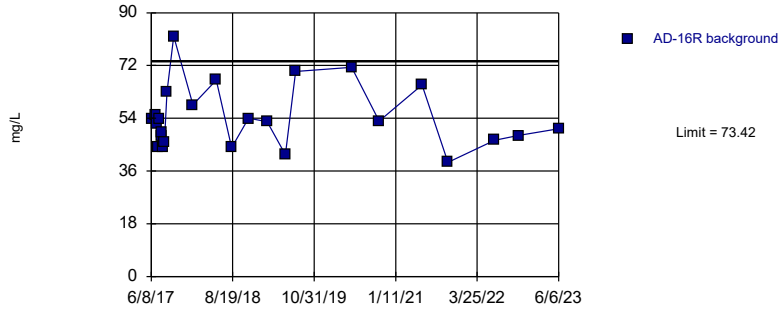
Prediction Limit

Intrawell Parametric, AD-16R



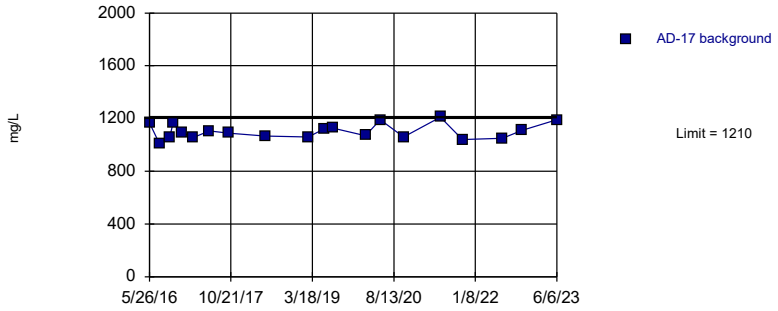
Background Data Summary: Mean=54.12, Std. Dev.=10.52, n=25. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.925, critical = 0.888. Kappa = 1.834 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-17 (bg)



Background Data Summary: Mean=1101, Std. Dev.=57.27, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9406, critical = 0.868. Kappa = 1.892 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

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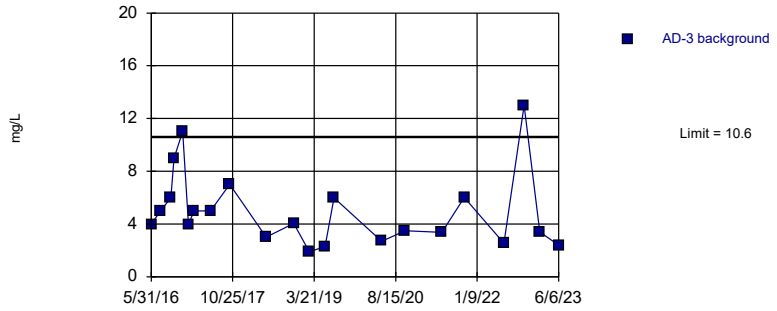
Prediction Limit

Intrawell Parametric, AD-3



Background Data Summary (based on square root transformation): Mean=2.164, Std. Dev.=0.5842, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9214, 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 Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

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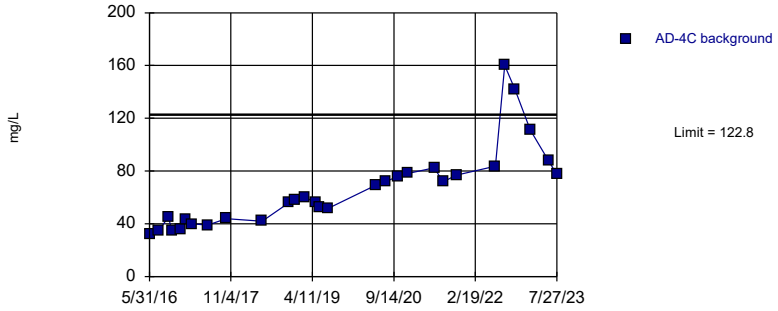
Prediction Limit

Intrawell Parametric, AD-4C



Background Data Summary (based on square root transformation): Mean=7.943, Std. Dev.=1.737, n=29. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9148, critical = 0.898. Kappa = 1.807 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

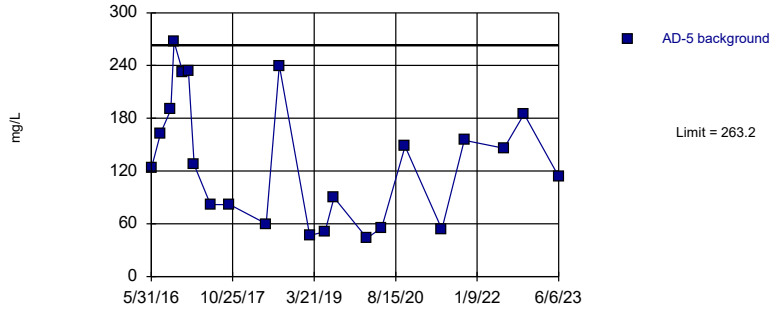
Constituent: Sulfate Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Sanitas™ v.10.0.15 Software licensed to . UG

Prediction Limit

Intrawell Parametric, AD-5 (bg)



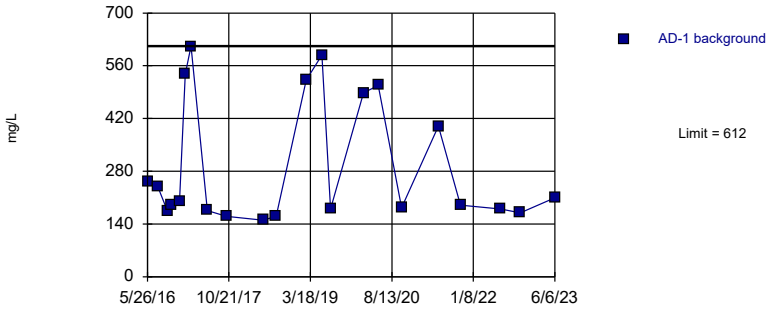
Background Data Summary: Mean=131.4, Std. Dev.=70.56, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9251, critical = 0.878. Kappa = 1.869 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Non-parametric, AD-1 (bg)



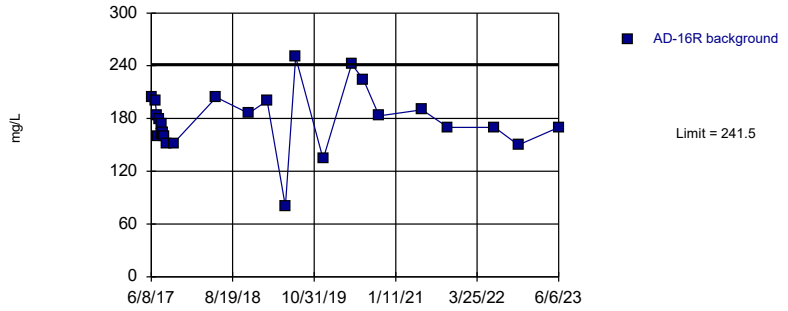
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 22 background values. Well-constituent pair annual alpha = 0.007401. Individual comparison alpha = 0.003707 (1 of 2). Assumes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

Constituent: Total Dissolved Solids Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-16R



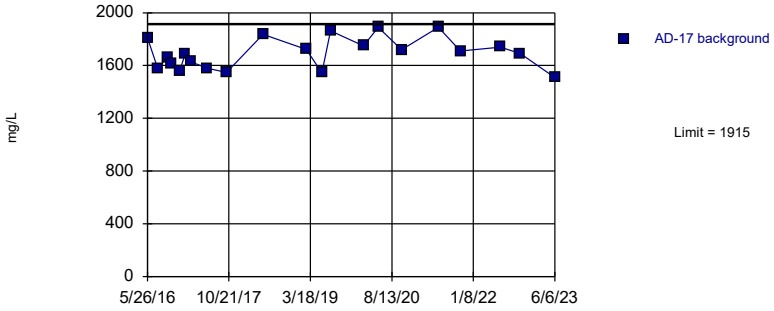
Background Data Summary: Mean=177.8, Std. Dev.=34.74, n=25. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9496, critical = 0.888. Kappa = 1.834 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-17 (bg)



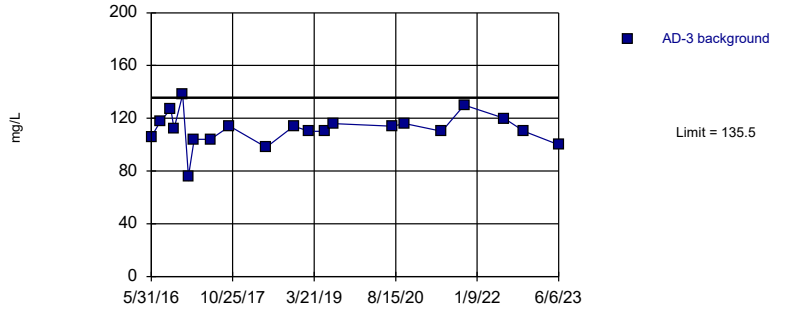
Background Data Summary: Mean=1692, Std. Dev.=118.5, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9477, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-3



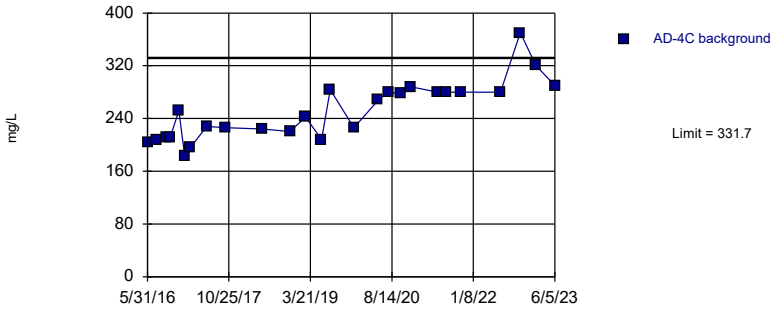
Background Data Summary: Mean=111.8, Std. Dev.=12.62, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9313, critical = 0.873. Kappa = 1.88 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

Prediction Limit

Intrawell Parametric, AD-4C



Background Data Summary: Mean=251.5, Std. Dev.=43.88, n=26. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.925, critical = 0.891. Kappa = 1.827 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

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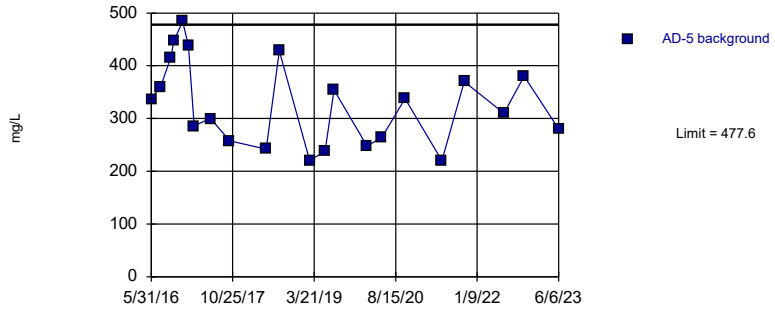
Prediction Limit

Intrawell Parametric, AD-5 (bg)



Background Data Summary: Mean=328.1, Std. Dev.=79.98, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9465, 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 Analysis Run 12/7/2023 3:44 PM

Welsh BASP Data: Welsh BASP

APPENDIX 3

Alternate source demonstration(s) included in this appendix. Alternate sources are sources or reasons that explain that statistically significant increases over background or statistically significant levels above the groundwater protection standard are not attributable to the CCR unit.

ALTERNATIVE SOURCE DEMONSTRATION REPORT TEXAS STATE CCR RULE

Welsh Plant
Registration No: CCR 110
Bottom Ash Storage Pond
Pittsburg, Texas

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Date: 2023.01.17 14:32:41 -05'00'

January 17, 2023
F-1182

Submitted to

AMERICAN ELECTRIC POWER

1 Riverside Plaza
Columbus, Ohio 43215-2372

Submitted by

Geosyntec consultants

engineers | scientists | innovators

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

January 2023

CHA8495

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS

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January 17, 2023
F-1182

LIST OF ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
ASD	Alternative Source Demonstration
BASP	Bottom Ash Storage Pond
CCR	Coal Combustion Residuals
EPRI	Electric Power Research Institute
HDPE	High-Density Polyethylene
LPL	Lower Prediction Limit
QA	Quality Assurance
QC	Quality Control
PBAP	Primary Bottom Ash Pond
SSI	Statistically Significant Increase
SWFPR	Site-Wide False Positive Rate
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TDS	Total Dissolved Solids
TPDES	Texas Pollutant Discharge Elimination System
UPL	Upper Prediction Limit

SECTION 1

INTRODUCTION AND SUMMARY

This Alternative Source Demonstration (ASD) report has been prepared to address a statistically significant increase (SSI) for sulfate in the groundwater monitoring network at the Welsh Power Plant (Welsh Plant) Bottom Ash Storage Pond (BASP), located in Pittsburg, Texas, following the first semiannual detection monitoring event of 2022. The Welsh Plant has three coal combustion residuals (CCR) storage units regulated by the Texas Commission on Environmental Quality (TCEQ) under Registration No. CCR110, including the BASP.

Background values for the BASP were originally calculated in January 2018, and have been updated intermittently in accordance with Statistical Analysis Plan prepared for the Welsh Plant (Geosyntec, 2021a). Following the most recent update in December 2021, revised upper prediction limits (UPLs) were calculated for each Appendix III parameter to represent background values (Geosyntec, 2021b). Lower prediction limits (LPLs) were also calculated for pH. Prediction limits were calculated based on a one-of-two retesting procedure to maintain an appropriate site-wide false positive rate (SWFPR). With this procedure, an SSI is concluded only if both samples in a series of two exceed the UPL or, in the case of pH, are below the LPL. In practice, if the initial result did not exceed the UPL or was not below the LPL, a second sample was not collected or analyzed.

The first semiannual detection monitoring event of 2022 was performed in June 2022 (initial sampling event), and the results were compared to the calculated prediction limits. Where initial exceedances were identified, verification resampling was completed in August 2022. Following verification resampling, an SSI was identified for sulfate at well AD-4C using intrawell comparisons. A summary of the detection monitoring analytical results and the calculated prediction limits to which they were compared is provided in **Table 1**.

1.1 CCR Rule Requirements

TCEQ regulations (TCEQ, 2020a) regarding detection monitoring programs for CCR landfills and surface impoundments provide owners and operators with the option to make an ASD when an SSI is identified (30 TAC §352.941(c)(2)). In making a demonstration under this section, the owner or operator must:

> *Within 90 days of making a determination of an SSI over the background value for any Appendix III constituent adopted by reference in §352.1421 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, demonstration that a source other than a coal combustion residuals*

> *unit caused the SSI or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.*

Pursuant to this regulation, Geosyntec Consultants, Inc. (Geosyntec) has prepared this ASD report, which documents that the SSI identified for sulfate at well AD-4C should not be attributed to a release from the BASP at the Welsh Plant.

1.2 Demonstration of Alternative Sources

An evaluation was completed to assess possible alternative sources to which the identified SSI could be attributed. Alternative sources were identified from amongst five types, based on the 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; and
- ASD Type V: Alternative Sources.

A demonstration was conducted to assess whether the increase in sulfate concentrations at well AD-4C was based on Type IV causes (natural variation) and not by a release from the BASP.

SECTION 2

SITE BACKGROUND

The site background summary included in this section was primarily taken from Arcadis (2022), unless otherwise noted.

2.1 BASP Location and Design

The BASP is a 22-acre CCR surface impoundment located in the southern portion of the Welsh Plant, immediately south of the Landfill and Primary Bottom Ash Pond (PBAP) (**Figure 1**). It was constructed and placed into operation in 2000 to receive bottom ash and economizer ash dredged and sluiced from the PBAP.

The BASP was constructed with approximately 20-foot high compacted clay perimeter embankments and a 60-mil thick high density polyethylene liner placed over the base of the pond and the interior embankment slopes. Surface water flow within the BASP is primarily controlled by the principal spillway pipe drain and weir at the southeast corner of the BASP that conveys water to the approximately 0.25-acre clear water pond contained within the BASP.

In April 2021, closure of the BASP was initiated (American Electric Power [AEP], 2022), which involves removal of CCR from the unit. The BASP no longer received CCR material or transport waters (American Electric Power [AEP], 2021). It also stopped receiving non-CCR wastewaters such as stormwater runoff from the landfill and surrounding areas.

2.2 Regional Geology

The Welsh Plant is located within the West Gulf Coastal Plain. The BASP is immediately underlain by the Eocene-age Recklaw Formation which consists of very fine to fine grained sand and clay (Flawn, 1966). The Recklaw Formation is up to approximately 110-feet thick in Titus County, where the Welsh Plant is located. This formation is underlain by the Eocene-age Carrizo Sand consisting of fine to coarse sand, silt, and clay. Monitoring well AD-4C is screened within the Recklaw Formation. Subsurface lithology at and near monitoring well AD-4C is shown on geologic cross sections from Arcadis (2022) which are provided in **Attachment A**.

2.3 Hydrogeology and BASP Monitoring Well Network

The uppermost aquifer in the vicinity of the BASP consists of an approximately 12-foot thick very fine to fine grained silty sand and sandy silt component of the Recklaw Formation that is first encountered approximately 8 feet below the floor of the BASP (Arcadis, 2022). This aquifer is recharged primarily through infiltration of regional precipitation. Based on the gradation of its soil, the uppermost aquifer is expected to have a hydraulic conductivity of approximately 10^{-4} centimeters per foot (cm/ft) (Fetter, 1980).

The BASP monitoring well sampling network consists of background monitoring wells AD-1, AD-5, and AD-17 and downgradient compliance monitoring wells AD-3, AD-4C, and AD-16R (**Figure 1**) as recommended by Arcadis (2022). As shown on **Figure 2**, monitoring wells AD-2 and AD-14 are located cross-gradient to the BASP, with monitoring well AD-14 also located downgradient of the Landfill. Because AD-14 is downgradient of the Landfill and could potentially be impacted by a release from the Landfill, the well was not included in the BASP monitoring well network despite its hydrogeological downgradient location. Monitoring well AD-16R was installed further away from the Landfill near AD-14 in 2017 to address the monitoring well network data gap created by the exclusion of AD-14 from the BASP well network.

The groundwater flow direction near the BASP is generally to the southeast (**Figure 2**). Potentiometric groundwater flow maps from sampling events completed within the past year are provided as **Attachment B**. No seasonal groundwater flow direction variability has been observed near the BASP.

SECTION 3

ALTERNATIVE SOURCE DEMONSTRATION

An initial review of groundwater sampling field forms, site geochemistry, and site historical data did not identify alternative sources due to a Type I issue (sampling causes). A review of the laboratory and statistical analyses did not identify any Type II (laboratory causes) or Type III (statistical evaluation causes) issues. Groundwater sampling, laboratory analysis, and statistical evaluations were generally completed in accordance with draft TCEQ guidance for groundwater monitoring TG-32 (TCEQ, 2020b). Further, an initial review of site geochemistry did not identify evidence of any Type V (anthropogenic) impacts. As described below, the SSI observed at monitoring well AD-4C is attributed to natural variation, which is a Type IV cause.

3.1 Comparison of Sulfate Concentrations to Background

An SSI for sulfate was identified at monitoring well AD-4C. Sulfate concentrations at background wells AD-1, AD-5, and AD-17, which are located upgradient or background of the BASP and AD-4C, have historically been higher than those observed at AD-4C (**Figure 3**). Historical sulfate concentrations at AD-1 were generally higher than present sulfate concentrations at AD-4C, and subject to significant variability, including a peak value of 616 milligrams per liter (mg/L) sulfate in June 2007 (**Figure 3**). Since background monitoring was initiated in 2016, sulfate concentrations at both AD-1 (upgradient) and AD-4C (downgradient) have appeared to trend upwards at a similar rate (**Figure 3**), suggesting the potential for regional trends in groundwater conditions. Furthermore, sulfate concentrations at AD-17, the background well furthest from AD-4C, typically exceed 1,000 mg/L, an order of magnitude greater than sulfate concentrations observed at AD-4C.

Sulfate concentrations reported for groundwater monitoring wells across Titus County are highly variable, with concentrations similar to those observed at the site and the highest concentrations in wells that were 60 feet or less in depth (**Attachment C**; Texas Water Commission, 1965). Thus, the potential SSI for sulfate at AD-4C may represent the migration of groundwater with higher concentrations of sulfate from upgradient locations such as AD-1. Such migration is likely occurring through the porous sand and silty sand comprising the uppermost aquifer.

3.2 Supporting Evidence: Boron Concentrations

Boron is a conservative (non-reactive) CCR constituent which can function as a ‘tracer’ for potential CCR unit releases due to its lack of attenuation by chemical processes (e.g., sorption, precipitation) during groundwater flow and its high relative concentration in the BASP compared to downgradient groundwater. The concentration of boron in the water sample collected within the BASP in August 2020 was 4.58 mg/L and the concentrations of boron at monitoring well AD-4C

are consistently less than 0.1 mg/L. Since the previous sample was collected in August 2020, there have been no notable changes in coal handling or sourcing at the Welsh Plant that would have affected the composition of ash or pond water.

If BASP water, which has a boron concentration approximately one order of magnitude greater than background well AD-1, were impacting groundwater quality at downgradient monitoring wells, an increase in boron concentrations at monitoring well AD-4C commensurate with the observed increases in sulfate at the well would be expected. The current boron concentrations at AD-4C do not display an increasing or decreasing trend, which suggests that groundwater quality changes should not be attributed to a release from the BASP (**Figure 4**).

3.3 Sampling Requirements

The ASD described above supports the determination that the identified SSI is from natural variability within the uppermost aquifer and not due to a release from the Welsh BASP. Therefore, the unit will remain in the detection monitoring program. Groundwater at the unit will continue to be sampled for Appendix III parameters on a semiannual basis and prediction limits will be updated when appropriate to incorporate recent data.

SECTION 4

CONCLUSIONS AND RECOMMENDATIONS

The preceding information serves as the ASD prepared in accordance with 30 TAC §352.941(c)(2) and supports the position that the sulfate SSI at AD-4C identified during the first semiannual detection monitoring event of 2022 should be attributed to natural variation and not to a release from the Welsh BASP. Therefore, no further action is warranted, and the Welsh BASP will remain in the detection monitoring program. Certification of this ASD by a qualified professional engineer is provided in **Attachment D**.

SECTION 5

REFERENCES

American Electric Power, 2022. Annual Groundwater Monitoring Report, Bottom Ash Storage Pond CCR Management Unit. January.

American Electric Power, 2021. 2021 Annual Dam and Dike Inspection Report, CCR Ash Ponds, Welsh Power Plant. December.

Arcadis, 2022. Bottom Ash Storage Pond – CCR Groundwater Monitoring Well Network Evaluation. J. Robert Welsh Power Plant. November.

EPRI, 2017. Guidelines for Development of Alternative Source Demonstrations at Coal Combustion Residual Sites. 3002010920. October.

Fetter, C.W., 1980. Applied Hydrogeology. University of Wisconsin - Oshkosh.

Flawn, P.T., 1966. Geologic Atlas of Texas, Texarkana Sheet. The University of Texas at Austin Bureau of Economic Geology. July.

Geosyntec, 2020. Alternative Source Demonstration Report – Federal CCR Rule. J. Robert Welsh Plant – Bottom Ash Storage Pond. November.

Geosyntec, 2021a. Statistical Analysis Plan – J. Robert Welsh Plant. Revision 2. December.

Geosyntec, 2021b. Statistical Analysis Summary – Background Update Calculations. Bottom Ash Storage Pond – J. Robert Welsh Plant. December.

TCEQ, 2020a. Title 30, Part 1, Chapter 352: Coal Combustion Residuals Waste Management, May 22.

TCEQ, 2020b. Coal Combustion Residuals Groundwater Monitoring and Corrective Action Draft Technical Guideline No. 32. Topic: Coal Combustion Residuals (CCR) Groundwater Monitoring and Corrective Action. Waste Permits Division. May.

Texas Water Commission. 1965. Ground-Water Resources of Camp, Franklin, Morris and Titus Counties, Texas. Texas Water Commission Bulletin 6517. July.

TABLES

Table 1: Detection Monitoring Data Evalation
Welsh - Bottom Ash Storage Pond

Geosyntec Consultants, Inc.

Analyte	Unit	Description	AD-3	AD-4C		AD-16R
			6/28/2022	6/28/2022	8/26/2022	6/27/2022
Boron	mg/L	Intrawell Background Value (UPL)	0.0444	0.0481		0.0595
		Analytical Result	0.016	0.043	--	0.026
Calcium	mg/L	Intrawell Background Value (UPL)	1.31	1.19		2.95
		Analytical Result	0.68	1.08	--	0.34
Chloride	mg/L	Intrawell Background Value (UPL)	9.83	16.0		7.79
		Analytical Result	8.01	14.1	--	7.21
Fluoride	mg/L	Intrawell Background Value (UPL)	1.00	1.00		1.00
		Analytical Result	0.14	0.12	--	0.10
pH	SU	Intrawell Background Value (UPL)	5.3	5.7		4.8
		Intrawell Background Value (LPL)	3.9	4.1		2.7
		Analytical Result	3.9	4.8	--	3.2
Sulfate	mg/L	Intrawell Background Value (UPL)	9.54	82.8		75.7
		Analytical Result	2.55	**83.6**	**160**	46.5
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	136	301		251
		Analytical Result	120	280	--	170

Notes:
UPL: Upper prediction limit
LPL: Lower prediction limit
Bold values exceed the background value.
Background values are shaded gray.

FIGURES

Legend

- Downgradient Sampling Location
- Background Sampling Location
- CCR Units

Notes

- Monitoring well coordinates provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2022).
- Satellite imagery provided by ESRI.

500 250 0 500 Feet

Site Layout
Bottom Ash Storage Pond

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2023/01/06

Figure **1**

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\AEP-Welsh_Updated_BASP_Site_Layout.mxd. BAres. 1/6/2023. CHA8423/14/08.

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

- Monitoring well coordinates and water level data (collected on June 27 and 28, 2022) provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2018).
- Groundwater elevation units are feet above mean sea level.

500 250 0 500 Feet

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED
PROFESSIONAL ENGINEER

Beth Ann Gross

Dec 7, 2022

Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Groundwater Potentiometric Map
June 2022

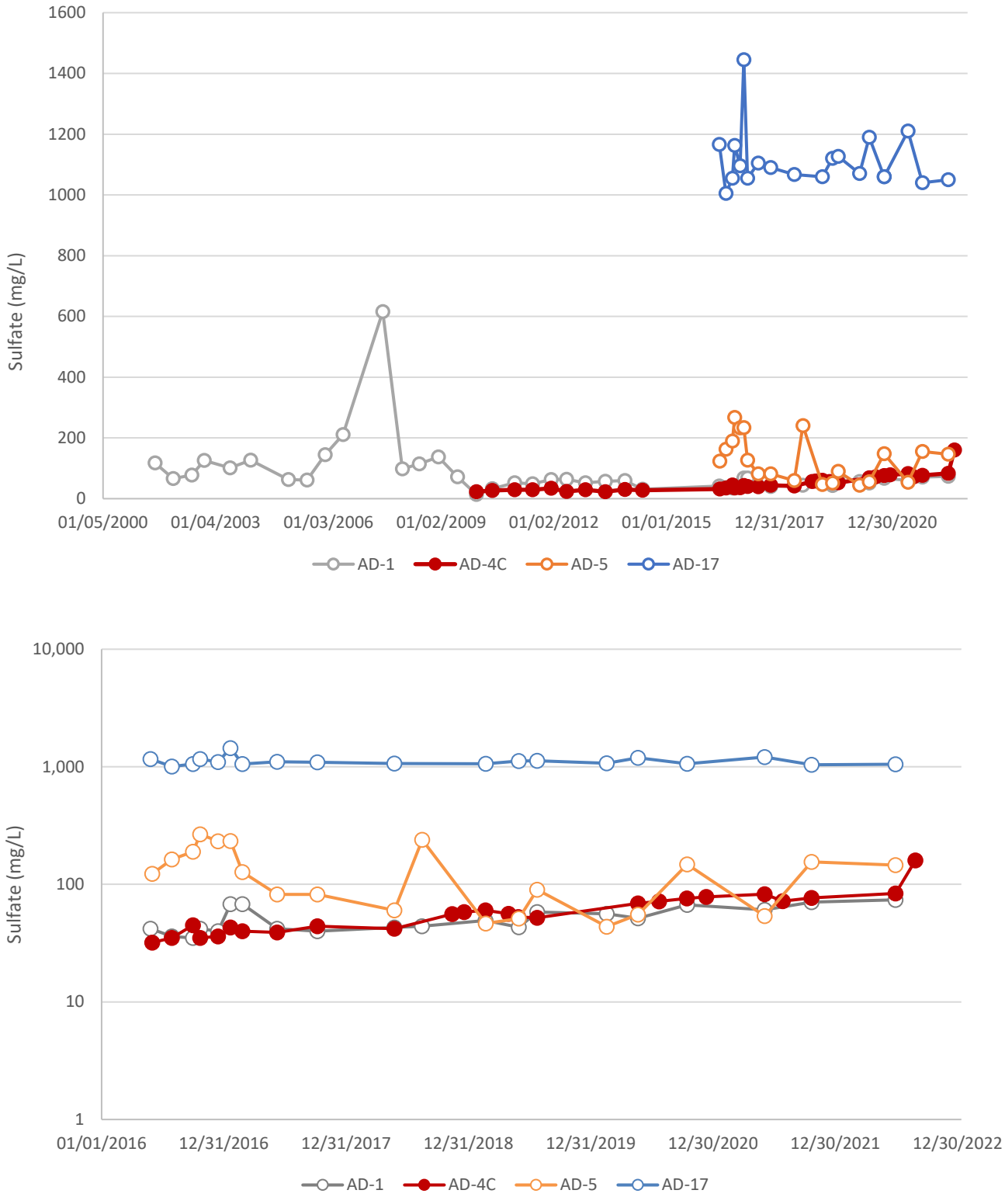
AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2022/10/31

Figure 2

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2022\AEP-Welsh_GW_2022-06June.mxd. ASoltero. 10/31/2022. CHA8423/14/08.



Notes: Sulfate time series diagram for BASP upgradient wells AD-1, AD-5, and AD-17 and downgradient well AD-4C. The bottom graph only shows data from 2016 onwards. Data collected as part of state and Federal CCR programs. Data for AD-4C was collected under the Federal CCR program.

Sulfate Time Series Graphs

Welsh Bottom Ash Storage Pond

Geosyntec consultants

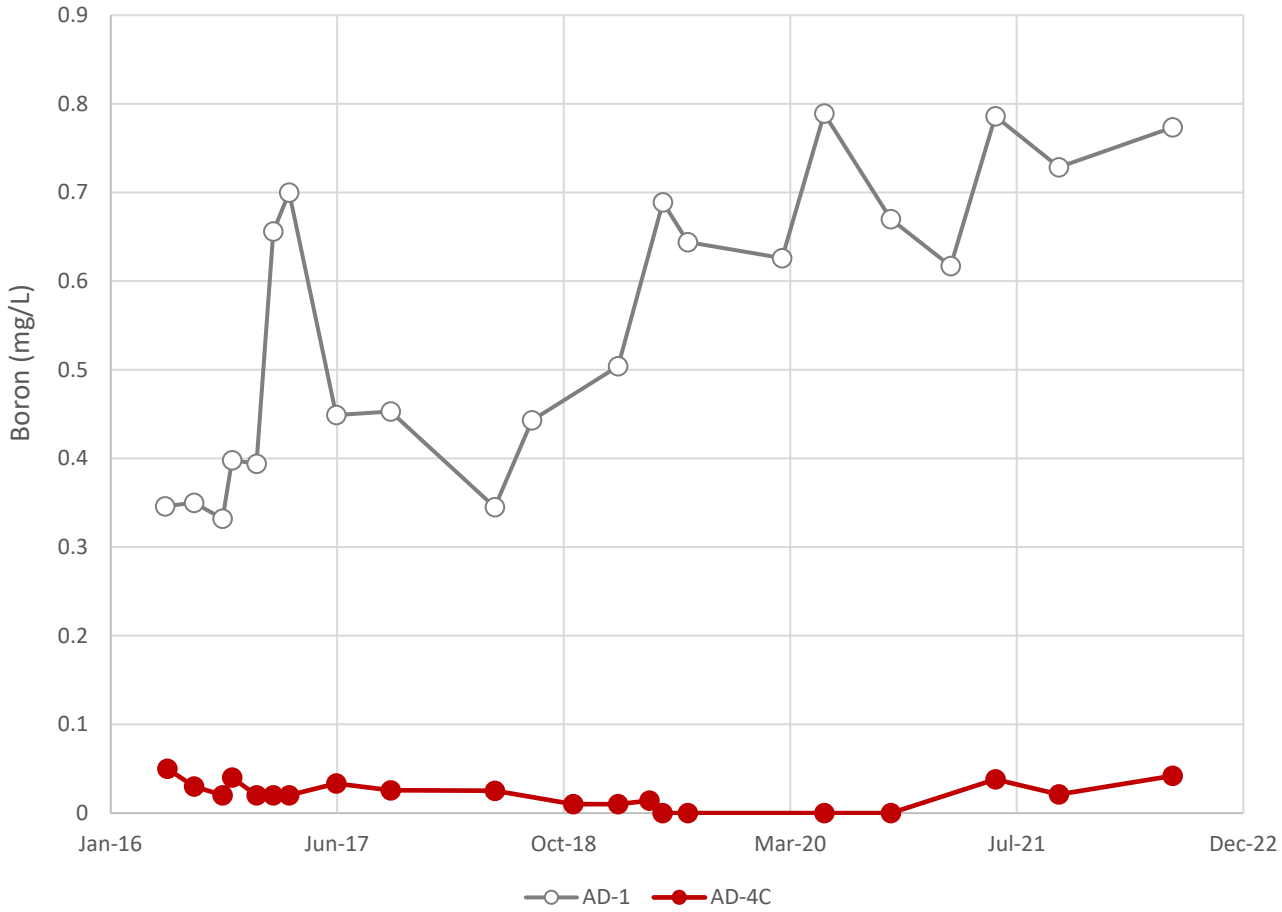
AMERICAN ELECTRIC POWER

Figure 3

Columbus, Ohio

January 2023

\\cmanbos-01\Data\Projects\AEP\Legal Department - ASD Review\Welsh\BASP\2021-10 1st Event 2021\Figures



Notes: Boron data were collected under the Federal CCR program. Concentrations are shown in milligrams per liter (mg/L).

Boron Time Series Graph
Welsh Bottom Ash Storage Pond

Geosyntec consultants | AMERICAN ELECTRIC POWER | Figure 4

Columbus, Ohio | January 2023

ATTACHMENT A

Geologic Cross-Sections

Document Path: Z:\GISProjects_ENV\AEP\Welsh Plant\MXD\Landfill report\September 2019\Fig2-3-Cross Section LocationsREV.mxd

A
AD-23
AD-22
FM 1735
SB-4 (background)
AD5
AD6
AD-18
SB-3
SB-2
AD-17
B
AD12
Temp-1
C
AD1
D
AD7
A
Ash-3
E
AD8
SB-5
A'
AD-15
B1
B2
Ash-2
Primary Bottom Ash Pond
Ash-1
Weir Box
Drainage Canal
AD9
G-1
B3
SB-6
B4
Clear Water Pond
B5
Welsh Reservoir
AD13
SB-7
AD10
B'
B6
G-2
AD11
TPDES Outfall
Landfill
AD14
AD-19
AD-16
G-3
AD-16R
AD-21
C'
AD-20
Bottom Ash Storage Pond
AD4a
AD4b
1/4-acre Clear Water Pond
D4
AD4c
Ash-4
Weir Box
SB-8
AD2
AD3
D'
E'
GB2
GB6
GB7
GB5
GB4
MW9
MW10

Legend

- Existing CCR Unit Upgradient Monitoring Well
- Existing CCR Unit Downgradient Monitoring Well
- Monitoring Well Location
- Piezometer/Temporary Monitoring Well Location
- Plugged Monitoring Well/Piezometer
- Soil Boring (May 2018)
- Geotechnical Soil Boring (October 2018)
- Ash Pore Water Sample Location (May 2018)
- Site Features
- A-A' LINE OF GEOLOGIC CROSS SECTION

0 800 1,600
SCALE IN FEET

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

J. ROBERT WELSH POWER PLANT
1187 COUNTY ROAD 4865
PITTSBURG, TITUS COUNTY, TEXAS

SITE LAYOUT AND WELL LOCATIONS (UPDATED SEPTEMBER 2022)

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3

WEST

A

EAST

A'

STATE OF TEXAS
Kenneth J. Brandner
Geology
1787
LICENSED
PROFESSIONAL GEOSCIENTIST
9-29-22

AD-23 AD-22 AD-5 AD-6 AD-7 AD-8

PRIMARY BOTTOM ASH POND

WELSH RESERVOIR

370'
360'
350'
340'
330'
320'
310'
300'

ELEVATION (FEET MSL)

CLAYEY SAND, BROWN, UNSATURATED

SILTY CLAY, GRAY WITH RED MOTTLING.

CLAYEY SAND, REDDISH BROWN TO GRAY.

QUEEN CITY FORMATION

FILL (ASH)

CLAY, SANDY CLAY AND SILT, ORANGE, RED, GRAY AND BROWN.

SILTY SAND AND CLAYEY SAND, BROWN TO GRAY.

SILTY CLAY, GRAY TO BLACK.
(CONFINING UNIT)

CLAY

WELSH RESERVOIR

RECKLAW FORMATION
(AVERAGE HYDRAULIC CONDUCTIVITY = 0.95 ft/day)
(EFFECTIVE POROSITY = 0.21)

NOTES:
1. BASE OF ASH POND TAKEN FROM "WELSH POWER PLANT-UNIT 1 FLY ASH STORAGE AREA PHASE I " DRAWING ID WEPX-88, DATED 12-3-76; AND U.S. GEOLOGICAL SURVEY 7 1/2 MINUTE SERIES TOPOGRAPHIC MAP, CASON, TX QUADRANGLE, 1964 (PHOTO REVISED 1980).
2. HYDRAULIC CONDUCTIVITY CALCULATED BASED ON ON-SITE AQUIFER TEST OF MONITORING WELL AD-6 ON 9-17-21; AND SLUG TESTING OF MONITORING WELLS AD-6, AD-9, AD-13, AD-17, AND AD-19 DURING OCTOBER 2018.
3. EFFECTIVE POROSITY ESTIMATED AT 0.21 BASED ON SITE LITHOLOGY. SITE SPECIFIC YIELD FOR FINE SAND, REFERENCE: C. W. FETTER, "APPLIED HYDROGEOLOGY", UNIVERSITY OF WISCONSIN - OSHKOSH, 1980.

LEGEND

- MONITORING WELL SCREENED INTERVAL
- WATER LEVEL IN EVALUATION (6/19/19)
- PROJECTED BASE OF PRIMARY BOTTOM ASH POND (SEE NOTE)

0 600'
HORIZONTAL SCALE

J. ROBERT WELSH POWER PLANT
1187 COUNTY ROAD 4865
PITTSBURG, TITUS COUNTY, TEXAS

CROSS SECTION
A - A'
(UPDATED SEPTEMBER 2022)

ARCADIS

FIGURE
4

WEST

B

EAST

B'

LANDFILL

B-2 B-10

AD-12

AD-17

AD-13

AD-10

FILL
(W/ASH-COAL PIECES)

SILTY SAND, DRY

CLAY AND SANDY CLAY, GRAY TO TAN.

5'

CLAYEY/SILTY SAND AND SANDY SILT,
BROWN TO GRAY, FINE GRAINED.

SILTY AND SANDY CLAY, GRAY TO BROWN.
(CONFINING UNIT)

380'
370'
360'
350'
340'
330'
320'
310'
300'

ELEVATION (FEET MSL)

RECKLAW
FORMATION
(AVERAGE HYDRAULIC CONDUCTIVITY = 0.21
0.95 ft/day)
(EFFECTIVE POROSITY =

STATE OF TEXAS
Kenneth J. Brammer
Geology
1780
LICENSED
PROFESSIONAL GEOSCIENTIST

9-29-22

NOTES:
1. BASE OF LANDFILL ELEVATION TAKEN FROM "WELSH POWER PLANT-UNIT 1 FLY ASH STORAGE AREA PHASE I" DRAWING ID WEPX-88, DATED 12/3/76.
2. HYDRAULIC CONDUCTIVITY CALCULATED BASED ON ON-SITE AQUIFER TEST OF MONITORING WELL AD-6 ON 9-21-17; AND SLUG TESTING OF MONITORING WELLS AD-6, AD-9, AD-13, AD-17, AND AD-19 DURING OCTOBER 2018.
3. EFFECTIVE POROSITY ESTIMATED AT 0.21 BASED ON SITE LITHOLOGY. SITE SPECIFIC YIELD FOR FINE SAND, REFERENCE: C. W. FETTER, "APPLIED HYDROGEOLOGY", UNIVERSITY OF WISCONSIN - OSHKOSH, 1980.

LEGEND

- MONITORING WELL SCREENED INTERVAL
- WATER LEVEL IN MONITORING WELL (3/4/16)
- BASE OF LANDFILL (SEE NOTE)

0 300'
HORIZONTAL SCALE

J. ROBERT WELSH POWER PLANT
1187 COUNTY ROAD 4865
PITTSBURG, TITUS COUNTY, TEXAS

CROSS SECTION
B - B'
(UPDATED SEPTEMBER 2022)

ARCADIS

FIGURE
5

WEST

C

EAST

C'

BOTTOM ASH STORAGE POND

WELSH RESERVOIR

370'
360'
350'
340'
330'
320'
310'
300'

PERIMETER ROAD (EL. 360')

PERIMETER ROAD (EL. 360')

B-12

B-13

AD-1

AD-4A

AD-4B

AD-4C

AD-20

AD-21

SILTY CLAY AND SANDY CLAY, BROWN TO GRAY.

CLAYEY SAND, DRY

BOTTOM ASH STORAGE 60-ML. HDPE LINER (PROJECTED)

SANDY SILT AND SILTY SAND, VERY FINE TO FINE GRAINED, GRAY TO TAN.

SANDY CLAY

REDDISH BROWN TO GRAY, SILTY CLAY.

DARK GRAY SILTY, SANDY CLAY.
(confining unit)

RECLAIM FORMATION
(AVERAGE HYDRAULIC CONDUCTIVITY = 0.95 ft/day)
(EFFECTIVE POROSITY = 0.21)

ELEVATION (FEET MSL)

ELEVATION (FEET MSL)

NOTES:
1. BASE OF BOTTOM ASH STORAGE HAS A 60-MIL. HDPE LINER AT ELEVATION 340.0', TAKEN FROM FREESE AND NICHOLS "HYDRAULIC ANALYSIS OF WELSH POWER PLANT ASH PONDS, AMERICAN ELECTRIC POWER COMPANY", DATED DECEMBER 2010.
2. HYDRAULIC CONDUCTIVITY CALCULATED BASED ON ON-SITE AQUIFER TEST OF MONITORING WELL AD-6 ON 9-17-21; AND SLUG TESTING OF MONITORING WELLS AD-6, AD-9, AD-13, AD-17, AND AD-19 DURING OCTOBER 2018.
3. EFFECTIVE POROSITY ESTIMATED AT 0.21 BASED ON SITE LITHOLOGY. SITE SPECIFIC YIELD FOR FINE SAND, REFERENCE: C. W. FETTER, "APPLIED HYDROGEOLOGY", UNIVERSITY OF WISCONSIN - OSHKOSH, 1980.

STATE OF TEXAS
Kenneth J. Brandner
Geology
1787
LICENSED PROFESSIONAL GEOSCIENTIST

9-29-22

LEGEND

MONITORING WELL SCREENED INTERVAL

WATER LEVEL IN MONITORING WELL (10/29/18)

PROJECTED BASE OF ASH STORAGE (SEE NOTE)

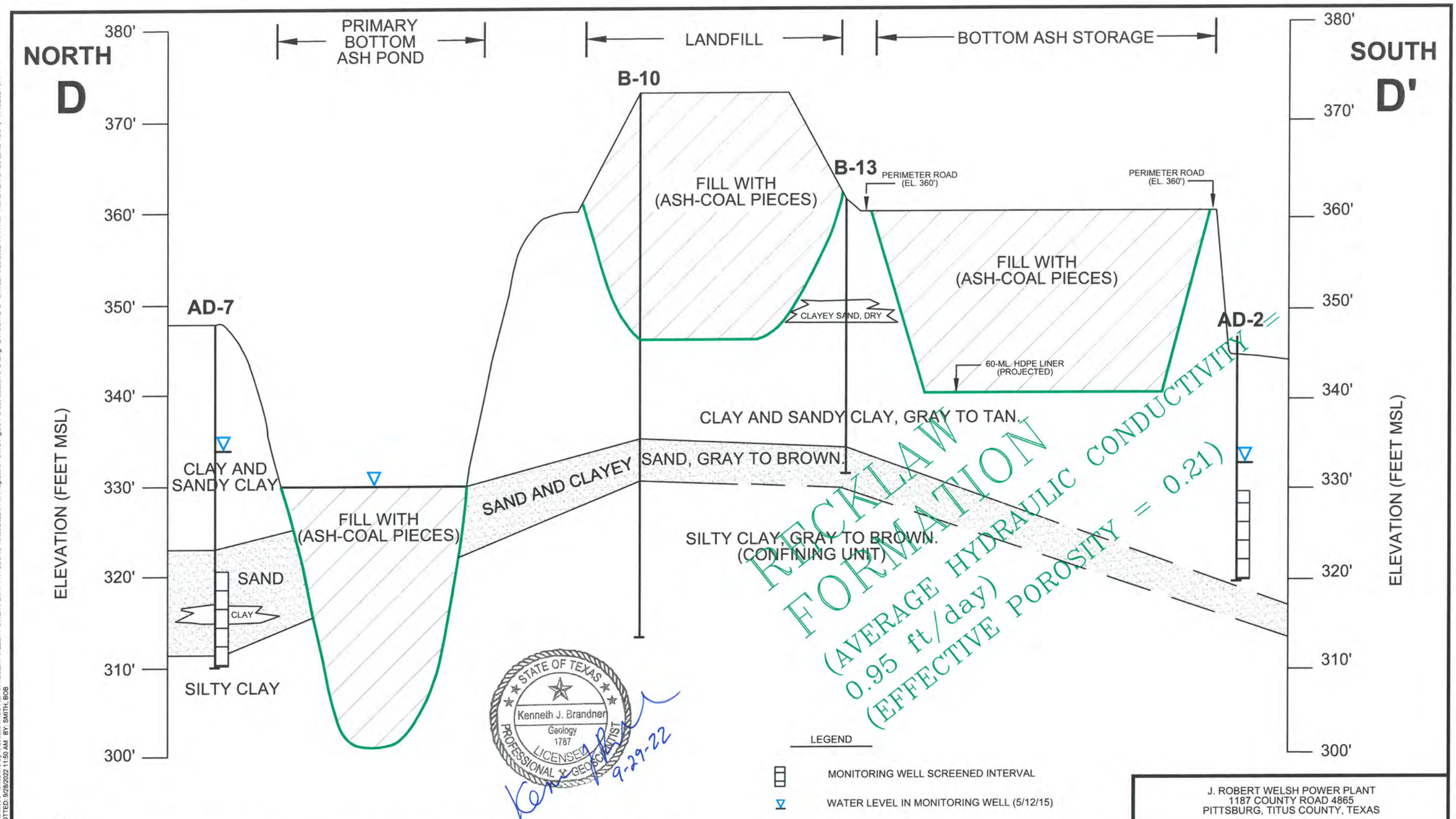
0 200'
HORIZONTAL SCALE

J. ROBERT WELSH POWER PLANT
1187 COUNTY ROAD 4865
PITTSBURG, TITUS COUNTY, TEXAS

CROSS SECTION
C - C'
(UPDATED SEPTEMBER 2022)

ARCADIS

FIGURE
6



NOTES:
1. BASE OF ASH POND TAKEN FROM "WELSH POWER PLANT-UNIT 1 FLY ASH STORAGE AREA PHASE I " DRAWING ID WEPX-88, DATED 12-3-76; AND U.S. GEOLOGICAL SURVEY 7 1/2 MINUTE SERIES TOPOGRAPHIC MAP, CASON, TX QUADRANGLE, 1964 (PHOTO REVISED 1980).
2. HYDRAULIC CONDUCTIVITY CALCULATED BASED ON ON-SITE AQUIFER TEST OF MONITORING WELL AD-6 ON 9-17-21; AND SLUG TESTING OF MONITORING WELLS AD-6, AD-9, AD-13, AD-17, AND AD-19 DURING OCTOBER 2018.
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LEGEND

- MONITORING WELL SCREENED INTERVAL
- WATER LEVEL IN MONITORING WELL (5/12/15)
- BASE OF CCR UNIT

0 300'
HORIZONTAL SCALE

J. ROBERT WELSH POWER PLANT
1187 COUNTY ROAD 4865
PITTSBURG, TITUS COUNTY, TEXAS

CROSS SECTION D - D' (UPDATED SEPTEMBER 2022)

ARCADIS

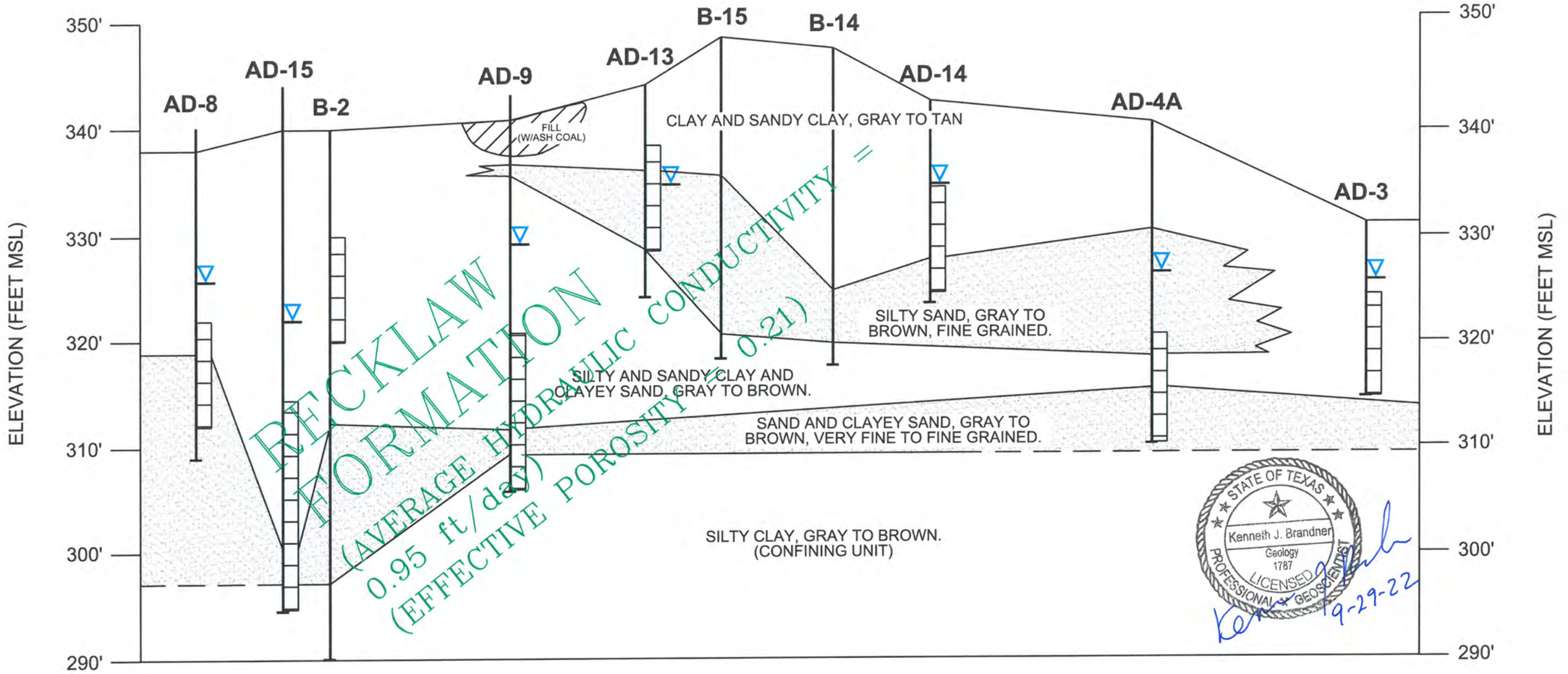
FIGURE 7

NORTH

E

SOUTH

E'



NOTES:
1. BASE OF ASH POND TAKEN FROM "WELSH POWER PLANT-UNIT 1 FLY ASH STORAGE AREA PHASE I " DRAWING ID WEPX-88, DATED 12-3-76; AND U.S. GEOLOGICAL SURVEY 7 1/2 MINUTE SERIES TOPOGRAPHIC MAP, CASON, TX QUADRANGLE, 1964 (PHOTO REVISED 1980).
2. HYDRAULIC CONDUCTIVITY CALCULATED BASED ON ON-SITE AQUIFER TEST OF MONITORING WELL AD-6 ON 9-17-21; AND SLUG TESTING OF MONITORING WELLS AD-6, AD-9, AD-13, AD-17, AND AD-19 DURING OCTOBER 2018.
3. EFFECTIVE POROSITY ESTIMATED AT 0.21 BASED ON SITE LITHOLOGY. SITE SPECIFIC YIELD FOR FINE SAND, REFERENCE: C. W. FETTER, "APPLIED HYDROGEOLOGY", UNIVERSITY OF WISCONSIN - OSHKOSH, 1980.

LEGEND

MONITORING WELL SCREENED INTERVAL

WATER LEVEL IN MONITORING WELL (3/4/16)

0 300'
HORIZONTAL SCALE

J. ROBERT WELSH POWER PLANT
1187 COUNTY ROAD 4865
PITTSBURG, TITUS COUNTY, TEXAS

CROSS SECTION
E - E'
(UPDATED SEPTEMBER 2022)

ARCADIS

FIGURE
8

ATTACHMENT B

Historical Potentiometric Maps

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

- Monitoring well coordinates and water level data (collected on June 2, 2021) provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluations (Arcadis, 2016).
- Groundwater elevation units are feet above mean sea level.

500 250 0 500 Feet

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED
PROFESSIONAL ENGINEER

11/22/2021

Beth Ann Gross

Geosyntec Consultants
Texas Registered Engineering Firm No.
F-1182

Groundwater Potentiometric Map
June 2021

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2021/11/19

Figure
2

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2021\AEP-Welsh_GW_2021-06June.mxd. ARevezzo. 11/19/2021. CHA8423/14/08.

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

- Monitoring well coordinates and water level data (collected on October 21, 2021) provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2016).
- Groundwater elevation units are feet above mean sea level.

500 250 0 500 Feet

STATE OF TEXAS
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79864
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PROFESSIONAL ENGINEER

Beth Ann Gross

January 25, 2022

Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Groundwater Potentiometric Map
October 2021

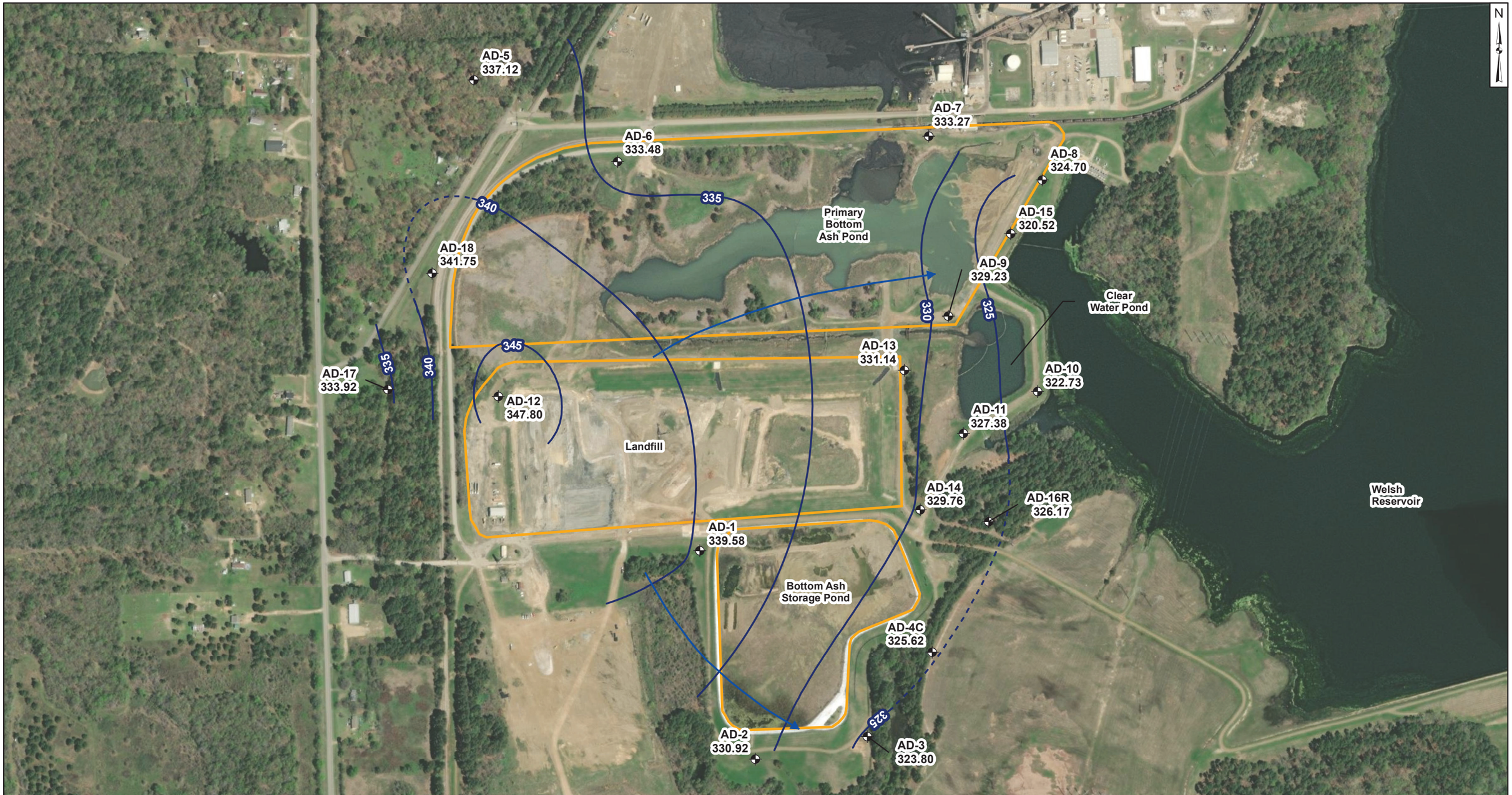
AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2022/01/20

Figure **3**

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2021\AEP-Welsh_GW_2021-10Oct.mxd. ASoltero. 1/20/2022. CHA8423/14/08.



Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

- Monitoring well coordinates and water level data (collected on March 1, 2022) provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2016).
- Groundwater elevation units are feet above mean sea level.

500 250 0 500 Feet

STATE OF TEXAS
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Beth Ann Gross
July 26, 2022

Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Groundwater Potentiometric Map
March 2022

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2022/07/26

Figure

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2022\AEP-Welsh_GW_2022-03March.mxd. ASoltero. 7/26/2022. CHA8423/14/08.

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

- Monitoring well coordinates and water level data (collected on June 27 and 28, 2022) provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2018).
- Groundwater elevation units are feet above mean sea level.

500 250 0 500 Feet

STATE OF TEXAS
BETH ANN GROSS
79864
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Beth Ann Gross

Dec 7, 2022

Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Groundwater Potentiometric Map
June 2022

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2022/10/31

Figure 2

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2022\AEP-Welsh_GW_2022-06June.mxd. ASoltero. 10/31/2022. CHA8423/14/08.

ATTACHMENT C

Chemical Analysis of Wells in Titus County

Table 11.--Chemical analyses of water from wells and springs in Camp, Franklin, Morris, Titus, and adjoining counties--Continued

Titus County

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe) (total)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Percent sodium	Sodium adsorption ratio (SAR)	Residual sodium carbonate (RSC)	Specific conductance (micromhos at 25°C)	pH
YA-16-41-101	22	Aug. 20, 1963	--	--	--	--	--	*17		7	0.0	18	--	40	--	--	--	27	57	1.4	0.00	149	5.1
102	34	do	--	--	--	--	--	--		34	--	358	--	--	--	--	--	324	--	--	--	1,250	5.8
201	30	May 26, 1942	--	--	--	12	1.2	*32		55	15	24	--	15	--	--	127	36	--	--	--	--	--
301	60	do	--	--	--	179	126	*126		12	1,025	115	0	3.0	--	--	1,580	968	--	--	--	--	--
302	60	do	--	--	--	134	39	*152		116	211	361	--	1.0	--	--	955	494	--	--	--	--	--
801	200	Feb. 25, 1963	13	0.13	--	6.8	2.0	*147		308	.0	65	.4	.0	--	--	385	25	93	13	4.55	703	7.3
802	31	do	--	--	--	--	--	--		22	4.0	238	--	44	--	--	--	181	--	--	.00	955	5.2
902	470	July 30, 1963	11	.13	--	3.2	.7	*326		406	.0	272	.9	1.5	--	--	815	11	98	43	6.43	1,410	7.5
903	27	May 26, 1942	--	--	--	82	63	*155		268	296	191	0	3.0	--	--	922	464	--	--	--	--	--
42-401	48	June 3, 1942	--	--	--	226	63	*421		549	33	890	--	0	--	--	1,903	824	--	--	--	--	--
702	22	do	--	--	--	12	5.8	*58		55	18	77	--	10	--	--	208	54	--	--	--	--	--
49-103	20	May 22, 1942	--	--	--	.8	1.0	*12		18	11	3.0	--	1.5	--	--	38	6	--	--	--	--	--
202	315	Feb. 20, 1963	51	22	--	9.8	3.2	*24		91	.0	11	.1	.0	--	--	144	38	58	1.7	.74	215	5.8
203	30	do	--	--	--	--	--	*275		64	1,420	700	--	--	--	--	--	1,920	24	2.7	.00	4,090	5.5
206	485	Feb. 25, 1963	14	.68	--	20	.7	*58		122	13	13	.2	1.0	--	--	162	8	94	8.9	1.84	284	7.3
301	24	May 26, 1942	--	--	--	2.4	1.2	*28		31	7	22	--	10	--	--	86	11	--	--	--	--	--
401	24	May 22, 1942	--	--	--	21	3.6	*13		43	26	20	--	7.0	--	--	112	67	--	--	--	--	--
402	395	Mar. 12, 1963	50	11	--	9.0	3.9	16	2.6	64	3.4	14	.2	0	--	0.00	130	38	45	1.1	.28	156	5.9
503	360	Feb. 20, 1963	54	12	--	9	3.2	*26		78	4.6	16	.1	.0	--	--	151	36	61	1.9	.57	218	5.8
601	22	May 25, 1942	--	--	--	49	19	*109		171	74	138	.2	33	--	--	506	202	--	--	--	--	--
603	350	July 30, 1963	11	.12	--	1.5	.1	*86		204	.0	16	.2	1.8	--	--	217	4	98	19	3.26	353	7.4
701	437	May 27, 1942	20	.07	--	3.7	1.2	*231		370	2	149	.2	2.0	--	--	594	14	--	--	--	--	8.2
701	437	June 22, 1949	15	.14	--	1.6	.7	196	1.6	a337	1.6	109	.1	2.2	--	.79	509	--	--	--	--	869	8.5
701	437	Feb. 19, 1963	12	2.8	--	1.5	.5	170	1.1	322	3.2	74	.2	.0	--	.20	421	6	98	30	5.17	758	7.4
702	597	May 27, 1942	20	.05	--	3.8	1.0	224	--	380	2	132	0	.0	--	--	567	14	--	--	--	--	8.4
702	597	Feb. 19, 1963	12	1.4	--	2.5	.7	218	1.2	368	.0	126	.3	.0	--	.27	542	9	98	32	5.85	991	7.7
706	430	May 14, 1942	39	5.6	--	14	6.6	30	--	126	2	15	.1	.5	--	--	176	62	--	--	--	--	--

See footnotes at end of table.

Table 11.--Chemical analyses of water from wells and springs in Camp, Franklin, Morris, Titus, and adjoining counties--Continued

Titus County

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe) (total)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Percent sodium	Sodium adsorption ratio (SAR)	Residual sodium carbonate (RSC)	Specific conductance (micromhos at 25°C)	pH
YA-16-49-708	460	Mar. 14, 1963	13	0.13	--	1.5	0.2	152	.8	298	3.2	62	0.2	0.0	--	0.10	380	5	98	30	4.78	651	8.0
804	18	May 14, 1942	--	--	--	10	1.2		*7.4	24	18	6.0	--	0	--	--	55	31	--	--	--	--	--
924	300	Apr. 25, 1963	33	2.7	--	20	4.0		*55	156	13	31	.5	.0	--	--	234	66	64	2.9	1.23	352	7.1
50-101	35	June 3, 1942	--	--	--	13	2.4		*46	49	12	14	--	86	--	--	197	42	--	--	--	--	--
102	31	do	--	--	--	79	35		*44	110	11	141	--	169	--	--	533	342	--	--	--	--	--
202	48	do	--	--	--	47	12		*38	49	2	125	--	39	--	--	287	168	--	--	--	--	--
403	310	July 30, 1963	18	.09	--	27	6.9		*107	284	57	26	.2	.0	--	--	382	96	71	4.8	2.73	601	7.2
404	10	May 25, 1942	--	--	--	31	28		*6.4	18	74	78	--	5.0	--	--	231	192	--	--	--	--	--
409	300	July 30, 1963	12	.05	--	4.2	.9		*116	270	23	13	.2	2.0	--	--	304	14	95	13	4.15	485	7.3
501	37	May 25, 1942	--	--	--	308	97		*76	488	274	460	0	2.0	--	--	1,457	1,170	--	--	--	--	--
703	18	June 3, 1942	--	--	--	1.6	3.2		*2.3	12	4	4.0	.3	2.0	--	--	23	17	--	--	--	--	--
57-102	246	Aug. 22, 1963	34	2.9	--	45	9.7		*34	130	75	29	.2	.2	--	--	291	152	33	1.2	.00	452	6.6
110	700	June 3, 1963	12	.09	--	4.5	1.2		*420	396	0	425	.5	.7	--	--	1,060	16	98	46	6.17	1,890	7.6
114	475	Aug. 22, 1963	13	.06	--	6.0	.7		*56	155	.0	8.5	.2	.5	--	--	161	18	87	5.7	2.18	272	7.2
301	20	May 13, 1942	--	--	--	4.8	3.6		*10	12	26	7.0	.2	2.0	--	--	60	27	--	--	--	--	--
302	420	July 31, 1963	13	.22	--	3.5	.5		*104	266	.2	15	.2	2.2	--	.06	271	11	95	14	4.14	440	7.3
401	300	Aug. 22, 1963	13	--	--	4.8	1.0		*157	286	.0	86	.6	.0	--	--	403	16	96	17	4.37	688	7.7
402	300	May 1, 1963	13	1.1	0.00	5.0	1.1	157	1.6	296	.2	88	.5	.0	0.94	.28	414	17	95	17	4.51	708	7.5
601	18	May 13, 1942	--	--	--	8.8	2.4		*11	18	5	18	.2	12	--	--	67	32	--	--	--	--	--
58-101	9	May 14, 1942	--	--	--	12	6.1		*31	12	63	29	.2	6.0	--	--	153	54	--	--	--	--	--
103	24	do	--	--	--	8.8	3.6		*13	6	12	20	--	25	--	--	85	37	--	--	--	--	--
203	21	do	--	--	--	13	2.4		*29	61	5	28	--	12	--	--	119	42	--	--	--	--	--
401	13	May 13, 1942	--	--	--	4.8	2.4		*8.1	18	2	10	.1	10	--	--	47	22	--	--	--	--	--
701	25	May 14, 1942	--	--	--	13	12		*38	12	2	35	--	130	--	--	236	83	--	--	--	--	--
17-48-102	26	Aug. 21, 1963	--	--	--	--	--		--	53	--	38	--	--	--	--	--	53	--	--	.00	299	5.6
202	18	Mar. 22, 1942	--	--	--	11	1.0		*104	12	30	84	--	120	--	--	356	31	--	--	--	--	--
202	18	Aug. 21, 1963	--	--	--	--	--		--	22	--	89	--	--	--	--	--	86	--	--	.00	696	5.6

See footnotes at end of table.

Table 11.--Chemical analyses of water from wells and springs in Camp, Franklin, Morris, Titus, and adjoining counties--Continued

Titus County

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe) (total)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Percent sodium	Sodium adsorption ratio (SAR)	Residual sodium carbonate (RSC)	Specific conductance (micromhos at 25°C)	pH
YA-17-48-801	13	May 22, 1942	--	--	--	11	4.9	*37		43	12	40	--	29	--	--	155	48	--	--	--	--	--
802	18	May 20, 1942	--	--	--	5.6	6.1	*17		31	7	12	--	33	--	--	96	39	--	--	--	--	--
901	25	May 22, 1942	--	--	--	13	4.9	*37		12	22	39	--	55	--	--	177	53	--	--	--	--	--
56-201	40	May 27, 1942	--	--	--	22	15	*17		12	2	18	--	141	--	--	221	114	--	--	--	--	--
303	20	May 20, 1942	--	--	--	26	4.6	*34		55	11	65	--	10	--	--	178	83	--	--	--	--	--
304	310	Aug. 13, 1963	18	1.8	--	7.5	2.6	*117		190	74	35	0.2	.0	--	--	347	29	90	9.4	2.53	560	7.2
401	11	May 27, 1942	--	--	--	16	7.3	*134		31	122	102	--	82	--	--	478	70	--	--	--	--	--
402	30	do	--	--	--	4.4	1.2	*19		18	30	4.0	.2	6.0	--	--	74	16	--	--	--	--	--
415	225	Jan. 17, 1963	12	.37	--	3.5	1.2	*132		248	71	15	.1	2.8	--	--	360	14	96	15	3.79	526	7.5
601	28	May 20, 1942	--	--	--	98	55	*67		171	185	199	.1	1.5	--	--	690	469	--	--	--	--	--
701	38	May 15, 1942	--	--	--	6.0	0	*5.1		18	4	5.0	0	0	--	--	29	15	--	--	--	--	--
† 707	260	Oct. 15, 1962	22	.1	--	6.7	2.5	*191.1		201.3	198	50.0	--	--	--	--	--	27	--	--	--	892	8.02
707	260	July 27, 1963	7.8	1.7	0.00	8.2	2.3	182	2.4	184	202	50	.1	2.8	0.24	0.09	548	30	92	14	2.42	866	7.0
801	Spring	May 15, 1942	--	--	--	8.8	2.4	*1.2		37	2	1.0	--	1.5	--	--	35	32	--	--	--	--	--
901	502	May 29, 1942	--	--	--	5.2	4.9	*297		323	2	288	.2	7.0	--	--	764	33	--	--	--	--	--
64-101	380	July 31, 1963	14	.09	--	3.8	.9	*82		187	1.8	24	.2	1.2	--	--	220	13	93	9.9	2.80	356	7.5
102	17	May 15, 1942	--	--	--	4.8	2.4	*22		49	3	15	.1	6.0	--	--	77	22	--	--	--	--	--
201	48	do	--	--	--	48	22	*124		43	30	254	--	66	--	--	565	208	--	--	--	--	--
301	40	do	--	--	--	205	126	*239		580	418	450	0	9.0	--	--	1,732	1,033	--	--	--	--	--
401	32	do	--	--	--	24	18	*127		98	30	195	--	32	--	--	474	136	--	--	--	--	--

* Sodium and potassium calculated as sodium (Na).
† Analyses by Curtis Laboratories.
a/ Includes the equivalent of 5 ppm as carbonate (CO_3).

ATTACHMENT D

Certification by a Qualified Professional Engineer

CERTIFICATION BY A QUALIFIED PROFESSIONAL ENGINEER

I certify that the selected and above described alternative source demonstration is appropriate for evaluating the groundwater monitoring data for the Welsh Bottom Ash Storage Pond CCR management area and that the requirements of § 352.941(c) have been met.

Beth Ann Gross
Printed Name of Licensed Professional Engineer

Beth Ann Gross
Signature

Geosyntec Consultants
2039 Centre Pointe Boulevard, Suite 103
Tallahassee, FL 32308

Texas Registered Engineering Firm
No. F-1182

79864	Texas	January 17, 2023
License Number	Licensing State	Date

Texas Commission on Environmental Quality

Waste Permits Division Correspondence Cover Sheet

Date: 9/5/2023
Facility Name: AEP Welsh Power Plant
Permit or Registration No.: CCR 110

Nature of Correspondence:
☒ Initial/New
☐ Response/Revision to TCEQ Tracking No.: _____ (from subject line of TCEQ letter regarding initial submission)

Affix this cover sheet to the front of your submission to the Waste Permits Division. Check appropriate box for type of correspondence. Contact WPD at (512) 239-2335 if you have questions regarding this form.

Table 1 - Municipal Solid Waste Correspondence

Applications	Reports and Notifications
☐ New Notice of Intent	☐ Alternative Daily Cover Report
☐ Notice of Intent Revision	☐ Closure Report
☐ New Permit (including Subchapter T)	☐ Compost Report
☐ New Registration (including Subchapter T)	☐ Groundwater Alternate Source Demonstration
☐ Major Amendment	☐ Groundwater Corrective Action
☐ Minor Amendment	☐ Groundwater Monitoring Report
☐ Limited Scope Major Amendment	☐ Groundwater Background Evaluation
☐ Notice Modification	☐ Landfill Gas Corrective Action
☐ Non-Notice Modification	☐ Landfill Gas Monitoring
☐ Transfer/Name Change Modification	☐ Liner Evaluation Report
☐ Temporary Authorization	☐ Soil Boring Plan
☐ Voluntary Revocation	☐ Special Waste Request
☐ Subchapter T Disturbance Non-Enclosed Structure	☐ Other:
☐ Other:	

Table 2 - Industrial & Hazardous Waste Correspondence

Applications	Reports and Responses
☐ New	☐ Annual/Biennial Site Activity Report
☐ Renewal	☐ CPT Plan/Result
☐ Post-Closure Order	☐ Closure Certification/Report
☐ Major Amendment	☐ Construction Certification/Report
☐ Minor Amendment	☐ CPT Plan/Result
☐ CCR Registration	☐ Extension Request
☐ CCR Registration Major Amendment	☐ Groundwater Monitoring Report
☐ CCR Registration Minor Amendment	☐ Interim Status Change
☐ Class 3 Modification	☐ Interim Status Closure Plan
☐ Class 2 Modification	☐ Soil Core Monitoring Report
☐ Class 1 ED Modification	☐ Treatability Study
☐ Class 1 Modification	☐ Trial Burn Plan/Result
☐ Endorsement	☐ Unsaturated Zone Monitoring Report
☐ Temporary Authorization	☐ Waste Minimization Report
☐ Voluntary Revocation	☒ Other: A**lternate Source Demo - BASP**
☐ 335.6 Notification	
☐ Other:	

Geosyntec consultants

engineers | scientists | innovators

AMERICAN ELECTRIC POWER

BOUNDLESS ENERGY™

ALTERNATIVE SOURCE DEMONSTRATION REPORT TEXAS STATE CCR RULE

Welsh Power Plant

Registration No. CCR 110

Pittsburg, 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 CHA8495

September 2023

Geosyntec consultants

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
ASD	alternative source demonstration
BASP	Bottom Ash Storage Pond
CCR	coal combustion residuals
EPRI	Electric Power Research Institute
HDPE	high-density polyethylene
LPL	lower prediction limit
meq/kg	milliequivalents per kilogram
mg/L	milligrams per liter
PBAP	Primary Bottom Ash Pond
SSI	statistically significant increase
SU	standard units
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TDS	total dissolved solids
UPL	upper prediction limit

1. INTRODUCTION AND SUMMARY

This Alternative Source Demonstration (ASD) report has been prepared to address statistically significant increases (SSIs) for boron, calcium, sulfate, and total dissolved solids (TDS) in the groundwater monitoring network at the Welsh Power Plant (Welsh Plant) Bottom Ash Storage Pond (BASP) in Pittsburg, Texas, following the second semiannual detection monitoring event of 2022. The Welsh Plant has three coal combustion residuals (CCR) storage units regulated by the Texas Commission on Environmental Quality (TCEQ) under Registration No. CCR 110, including the BASP (**Figure 1**).

Background groundwater values for the BASP were originally calculated in January 2018 and have been updated intermittently in accordance with the *Statistical Analysis Plan* prepared for the Welsh Plant (Geosyntec 2021a). For the most recent update in December 2021, revised upper prediction limits (UPLs) were calculated for each Appendix III parameter to represent background values (Geosyntec 2021b). Revised lower prediction limits (LPLs) were also calculated for pH. Prediction limits were calculated based on a one-of-two retesting procedure to maintain an appropriate site-wide false positive rate. With this procedure, an SSI is concluded only if both samples in a series of two have reported results above the UPL or, in the case of pH, are below the LPL. In practice, if the initial result was not above the UPL or was not below the LPL, a second sample was not collected or analyzed.

The second semiannual detection monitoring event of 2022 was performed in November 2022 (initial sampling event), and the results were compared to the calculated prediction limits. Where initial values were identified above the UPL or below the LPL, verification resampling was completed in February 2023. Following verification resampling, intrawell comparisons were used to identify SSIs for boron, calcium, sulfate, and TDS at well AD-4C. A summary of the detection monitoring analytical results for the downgradient compliance wells and the calculated prediction limits to which they were compared is provided in **Table 1**.

1.1 CCR Rule Requirements

TCEQ regulations regarding detection monitoring programs for CCR landfills and surface impoundments provide owners and operators with the option to make an ASD when an SSI is identified (Texas Administrative Code [TAC], Title 30, §352.941(c)(2)):

> In making a demonstration under this section, the owner or operator must . . . within 90 days of making a determination of an SSI over the background value for any Appendix III constituent adopted by reference in §352.1421 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, demonstration that a source other than a coal combustion residuals unit caused the SSI or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

Pursuant to this regulation, Geosyntec Consultants, Inc. (Geosyntec) has prepared this ASD report on behalf of American Electric Power (AEP) to document that the SSIs identified for boron, calcium, sulfate, and TDS at well AD-4C are from sources other than a release from the BASP at the Welsh Plant.

1.2 Demonstration of Alternative Sources

An evaluation was completed to assess possible alternative sources to which each identified SSI could be attributed. Alternative sources were categorized into the following five types, based on methods provided by the Electric Power Research Institute (EPRI 2017):

- ASD Type I: Sampling Causes
- ASD Type II: Laboratory Causes
- ASD Type III: Statistical Evaluation Causes
- ASD Type IV: Natural Variation
- ASD Type V: Alternative Sources

A demonstration was conducted to show that the identified SSIs at AD-4C were based on Type IV (natural variation) and Type V (an anthropogenic alternative source) causes and not by a release from the BASP.

2. SUMMARY OF SITE CONDITIONS

The site background summary included in this section was primarily taken from Arcadis (2022), unless otherwise noted.

2.1 BASP Location and Design

The BASP is a 22-acre CCR surface impoundment located in the southern portion of the Welsh Plant, immediately south of the Landfill and Primary Bottom Ash Pond (PBAP) (**Figure 1**). It was designed with approximately 20-foot-high compacted-clay perimeter embankments and a 60-mil-thick high-density polyethylene (HDPE) liner placed over the base of the pond and the interior embankment slopes. The BASP was constructed and placed into operation in 2000 to receive bottom ash and economizer ash dredged and sluiced from the PBAP.

Closure of the BASP was initiated in April 2021 (AEP 2022a). Closure activities are ongoing and involve removal of CCR from the unit. In November 2021, removal of the CCR material from the BASP began, with the CCR material stockpiled in the northern portion of the BASP. The BASP no longer receives CCR material or transport waters and no longer receives non-CCR wastewaters such as stormwater runoff from the landfill and surrounding areas. Dewatering activities began in early 2022 and included installation of dewatering pumps and trenches. As a result of the closure activities, the BASP no longer contained impounded water as of November 3, 2022 (AEP 2022b). Ongoing closure activities include the transport of stockpiled CCR material from the northern portion of the BASP to the Landfill.

2.2 Regional Geology / Site Hydrogeology

The Welsh Plant is located within the West Gulf Coastal Plain. The BASP is immediately underlain by the Eocene-age Recklaw Formation, which consists of very-fine- to fine-grained sand and clay (Flawn 1966). The Recklaw Formation is as much as 110-feet thick in Titus County, where the Welsh Plant is located. This formation is underlain by the Eocene-age Carrizo Sand, consisting of fine to coarse sand, silt, and clay.

The uppermost aquifer in the vicinity of the BASP consists of an interval of the Recklaw Formation that is approximately 12-feet thick and composed of very-fine- to fine-grained silty sand and sandy silt. This aquifer is first encountered approximately 8 feet below the base of the BASP (Arcadis 2022). It is recharged primarily through infiltration of regional precipitation. Groundwater flow velocities in the uppermost aquifer in the vicinity of the BASP have been reported as approximately 1–20 feet per year (AEP 2022a).

Monitoring well AD-4C is screened within the Recklaw Formation. Subsurface lithology at and near monitoring well AD-4C is shown on geologic cross sections from Arcadis (2022) (**Attachment A**).

2.3 BASP Monitoring Well Network and Flow Conditions

The BASP monitoring well sampling network consists of background monitoring wells AD-1, AD-5, and AD-17 and downgradient compliance monitoring wells AD-3, AD-4C, and AD-16R (**Figure 1**). The groundwater flow direction near the BASP is generally to the southeast (**Figure 2**). Potentiometric groundwater flow maps from sampling events completed within the past year

are provided as **Attachment B**. No seasonal groundwater flow direction variability has been observed near the BASP.

3. ALTERNATIVE SOURCE DEMONSTRATION

The ASD evaluation methods, proposed alternative sources for the observed SSIs, and future groundwater sampling requirements are described below.

3.1 Proposed Alternative Sources

An initial review of groundwater sampling field forms did not identify alternative sources due to a Type I (sampling) issue. A review of the laboratory quality assurance and quality control data and the statistical analyses did not identify any Type II (laboratory) or Type III (statistical evaluation) issues. Groundwater sampling, laboratory analysis, and statistical evaluations were generally completed in accordance with 30 TAC §352.941(a) and draft TCEQ guidance for groundwater monitoring (TCEQ 2020).

Based on a review of historical groundwater data and the timing of BASP closure activities, the SSIs of boron, calcium, sulfate, and TDS observed at monitoring well AD-4C were attributed to anthropogenic impacts associated with construction, a Type V (anthropogenic) issue. A review of site geochemistry data and historical groundwater data identified variability of boron concentrations in the upgradient monitoring wells. Therefore, the SSI of boron observed at monitoring well AD-4C was also attributed to natural variability, a Type IV issue.

3.1.1 Effects of Closure

The concentrations of boron, calcium, sulfate, and TDS in groundwater at well AD-4C all increased temporarily during the November 2022 sampling event (**Figure 3)**, resulting in SSIs for these four constituents. The reported concentrations of these constituents subsequently decreased to concentrations consistent with historical values from the samples collected in June for the first semiannual detection monitoring event of 2023 (**Figure 3**). This temporary increase and subsequent decrease in concentrations suggest that the SSIs are associated with pond closure activities, including dewatering and CCR material handling, that were ongoing at the BASP during the time of groundwater sampling (Section 2.1). The concentrations of calcium, sulfate, and TDS for subsequent sampling events have since declined to below their respective prediction limits, suggesting that concentrations of these constituents have already returned to pre-closure conditions. Boron concentrations at AD-4C have remained above the intrawell prediction limit since the November 2022 sampling event; however, this could be due to the effects of natural variability at the site (Type IV) as discussed in Section 3.1.2.

The decrease of the constituents of concern in 2023 is supported by an evaluation of the groundwater composition before and after the dewatering efforts. A Piper diagram, which represents the relative proportions of major cations and anions in the groundwater, was created to visualize changes in groundwater geochemistry at downgradient well AD-4C (**Figure 4**). The groundwater geochemical signature at downgradient well AD-4C has remained similar throughout the monitoring period, as illustrated by the tight clustering of sample results on the Piper diagram. This includes the most recent sample collected in June 2023, following the spike in select constituent concentrations in late 2022 and early 2023. These results illustrate stable geochemical composition of AD-4C groundwater and suggest a lack of influence from the BASP on the groundwater composition. Because boron concentrations remain above the intrawell prediction limit, an additional sample for all major cations and anions will be collected in 2023 to evaluate

whether groundwater conditions at AD-4C remain representative of pre-closure conditions and do not indicate changes due to a release from the BASP.

3.1.2 Comparison of Boron Concentrations to Background

While boron concentrations at downgradient well AD-4C temporarily underwent a sharp increase and subsequent decrease during and following the closure activities described above (**Figure 3**), concentrations of boron remained above the UPL at AD-4C in 2023. This continued concentration increase may be attributed to natural variability of boron concentrations in the uppermost aquifer.

Boron concentrations at background wells AD-1, AD-5, and AD-17, which are located upgradient or background of the BASP and AD-4C, have historically been comparable to or higher than those observed at AD-4C (**Figure 5**). Boron concentrations at both AD-1 (upgradient) and AD-4C (downgradient) appear to have upward trends over the duration of the monitoring period (**Figure 5**), suggesting the possibility that regional trends in groundwater conditions have occurred on a site-wide scale.

Three boron concentrations (0.20, 0.27, and 0.79 milligrams per liter) were reported for two groundwater monitoring samples collected from wells within Titus County that are screened at depths of 60 feet or less (**Attachment C**; Texas Water Commission 1965). These reported values are greater than the observed boron concentrations at AD-4C and are comparable to the observed background results. The ongoing increase in boron concentrations at AD-4C could represent the migration of groundwater with higher concentrations of boron from upgradient locations such as AD-17. Such background concentrations are observed at the BASP, and these observations are supported by additional studies (**Attachment C**). Migration of groundwater containing boron is likely occurring through the porous sand and silty sand that compose the uppermost aquifer in the vicinity of the BASP.

3.2 Sampling Requirements

The ASD described above supports the determination that the identified SSIs at AD-4C are due to a combination of anthropogenic impacts associated with unit closure and, in the case of boron, natural variability within the uppermost aquifer, and not due to a release from the Welsh BASP. Therefore, the unit will remain in the detection monitoring program. Groundwater at the unit will continue to be sampled semiannually for Appendix III parameters.

4. CONCLUSIONS AND RECOMMENDATIONS

The preceding information serves as the ASD prepared in accordance with 30 TAC §352.941(c)(2) and supports the position that the boron, calcium, sulfate, and TDS SSIs at AD-4C identified during the second semiannual detection monitoring event of 2022 should be attributed to a combination of anthropogenic impacts associated with unit closure and natural variation and not to a release from the Welsh BASP. Therefore, no further action is warranted, and the Welsh BASP will remain in the detection monitoring program. Certification of this ASD by a qualified professional engineer is provided in **Attachment D**.

5. REFERENCES

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TABLES

Table 1. Detection Monitoring Data Evaluation
Alternative Source Demonstration Report
Welsh Plant, Bottom Ash Storage Pond

Analyte	Unit	Description	AD-3		AD-4C		AD-16R	
			11/1/2022	2/7/2023	11/1/2022	2/7/2023	11/1/2022	2/7/2023
Boron	mg/L	Intrawell Background Value (UPL)	0.0444		0.0481		0.0595	
		Analytical Result	0.009	--	**0.068**	**0.120**	0.019	--
Calcium	mg/L	Intrawell Background Value (UPL)	1.31		1.19		2.95	
		Analytical Result	**1.57**	0.57	**1.42**	**1.65**	0.32	--
Chloride	mg/L	Intrawell Background Value (UPL)	9.83		16.0		7.79	
		Analytical Result	8.04	--	**19.1**	10.9	**7.96**	6.85
Fluoride	mg/L	Intrawell Background Value (UPL)	1.00		1.00		1.00	
		Analytical Result	0.14	--	0.1	--	0.10	--
pH	SU	Intrawell Background Value (UPL)	5.3		5.7		4.8	
		Intrawell Background Value (LPL)	3.9		4.1		2.7	
		Analytical Result	4.4	--	4.9	--	3.4	--
Sulfate	mg/L	Intrawell Background Value (UPL)	9.54		82.8		75.7	
		Analytical Result	**13.0**	3.39	**142**	**111**	48.1	--
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	136		301		251	
		Analytical Result	110	--	**370**	**320**	150	--

Notes:
Bold values exceed the background value.
Background values are shaded gray.
LPL: lower prediction limit
mg/L: milligrams per liter
SU: standard units
UPL: upper prediction limit
--: not measured

FIGURES

Legend

- Downgradient Sampling Location
- Background Sampling Location
- CCR Units

Notes

- Monitoring well coordinates provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2022).
- Satellite imagery provided by ESRI.
- AEP: American Electric Power
- CCR: Coal combustion residuals

500 250 0 500 Feet

Site Layout
Bottom Ash Storage Pond

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2023/01/06

Figure **1**

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\AEP-Welsh_Updated_BASP_Site_Layout.mxd. BAres. 1/6/2023. CHA8423/14/08.

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

- Monitoring well coordinates and water level data (collected on November 1, 2022) provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2018).
- Groundwater elevation units are feet above mean sea level.
- Satellite imagery provided by ESRI.
- AEP: American Electric Power
- CCR: Coal combustion residuals

500 250 0 500 Feet

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED
PROFESSIONAL ENGINEER

Beth Ann Gross

January 5, 2023

Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Groundwater Potentiometric Map
November 2022

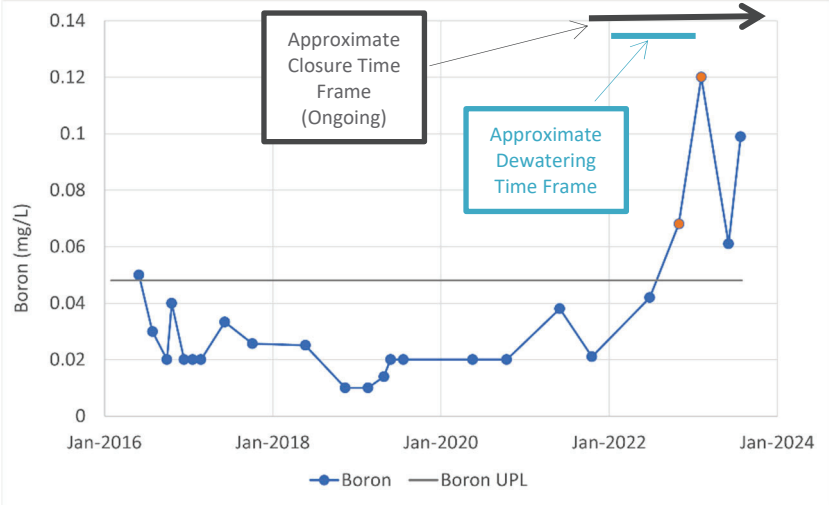
AEP Welsh Power Plant
Cason, Texas

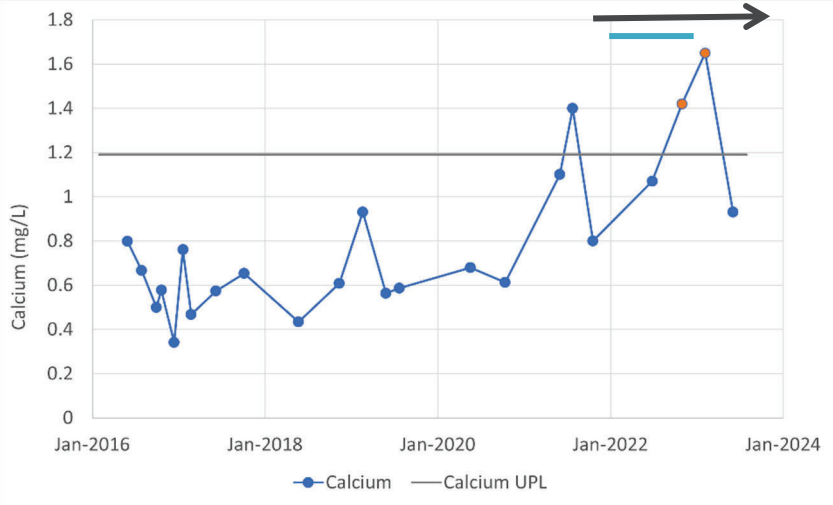
Geosyntec consultants

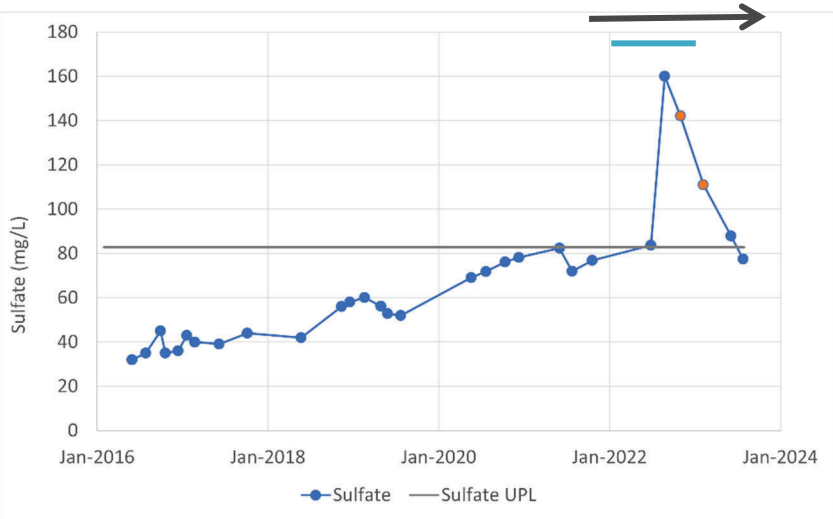
Columbus, Ohio | 2022/11/16

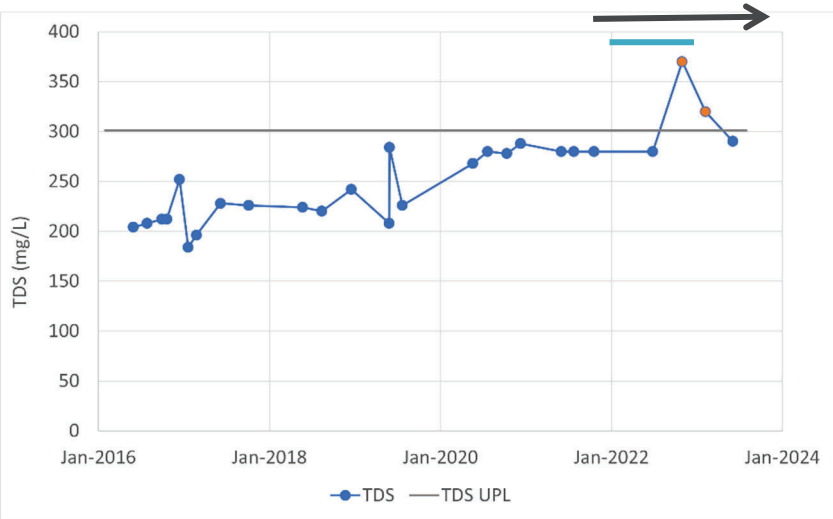
Figure 2

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2022\AEP-Welsh_GW_2022-11Nov.mxd. ASoltero. 11/16/2022. CHA8423/14/08.









AD-4C Time Series Graphs

Welsh Bottom Ash Storage Pond

Notes: The results for the second semiannual detection event of 2022 are shown in orange. The intrawell upper prediction limits (UPL) for boron, calcium, sulfate, and total dissolved solids (TDS) at AD-4C are shown. All results are shown in milligrams per liter (mg/L). Dewatering occurred at the Bottom Ash Storage Pond from January through October 2022, as represented by the teal bars. Ash removal started in November 2021 and is ongoing, as represented by the black arrows.

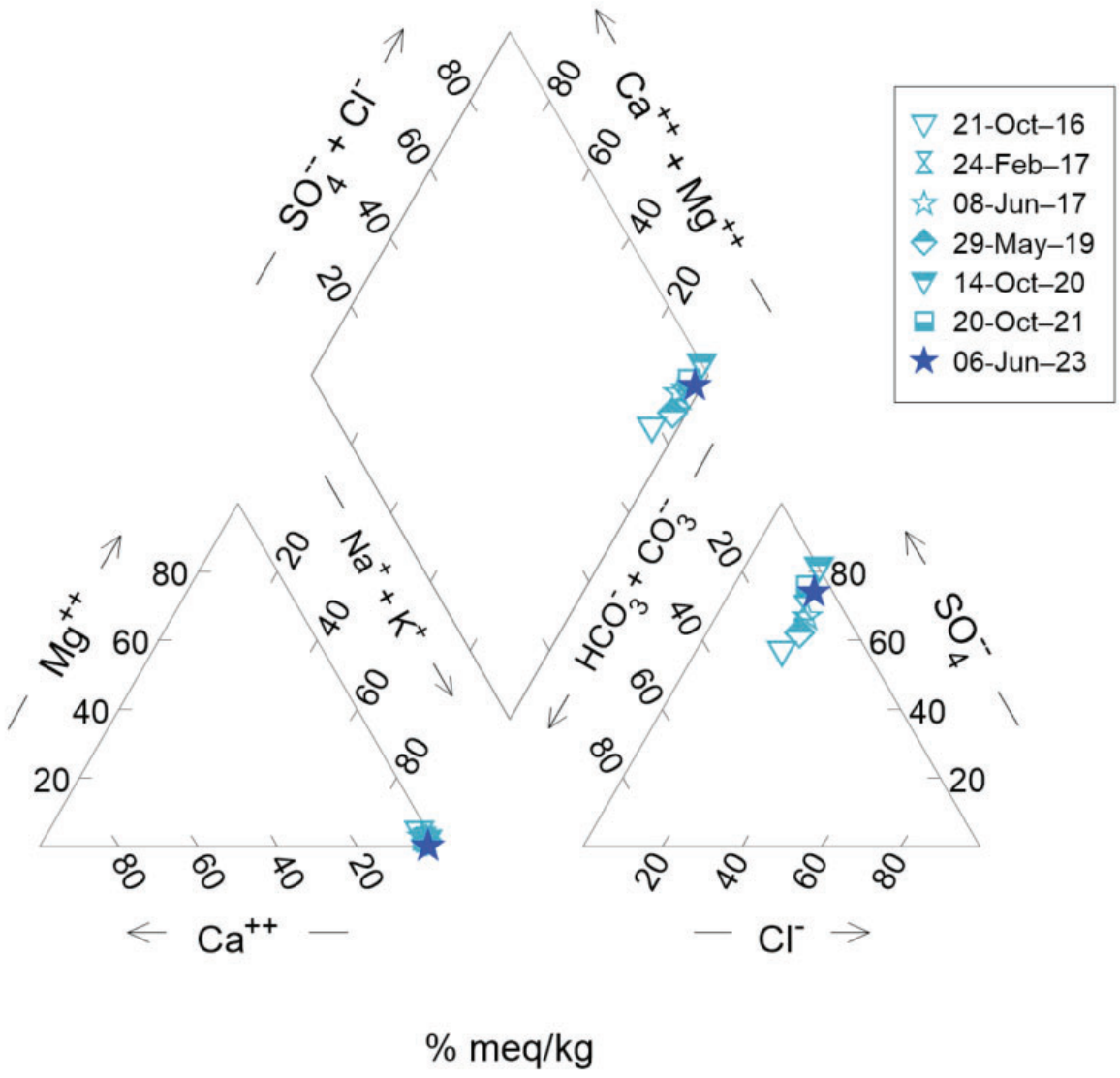
Geosyntec consultants

AMERICAN ELECTRIC POWER

Columbus, Ohio

Aug-2023

Figure 3



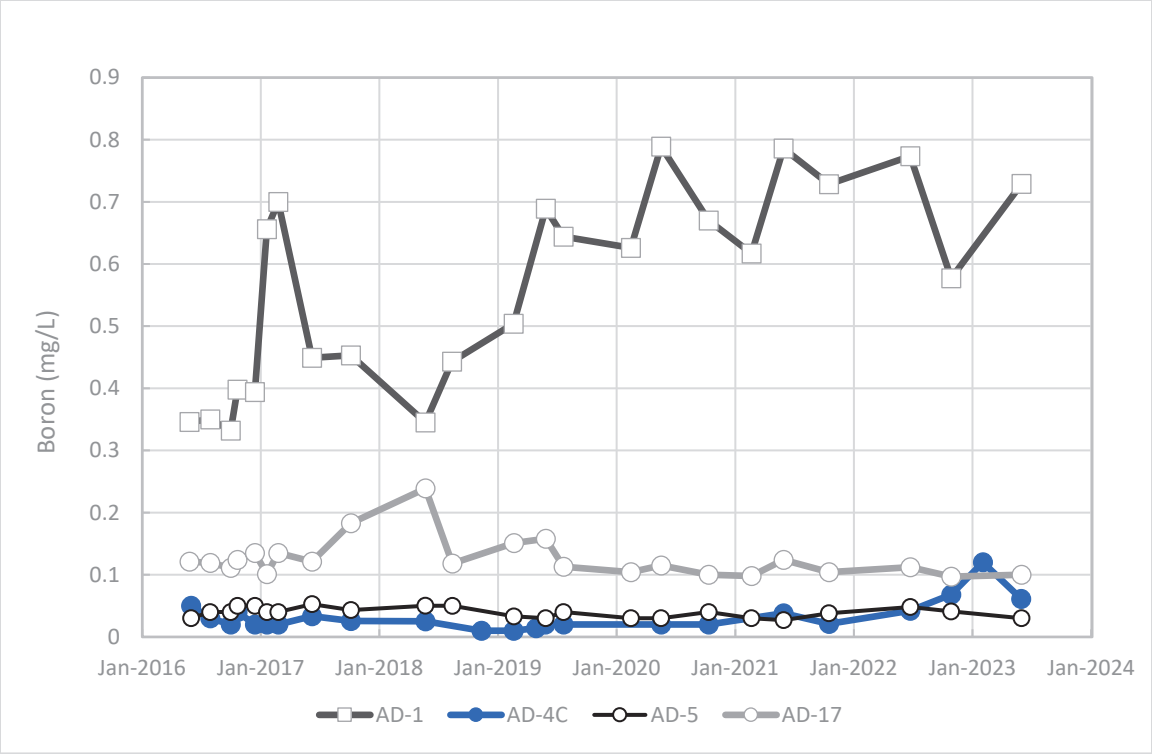
Notes: Results are shown in milliequivalents per kilogram (meq/kg).

AD-4C Piper Diagram
Welsh Bottom Ash Storage Pond

Geosyntec consultants | Columbus, Ohio

AMERICAN ELECTRIC POWER | August 2023

Figure **4**



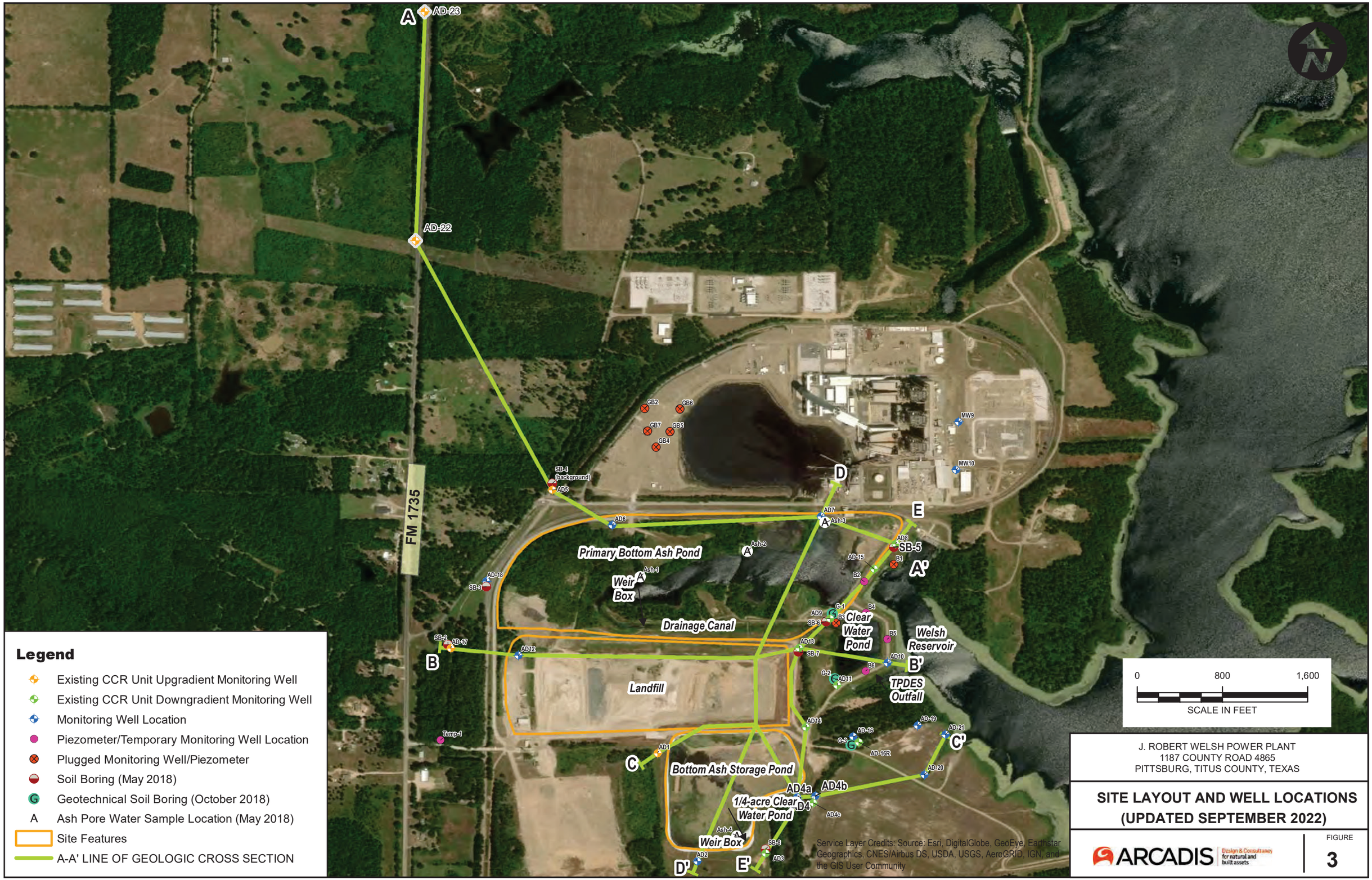
Notes: Sulfate time series diagram for BASP upgradient wells AD-1, AD-5, and AD-17 and downgradient well AD-4C. Data collected as part of the federal coal combustions residuals (CCR) program. Results are shown in milligrams per liter (mg/L).

Boron Time Series Graph
Welsh Bottom Ash Storage Pond

Geosyntec consultants | AMERICAN ELECTRIC POWER | Figure **5**

Columbus, Ohio | August 2023

ATTACHMENT A
Geologic Cross Sections



Legend

- Existing CCR Unit Upgradient Monitoring Well
- Existing CCR Unit Downgradient Monitoring Well
- Monitoring Well Location
- Piezometer/Temporary Monitoring Well Location
- Plugged Monitoring Well/Piezometer
- Soil Boring (May 2018)
- Geotechnical Soil Boring (October 2018)
- A Ash Pore Water Sample Location (May 2018)
- Site Features
- A-A' LINE OF GEOLOGIC CROSS SECTION

J. ROBERT WELSH POWER PLANT
1187 COUNTY ROAD 4865
PITTSBURG, TITUS COUNTY, TEXAS

SITE LAYOUT AND WELL LOCATIONS (UPDATED SEPTEMBER 2022)

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3

Document Path: Z:\GISProjects_ENVVAEP\Welsh Plant\MXD\Landfill report\September 2019\Fig2-3-Cross Section Locations REV.mxd

WEST

A

EAST

A'

AD-23 AD-22 AD-5 AD-6 AD-7 AD-8

PRIMARY BOTTOM ASH POND

WELSH RESERVOIR

CLAYEY SAND, BROWN, UNSATURATED

SILTY CLAY, GRAY WITH RED MOTTLING.

CLAYEY SAND, REDDISH BROWN TO GRAY.

QUEEN CITY FORMATION

FILL (ASH)

CLAY, SANDY CLAY AND SILT, ORANGE, RED, GRAY AND BROWN.

SILTY SAND AND CLAYEY SAND, BROWN TO GRAY.

SILTY CLAY, GRAY TO BLACK. (CONFINING UNIT)

CLAY

WELSH RESERVOIR

RECKLAW FORMATION (AVERAGE HYDRAULIC CONDUCTIVITY = 0.95 ft/day) (EFFECTIVE POROSITY = 0.21)

ELEVATION (FEET MSL)

370' 360' 350' 340' 330' 320' 310' 300'

NOTES:
1. BASE OF ASH POND TAKEN FROM "WELSH POWER PLANT-UNIT 1 FLY ASH STORAGE AREA PHASE I " DRAWING ID WEPX-88, DATED 12-3-76; AND U.S. GEOLOGICAL SURVEY 7 1/2 MINUTE SERIES TOPOGRAPHIC MAP, CASON, TX QUADRANGLE, 1964 (PHOTO REVISED 1980).
2. HYDRAULIC CONDUCTIVITY CALCULATED BASED ON ON-SITE AQUIFER TEST OF MONITORING WELL AD-6 ON 9-17-21; AND SLUG TESTING OF MONITORING WELLS AD-6, AD-9, AD-13, AD-17, AND AD-19 DURING OCTOBER 2018.
3. EFFECTIVE POROSITY ESTIMATED AT 0.21 BASED ON SITE LITHOLOGY. SITE SPECIFIC YIELD FOR FINE SAND, REFERENCE: C. W. FETTER, "APPLIED HYDROGEOLOGY", UNIVERSITY OF WISCONSIN - OSHKOSH, 1980.

LEGEND

- MONITORING WELL SCREENED INTERVAL
- WATER LEVEL IN EVALUATION (6/19/19)
- PROJECTED BASE OF PRIMARY BOTTOM ASH POND (SEE NOTE)

0 600'
HORIZONTAL SCALE

J. ROBERT WELSH POWER PLANT
1187 COUNTY ROAD 4865
PITTSBURG, TITUS COUNTY, TEXAS

CROSS SECTION A - A' (UPDATED SEPTEMBER 2022)

ARCADIS

FIGURE 4

WEST

B

EAST

B'

LANDFILL

B-2 B-10

AD-12

AD-17

AD-13

AD-10

FILL
(W/ASH-COAL PIECES)

SILTY SAND, DRY

CLAY AND SANDY CLAY, GRAY TO TAN.

5'

CLAYEY/SILTY SAND AND SANDY SILT,
BROWN TO GRAY, FINE GRAINED.

SILTY AND SANDY CLAY, GRAY TO BROWN.
(CONFINING UNIT)

ELEVATION (FEET MSL)

380'
370'
360'
350'
340'
330'
320'
310'
300'

RECKLAW FORMATION
(AVERAGE HYDRAULIC CONDUCTIVITY = 0.95 ft/day)
(EFFECTIVE POROSITY = 0.21)

STATE OF TEXAS
Kenneth J. Brammer
Geology
1780
LICENSED
PROFESSIONAL GEOSCIENTIST

9-29-22

NOTES:
1. BASE OF LANDFILL ELEVATION TAKEN FROM "WELSH POWER PLANT-UNIT 1 FLY ASH STORAGE AREA PHASE I" DRAWING ID WEPX-88, DATED 12/3/76.
2. HYDRAULIC CONDUCTIVITY CALCULATED BASED ON ON-SITE AQUIFER TEST OF MONITORING WELL AD-6 ON 9-21-17; AND SLUG TESTING OF MONITORING WELLS AD-6, AD-9, AD-13, AD-17, AND AD-19 DURING OCTOBER 2018.
3. EFFECTIVE POROSITY ESTIMATED AT 0.21 BASED ON SITE LITHOLOGY. SITE SPECIFIC YIELD FOR FINE SAND, REFERENCE: C. W. FETTER, "APPLIED HYDROGEOLOGY", UNIVERSITY OF WISCONSIN - OSHKOSH, 1980.

LEGEND

- MONITORING WELL SCREENED INTERVAL
- WATER LEVEL IN MONITORING WELL (3/4/16)
- BASE OF LANDFILL (SEE NOTE)

0 300'
HORIZONTAL SCALE

J. ROBERT WELSH POWER PLANT
1187 COUNTY ROAD 4865
PITTSBURG, TITUS COUNTY, TEXAS

CROSS SECTION
B - B'
(UPDATED SEPTEMBER 2022)

ARCADIS

FIGURE
5

WEST

C

EAST

C'

BOTTOM ASH STORAGE POND

WELSH RESERVOIR

370'
360'
350'
340'
330'
320'
310'
300'

PERIMETER ROAD (EL. 360')

PERIMETER ROAD (EL. 360')

B-12

B-13

AD-1

AD-4A

AD-4B AD-4C

AD-20

AD-21

SILTY CLAY AND SANDY CLAY, BROWN TO GRAY.

CLAYEY SAND, DRY

BOTTOM ASH STORAGE 60-ML. HDPE LINER (PROJECTED)

SANDY SILT AND SILTY SAND, VERY FINE TO FINE GRAINED, GRAY TO TAN.

SANDY CLAY

REDDISH BROWN TO GRAY, SILTY CLAY.

DARK GRAY SILTY, SANDY CLAY.
(confining unit)

RECKLAW FORMATION
(AVERAGE HYDRAULIC CONDUCTIVITY = 0.95 ft/day)
(EFFECTIVE POROSITY = 0.21)

ELEVATION (FEET MSL)

ELEVATION (FEET MSL)

NOTES:
1. BASE OF BOTTOM ASH STORAGE HAS A 60-MIL. HDPE LINER AT ELEVATION 340.0', TAKEN FROM FREESE AND NICHOLS "HYDRAULIC ANALYSIS OF WELSH POWER PLANT ASH PONDS, AMERICAN ELECTRIC POWER COMPANY", DATED DECEMBER 2010.
2. HYDRAULIC CONDUCTIVITY CALCULATED BASED ON ON-SITE AQUIFER TEST OF MONITORING WELL AD-6 ON 9-17-21; AND SLUG TESTING OF MONITORING WELLS AD-6, AD-9, AD-13, AD-17, AND AD-19 DURING OCTOBER 2018.
3. EFFECTIVE POROSITY ESTIMATED AT 0.21 BASED ON SITE LITHOLOGY. SITE SPECIFIC YIELD FOR FINE SAND, REFERENCE: C. W. FETTER, "APPLIED HYDROGEOLOGY", UNIVERSITY OF WISCONSIN - OSHKOSH, 1980.

STATE OF TEXAS
Kenneth J. Brandner
Geology
1787
LICENSED PROFESSIONAL GEOSCIENTIST

9-29-22

LEGEND

MONITORING WELL SCREENED INTERVAL

WATER LEVEL IN MONITORING WELL (10/29/18)

PROJECTED BASE OF ASH STORAGE (SEE NOTE)

0 200'
HORIZONTAL SCALE

J. ROBERT WELSH POWER PLANT
1187 COUNTY ROAD 4865
PITTSBURG, TITUS COUNTY, TEXAS

CROSS SECTION
C - C'
(UPDATED SEPTEMBER 2022)

ARCADIS

FIGURE
6

NORTH

D

SOUTH

D'

PRIMARY BOTTOM ASH POND

LANDFILL

BOTTOM ASH STORAGE

ELEVATION (FEET MSL)

380'
370'
360'
350'
340'
330'
320'
310'
300'

AD-7

AD-2

B-10

B-13

PERIMETER ROAD (EL. 360')

PERIMETER ROAD (EL. 360')

FILL WITH (ASH-COAL PIECES)

FILL WITH (ASH-COAL PIECES)

CLAYEY SAND, DRY

60-MIL HDPE LINER (PROJECTED)

CLAY AND SANDY CLAY, GRAY TO TAN.

CLAY AND SANDY CLAY

FILL WITH (ASH-COAL PIECES)

SAND AND CLAYEY SAND, GRAY TO BROWN.

SAND

CLAY

SILTY CLAY

SILTY CLAY, GRAY TO BROWN. (CONFINING UNIT)

RECLAW FORMATION
(AVERAGE HYDRAULIC CONDUCTIVITY
0.95 ft/day)
(EFFECTIVE POROSITY = 0.21)

STATE OF TEXAS
Kenneth J. Brandner
Geology
1787
LICENSED
PROFESSIONAL GEOSCIENTIST

9-29-22

LEGEND

- MONITORING WELL SCREENED INTERVAL
- WATER LEVEL IN MONITORING WELL (5/12/15)
- BASE OF CCR UNIT

0 300'
HORIZONTAL SCALE

NOTES:
1. BASE OF ASH POND TAKEN FROM "WELSH POWER PLANT-UNIT 1 FLY ASH STORAGE AREA PHASE I " DRAWING ID WEPX-88, DATED 12-3-76; AND U.S. GEOLOGICAL SURVEY 7 1/2 MINUTE SERIES TOPOGRAPHIC MAP, CASON, TX QUADRANGLE, 1964 (PHOTO REVISED 1980).
2. HYDRAULIC CONDUCTIVITY CALCULATED BASED ON ON-SITE AQUIFER TEST OF MONITORING WELL AD-6 ON 9-17-21; AND SLUG TESTING OF MONITORING WELLS AD-6, AD-9, AD-13, AD-17, AND AD-19 DURING OCTOBER 2018.
3. EFFECTIVE POROSITY ESTIMATED AT 0.21 BASED ON SITE LITHOLOGY. SITE SPECIFIC YIELD FOR FINE SAND, REFERENCE: C. W. FETTER, "APPLIED HYDROGEOLOGY", UNIVERSITY OF WISCONSIN - OSHKOSH, 1980.

J. ROBERT WELSH POWER PLANT
1187 COUNTY ROAD 4865
PITTSBURG, TITUS COUNTY, TEXAS

CROSS SECTION D - D' (UPDATED SEPTEMBER 2022)

ARCADIS

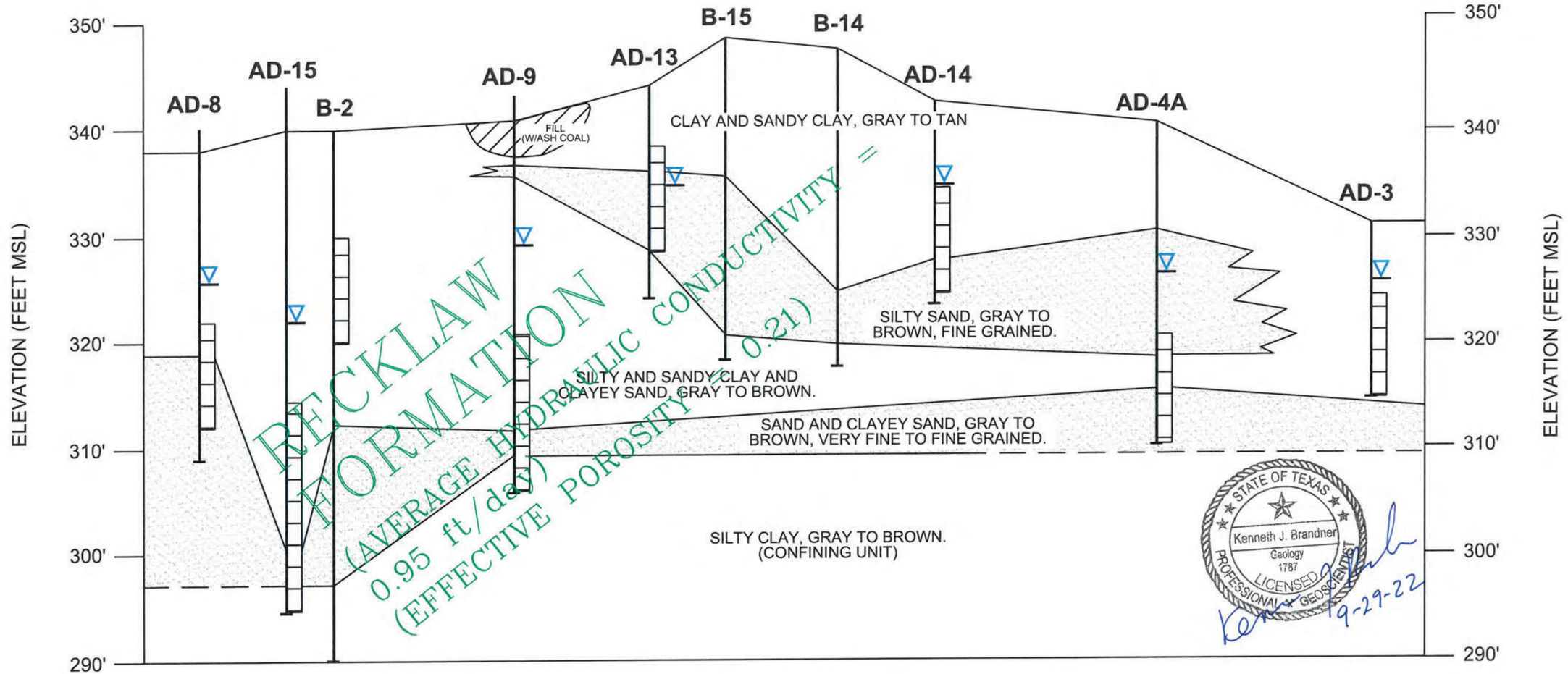
FIGURE 7

NORTH

E

SOUTH

E'



STATE OF TEXAS
Kenneth J. Brandner
Geology
1787
LICENSED PROFESSIONAL GEOSCIENTIST
9-29-22

NOTES:
1. BASE OF ASH POND TAKEN FROM "WELSH POWER PLANT-UNIT 1 FLY ASH STORAGE AREA PHASE I " DRAWING ID WEPX-88, DATED 12-3-76; AND U.S. GEOLOGICAL SURVEY 7 1/2 MINUTE SERIES TOPOGRAPHIC MAP, CASON, TX QUADRANGLE, 1964 (PHOTO REVISED 1980).
2. HYDRAULIC CONDUCTIVITY CALCULATED BASED ON ON-SITE AQUIFER TEST OF MONITORING WELL AD-6 ON 9-17-21; AND SLUG TESTING OF MONITORING WELLS AD-6, AD-9, AD-13, AD-17, AND AD-19 DURING OCTOBER 2018.
3. EFFECTIVE POROSITY ESTIMATED AT 0.21 BASED ON SITE LITHOLOGY. SITE SPECIFIC YIELD FOR FINE SAND, REFERENCE: C. W. FETTER, "APPLIED HYDROGEOLOGY", UNIVERSITY OF WISCONSIN - OSHKOSH, 1980.

LEGEND

MONITORING WELL SCREENED INTERVAL

WATER LEVEL IN MONITORING WELL (3/4/16)

0 300'
HORIZONTAL SCALE

J. ROBERT WELSH POWER PLANT
1187 COUNTY ROAD 4865
PITTSBURG, TITUS COUNTY, TEXAS

CROSS SECTION
E - E'
(UPDATED SEPTEMBER 2022)

ARCADIS

FIGURE
8

ATTACHMENT B
Historical Potentiometric Maps

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

- Monitoring well coordinates and water level data (collected on June 2, 2021) provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluations (Arcadis, 2016).
- Groundwater elevation units are feet above mean sea level.

500 250 0 500 Feet

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED PROFESSIONAL ENGINEER

11/22/2021

Beth Ann Gross

Geosyntec Consultants
Texas Registered Engineering Firm No. F-1182

Groundwater Potentiometric Map
June 2021

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2021/11/19

Figure **2**

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2021\AEP-Welsh_GW_2021-06June.mxd. ARevezzo. 11/19/2021. CHA8423/14/08.

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

- Monitoring well coordinates and water level data (collected on October 21, 2021) provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2016).
- Groundwater elevation units are feet above mean sea level.

500 250 0 500 Feet

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED
PROFESSIONAL ENGINEER

Beth Ann Gross

January 25, 2022

Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Groundwater Potentiometric Map
October 2021

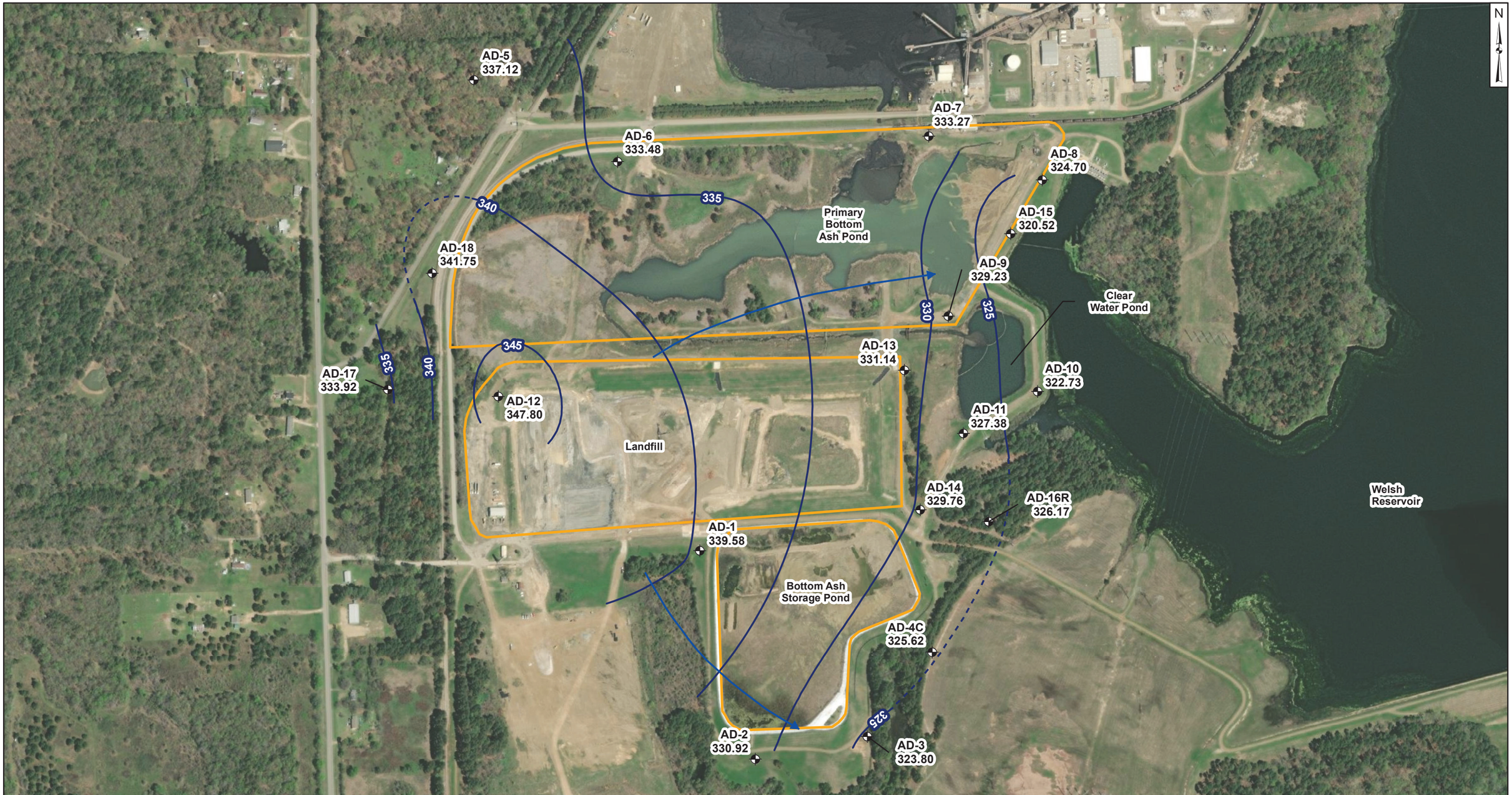
AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2022/01/20

Figure **3**

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2021\AEP-Welsh_GW_2021-10Oct.mxd. ASoltero. 1/20/2022. CHA8423/14/08.



Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

- Monitoring well coordinates and water level data (collected on March 1, 2022) provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2016).
- Groundwater elevation units are feet above mean sea level.

STATE OF TEXAS
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Beth Ann Gross
July 26, 2022

Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Groundwater Potentiometric Map
March 2022

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2022/07/26

Figure
X

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2022\AEP-Welsh_GW_2022-03March.mxd. ASoltero. 7/26/2022. CHA8423/14/08.

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

- Monitoring well coordinates and water level data (collected on June 27 and 28, 2022) provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2018).
- Groundwater elevation units are feet above mean sea level.

500 250 0 500 Feet

STATE OF TEXAS
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Beth Ann Gross

Dec 7, 2022

Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Groundwater Potentiometric Map
June 2022

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2022/10/31

Figure

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2022\AEP-Welsh_GW_2022-06June.mxd. ASoltero. 10/31/2022. CHA8423/14/08.

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

- Monitoring well coordinates and water level data (collected on November 1, 2022) provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2018).
- Groundwater elevation units are feet above mean sea level.
- Satellite imagery provided by ESRI.

500 250 0 500 Feet

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED PROFESSIONAL ENGINEER

Beth Ann Gross

January 5, 2023

Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Groundwater Potentiometric Map
November 2022

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2022/11/16

Figure

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2022\AEP-Welsh_GW_2022-11Nov.mxd. ASoltero. 11/16/2022. CHA8423/14/08.

ATTACHMENT C
Chemical Analysis of Wells in Titus County

Table 11.--Chemical analyses of water from wells and springs in Camp, Franklin, Morris, Titus, and adjoining counties--Continued

Titus County

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe) (total)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Percent sodium	Sodium adsorption ratio (SAR)	Residual sodium carbonate (RSC)	Specific conductance (micromhos at 25°C)	pH
YA-16-41-101	22	Aug. 20, 1963	--	--	--	--	--	*17		7	0.0	18	--	40	--	--	--	27	57	1.4	0.00	149	5.1
102	34	do	--	--	--	--	--	--		34	--	358	--	--	--	--	--	324	--	--	--	1,250	5.8
201	30	May 26, 1942	--	--	--	12	1.2	*32		55	15	24	--	15	--	--	127	36	--	--	--	--	--
301	60	do	--	--	--	179	126	*126		12	1,025	115	0	3.0	--	--	1,580	968	--	--	--	--	--
302	60	do	--	--	--	134	39	*152		116	211	361	--	1.0	--	--	955	494	--	--	--	--	--
801	200	Feb. 25, 1963	13	0.13	--	6.8	2.0	*147		308	.0	65	.4	.0	--	--	385	25	93	13	4.55	703	7.3
802	31	do	--	--	--	--	--	--		22	4.0	238	--	44	--	--	--	181	--	--	.00	955	5.2
902	470	July 30, 1963	11	.13	--	3.2	.7	*326		406	.0	272	.9	1.5	--	--	815	11	98	43	6.43	1,410	7.5
903	27	May 26, 1942	--	--	--	82	63	*155		268	296	191	0	3.0	--	--	922	464	--	--	--	--	--
42-401	48	June 3, 1942	--	--	--	226	63	*421		549	33	890	--	0	--	--	1,903	824	--	--	--	--	--
702	22	do	--	--	--	12	5.8	*58		55	18	77	--	10	--	--	208	54	--	--	--	--	--
49-103	20	May 22, 1942	--	--	--	.8	1.0	*12		18	11	3.0	--	1.5	--	--	38	6	--	--	--	--	--
202	315	Feb. 20, 1963	51	22	--	9.8	3.2	*24		91	.0	11	.1	.0	--	--	144	38	58	1.7	.74	215	5.8
203	30	do	--	--	--	--	--	*275		64	1,420	700	--	--	--	--	--	1,920	24	2.7	.00	4,090	5.5
206	485	Feb. 25, 1963	14	.68	--	20	.7	*58		122	13	13	.2	1.0	--	--	162	8	94	8.9	1.84	284	7.3
301	24	May 26, 1942	--	--	--	2.4	1.2	*28		31	7	22	--	10	--	--	86	11	--	--	--	--	--
401	24	May 22, 1942	--	--	--	21	3.6	*13		43	26	20	--	7.0	--	--	112	67	--	--	--	--	--
402	395	Mar. 12, 1963	50	11	--	9.0	3.9	16	2.6	64	3.4	14	.2	0	--	0.00	130	38	45	1.1	.28	156	5.9
503	360	Feb. 20, 1963	54	12	--	9	3.2	*26		78	4.6	16	.1	.0	--	--	151	36	61	1.9	.57	218	5.8
601	22	May 25, 1942	--	--	--	49	19	*109		171	74	138	.2	33	--	--	506	202	--	--	--	--	--
603	350	July 30, 1963	11	.12	--	1.5	.1	*86		204	.0	16	.2	1.8	--	--	217	4	98	19	3.26	353	7.4
701	437	May 27, 1942	20	.07	--	3.7	1.2	*231		370	2	149	.2	2.0	--	--	594	14	--	--	--	--	8.2
701	437	June 22, 1949	15	.14	--	1.6	.7	196	1.6	a/337	1.6	109	.1	2.2	--	.79	509	--	--	--	--	869	8.5
701	437	Feb. 19, 1963	12	2.8	--	1.5	.5	170	1.1	322	3.2	74	.2	.0	--	.20	421	6	98	30	5.17	758	7.4
702	597	May 27, 1942	20	.05	--	3.8	1.0	224	--	380	2	132	0	.0	--	--	567	14	--	--	--	--	8.4
702	597	Feb. 19, 1963	12	1.4	--	2.5	.7	218	1.2	368	.0	126	.3	.0	--	.27	542	9	98	32	5.85	991	7.7
706	430	May 14, 1942	39	5.6	--	14	6.6	30	--	126	2	15	.1	.5	--	--	176	62	--	--	--	--	--

See footnotes at end of table.

Table 11.--Chemical analyses of water from wells and springs in Camp, Franklin, Morris, Titus, and adjoining counties--Continued

Titus County

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe) (total)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Percent sodium	Sodium adsorption ratio (SAR)	Residual sodium carbonate (RSC)	Specific conductance (micromhos at 25°C)	pH
YA-16-49-708	460	Mar. 14, 1963	13	0.13	--	1.5	0.2	152	.8	298	3.2	62	0.2	0.0	--	0.10	380	5	98	30	4.78	651	8.0
804	18	May 14, 1942	--	--	--	10	1.2	*7.4		24	18	6.0	--	0	--	--	55	31	--	--	--	--	--
924	300	Apr. 25, 1963	33	2.7	--	20	4.0	*55		156	13	31	.5	.0	--	--	234	66	64	2.9	1.23	352	7.1
50-101	35	June 3, 1942	--	--	--	13	2.4	*46		49	12	14	--	86	--	--	197	42	--	--	--	--	--
102	31	do	--	--	--	79	35	*44		110	11	141	--	169	--	--	533	342	--	--	--	--	--
202	48	do	--	--	--	47	12	*38		49	2	125	--	39	--	--	287	168	--	--	--	--	--
403	310	July 30, 1963	18	.09	--	27	6.9	*107		284	57	26	.2	.0	--	--	382	96	71	4.8	2.73	601	7.2
404	10	May 25, 1942	--	--	--	31	28	*6.4		18	74	78	--	5.0	--	--	231	192	--	--	--	--	--
409	300	July 30, 1963	12	.05	--	4.2	.9	*116		270	23	13	.2	2.0	--	--	304	14	95	13	4.15	485	7.3
501	37	May 25, 1942	--	--	--	308	97	*76		488	274	460	0	2.0	--	--	1,457	1,170	--	--	--	--	--
703	18	June 3, 1942	--	--	--	1.6	3.2	*2.3		12	4	4.0	.3	2.0	--	--	23	17	--	--	--	--	--
57-102	246	Aug. 22, 1963	34	2.9	--	45	9.7	*34		130	75	29	.2	.2	--	--	291	152	33	1.2	.00	452	6.6
110	700	June 3, 1963	12	.09	--	4.5	1.2	*420		396	0	425	.5	.7	--	--	1,060	16	98	46	6.17	1,890	7.6
114	475	Aug. 22, 1963	13	.06	--	6.0	.7	*56		155	.0	8.5	.2	.5	--	--	161	18	87	5.7	2.18	272	7.2
301	20	May 13, 1942	--	--	--	4.8	3.6	*10		12	26	7.0	.2	2.0	--	--	60	27	--	--	--	--	--
302	420	July 31, 1963	13	.22	--	3.5	.5	*104		266	.2	15	.2	2.2	--	.06	271	11	95	14	4.14	440	7.3
401	300	Aug. 22, 1963	13	--	--	4.8	1.0	*157		286	.0	86	.6	.0	--	--	403	16	96	17	4.37	688	7.7
402	300	May 1, 1963	13	1.1	0.00	5.0	1.1	157	1.6	296	.2	88	.5	.0	0.94	.28	414	17	95	17	4.51	708	7.5
601	18	May 13, 1942	--	--	--	8.8	2.4	*11		18	5	18	.2	12	--	--	67	32	--	--	--	--	--
58-101	9	May 14, 1942	--	--	--	12	6.1	*31		12	63	29	.2	6.0	--	--	153	54	--	--	--	--	--
103	24	do	--	--	--	8.8	3.6	*13		6	12	20	--	25	--	--	85	37	--	--	--	--	--
203	21	do	--	--	--	13	2.4	*29		61	5	28	--	12	--	--	119	42	--	--	--	--	--
401	13	May 13, 1942	--	--	--	4.8	2.4	*8.1		18	2	10	.1	10	--	--	47	22	--	--	--	--	--
701	25	May 14, 1942	--	--	--	13	12	*38		12	2	35	--	130	--	--	236	83	--	--	--	--	--
17-48-102	26	Aug. 21, 1963	--	--	--	--	--	--		53	--	38	--	--	--	--	--	53	--	--	.00	299	5.6
202	18	Mar. 22, 1942	--	--	--	11	1.0	*104		12	30	84	--	120	--	--	356	31	--	--	--	--	--
202	18	Aug. 21, 1963	--	--	--	--	--	--		22	--	89	--	--	--	--	--	86	--	--	.00	696	5.6

See footnotes at end of table.

Table 11.--Chemical analyses of water from wells and springs in Camp, Franklin, Morris, Titus, and adjoining counties--Continued

Titus County

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe) (total)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Percent sodium	Sodium adsorption ratio (SAR)	Residual sodium carbonate (RSC)	Specific conductance (micromhos at 25°C)	pH
YA-17-48-801	13	May 22, 1942	--	--	--	11	4.9	*37		43	12	40	--	29	--	--	155	48	--	--	--	--	--
802	18	May 20, 1942	--	--	--	5.6	6.1	*17		31	7	12	--	33	--	--	96	39	--	--	--	--	--
901	25	May 22, 1942	--	--	--	13	4.9	*37		12	22	39	--	55	--	--	177	53	--	--	--	--	--
56-201	40	May 27, 1942	--	--	--	22	15	*17		12	2	18	--	141	--	--	221	114	--	--	--	--	--
303	20	May 20, 1942	--	--	--	26	4.6	*34		55	11	65	--	10	--	--	178	83	--	--	--	--	--
304	310	Aug. 13, 1963	18	1.8	--	7.5	2.6	*117		190	74	35	0.2	.0	--	--	347	29	90	9.4	2.53	560	7.2
401	11	May 27, 1942	--	--	--	16	7.3	*134		31	122	102	--	82	--	--	478	70	--	--	--	--	--
402	30	do	--	--	--	4.4	1.2	*19		18	30	4.0	.2	6.0	--	--	74	16	--	--	--	--	--
415	225	Jan. 17, 1963	12	.37	--	3.5	1.2	*132		248	71	15	.1	2.8	--	--	360	14	96	15	3.79	526	7.5
601	28	May 20, 1942	--	--	--	98	55	*67		171	185	199	.1	1.5	--	--	690	469	--	--	--	--	--
701	38	May 15, 1942	--	--	--	6.0	0	*5.1		18	4	5.0	0	0	--	--	29	15	--	--	--	--	--
† 707	260	Oct. 15, 1962	22	.1	--	6.7	2.5	*191.1		201.3	198	50.0	--	--	--	--	--	27	--	--	--	892	8.02
707	260	July 27, 1963	7.8	1.7	0.00	8.2	2.3	182	2.4	184	202	50	.1	2.8	0.24	0.09	548	30	92	14	2.42	866	7.0
801	Spring	May 15, 1942	--	--	--	8.8	2.4	*1.2		37	2	1.0	--	1.5	--	--	35	32	--	--	--	--	--
901	502	May 29, 1942	--	--	--	5.2	4.9	*297		323	2	288	.2	7.0	--	--	764	33	--	--	--	--	--
64-101	380	July 31, 1963	14	.09	--	3.8	.9	*82		187	1.8	24	.2	1.2	--	--	220	13	93	9.9	2.80	356	7.5
102	17	May 15, 1942	--	--	--	4.8	2.4	*22		49	3	15	.1	6.0	--	--	77	22	--	--	--	--	--
201	48	do	--	--	--	48	22	*124		43	30	254	--	66	--	--	565	208	--	--	--	--	--
301	40	do	--	--	--	205	126	*239		580	418	450	0	9.0	--	--	1,732	1,033	--	--	--	--	--
401	32	do	--	--	--	24	18	*127		98	30	195	--	32	--	--	474	136	--	--	--	--	--

* Sodium and potassium calculated as sodium (Na).
† Analyses by Curtis Laboratories.
a/ Includes the equivalent of 5 ppm as carbonate (CO_3).

ATTACHMENT D
Certification by a Qualified Professional Engineer

CERTIFICATION BY A QUALIFIED PROFESSIONAL ENGINEER

I certify that the selected and above described alternative source demonstration is appropriate for evaluating the groundwater monitoring data for the Welsh Bottom Ash Storage Pond CCR management area and that the requirements of §352.941(c) 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	September 5, 2023
License Number	Licensing State	Date

APPENDIX 4 - NA

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

APPENDIX 5- NA

Reports documenting monitoring well plugging and abandonment or well installation are included in the appendix. or other information required to be included in the annual report such as program related notification or assessment of corrective measures.

APPENDIX 6

Field reports and analytical reports.

CCR Groundwater Monitoring Well Inspection Form

Facility: AEP WELSH PP

Sampling Contractor: EAGLE

Sampling Period: FEBRUARY 2023

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	✓	✓	✓	✓	✓	✓	✓		13.48
AD-09	✓	✓	✓	✓	✓	✓	✓		12.75
AD-08	✓	✓	✓	✓	✓	✓	✓		19.95
AD-05	✓	✓	✓	✓	✓	✓	✓		17.83
AD-06	✓	✓	✓	✓	✓	✓	✓		13.17
AD-12	✓	✓	✓	✓	✓	✓	✓		
AD-01	✓	✓	✓	✓	✓	✓	✓		
AD-02	✓	✓	✓	✓	✓	✓	✓		
AD-03	✓	✓	✓	✓		✓	✓	PAD BROKEN	
AD-07	✓	✓	✓	✓	✓	✓	✓		
AD-16R	✓	✓	✓	✓	✓	✓	✓		17.31
AD-04C	✓	✓	✓	✓	✓	✓	✓		

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: AEP WELSH PP

Sampling Period: FEBRUARY 2023

Sampling Contractor: EADIE

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-04b	✓	✓	✓	✓	✓	✓	✓		6.67
AD-04	✓	✓	✓	✓	✓	✓	✓		15.90
AD-04a	✓	✓	✓	✓	✓	✓	✓		15.94
AD-17	✓	✓	✓	✓	✓	✓	✓		23.33
AD-18	✓	✓	✓	✓	✓	✓	✓		5.71
AD-22				✓	✓		✓	NO LOCK NO LABEL	4.66
AD-23	✓	✓	✓	✓	✓	✓	✓		9.34

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: Welsh

Sampling Period: 2-6-23

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-15	✓	✓	✓	✓	✓	✓	✓	
AD-16	✓	✓	✓	✓	✓	✓	✓	DTW 19.26
AD11	✓	✓	✓	✓	✓	✓	✓	
AD-14	✓	✓	✓	✓	✓	✓	✓	

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	AFF WELSHPP
Sample by	Kenny McDonald

Sample Location ID	AP-03

Depth to water, feet (TOC)	7.30
Measured Total Depth, feet (TOC)	20.13

Depth to water date	02/07/23

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	7.91	220	4.61	75	20.2	3.21	372	16.84		
0923	7.98	220	4.68	72	5.1	3.07	420	17.21		
0928	8.02	220	4.71	72	4.6	2.93	427	17.63		
0933	8.06	220	4.73	65	3.9	2.88	431	17.72		

Total volume purged	
Sample appearance	CLEAR
Sample time	0935
Sample date	02/07/23

Facility Name	AFP WELSHPP
Sample by	KENNY McDONALD

Sample Location ID	AD-04C

Depth to water, feet (TOC)	7.76
Measured Total Depth, feet (TOC)	18.82

Depth to water date	02/07/23

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)		
1042	8.13	210	4.82	343	1.8	8.23	427	18.59		
1047	8.20	210	4.86	350	4.7	2.48	226	18.61		
1052	8.26	210	4.91	350	3.8	2.41	232	18.63		
1057	8.33	210	4.91	352	4.5	2.36	224	18.66		

Total volume purged	
Sample appearance	CLEAR
Sample time	1059
Sample date	02/07/23

Facility Name	AEP WELSH PP
Sample by	Kenny McDonald

Sample Location ID	AD-08

Depth to water, feet (TOC)	13.81
Measured Total Depth, feet (TOC)	29.04

Depth to water date	02/06/23

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)		
1011	14.23	220	6.30	473	8.4	8.21	345	20.63		
1016	14.27	220	6.35	476	12.8	1.94	344	20.91		
1021	14.29	220	6.35	481	13.2	1.73	342	21.01		
1026	14.36	220	6.33	486	12.0	1.64	342	21.07		

Total volume purged	
Sample appearance	Clear
Sample time	1028
Sample date	02/06/23

Facility Name	AEP WELSH PP
Sample by	Kenny McDonald

Sample Location ID	AD-09

Depth to water, feet (TOC)	13.14
Measured Total Depth, feet (TOC)	36.45

Depth to water date	02/06/23

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	13.48	218	5.47	363	10.7	3.61	313	17.91		
0913	13.51	218	5.38	352	11.4	3.13	363	18.32		
0918	13.58	218	4.94	386	12.1	3.09	386	19.06		
0923	13.67	218	4.90	391	11.2	3.06	392	19.13		
0928	13.73	218	4.87	400	12.8	3.04	396	19.21		

Total volume purged	
Sample appearance	
Sample time	0930
Sample date	02/06/23

Facility Name	WISH
Sample by	Matt Hamill

Depth to water, feet (TOC)	14.21
Measured Total Depth, feet (TOC)	22.16

Sample Location ID	AD-11
Depth to water date	2-6-23

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	14.32	220	5.46	480	13.7	0.01	136	14.35		
1030	14.34	220	5.04	656	3.2	0.01	151	14.65		
1035	14.35	220	5.02	656	2.1	0.01	155	14.74		

Total volume purged	
Sample appearance	clear
Sample time	1037
Sample date	2-6-23

Duplicate
915

Facility Name	AEP WELSHPP
Sample by	Kenny McDonald

Sample Location ID	AO-13

Depth to water, feet (TOC)	14.00
Measured Total Depth, feet (TOC)	19.40

Depth to water date	02/06/23

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)		
0846	15.13	110	5.43	456	2.8	4.64	372	20.12		
0851	16.04	110	5.48	423	4.6	3.91	373	20.23		
			WON'T HOLD WATER LEVEL							

Total volume purged	
Sample appearance	clear
Sample time	1103
Sample date	02/06/23

Facility Name	Welsh
Sample by	Matt Hamilton

Depth to water, feet (TOC)	12.64
Measured Total Depth, feet (TOC)	21.27

Sample Location ID	MW-14
Depth to water date	2-6-23

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)		
1120	12.82	220	4.84	337	21.3	0.01	227	20.84		
1125	12.63	220	4.77	304	0	0.15	243	20.43		
1130	12.67	220	4.77	295	0	0.25	245	20.33		

Total volume purged	
Sample appearance	clear
Sample time	1132
Sample date	2-6-23

Facility Name	Welsh
Sample by	Matt Hamilton

Depth to water, feet (TOC)	21.01
Measured Total Depth, feet (TOC)	44.15

Sample Location ID	AD-15
Depth to water date	2-6-23

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)		
925	21.43	250	4.37	258	33	0.85	196	17.03		
930	21.51	250	4.22	147	24	0.13	201	20.18		
935	21.54	250	4.22	137	18	0.04	198	24.75		
940	21.56	250	4.23	135	12	0.08	193	24.93		
945	21.58	250	4.25	138	7.5	0.01	186	24.04		
950	21.59	250	4.32	144	6.2	0.06	174	21.26		
955	21.56	250	4.33	147	6.2	0.05	169	21.34		

Total volume purged	
Sample appearance	clear
Sample time	957
Sample date	2-6-23

Facility Name	AEP WNSHPP
Sample by	Kenny McDonald

Sample Location ID	AO-16R

Depth to water, feet (TOC)	26.03
Measured Total Depth, feet (TOC)	31.30

Depth to water date	02/07/23

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)		
1000	26.32	120	3.75	212	11.8	5.31	488	18.37		
1005	26.37	120	3.71	209	3.6	2.21	432	18.44		
1010	26.40	120	3.67	202	2.9	2.18	427	18.41		
1015	26.44	120	3.65	197	2.7	2.14	419	18.49		

Total volume purged	
Sample appearance	CLEAR
Sample time	1017
Sample date	02/07/23

CCR Groundwater Monitoring Well Inspection Form

Facility: Weber Sampling Period: June 2023

Sampling Contractor: Eagle 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 DTW = Depth to Water
AD-15	✓	✓	✓	✓	✓	✓	✓	
AD-11	✓	✓	✓		✓	✓	✓	vegitation around well overgrown
AD-14	✓	✓	✓		✓	✓	✓	vegitation around well overgrown
AD-10	✓	✓	✓		✓	✓	✓	DTW-15.61 overgrown
AD-16A	✓	✓	✓	✓	✓	✓	✓	
AD-3	✓	✓	✓	✓	✓	✓	✓	no bollards
AD-2	✓	✓	✓	✓		✓	✓	DTW - 15.01 no bollards
AD-17	✓	✓	✓	✓	✓	✓	✓	
AD-18	✓	✓	✓	✓	✓	✓	✓	DTW 7.03
AD-22	✓	✓	✓		✓	✓	✓	DTW 10.94
AD-23	✓	✓	✓		✓	✓	✓	DTW 12.01

*Not all wells will be vented, especially flush mounted wells. If that is the case, please note "flush mount well" in the comments.

CCR Groundwater Monitoring Well Inspection Form

Facility: WELSH PP

Sampling Period: JUNE 2023

Sampling Contractor: EAGLE ENVIRONMENTAL

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-08	✓	✓	✓	✓	✓	✓	✓		
AD-04C	✓	✓	✓	✓	✓	✓	✓		
AD-04	✓	✓	✓	✓	✓	✓	✓		17.52
AD-04A	✓	✓	✓	✓	✓	✓	✓		17.61
AD-04B	✓	✓	✓	✓	✓	✓	✓		8.63
AD-07	✓	✓	✓	✓	✓	✓	✓		17.23
AD-12	✓	✓	✓	✓	✓	✓	✓		
AD-06	✓	✓	✓	✓	✓	✓	✓		13.13
AD-05	✓	✓	✓	✓	✓	✓	✓		
AD-09	✓	✓	✓	✓	✓	✓	✓		
AD-01	✓	✓	✓			✓	✓	NOT MOWED	

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 WASH PP
Sample by	Kerry McDonald

Sample Location ID	AP-01

Depth to water, feet (TOC)	18.38
Measured Total Depth, feet (TOC)	28.71

Depth to water date	06/06/23

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)		
1037	18.42	214	4.99	364	13.6	1.78	198	23.12		
1042	18.46	214	4.93	304	1.3	1.50	197	23.08		
1047	18.51	214	4.92	292	1.8	1.36	191	23.04		
1052	18.56	214	4.91	291	0.9	1.31	186	22.97		

Total volume purged	
Sample appearance	clear
Sample time	1054
Sample date	06/06/23

BACKGROUND DUPLICATE 1200

Facility Name	Welsh
Sample by	Matt Hamilton

Sample Location ID	AD-3

Depth to water, feet (TOC)	9.04
Measured Total Depth, feet (TOC)	20.13

Depth to water date	6-6-23

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)		
1042	9.48	300	4.04	112	37.5	2.4	338	25.58		
1047	9.54	300	4.22	102	19.3	3.46	331	24.85		
1052	9.60	300	4.30	64	9.5	3.49	327	24.72		
1057	9.61	300	4.31	63	9.6	3.51	324	24.68		

Total volume purged	
Sample appearance	clear
Sample time	1059
Sample date	6-6-23

Facility Name	AEP Rivesh PP
Sample by	Kenny McDonald

Sample Location ID	AD-04C

Depth to water, feet (TOC)	8.84
Measured Total Depth, feet (TOC)	18.82

Depth to water date	06/05/23

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)		
1014	8.94	200	5.25	339	18.2	3.28	336	22.54		
1019	8.99	200	5.15	338	17.5	2.41	198	22.27		
1024	9.03	200	5.12	337	17.3	2.33	174	22.13		
1029	9.09	200	5.10	335	17.3	2.29	170	22.06		
1034	9.14	200	5.08	334	17.0	2.27	163	22.01		

Total volume purged	
Sample appearance	Clear
Sample time	1036
Sample date	06/05/23

Facility Name	AMP WELSH PP
Sample by	Kinny McDonald

Sample Location ID	AD-05

Depth to water, feet (TOC)	14.42
Measured Total Depth, feet (TOC)	32.88

Depth to water date	06/06/23

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)		
0826	15.37	104	5.75	464	166	4.57	271	21.52		
0831	16.52	104	5.80	463	158	3.52	195	21.40		
				WON'T HOLD	WATER LEVEL					

Total volume purged	
Sample appearance	TURBID
Sample time	0900
Sample date	06/06/23

Facility Name	AEP WELSH PP
Sample by	Kenny McDaniel

Sample Location ID	AD-08

Depth to water, feet (TOC)	14.50
Measured Total Depth, feet (TOC)	29.04

Depth to water date	06/05/23

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)		
0856	14.72	210	6.45	471	13.6	2.81	318	22.45		
0901	14.74	210	6.11	474	8.3	2.78	339	22.79		
0906	14.74	210	6.11	473	9.0	2.75	345	22.87		
0911	14.77	210	6.13	472	8.6	2.73	353	22.89		

Total volume purged	
Sample appearance	CLEAR
Sample time	0913
Sample date	06/05/23

PBAP DUPLICATE 1200

Facility Name	AEP WELSH PP
Sample by	Kenny McDonald

Sample Location ID	AD-09

Depth to water, feet (TOC)	14.23
Measured Total Depth, feet (TOC)	36.45

Depth to water date	06/06/23

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)		
0938	14.31	218	5.08	568	2.8	2.62	217	23.77		
0943	14.33	218	5.05	566	1.1	2.37	219	23.81		
0948	14.39	218	5.07	557	0.7	2.34	213	23.84		
0953	14.42	218	5.10	561	0.9	2.31	211	23.87		

Total volume purged	
Sample appearance	CLEAR
Sample time	0955
Sample date	06/06/23

Facility Name	Welsh
Sample by	Matt Hamilton

Depth to water, feet (TOC)	14.98
Measured Total Depth, feet (TOC)	22.10

Sample Location ID	AD-11
Depth to water date	6-5-23

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	15.08	200	3.31	884	35.7	1.58	278	22.65		
1043	15.08	200	3.37	908	16.6	0.60	255	21.45		
1048	15.10	200	3.94	93-	17.5	0.48	252	21.42		
1053	15.11	200	3.97	937	17.7	0.45	254	21.41		

Total volume purged	
Sample appearance	clear
Sample time	1055
Sample date	6-5-23

Land fill Duplicate

1122

Facility Name	AEP WELSH PP
Sample by	Kenny McDonald

Sample Location ID	AD-13

Depth to water, feet (TOC)	16.02
Measured Total Depth, feet (TOC)	19.40

Depth to water date	06/05/23

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)		
0838	16.94	104	4.62	490	20.7	3.82	227	22.54		
0843	18.02	104	4.64	493	19.4	2.97	235	22.61		
			won't	Hold water level						

Total volume purged	
Sample appearance	clear
Sample time	1114
Sample date	06/05/23

Facility Name	Welsh
Sample by	Matt Hamilton

Sample Location ID	AD-14

Depth to water, feet (TOC)	15.39
Measured Total Depth, feet (TOC)	21.27

Depth to water date	6-5-23

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)		
1141	15.58	220	4.26	884	25.4	7.50	331	23.46		
1146	15.70	220	4.95	879	19.9	0.73	310	22.11		
1151	15.78	220	5.33	863	8.9	0.68	299	21.84		
1156	15.79	220	5.34	861	9.1	0.66	297	21.76		

Total volume purged	
Sample appearance	clear
Sample time	1158
Sample date	6-5-23

Facility Name	Welsh
Sample by	Matt Hamilton

Sample Location ID	AD-15

Depth to water, feet (TOC)	21.87
Measured Total Depth, feet (TOC)	49.15

Depth to water date	6-5-23

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)		
928	21.89	280	4.03	325	623	1.73	260	23.34		
933	22.02	280	4.09	165	458	1.68	285	23.33		
938	22.11	280	4.14	149	354	1.21	268	23.42		
943	22.15	280	4.17	152	149	0.99	286	23.50		
948	22.17	280	4.19	158	137	0.87	284	23.59		
953	22.18	280	4.23	164	136	0.79	279	23.65		
958	22.18	280	4.27	170	135	0.74	275	23.71		
1003	22.19	280	4.30	179	130	0.70	271	23.73		
1008	22.19	280	4.32	182	131	0.67	264	23.76		
1013	22.19	280	4.33	183	132	0.66	268	23.77		

Total volume purged	
Sample appearance	turbid
Sample time	1015
Sample date	6-5-23

Facility Name	Welsh
Sample by	Matt Hamilton

Depth to water, feet (TOC)	25.98
Measured Total Depth, feet (TOC)	31.30

Sample Location ID	AD-16R
Depth to water date	6-6-23

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)		
937	26.19	150	3.36	217	3.4	2.77	225	23.04		
943	26.34	150	3.39	208	1.5	2.59	328	22.21		
949	26.43	150	3.42	205	0	2.53	336	22.09		

Total volume purged	
Sample appearance	clear
Sample time	949
Sample date	6-6-23

BASP D-p

1021

Facility Name	Plant Hammond
Sample by	Welsh

Depth to water, feet (TOC)	23.23
Measured Total Depth, feet (TOC)	41.47

Sample Location ID	AD-17
Depth to water date	6-6-23

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)		
851	23.99	100	5.86	1,720	213	1.23	65	26.23		
856	24.72	100	5.35	1,770	252	2.72	49	22.67		
				W.H Not						
				Hold						

Total volume purged	
Sample appearance	Clear
Sample time	1134
Sample date	6-6-23

Facility Name	ACP WELSH PP
Sample by	Kenny McDonald

Sample Location ID	AD-04C

Depth to water, feet (TOC)	8.52
Measured Total Depth, feet (TOC)	18.82

Depth to water date	07/27/23

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)		
1407	8.59	180	5.09	306	18.2	4.21	195	27.68		
1412	8.61	180	5.09	305	15.9	3.63	127	28.16		
1417	8.62	180	5.09	304	14.6	3.48	118	28.29		
1422	8.62	180	5.08	305	15.0	3.43	111	28.31		
1427	8.64	180	5.08	305	14.3	3.41	108	28.35		

Total volume purged	
Sample appearance	clear
Sample time	1429
Sample date	07/27/23

CCR Groundwater Monitoring Well Inspection Form

Facility: AEP WELSH PP

Sampling Period: OCTOBER 2023

Sampling Contractor: EAGLE

Signature: KAM

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	DTW
AD-13	✓	✓	✓	✓	✓	✓	✓		
AD-09	✓	✓	✓	✓	✓	✓	✓		
AD-08	✓	✓	✓	✓	✓	✓	✓		
AD-07	✓	✓	✓	✓	✓	✓	✓		16.99
AD-05	✓	✓	✓	✓	✓	✓	✓		
AD-04c	✓	✓	✓	✓	✓	✓	✓		
AD-04b	✓	✓	✓	✓	✓	✓	✓		9.90
AD-04	✓	✓	✓	✓	✓	✓	✓		18.62
AD-04a	✓	✓	✓	✓	✓	✓	✓		18.71
AD-01	✓	✓	✓		✓	✓	✓	OVERGROWN	
AD-12	✓	✓	✓		✓	✓	✓	OVERGROWN	21.40
AD-06	✓	✓	✓		✓	✓	✓	OVERGROWN	14.03

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: Welsh

Sampling Period: Oct 2023

Sampling Contractor: Eagle

Signature: Tabb Tomo

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
AD-15	✓	✓	✓	✓	✓	✓	✓	
AD-10	✓	✓	✓	✓	✓	✓	✓	
AD-11	✓	✓	✓	✓	✓	✓	✓	
AD-14	✓	✓	✓	✓	✓	✓	✓	
AD-17	✓	✓	✓	✓	✓	✓	✓	
AD-18	✓	✓	✓	✓	✓	✓	✓	
AD-16R	✓	✓	✓	✓	✓	✓	✓	
AD-3	✓	✓	✓	✓		✓	✓	no bullets
AD-2	✓	✓	✓	✓		✓	✓	no Bullets
AD-22	✓	✓	✓	✓	✓	✓	✓	
AD-23	✓	✓	✓	✓	✓	✓	✓	

*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 WELSH PP
Sample by	KEARY McDONALD

Sample Location ID	AD-01

Depth to water, feet (TOC)	19.06
Measured Total Depth, feet (TOC)	28.71

Depth to water date	10/04/23

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	19.26	220	5.30	270	2.8	2.11	383	24.45		
0959	19.27	220	5.30	268	1.3	2.10	387	24.43		
1004	19.27	220	5.29	267	1.1	2.08	389	24.43		
1009	19.29	220	5.29	267	0.8	2.05	391	24.40		

Total volume purged	
Sample appearance	CLEAR
Sample time	1011
Sample date	10/04/23

BACKGROUND DUP 1200

Facility Name	Welch
Sample by	M.H. Hamilton

Depth to water, feet (TOC)	10.13
Measured Total Depth, feet (TOC)	21.13

Sample Location ID	AD-3
Depth to water date	10-4-23

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)		
1013	10.45	300	4.71	69	15.1	1.35	337	25.43		
1018	11.06	300	4.54	66	20.5	0.65	337	20.46		
1023	11.11	300	4.49	65	23.2	0.52	340	25.53		
1028	11.12	300	4.48	64	23.3	0.49	343	25.48		

Total volume purged	
Sample appearance	clear
Sample time	1030
Sample date	10-4-23

Facility Name	AEP WELSH PP
Sample by	KENNY McDONALD

Sample Location ID	AP-04C

Depth to water, feet (TOC)	10.01
Measured Total Depth, feet (TOC)	18.82

Depth to water date	10/04/23

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)		
0904	10.11	210	4.84	345	12.6	4.11	382	24.62		
0909	10.16	210	4.92	341	11.8	3.07	342	24.65		
0914	10.20	210	4.94	340	10.7	2.93	396	24.67		
0919	10.23	210	4.97	340	11.2	2.88	401	24.68		

Total volume purged	
Sample appearance	CLEAR
Sample time	0921
Sample date	10/04/23

Facility Name	AEP WELSH PP
Sample by	Kenny McDonald

Sample Location ID	AP-05

Depth to water, feet (TOC)	14.38
Measured Total Depth, feet (TOC)	32.88

Depth to water date	10/04/23

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)		
0836	15.21	100	6.45	648	116	2.79	329	24.79		
0841	16.16	100	6.59	484	82.3	1.43	87	24.86		
				Won't Hold						

Total volume purged	
Sample appearance	SLIGHTLY TURBID
Sample time	1118
Sample date	10/04/23

Facility Name	AFP WELSH PP
Sample by	Kerry McDonald

Sample Location ID	AD-08

Depth to water, feet (TOC)	14.57
Measured Total Depth, feet (TOC)	29.04

Depth to water date	10/03/23

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)		
1003	14.61	216	6.59	455	4.8	2.03	47	26.42		
1008	14.61	216	6.67	442	2.3	1.69	43	26.69		
1013	14.61	216	6.67	438	1.6	1.68	40	26.73		
1018	14.63	216	6.68	433	1.3	1.65	39	26.76		

Total volume purged	
Sample appearance	clear
Sample time	1020
Sample date	10/03/23

PBAP Duplicate 1200

Facility Name	AEP WELSH PP
Sample by	Kenny McDonald

Sample Location ID	AD-9

Depth to water, feet (TOC)	14.11
Measured Total Depth, feet (TOC)	36.45

Depth to water date	10/03/23

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)		
856	14.18	220	6.32	2450	1.4	5.60	192	23.01		
901	14.21	220	5.88	1300	0.0	2.34	28	23.09		
906	14.22	220	5.87	1310	0.0	2.33	16	22.87		
916	14.27	220	5.85	1480	0.6	2.27	20	23.01		
921	14.29	220	5.84	1460	0.0	2.24	24	22.96		

Total volume purged	
Sample appearance	CLEAR
Sample time	0923
Sample date	10/03/23

Facility Name	
Sample by	Welsh Matt Hamilton

Depth to water, feet (TOC)	15.15
Measured Total Depth, feet (TOC)	22.10

Sample Location ID	AD-11
Depth to water date	10-3-23

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)		
958	15.32	200	4.27	1,110	3.2	1.13	235	26.62		
1003	15.35	200	4.15	1,080	27.9	0.69	282	25.75		
1008	15.37	200	4.12	1,050	19.0	0.64	285	25.33		
1013	15.38	200	4.12	1050	19.2	0.65	286	25.24		

Total volume purged	
Sample appearance	clear
Sample time	1015
Sample date	10-3-23

Landfill Dup

1036

Facility Name	AEP WELSH PP
Sample by	KENNY McDONALD

Sample Location ID	AD-13

Depth to water, feet (TOC)	16.54
Measured Total Depth, feet (TOC)	19.40

Depth to water date	10/03/23

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)		
0836	17.42	98	5.40	429	16.4	3.30	286	28.93		
0841	18.71	98	5.32	437	14.8	2.71	261	28.72		
			WON'T HOLD							

Total volume purged	
Sample appearance	CLEAR
Sample time	1118
Sample date	10/03/23

Facility Name	Welch
Sample by	Matt Hamilton

Depth-to water, feet (TOC)	16.31
Measured Total Depth, feet (TOC)	21.27

Sample Location ID	AP-14
Depth to water date	10-3-23

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)		
1057	16.53	220	4.55	981	34.3	2.47	263	3.49		
1102	16.82	220	4.58	686	8.9	0.98	285	26.73		
1107	16.64	220	4.61	872	5.3	0.95	290	26.25		

Total volume purged	
Sample appearance	clear
Sample time	1109
Sample date	10.3.23

Facility Name	Welsh
Sample by	Matt Hamilton

Depth-to water, feet (TOC)	22.47
Measured Total Depth, feet (TOC)	44.15

Sample Location ID	AD-15
Depth to water date	10-3-23

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)		
913	23.15	280	4.48	214	12.8	2.48	185	25.68		
918	23.23	280	4.63	137	50.1	0.66	164	25.28		
923	23.26	280	4.83	136	37.1	0.57	170	25.34		
928	23.28	280	4.86	164	31.5	0.51	164	25.45		
933	23.25	280	4.87	166	81.2	0.49	161	25.48		
938	23.30	280	4.87	168	31.1	0.48	159	25.50		

Total volume purged	
Sample appearance	clear
Sample time	940
Sample date	10-3-23

AD-10 - 19.24
AD-2 - 15.56
AD-18 - 9.31
AD-22 11.85
AD-23 13.33

Facility Name	Welsh
Sample by	Matt Hamilton

Depth to water, feet (TOC)	26.72
Measured Total Depth, feet (TOC)	31.36

Sample Location ID	AD-16R
Depth to water date	10-4-23

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)		
902	27.31	150	3.58	205	1.8	2.09	397	23.35		
907	27.42	150	3.56	168	0	1.31	409	22.67		
912	27.50	150	3.55	194	0	1.26	415	22.50		

Total volume purged	
Sample appearance	clear
Sample time	914
Sample date	10-4-23

BASP

Dup @ 113a

Facility Name	Weed
Sample by	Matt Hamilton

Depth to water, feet (TOC)	23.15
Measured Total Depth, feet (TOC)	41.47

Sample Location ID	AD-17
Depth to water date	10-4-23

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)		
834	24.06	100	5.83	1,760	85.8	1.27	16	23.91		
839	24.91	100	5.75	1,780	78.6	0.66	12	22.53		
				Well not hold						
				Water level						

Total volume purged	
Sample appearance	slightly turbid
Sample time	11:07
Sample date	10-4-23

CCR Groundwater Monitoring Well Inspection Form

Facility: Welsh

Sampling Period: Dec 2023

Sampling Contractor: Eagle

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-16R	✓	✓	✓	✓	✓	✓	✓	
AD-4C	✓	✓	✓	✓	✓	✓	✓	
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	Metal Fabrication
Sample by	Welch

Depth to water, feet (TOC)	9.25
Measured Total Depth, feet (TOC)	20.13

Sample Location ID	AD-3
Depth to water date	12-14-23

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	9.46	300	4.29	77	83.4	3.72	390	17.41		
1051	10.15	300	4.42	69	54.2	1.02	400	18.43		
1056	14.17	300	4.49	68	19.5	0.97	407	19.06		
1101	10.18	300	4.56	69	20.1	0.96	411	16.10		

Total volume purged	
Sample appearance	Clear
Sample time	1103
Sample date	12-14-23

Facility Name	Welsh
Sample by	Hart Hamilton

Depth to water, feet (TOC)	8.27
Measured Total Depth, feet (TOC)	16.82

Sample Location ID	AD-4C
Depth to water date	12-14-23

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)		
937	8.33	220	4.51	421	33.4	9.88	265	15.11		
942	8.40	220	4.41	331	42.8	0.45	308	16.94		
947	8.52	220	4.54	330	43.5	0.76	324	17.43		
952	8.58	220	4.57	326	42.8	0.66	328	17.81		
957	8.61	220	4.57	324	42.9	0.65	330	17.89		

Total volume purged	
Sample appearance	clear
Sample time	959
Sample date	12-14-23

Facility Name	Welsh
Sample by	Matt Hamilton

Depth to water, feet (TOC)	27.45
Measured Total Depth, feet (TOC)	31.30

Sample Location ID	AD-16R
Depth to water date	12-14-23

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)		
915	27.42	150	3.66	142	21.9	5.55	40	15.58		
920	28.06	150	3.69	150	20.2	1.64	50	17.65		
925	28.18	150	3.72	153	20.5	1.79	517	17.74		

Total volume purged	
Sample appearance	Clear
Sample time	927
Sample date	12-14-23

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 230473 **Customer: Welsh Power Station** **Date Reported: 03/10/2023**

Customer Sample ID: AD-3 Customer Description: TG-32
Lab Number: 230473-001 Preparation:
Date Collected: 02/07/2023 10:35 EST Date Received: 02/13/2023 10:30 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Calcium	0.57	mg/L	1	0.05	0.02		GES	02/15/2023 09:16	EPA 200.8-1994, Rev. 5.4

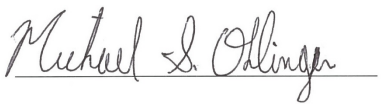
Customer Sample ID: AD-4c Customer Description: TG-32
Lab Number: 230473-002 Preparation:
Date Collected: 02/07/2023 11:59 EST Date Received: 02/13/2023 10:30 EST

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.120	mg/L	1	0.050	0.009		GES	02/15/2023 09:22	EPA 200.8-1994, Rev. 5.4
Calcium	1.65	mg/L	1	0.05	0.02		GES	02/15/2023 09:22	EPA 200.8-1994, Rev. 5.4

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

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

230473 - Metals

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125

Contacts: Michael Ohlinger (614-836-4184)

Project Name: Welsh BASP
Contact Name: Jill Parker-Witt
Contact Phone: (318) 673-3816
Sampler(s): Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 230438

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 Boron	250 mL bottle, pH<2, HNO_3 Calcium	1 L bottle, Cool, 0-6°C Chloride	1 L bottle, Cool, 0-60C Sulfate	1 L bottle, Cool, 0-60C TDS			Sample Specific Notes:
AD-3	2/7/2023	935	G	GW	2			X		X				TG-32 needed
AD-4c	2/7/2023	1059	G	GW	2		X	X	X	X	X			
AD-16R	2/7/2023	1017	G	GW	1				X					
Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____; F= filter in field							4	4	1	1	1			

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by: KAM	Company: EAGLE	Date/Time: 02/08/23 1200	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: 2/9/23

Michael Ohlinger

2/13/23 - Metals

WATER & WASTE SAMPLE RECEIPT FORM (IR#1)

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS FedEX USPS
	Other _____

Plant/Customer Welsh Number of Plastic Containers: 2

Opened By MSO Number of Glass Containers: —

Date/Time 2/13/23 10:30AM Number of Mercury Containers: —

Were all temperatures within 0-6°C? Y / N or (N/A) Initial: _____ on ice / (no ice)

(IR Gun Ser# 210441568, *Expir.5/27/2023)* - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? Y / (N) Comments Received with Cold Samples

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 COC filled out properly? Y (N) Comments Metals sent separately

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 2/13/23

pH paper (circle one): MQuant pH Cat 1.09535.0001 lot HC904495 _____ (OR) Lab rat pH Cat # LRS -4801 Lot X000RWDG21 _____

- 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# 230473 Initial & Date & Time : _____

Logged by MSO Comments: _____

Reviewed by _____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

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	Jonathan Barnhill	Lab Supervisor	3/10/2023
Name (printed)	Signature	Official Title	Date

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Pirkey PP

Reviewer Name: Jonathan Barnhill

LRC Date: 3/10/2023

Laboratory Job Number: 230473

Prep Batch Number(s): PB23021411 QC2302100

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	

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 PP

Reviewer Name: Jonathan Barnhill

LRC Date: 3/10/2023

Laboratory Job Number: 230473

Prep Batch Number(s): PB23021411 QC2302100

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	

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

Reviewer Name: Jonathan Barnhill

LRC Date: 3/10/2023

Laboratory Job Number: 230473

Prep Batch Number(s): PB23021411 QC2302100

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: 230438 **Customer: Welsh Power Station** **Date Reported: 03/10/2023**

Customer Sample ID: AD-3
Customer Description: TG-32
Lab Number: 230438-001
Preparation:
Date Collected: 02/07/2023 10:35 EST
Date Received: 02/09/2023 10:00 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Sulfate	3.39	mg/L	2	0.40	0.06		CRJ	02/15/2023 14:07	EPA 300.1 -1997, Rev. 1.0

Customer Sample ID: AD-4c
Customer Description: TG-32
Lab Number: 230438-002
Preparation:
Date Collected: 02/07/2023 11:59 EST
Date Received: 02/09/2023 10:00 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	10.9	mg/L	2	0.04	0.02		CRJ	02/15/2023 14:40	EPA 300.1 -1997, Rev. 1.0
Sulfate	111	mg/L	10	2.0	0.3		CRJ	02/16/2023 03:17	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	320	mg/L	1	50	20		SDW	02/10/2023 10:28	SM 2540C-2015

Customer Sample ID: AD-16R
Customer Description: TG-32
Lab Number: 230438-003
Preparation:
Date Collected: 02/07/2023 11:17 EST
Date Received: 02/09/2023 10:00 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	6.85	mg/L	2	0.04	0.02		CRJ	02/15/2023 15:13	EPA 300.1 -1997, Rev. 1.0

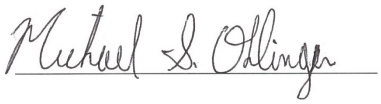
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 230438 **Customer: Welsh Power Station** **Date Reported: 03/10/2023**

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

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)

Project Name: Welsh BASP
Contact Name: Jill Parker-Witt
Contact Phone: (318) 673-3816
Sampler(s): Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
Routine (26 days)

Site Contact: | Date:

For Lab Use Only:
COC/Order #: 230438

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 Boron	250 mL bottle, pH<2, HNO_3 Calcium	1 L bottle, Cool, 0-6°C Chloride	1 L bottle, Cool, 0-60C Sulfate	1 L bottle, Cool, 0-60C TDS			Sample Specific Notes:
AD-3	2/7/2023	935	G	GW	2			X		X				TG-32 needed
AD-4c	2/7/2023	1059	G	GW	2		X	X	X	X	X			
AD-16R	2/7/2023	1017	G	GW	1				X					
Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____; F= filter in field							4	4	1	1	1			

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
KAM	EAGLE	02/08/23 1200		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: Michael Ohlinger	Date/Time: 2/9/23

Form COC-04, AEP Chain of Custody (COC) Record for Coal Combustion Residual (CCR) Sampling - Shreveport, Rev. 1, 1/10/17

WATER & WASTE SAMPLE RECEIPT FORM (Temp Gun 1)

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Welsh — Number of Plastic Containers: 3

Opened By MGK/TTP — Number of Glass Containers: -

Date/Time 2/9/23 — 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# 221368900, *Expir. 3/22/2024)* - 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 Metals not received

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:** _____

pH paper (circle one): MQuant,PN1.09535.0001,LOT# HC904495 (OR) ~~Lab Rat~~,PN4801,LOT# X000RWDG21

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# 230438 — Initial & Date & Time : _____

Comments: _____

Logged by MSJ

Reviewed by (TP)

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.

Timothy Arnold		Chemist Principal	3/10/2023
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: Welsh BASP

Reviewer Name: Timothy Arnold

LRC Date: 3/10/2023

Laboratory Job Number: 230438

Prep Batch Number(s): QC2302093

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	

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh BASP

Reviewer Name: Timothy Arnold

LRC Date: 3/10/2023

Laboratory Job Number: 230438

Prep Batch Number(s): QC2302093

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: Welsh BASP

Reviewer Name: Timothy Arnold

LRC Date: 3/10/2023

Laboratory Job Number: 230438

Prep Batch Number(s): QC2302093

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."

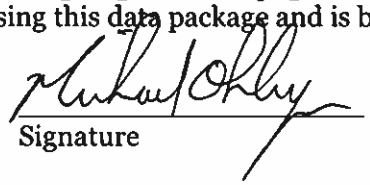
Municipal Solid Waste Laboratory Review Checklist

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	3/9/23
Name (printed)	Signature	Official Title	Date

TDS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh BASP

Reviewer Name: Michael Ohlinger

LRC Date: 3/9/2023

Laboratory Job Number: 230438

Prep Batch Number(s): QC2302059

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: Welsh BASP

Reviewer Name: Michael Ohlinger

LRC Date: 4/5/22

Laboratory Job Number: 230438

Prep Batch Number(s): QC2302059

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: Welsh BASP

Reviewer Name: Michael Ohlinger

LRC Date: 3/9/2023

Laboratory Job Number: 230438

Prep Batch Number(s): QC2302059

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."

Water Analysis Report

Reissued

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231717 **Customer: Welsh Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-3
Customer Description: TG-32
Lab Number: 231717-001
Preparation:
Date Collected: 06/06/2023 11:59 EDT
Date Received: 06/09/2023 13:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.022	µg/L	1	0.100	0.008	J1	GES	06/20/2023 10:14	EPA 200.8-1994, Rev. 5.4
Arsenic	0.51	µg/L	1	0.10	0.03		GES	06/20/2023 10:14	EPA 200.8-1994, Rev. 5.4
Barium	34.5	µg/L	1	0.20	0.05		GES	06/20/2023 10:14	EPA 200.8-1994, Rev. 5.4
Beryllium	0.173	µg/L	1	0.050	0.007		GES	06/20/2023 10:14	EPA 200.8-1994, Rev. 5.4
Boron	0.007	mg/L	1	0.050	0.007	J1	GES	06/20/2023 10:14	EPA 200.8-1994, Rev. 5.4
Cadmium	0.034	µg/L	1	0.020	0.004		GES	06/20/2023 10:14	EPA 200.8-1994, Rev. 5.4
Calcium	0.65	mg/L	1	0.05	0.01		GES	06/20/2023 10:14	EPA 200.8-1994, Rev. 5.4
Chromium	0.52	µg/L	1	0.30	0.07		GES	06/20/2023 10:14	EPA 200.8-1994, Rev. 5.4
Cobalt	1.12	µg/L	1	0.020	0.005		GES	06/20/2023 10:14	EPA 200.8-1994, Rev. 5.4
Lead	0.61	µg/L	1	0.20	0.05		GES	06/20/2023 10:14	EPA 200.8-1994, Rev. 5.4
Lithium	0.0103	mg/L	1	0.00030	0.00007		GES	06/20/2023 10:14	EPA 200.8-1994, Rev. 5.4
Magnesium	0.483	mg/L	1	0.100	0.006		GES	06/20/2023 10:14	EPA 200.8-1994, Rev. 5.4
Mercury	560	ng/L	10	50	20		JAB	06/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	06/20/2023 10:14	EPA 200.8-1994, Rev. 5.4
Potassium	0.477	mg/L	1	0.100	0.008		GES	06/20/2023 10:14	EPA 200.8-1994, Rev. 5.4
Selenium	0.20	µg/L	1	0.50	0.04	J1	GES	06/20/2023 10:14	EPA 200.8-1994, Rev. 5.4
Sodium	8.07	mg/L	1	0.20	0.01		GES	06/20/2023 10:14	EPA 200.8-1994, Rev. 5.4
Thallium	0.02	µg/L	1	0.20	0.02	J1	GES	06/20/2023 10:14	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	0.12	0.17		TTP	06/26/2023 16:02	SW-846 9315-1986, Rev. 0
Carrier Recovery	104	%						
Radium-228	0.15	pCi/L	0.13	0.44		ST	06/29/2023 13:45	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	92.6	%						

* 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
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 231717 **Customer: Welsh Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-4c
Customer Description: TG-32
Lab Number: 231717-002
Preparation:
Date Collected: 06/05/2023 11:36 EDT
Date Received: 06/09/2023 13:30 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	GES	06/20/2023 10:19	EPA 200.8-1994, Rev. 5.4
Arsenic	0.59	µg/L	1	0.10	0.03		GES	06/20/2023 10:19	EPA 200.8-1994, Rev. 5.4
Barium	48.2	µg/L	1	0.20	0.05		GES	06/20/2023 10:19	EPA 200.8-1994, Rev. 5.4
Beryllium	0.15	µg/L	5	0.25	0.04	J1	GES	06/20/2023 10:49	EPA 200.8-1994, Rev. 5.4
Boron	0.061	mg/L	1	0.050	0.007		GES	06/20/2023 10:19	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	06/20/2023 10:19	EPA 200.8-1994, Rev. 5.4
Calcium	0.93	mg/L	1	0.05	0.01		GES	06/20/2023 10:19	EPA 200.8-1994, Rev. 5.4
Chromium	0.51	µg/L	1	0.30	0.07		GES	06/20/2023 10:19	EPA 200.8-1994, Rev. 5.4
Cobalt	0.476	µg/L	1	0.020	0.005		GES	06/20/2023 10:19	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	06/20/2023 10:19	EPA 200.8-1994, Rev. 5.4
Lithium	0.0051	mg/L	5	0.0015	0.0004		GES	06/20/2023 10:49	EPA 200.8-1994, Rev. 5.4
Magnesium	0.591	mg/L	1	0.100	0.006		GES	06/20/2023 10:19	EPA 200.8-1994, Rev. 5.4
Mercury	130	ng/L	10	50	20		JAB	06/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	06/20/2023 10:19	EPA 200.8-1994, Rev. 5.4
Potassium	0.216	mg/L	1	0.100	0.008		GES	06/20/2023 10:19	EPA 200.8-1994, Rev. 5.4
Selenium	0.27	µg/L	1	0.50	0.04	J1	GES	06/20/2023 10:19	EPA 200.8-1994, Rev. 5.4
Sodium	56.1	mg/L	1	0.20	0.01		GES	06/20/2023 10:19	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	06/20/2023 10:19	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.27	pCi/L	0.11	0.26		TTP	06/26/2023 16:02	SW-846 9315-1986, Rev. 0
Carrier Recovery	79.9	%						
Radium-228	0.32	pCi/L	0.15	0.49		ST	06/29/2023 13:45	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	82.9	%						

* 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

Water Analysis Report

Reissued

Job ID: 231717 **Customer: Welsh Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-16R
Customer Description: TG-32
Lab Number: 231717-003
Preparation:
Date Collected: 06/06/2023 10:49 EDT
Date Received: 06/09/2023 13:30 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	GES	06/20/2023 10:24	EPA 200.8-1994, Rev. 5.4
Arsenic	0.81	µg/L	1	0.10	0.03		GES	06/20/2023 10:24	EPA 200.8-1994, Rev. 5.4
Barium	39.7	µg/L	1	0.20	0.05		GES	06/20/2023 10:24	EPA 200.8-1994, Rev. 5.4
Beryllium	1.10	µg/L	5	0.25	0.04		GES	06/20/2023 10:54	EPA 200.8-1994, Rev. 5.4
Boron	0.019	mg/L	1	0.050	0.007	J1	GES	06/20/2023 10:24	EPA 200.8-1994, Rev. 5.4
Cadmium	0.681	µg/L	1	0.020	0.004		GES	06/20/2023 10:24	EPA 200.8-1994, Rev. 5.4
Calcium	0.35	mg/L	1	0.05	0.01		GES	06/20/2023 10:24	EPA 200.8-1994, Rev. 5.4
Chromium	0.64	µg/L	1	0.30	0.07		GES	06/20/2023 10:24	EPA 200.8-1994, Rev. 5.4
Cobalt	27.1	µg/L	1	0.020	0.005		GES	06/20/2023 10:24	EPA 200.8-1994, Rev. 5.4
Lead	0.29	µg/L	1	0.20	0.05		GES	06/20/2023 10:24	EPA 200.8-1994, Rev. 5.4
Lithium	0.0197	mg/L	5	0.0015	0.0004		GES	06/20/2023 10:54	EPA 200.8-1994, Rev. 5.4
Magnesium	1.05	mg/L	1	0.100	0.006		GES	06/20/2023 10:24	EPA 200.8-1994, Rev. 5.4
Mercury	16	ng/L	1	5	2		JAB	06/16/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	06/20/2023 10:24	EPA 200.8-1994, Rev. 5.4
Potassium	3.19	mg/L	1	0.100	0.008		GES	06/20/2023 10:24	EPA 200.8-1994, Rev. 5.4
Selenium	1.07	µg/L	1	0.50	0.04		GES	06/20/2023 10:24	EPA 200.8-1994, Rev. 5.4
Sodium	5.00	mg/L	1	0.20	0.01		GES	06/20/2023 10:24	EPA 200.8-1994, Rev. 5.4
Thallium	0.48	µg/L	1	0.20	0.02		GES	06/20/2023 10:24	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	2.49	pCi/L	0.29	0.19		TTP	06/26/2023 16:02	SW-846 9315-1986, Rev. 0
Carrier Recovery	89.8	%						
Radium-228	4.40	pCi/L	0.19	0.42		ST	06/29/2023 13:45	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.

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: 231717 **Customer: Welsh Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: DUPLICATE - BASP
Customer Description: TG-32
Lab Number: 231717-004
Preparation:
Date Collected: 06/06/2023 11:21 EDT
Date Received: 06/09/2023 13:30 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	GES	06/20/2023 10:29	EPA 200.8-1994, Rev. 5.4
Arsenic	0.80	µg/L	1	0.10	0.03		GES	06/20/2023 10:29	EPA 200.8-1994, Rev. 5.4
Barium	42.1	µg/L	1	0.20	0.05		GES	06/20/2023 10:29	EPA 200.8-1994, Rev. 5.4
Beryllium	1.10	µg/L	5	0.25	0.04		GES	06/20/2023 10:59	EPA 200.8-1994, Rev. 5.4
Boron	0.019	mg/L	1	0.050	0.007	J1	GES	06/20/2023 10:29	EPA 200.8-1994, Rev. 5.4
Cadmium	0.708	µg/L	1	0.020	0.004		GES	06/20/2023 10:29	EPA 200.8-1994, Rev. 5.4
Calcium	0.36	mg/L	1	0.05	0.01		GES	06/20/2023 10:29	EPA 200.8-1994, Rev. 5.4
Chromium	0.60	µg/L	1	0.30	0.07		GES	06/20/2023 10:29	EPA 200.8-1994, Rev. 5.4
Cobalt	27.8	µg/L	1	0.020	0.005		GES	06/20/2023 10:29	EPA 200.8-1994, Rev. 5.4
Lead	0.29	µg/L	1	0.20	0.05		GES	06/20/2023 10:29	EPA 200.8-1994, Rev. 5.4
Lithium	0.0197	mg/L	5	0.0015	0.0004		GES	06/20/2023 10:59	EPA 200.8-1994, Rev. 5.4
Mercury	16	ng/L	1	5	2		JAB	06/16/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	06/20/2023 10:29	EPA 200.8-1994, Rev. 5.4
Selenium	1.04	µg/L	1	0.50	0.04		GES	06/20/2023 10:29	EPA 200.8-1994, Rev. 5.4
Thallium	0.49	µg/L	1	0.20	0.02		GES	06/20/2023 10:29	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: 231717 **Customer: Welsh Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: EQUIPMENT BLANK - BASP
Customer Description: TG-32
Lab Number: 231717-005
Preparation:
Date Collected: 06/06/2023 11:31 EDT
Date Received: 06/09/2023 13:30 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	06/20/2023 10:34	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	06/20/2023 10:34	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	GES	06/20/2023 10:34	EPA 200.8-1994, Rev. 5.4
Beryllium	0.013	µg/L	1	0.050	0.007	J1	GES	06/20/2023 10:34	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	06/20/2023 10:34	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	06/20/2023 10:34	EPA 200.8-1994, Rev. 5.4
Calcium	0.01	mg/L	1	0.05	0.01	J1	GES	06/20/2023 10:34	EPA 200.8-1994, Rev. 5.4
Chromium	0.25	µg/L	1	0.30	0.07	J1	GES	06/20/2023 10:34	EPA 200.8-1994, Rev. 5.4
Cobalt	0.033	µg/L	1	0.020	0.005		GES	06/20/2023 10:34	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	06/20/2023 10:34	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00007	mg/L	1	0.00030	0.00007	U1	GES	06/20/2023 10:34	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	06/16/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	06/20/2023 10:34	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	06/20/2023 10:34	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	06/20/2023 10:34	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: 231717 **Customer: Welsh Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: FIELD BLANK - BASP
Customer Description: TG-32
Lab Number: 231717-006
Preparation:
Date Collected: 06/06/2023 11:35 EDT
Date Received: 06/09/2023 13:30 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	06/20/2023 10:40	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	06/20/2023 10:40	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	GES	06/20/2023 10:40	EPA 200.8-1994, Rev. 5.4
Beryllium	0.009	µg/L	1	0.050	0.007	J1	GES	06/20/2023 10:40	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	06/20/2023 10:40	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	06/20/2023 10:40	EPA 200.8-1994, Rev. 5.4
Calcium	0.04	mg/L	1	0.05	0.01	J1	GES	06/20/2023 10:40	EPA 200.8-1994, Rev. 5.4
Chromium	0.36	µg/L	1	0.30	0.07		GES	06/20/2023 10:40	EPA 200.8-1994, Rev. 5.4
Cobalt	0.035	µg/L	1	0.020	0.005		GES	06/20/2023 10:40	EPA 200.8-1994, Rev. 5.4
Lead	0.06	µg/L	1	0.20	0.05	J1	GES	06/20/2023 10:40	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00007	mg/L	1	0.00030	0.00007	U1	GES	06/20/2023 10:40	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.006	mg/L	1	0.100	0.006	U1	GES	06/20/2023 10:40	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	06/16/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	06/20/2023 10:40	EPA 200.8-1994, Rev. 5.4
Potassium	<0.008	mg/L	1	0.100	0.008	U1	GES	06/20/2023 10:40	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	06/20/2023 10:40	EPA 200.8-1994, Rev. 5.4
Sodium	<0.01	mg/L	1	0.20	0.01	U1	GES	06/20/2023 10:40	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	06/20/2023 10:40	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	0.13	0.17		TTP	06/26/2023 16:02	SW-846 9315-1986, Rev. 0
Carrier Recovery	95.6	%						
Radium-228	0.09	pCi/L	0.11	0.37		ST	06/29/2023 13:45	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	99.4	%						

* 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.

231717
Job Comments:

Report originally issued 7/7/23. Report reissued 10/29/23 to correct rounding errors on report and EDD.

Water Analysis Report

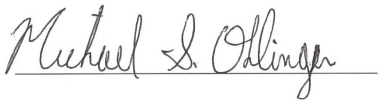
Reissued

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231717 **Customer: Welsh Power Station** **Date Reported: 10/29/2023**

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

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
U1 - Not detected at or above method detection limit (MDL).

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)

Project Name: Welsh BASP
Contact Name: Rebecca Jones
Contact Phone: (737) 330-3725
Sampler(s): Matt Hamilton Kenny McDonald

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 231717

Analysis Turnaround Time (In Calendar Days)
Routine (28 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, Na, K, Mg	250 mL bottle, pH<2, HNO_3 B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Mo, Se, TL	1 L bottle, Cool, 0-6°C TDS, F, Cl, SO_4	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	125 mL PTFE lined bottle, HCL**, pH<2 Hg	filter 500 mL bottle, then pH<2, HNO_3 dissolved Fe and Mn	Sample Specific Notes:
AD-3	6/6/2023	1059	G	GW	5			X		X	X		TG-32 needed
AD-4c	6/5/2023	1036	G	GW	5		X			X	X		
AD-16R	6/6/2023	949	G	GW	8			X		X	X		
DUPLICATE - BASP	6/6/2023	1021	G	GW	2			X			X		
EQUIPMENT BLANK - BASP	6/6/2023	1031	G	GW	2			X			X		
FIELD BLANK - BASP	6/6/2023	1035	G	GW	5		X			X	X		
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	4	1	4	2		

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company: Eqk	Date/Time: 6-7-23 16a	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: 6/9/23 1.30pm

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Welsh **Number of Plastic Containers:** 17 +3 6/12/23 MSO

Opened By MGK **Number of Glass Containers:** 6

Date/Time 6/9/23 1:30PM **Number of Mercury Containers:** -

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:** MGK 6/9/23

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# 231717 Initial & Date & Time : _____

Logged by MSO

Reviewed by MGK

Comments: Missing AD-4c Radium and one Radium bottle for AD-16R Likely in missing cooler FedEx 772376474221 Remaining samples arrived 6/12/23 MSO

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.

Jonathan Barnhill		Lab Supervisor	7/7/2023
Name (printed)	Signature	Official Title	Date

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 7/7/2023

Laboratory Job Number: 231717

Prep Batch Number(s): PB23061505 & QC2306175

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?		
	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	

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: Welsh CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 7/7/2023

Laboratory Job Number: 231717

Prep Batch Number(s): PB23061505 & QC2306175

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	

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: Welsh CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 7/7/2023

Laboratory Job Number: 231717

Prep Batch Number(s): PB23061505 & QC2306175

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."

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	6-20-23
Name (printed)	Signature	Official Title	Date

Mercury Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh

Reviewer Name: Becky Podlasiak

LRC Date: 6/19/2023

Laboratory Job Number: 231717

Prep Batch Number(s): PB23061503; PB23061608

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	Yes	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Mercury Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Mercury Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh

Reviewer Name: Becky Podlasiak

LRC Date: 6/19/2023

Laboratory Job Number: 231717

Prep Batch Number(s): PB23061503; PB23061608

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	Yes	
	I	Was the number of standards recommended in the method used for all analytes?	Yes	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	Yes	
	I	Are ICAL data available for all instruments used?	Yes	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	Yes	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	Yes	
	I	Were percent differences for each analyte within the method-required QC limits?	Yes	
	I	Was the ICAL curve verified for each analyte?	Yes	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	No	ER1
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

Mercury Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Mercury Laboratory Review Checklist

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh

Reviewer Name: Becky Podlasiak

LRC Date: 6/19/2023

Laboratory Job Number: 231717

Prep Batch Number(s): PB23061503; PB23061608

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: 231692 **Customer: Welsh Power Station** **Date Reported: 06/30/2023**

Customer Sample ID: AD-3
Customer Description: TG-32
Lab Number: 231692-001
Preparation:
Date Collected: 06/06/2023 12:59 EDT
Date Received: 06/08/2023 11:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	9.14	mg/L	2	0.04	0.01		CRJ	06/24/2023 08:23	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.11	mg/L	2	0.06	0.02		CRJ	06/24/2023 08:23	EPA 300.1 -1997, Rev. 1.0
Sulfate	2.4	mg/L	2	0.6	0.1		CRJ	06/24/2023 08:23	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	100	mg/L	1	50	20		ELT	06/08/2023 12:40	SM 2540C-2015

Customer Sample ID: AD-4c
Customer Description: TG-32
Lab Number: 231692-002
Preparation:
Date Collected: 06/05/2023 11:36 EDT
Date Received: 06/08/2023 11:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	18.7	mg/L	2	0.04	0.01		CRJ	06/24/2023 09:29	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.13	mg/L	2	0.06	0.02		CRJ	06/24/2023 09:29	EPA 300.1 -1997, Rev. 1.0
Sulfate	87.9	mg/L	2	0.6	0.1		CRJ	06/24/2023 09:29	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	06/12/2023 10:38	SM 2320B-2011
Bicarbonate Alkalinity	6	mg/L	1	20	5	J1	MGK	06/12/2023 10:38	SM 4500 CO2D-2011
TDS, Filterable Residue	290	mg/L	1	50	20		ELT	06/08/2023 12:40	SM 2540C-2015

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231692 **Customer: Welsh Power Station** **Date Reported: 06/30/2023**

Customer Sample ID: AD-16R
Customer Description: TG-32
Lab Number: 231692-003
Preparation:
Date Collected: 06/06/2023 10:49 EDT
Date Received: 06/08/2023 11:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	6.90	mg/L	2	0.04	0.01		CRJ	06/24/2023 12:47	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.06	mg/L	2	0.06	0.02		CRJ	06/24/2023 12:47	EPA 300.1 -1997, Rev. 1.0
Sulfate	50.4	mg/L	2	0.6	0.1		CRJ	06/24/2023 12:47	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	170	mg/L	1	50	20		ELT	06/08/2023 12:46	SM 2540C-2015

Customer Sample ID: DUPLICATE-BASP
Customer Description: TG-32
Lab Number: 231692-004
Preparation:
Date Collected: 06/06/2023 11:21 EDT
Date Received: 06/08/2023 11:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	6.91	mg/L	2	0.04	0.01		CRJ	06/24/2023 11:41	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.06	mg/L	2	0.06	0.02		CRJ	06/24/2023 11:41	EPA 300.1 -1997, Rev. 1.0
Sulfate	50.6	mg/L	2	0.6	0.1		CRJ	06/24/2023 11:41	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	170	mg/L	1	50	20		ELT	06/08/2023 12:46	SM 2540C-2015

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231692 **Customer: Welsh Power Station** **Date Reported: 06/30/2023**

Customer Sample ID: Field Blank-BASP
Customer Description: TG-32
Lab Number: 231692-005
Preparation:
Date Collected: 06/06/2023 11:35 EDT
Date Received: 06/08/2023 11:00 EDT

Ion Chromatography

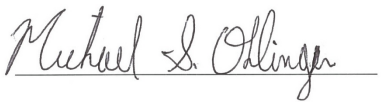
Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	0.01	mg/L	2	0.04	0.01	J1	CRJ	06/24/2023 10:35	EPA 300.1 -1997, Rev. 1.0
Fluoride	<0.02	mg/L	2	0.06	0.02	U1	CRJ	06/24/2023 10:35	EPA 300.1 -1997, Rev. 1.0
Sulfate	<0.1	mg/L	2	0.6	0.1	U1	CRJ	06/24/2023 10:35	EPA 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	06/12/2023 10:38	SM 2320B-2011
Bicarbonate Alkalinity	<5	mg/L	1	20	5	U1	MGK	06/12/2023 10:38	SM 4500 CO2D-2011
TDS, Filterable Residue	50	mg/L	1	50	20		ELT	06/08/2023 12:52	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

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231692 **Customer: Welsh Power Station** **Date Reported: 06/30/2023**

Data Qualifer Legend

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
U1 - Not detected at or above method detection limit (MDL).

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)

Project Name: Welsh BASP
Contact Name: Rebecca Jones
Contact Phone: (737) 330-3725
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 231692

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	1 L bottle, cool 0-6°C Total Alkalinity / Bicarbonate / Alkalinity TDS, F, Cl, SO_4	1 L bottle, Cool, 0-6°C TDS, F, Cl, SO_4	1 L bottle, Cool 0-6 Ra-226, Ra-228	40 mL Glass vial or 250 mL PTFE lined bottle, HCL**, pH<2 Hg	filter 500 mL bottle, then pH<2, HNO_3 dissolved Fe and Mn		Sample Specific Notes:
AD-3	6/6/2023	1059	G	GW	1				X					TG-32 needed
AD-4c	6/5/2023	1036	G	GW	1			X						
AD-16R	6/6/2023	949	G	GW	1				X					
DUPLICATE - BASP	6/6/2023	1021	G	GW	1				X					
FIELD BLANK - BASP	6/6/2023	1035	G	GW	1			X						
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	1	1	4				

** Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company: Eask	Date/Time: 6-7-23 1600	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time: 6/8/23 11:00

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Welsh Power Station **Number of Plastic Containers:** 5

Opened By Misgina/Michael **Number of Glass Containers:** _____

Date/Time 06/08/23 11:00 am **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? (Y) / N or N/A **Initial:** MBK (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:** MBK 06/08/23

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# 231692 Initial & Date & Time : _____

Comments: _____

Logged by MSO _____

_____

Reviewed by MBK _____

_____

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.
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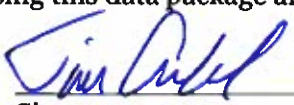
  - (b) Dilution factors
  - (c) Preparation methods
  - (d) Cleanup methods
  - (e) If required for the project, tentatively identified compounds (TICs)
- [x] R4 Surrogate recovery data including:
  - (a) Calculated recovery (%R)
  - (b) The laboratory's surrogate QC limits
- [x] R5 Test reports/summary 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		Chemist Principle	6/29/23
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: Welsh BASP

Reviewer Name: Tim Arnold

LRC Date: 6/29/23

Laboratory Job Number: 231692

Prep Batch Number(s): QC2306212

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: Welsh BASP

Reviewer Name: Tim Arnold

LRC Date: 6/29/23

Laboratory Job Number: 231692

Prep Batch Number(s): QC2306212

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	

Ion Chromatography Laboratory Review Checklist

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh BASP

Reviewer Name: Tim Arnold

LRC Date: 6/29/23

Laboratory Job Number: 231692

Prep Batch Number(s): QC2306212

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."

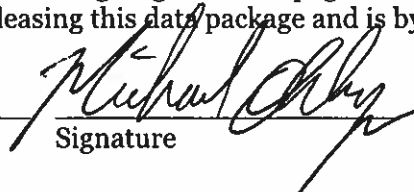
Municipal Solid Waste Laboratory Review Checklist

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	6/29/23
Name (printed)	Signature	Official Title	Date

TDS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh BASP

Reviewer Name: Michael Ohlinger

LRC Date: 6/29/23

Laboratory Job Number: 231692

Prep Batch Number(s): QC2306117

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: Welsh BASP

Reviewer Name: Michael Ohlinger

LRC Date:

Laboratory Job Number: 231692

Prep Batch Number(s): QC2306117

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: Welsh BASP

Reviewer Name: Michael Ohlinger

LRC Date: 6/29/23

Laboratory Job Number: 231692

Prep Batch Number(s): QC2306117

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."

Water Analysis Report

Reissued

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231716 **Customer: Welsh Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-1
Customer Description: TG-32
Lab Number: 231716-001
Preparation:
Date Collected: 06/06/2023 11:54 EDT
Date Received: 06/09/2023 13:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.041	µg/L	1	0.100	0.008	J1	GES	06/20/2023 09:43	EPA 200.8-1994, Rev. 5.4
Arsenic	0.21	µg/L	1	0.10	0.03		GES	06/20/2023 09:43	EPA 200.8-1994, Rev. 5.4
Barium	83.4	µg/L	1	0.20	0.05		GES	06/20/2023 09:43	EPA 200.8-1994, Rev. 5.4
Beryllium	1.11	µg/L	1	0.050	0.007		GES	06/20/2023 09:43	EPA 200.8-1994, Rev. 5.4
Boron	0.729	mg/L	1	0.050	0.007		GES	06/20/2023 09:43	EPA 200.8-1994, Rev. 5.4
Cadmium	0.034	µg/L	1	0.020	0.004		GES	06/20/2023 09:43	EPA 200.8-1994, Rev. 5.4
Calcium	6.59	mg/L	1	0.05	0.01		GES	06/20/2023 09:43	EPA 200.8-1994, Rev. 5.4
Chromium	0.35	µg/L	1	0.30	0.07		GES	06/20/2023 09:43	EPA 200.8-1994, Rev. 5.4
Cobalt	2.67	µg/L	1	0.020	0.005		GES	06/20/2023 09:43	EPA 200.8-1994, Rev. 5.4
Lead	0.37	µg/L	1	0.20	0.05		GES	06/20/2023 09:43	EPA 200.8-1994, Rev. 5.4
Lithium	0.00805	mg/L	1	0.00030	0.00007		GES	06/20/2023 09:43	EPA 200.8-1994, Rev. 5.4
Magnesium	3.20	mg/L	1	0.100	0.006		GES	06/20/2023 09:43	EPA 200.8-1994, Rev. 5.4
Mercury	2	ng/L	1	5	2	J1	JAB	06/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	06/20/2023 09:43	EPA 200.8-1994, Rev. 5.4
Potassium	0.989	mg/L	1	0.100	0.008		GES	06/20/2023 09:43	EPA 200.8-1994, Rev. 5.4
Selenium	10.1	µg/L	1	0.50	0.04		GES	06/20/2023 09:43	EPA 200.8-1994, Rev. 5.4
Sodium	35.5	mg/L	1	0.20	0.01		GES	06/20/2023 09:43	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	06/20/2023 09:43	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.46	pCi/L	0.13	0.22		TTP	06/26/2023 15:15	SW-846 9315-1986, Rev. 0
Carrier Recovery	90.8	%						
Radium-228	0.49	pCi/L	0.16	0.54		ST	06/29/2023 13:45	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	77.0	%						

* 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
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 231716 **Customer: Welsh Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-5
Customer Description: TG-32
Lab Number: 231716-002
Preparation:
Date Collected: 06/06/2023 10:00 EDT
Date Received: 06/09/2023 13:30 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	GES	06/20/2023 09:48	EPA 200.8-1994, Rev. 5.4
Arsenic	4.30	µg/L	1	0.10	0.03		GES	06/20/2023 09:48	EPA 200.8-1994, Rev. 5.4
Barium	45.5	µg/L	1	0.20	0.05		GES	06/20/2023 09:48	EPA 200.8-1994, Rev. 5.4
Beryllium	0.055	µg/L	1	0.050	0.007		GES	06/20/2023 09:48	EPA 200.8-1994, Rev. 5.4
Boron	0.030	mg/L	1	0.050	0.007	J1	GES	06/20/2023 09:48	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	06/20/2023 09:48	EPA 200.8-1994, Rev. 5.4
Calcium	26.5	mg/L	1	0.05	0.01		GES	06/20/2023 09:48	EPA 200.8-1994, Rev. 5.4
Chromium	0.24	µg/L	1	0.30	0.07	J1	GES	06/20/2023 09:48	EPA 200.8-1994, Rev. 5.4
Cobalt	9.47	µg/L	1	0.020	0.005		GES	06/20/2023 09:48	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	06/20/2023 09:48	EPA 200.8-1994, Rev. 5.4
Lithium	0.106	mg/L	1	0.00030	0.00007		GES	06/20/2023 09:48	EPA 200.8-1994, Rev. 5.4
Magnesium	9.62	mg/L	1	0.100	0.006		GES	06/20/2023 09:48	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	06/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	06/20/2023 09:48	EPA 200.8-1994, Rev. 5.4
Potassium	2.69	mg/L	1	0.100	0.008		GES	06/20/2023 09:48	EPA 200.8-1994, Rev. 5.4
Selenium	0.06	µg/L	1	0.50	0.04	J1	GES	06/20/2023 09:48	EPA 200.8-1994, Rev. 5.4
Sodium	25.4	mg/L	1	0.20	0.01		GES	06/20/2023 09:48	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	06/20/2023 09:48	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.63	pCi/L	0.16	0.22		TTP	06/26/2023 16:02	SW-846 9315-1986, Rev. 0
Carrier Recovery	77.6	%						
Radium-228	1.09	pCi/L	0.16	0.48		ST	06/29/2023 13:45	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.

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: 231716 **Customer: Welsh Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: AD-17
Customer Description: TG-32
Lab Number: 231716-003
Preparation:
Date Collected: 06/06/2023 12:34 EDT
Date Received: 06/09/2023 13:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.08	µg/L	10	1.00	0.08	U1	GES	06/20/2023 09:53	EPA 200.8-1994, Rev. 5.4
Arsenic	1.1	µg/L	10	1.0	0.3		GES	06/20/2023 09:53	EPA 200.8-1994, Rev. 5.4
Barium	19.6	µg/L	10	2.0	0.5		GES	06/20/2023 09:53	EPA 200.8-1994, Rev. 5.4
Beryllium	0.11	µg/L	10	0.50	0.07	J1	GES	06/20/2023 09:53	EPA 200.8-1994, Rev. 5.4
Boron	0.10	mg/L	10	0.50	0.07	J1	GES	06/20/2023 09:53	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.04	µg/L	10	0.20	0.04	U1	GES	06/20/2023 09:53	EPA 200.8-1994, Rev. 5.4
Calcium	150	mg/L	10	0.5	0.1		GES	06/20/2023 09:53	EPA 200.8-1994, Rev. 5.4
Chromium	1.1	µg/L	10	3.0	0.7	J1	GES	06/20/2023 09:53	EPA 200.8-1994, Rev. 5.4
Cobalt	36.8	µg/L	10	0.20	0.05		GES	06/20/2023 09:53	EPA 200.8-1994, Rev. 5.4
Lead	0.7	µg/L	10	2.0	0.5	J1	GES	06/20/2023 09:53	EPA 200.8-1994, Rev. 5.4
Lithium	0.254	mg/L	10	0.0030	0.0007		GES	06/20/2023 09:53	EPA 200.8-1994, Rev. 5.4
Magnesium	46.0	mg/L	10	1.00	0.06		GES	06/20/2023 09:53	EPA 200.8-1994, Rev. 5.4
Mercury	3	ng/L	1	5	2	J1	JAB	06/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<1	µg/L	10	5	1	U1	GES	06/20/2023 09:53	EPA 200.8-1994, Rev. 5.4
Potassium	7.43	mg/L	10	1.00	0.08		GES	06/20/2023 09:53	EPA 200.8-1994, Rev. 5.4
Selenium	0.5	µg/L	10	5.0	0.4	J1	GES	06/20/2023 09:53	EPA 200.8-1994, Rev. 5.4
Sodium	40.2	mg/L	10	2.0	0.1		GES	06/20/2023 09:53	EPA 200.8-1994, Rev. 5.4
Thallium	<0.2	µg/L	10	2.0	0.2	U1	GES	06/20/2023 09:53	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.53	pCi/L	0.14	0.24		TTP	06/26/2023 16:02	SW-846 9315-1986, Rev. 0
Carrier Recovery	96.9	%						
Radium-228	0.89	pCi/L	0.16	0.49		ST	06/29/2023 13:45	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	76.3	%						

* 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

Reissued

Job ID: 231716 **Customer: Welsh Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: DUPLICATE - BACKGROUND
Customer Description: TG-32
Lab Number: 231716-004
Preparation:
Date Collected: 06/06/2023 13:00 EDT
Date Received: 06/09/2023 13:30 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.033	µg/L	1	0.100	0.008	J1	GES	06/20/2023 09:59	EPA 200.8-1994, Rev. 5.4
Arsenic	0.20	µg/L	1	0.10	0.03		GES	06/20/2023 09:59	EPA 200.8-1994, Rev. 5.4
Barium	86.5	µg/L	1	0.20	0.05		GES	06/20/2023 09:59	EPA 200.8-1994, Rev. 5.4
Beryllium	1.10	µg/L	1	0.050	0.007		GES	06/20/2023 09:59	EPA 200.8-1994, Rev. 5.4
Boron	0.768	mg/L	1	0.050	0.007		GES	06/20/2023 09:59	EPA 200.8-1994, Rev. 5.4
Cadmium	0.033	µg/L	1	0.020	0.004		GES	06/20/2023 09:59	EPA 200.8-1994, Rev. 5.4
Calcium	6.99	mg/L	1	0.05	0.01		GES	06/20/2023 09:59	EPA 200.8-1994, Rev. 5.4
Chromium	0.31	µg/L	1	0.30	0.07		GES	06/20/2023 09:59	EPA 200.8-1994, Rev. 5.4
Cobalt	2.88	µg/L	1	0.020	0.005		GES	06/20/2023 09:59	EPA 200.8-1994, Rev. 5.4
Lead	0.53	µg/L	1	0.20	0.05		GES	06/20/2023 09:59	EPA 200.8-1994, Rev. 5.4
Lithium	0.00790	mg/L	1	0.00030	0.00007		GES	06/20/2023 09:59	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	06/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	06/20/2023 09:59	EPA 200.8-1994, Rev. 5.4
Selenium	10.1	µg/L	1	0.50	0.04		GES	06/20/2023 09:59	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	06/20/2023 09:59	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: 231716 **Customer: Welsh Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: EB - BACKGROUND
Customer Description: TG-32
Lab Number: 231716-005
Preparation:
Date Collected: 06/06/2023 12:25 EDT
Date Received: 06/09/2023 13:30 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	06/20/2023 10:04	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	06/20/2023 10:04	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	GES	06/20/2023 10:04	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	06/20/2023 10:04	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	06/20/2023 10:04	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	06/20/2023 10:04	EPA 200.8-1994, Rev. 5.4
Calcium	0.02	mg/L	1	0.05	0.01	J1	GES	06/20/2023 10:04	EPA 200.8-1994, Rev. 5.4
Chromium	0.26	µg/L	1	0.30	0.07	J1	GES	06/20/2023 10:04	EPA 200.8-1994, Rev. 5.4
Cobalt	0.033	µg/L	1	0.020	0.005		GES	06/20/2023 10:04	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	06/20/2023 10:04	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00007	mg/L	1	0.00030	0.00007	U1	GES	06/20/2023 10:04	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	06/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	06/20/2023 10:04	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	06/20/2023 10:04	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	06/20/2023 10:04	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: 231716 **Customer: Welsh Power Station** **Date Reported: 10/29/2023**

Customer Sample ID: FIELD BLANK - BACKGROUND
Customer Description: TG-32
Lab Number: 231716-006
Preparation:
Date Collected: 06/06/2023 12:22 EDT
Date Received: 06/09/2023 13:30 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	06/20/2023 10:09	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	06/20/2023 10:09	EPA 200.8-1994, Rev. 5.4
Barium	0.07	µg/L	1	0.20	0.05	J1	GES	06/20/2023 10:09	EPA 200.8-1994, Rev. 5.4
Beryllium	0.020	µg/L	1	0.050	0.007	J1	GES	06/20/2023 10:09	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	06/20/2023 10:09	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	06/20/2023 10:09	EPA 200.8-1994, Rev. 5.4
Calcium	0.02	mg/L	1	0.05	0.01	J1	GES	06/20/2023 10:09	EPA 200.8-1994, Rev. 5.4
Chromium	0.27	µg/L	1	0.30	0.07	J1	GES	06/20/2023 10:09	EPA 200.8-1994, Rev. 5.4
Cobalt	0.037	µg/L	1	0.020	0.005		GES	06/20/2023 10:09	EPA 200.8-1994, Rev. 5.4
Lead	0.22	µg/L	1	0.20	0.05		GES	06/20/2023 10:09	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00007	mg/L	1	0.00030	0.00007	U1	GES	06/20/2023 10:09	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	06/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	06/20/2023 10:09	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	06/20/2023 10:09	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	06/20/2023 10:09	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.36	pCi/L	0.11	0.19		TTP	06/26/2023 16:02	SW-846 9315-1986, Rev. 0
Carrier Recovery	96.9	%						
Radium-228	-0.20	pCi/L	0.12	0.42		ST	06/29/2023 13:45	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	93.5	%						

* 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.

231716
Job Comments:

Report originally issued 7/7/23. Report reissued 10/29/23 to correct rounding errors on report and EDD.

Water Analysis Report

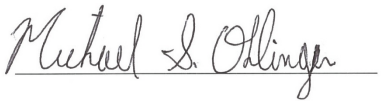
Reissued

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231716 **Customer: Welsh Power Station** **Date Reported: 10/29/2023**

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

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
U1 - Not detected at or above method detection limit (MDL).

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)

Project Name: Welsh Background
Contact Name: Rebecca Jones
Contact Phone: (737) 330-3725
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days): Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 231716

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	Field-filter 500 mL bottle, then pH<2, HNO_3: dissolved Fe and Mn	1 L bottle, Cool 0-6°C: TDS, F, Cl, SO_4	Three (six every 10th*) 1 L bottles, pH<2, HNO_3: Ra-226, Ra-228	125 mL PTFE lined bottle, HCL^{**}, pH<2: Hg			Sample Specific Notes:
AD-1	6/6/2023	1054	G	GW	8		X			X	X			Routine (28 days)
AD-5	6/6/2023	900	G	GW	5		X			X	X			TG-32 needed
AD-17	6/6/2023	1134	G	GW	5		X			X	X			
DUPLICATE - BACKGROUND	6/6/2023	1200	G	GW	2		X				X			
EQUIPMENT BLANK - BACKGROUND	6/6/2023	1125	G	GW	2		X				X			
FIELD BLANK - BACKGROUND	6/6/2023	1122	G	GW	5		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	2			

** Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company: Eqsk	Date/Time: 6-7-23 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: 6/9/23 1:30PM

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Welsh **Number of Plastic Containers:** 18

Opened By MSO/MGK **Number of Glass Containers:** 6

Date/Time 6/9/23 1:30PM **Number of Mercury Containers:** —

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:** MGK 6/9/23

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# ~~2316~~ 231716 Initial & Date & Time : _____

Logged by MSO Comments: Missing AD-17 Replum Likely from Missing cooler FedEx 772376474227

Reviewed by MGK of Missing sample arrival 6/12/23 MSO 6/12/23

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.

Susann Sultmann	S. Sultmann	Senior Chemist	6.20.23
Name (printed)	Signature	Official Title	Date

Mercury Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh

Reviewer Name: Becky Podlasiak

LRC Date: 6/19/2023

Laboratory Job Number: 231716

Prep Batch Number(s): PB23061503

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?	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	

Mercury Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh

Reviewer Name: Becky Podlasiak

LRC Date: 6/19/2023

Laboratory Job Number: 231716

Prep Batch Number(s): PB23061503

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: Welsh

Reviewer Name: Becky Podlasiak

LRC Date: 6/19/2023

Laboratory Job Number: 231716

Prep Batch Number(s): PB23061503

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	7/7/2023
Name (printed)	Signature	Official Title	Date

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 7/7/2023

Laboratory Job Number: 231716

Prep Batch Number(s): PB23061505 & QC2306175

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?		
	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	

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: Welsh CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 7/7/2023

Laboratory Job Number: 231716

Prep Batch Number(s): PB23061505 & QC2306175

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	

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: Welsh CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 7/7/2023

Laboratory Job Number: 231716

Prep Batch Number(s): PB23061505 & QC2306175

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: 231698 **Customer: Welsh Power Station** **Date Reported: 07/05/2023**

Customer Sample ID: AD-1 Customer Description: TG-32
Lab Number: 231698-001 Preparation:
Date Collected: 06/06/2023 11:54 EDT Date Received: 06/08/2023 11:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	3.03	mg/L	2	0.04	0.01		CRJ	06/28/2023 08:33	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.24	mg/L	2	0.06	0.02		CRJ	06/28/2023 08:33	EPA 300.1 -1997, Rev. 1.0
Sulfate	91.1	mg/L	2	0.6	0.1		CRJ	06/28/2023 08:33	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	210	mg/L	1	50	20		ELT	06/12/2023 08:06	SM 2540C-2015

Customer Sample ID: AD-5 Customer Description: TG-32
Lab Number: 231698-002 Preparation:
Date Collected: 06/06/2023 10:00 EDT Date Received: 06/08/2023 11:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	16.1	mg/L	2	0.04	0.01		CRJ	06/28/2023 12:24	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.15	mg/L	2	0.06	0.02		CRJ	06/28/2023 12:24	EPA 300.1 -1997, Rev. 1.0
Sulfate	114	mg/L	10	3.0	0.6		CRJ	06/28/2023 11:51	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	280	mg/L	1	50	20		ELT	06/12/2023 08:19	SM 2540C-2015

Customer Sample ID: AD-17 Customer Description: TG-32
Lab Number: 231698-003 Preparation:
Date Collected: 06/06/2023 12:34 EDT Date Received: 06/08/2023 11:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	35.6	mg/L	5	0.10	0.03		CRJ	06/28/2023 14:35	EPA 300.1 -1997, Rev. 1.0
Fluoride	<0.05	mg/L	5	0.15	0.05	U1	CRJ	06/28/2023 14:35	EPA 300.1 -1997, Rev. 1.0
Sulfate	1190	mg/L	50	15	3		CRJ	06/28/2023 14:02	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	1510	mg/L	2	100	40		ELT	06/12/2023 08:27	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: 231698 **Customer: Welsh Power Station** **Date Reported: 07/05/2023**

Customer Sample ID: DUPLICATE - BACKGROUND
Customer Description: TG-32
Lab Number: 231698-004
Preparation:
Date Collected: 06/06/2023 13:00 EDT
Date Received: 06/08/2023 11:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	3.05	mg/L	2	0.04	0.01		CRJ	06/28/2023 13:29	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.24	mg/L	2	0.06	0.02		CRJ	06/28/2023 13:29	EPA 300.1 -1997, Rev. 1.0
Sulfate	92.1	mg/L	2	0.6	0.1		CRJ	06/28/2023 13:29	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	220	mg/L	1	50	20		ELT	06/12/2023 08:27	SM 2540C-2015

Customer Sample ID: FIELD BLANK - BACKGROUND
Customer Description: TG-32
Lab Number: 231698-005
Preparation:
Date Collected: 06/06/2023 12:22 EDT
Date Received: 06/08/2023 11:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	<0.01	mg/L	2	0.04	0.01	U1	CRJ	06/28/2023 15:47	EPA 300.1 -1997, Rev. 1.0
Fluoride	<0.02	mg/L	2	0.06	0.02	U1	CRJ	06/28/2023 15:47	EPA 300.1 -1997, Rev. 1.0
Sulfate	<0.1	mg/L	2	0.6	0.1	U1	CRJ	06/28/2023 15:47	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	<20	mg/L	1	50	20	U1	ELT	06/12/2023 08:34	SM 2540C-2015

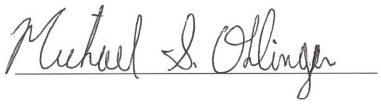
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 231698 **Customer: Welsh Power Station** **Date Reported: 07/05/2023**

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 above method detection limit (MDL).

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)

Project Name: Welsh Background
Contact Name: Rebecca Jones
Contact Phone: (737) 330-3725
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 231698

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	Field-filter 500 mL bottle, then pH<2, HNO_3: dissolved Fe and Mn	1 L bottle, Cool, 0-6°C: TDS, F, Cl, SO_4	Three (six every 10th*) 1 L bottles, pH<2, HNO_3: Ra-226, Ra-228	40 mL Glass vial or 125 mL PTFE lined bottle, HCL**, pH<2: Hg			Sample Specific Notes:
AD-1	6/6/2023	1054	G	GW	1				X					TG-32 needed
AD-5	6/6/2023	900	G	GW	1				X					
AD-17	6/6/2023	1134	G	GW	1				X					
DUPLICATE - BACKGROUND	6/6/2023	1200	G	GW	1				X					
FIELD BLANK - BACKGROUND	6/6/2023	1122	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:

Relinquished by: [signature]	Company: Eagle	Date/Time: 6-7-23 16:00	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: 6/8/23 11:00 AM

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Welsh Power Station **Number of Plastic Containers:** 5

Opened By Misgina/Michael **Number of Glass Containers:** _____

Date/Time 06/08/23 11:00Am **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# 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:** MGK 06/08/23

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# 231698 Initial & Date & Time : _____

Comments: _____

Logged by MSO

Reviewed by MGK

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		Chemist Principle	6/30/23
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: Welsh Background

Reviewer Name: Tim Arnold

LRC Date: 6/30/23

Laboratory Job Number: 231698

Prep Batch Number(s): QC2306254

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	

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh Background

Reviewer Name: Tim Arnold

LRC Date: 6/30/23

Laboratory Job Number: 231698

Prep Batch Number(s): QC2306254

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	

Ion Chromatography Laboratory Review Checklist

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh Background

Reviewer Name: Tim Arnold

LRC Date: 6/30/23

Laboratory Job Number: 231698

Prep Batch Number(s): QC2306254

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."

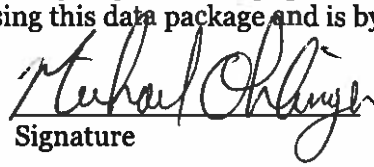
Municipal Solid Waste Laboratory Review Checklist

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	7/5/2023
Name (printed)	Signature	Official Title	Date

TDS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh Background

Reviewer Name: Michael Ohlinger

LRC Date: 7/5/2023

Laboratory Job Number: 231698

Prep Batch Number(s): QC2306119

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: Welsh Background

Reviewer Name: Michael Ohlinger

LRC Date: 7/5/2023

Laboratory Job Number: 231698

Prep Batch Number(s): QC2306119

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S1	O, I	**Initial calibration (ICAL)**		
	I	Were response factors and/or relative response factors for each analyte within QC limits?	NA	
	I	Were percent RSDs or correlation coefficient criteria met?	NA	
	I	Was the number of standards recommended in the method used for all analytes?	NA	
	I	Were all points generated between the lowest and highest standard used to calculate the curve?	NA	
	I	Are ICAL data available for all instruments used?	NA	
	I	Has the initial calibration curve been verified using an appropriate second source standard?	NA	
S2	O, I	**Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):**		
	I	Was the CCV analyzed at the method-required frequency?	NA	
	I	Were percent differences for each analyte within the method-required QC limits?	NA	
	I	Was the ICAL curve verified for each analyte?	NA	
	I	Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	NA	
S3	O	**Mass spectral tuning:**		
	I	Was the appropriate compound for the method used for tuning?	NA	
	I	Were ion abundance data within the method-required QC limits?	NA	
S4	O	**Internal standards (IS):**		
	I	Were IS area counts and retention times within the method-required QC limits?	NA	
S5	O, I	**Raw data (NELAC section 1 appendix A glossary, and section 5.)**		
	I	Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	Yes	
	I	Were data associated with manual integrations flagged on the raw data?	NA	

TDS Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
S6	O	**Dual column confirmation**		
	I	Did dual column confirmation results meet the method-required QC?	NA	
S7	O	**Tentatively identified compounds (TICs):**		
	I	If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	NA	
S8	I	**Interference Check Sample (ICS) results:**		
	I	Were percent recoveries within method QC limits?	NA	
S9	I	**Serial dilutions, post digestion spikes, and method of standard additions**		
	I	Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	NA	
S10	O, I	**Method detection limit (MDL) studies**		
	I	Was a MDL study performed for each reported analyte?	Yes	
	I	Is the MDL either adjusted or supported by the analysis of DCSs?	Yes	
S11	O, I	**Proficiency test reports:**		
	I	Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	Yes	
S12	O, I	**Standards documentation**		
	I	Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	Yes	
S13	O, I	**Compound/analyte identification procedures**		
	I	Are the procedures for compound/analyte identification documented?	Yes	
S14	O, I	**Demonstration of analyst competency (DOC)**		
	I	Was DOC conducted consistent with NELAC Chapter 5C?	Yes	
	I	Is documentation of the analyst's competency up-to-date and on file?	Yes	
S15	O, I	**Verification/validation documentation for methods (NELAC Chap 5n 5)**		
	I	Are all the methods used to generate the data documented, verified, and validated, where applicable?	Yes	
S16	O, I	**Laboratory standard operating procedures (SOPs):**		
	I	Are laboratory SOPs current and on file for each method performed?	Yes	

Table 3. Exception Reports.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh Background

Reviewer Name: Michael Ohlinger

LRC Date: 7/5/2023

Laboratory Job Number: 231698

Prep Batch Number(s): QC2306119

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."

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 232326 **Customer: Welsh Power Station** **Date Reported: 08/23/2023**

Customer Sample ID: AD-4c
Lab Number: 232326-001
Date Collected: 07/27/2023 15:29 EDT

Customer Description:
Preparation:
Date Received: 07/28/2023 10:30 EDT

Ion Chromatography

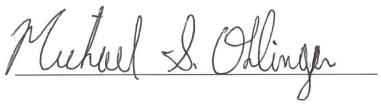
Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	19.2	mg/L	2	0.04	0.01		TEA	08/02/2023 01:15	EPA 300.1 -1997, Rev. 1.0
Sulfate	77.4	mg/L	2	0.60	0.12		TEA	08/02/2023 01:15	EPA 300.1 -1997, Rev. 1.0

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.099	mg/L	1	0.050	0.007		GES	08/01/2023 22:08	EPA 200.8-1994, Rev. 5.4

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

232326

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)

Project Name: Welsh BASP
Contact Name: Rebecca Jones
Contact Phone: (737) 330-3725
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days) Routine (28 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 Boron	1 L bottle, cool 0-6°C Total Alkalinity Bicarbonate Alkalinity TDS, F, Cl, SO4	1 L bottle, Cool, 0-6°C Cl, SO_4	1 L bottle, Cool 0-6 Ra-226, Ra-228	40 mL Glass vial or 250 mL PTFE lined bottle, HCL**, pH<2 Hg	filter 500 mL bottle, then pH<2, HNO_3 dissolved Fe and Mn		Sample Specific Notes:
AD-4c	7/27/2023	1429	G	GW	2		X		X					TG-32 needed
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	1	1	4				

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Kent Mt	EAGLE	07/27/23 1600		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time: 07/28/23 10:30 AM

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY (UPS) FedEX USPS
	Other _____

Plant/Customer Welsh BASF Number of Plastic Containers: 2

Opened By Misyna Number of Glass Containers: _____

Date/Time 07/28/23 10:30 Am Number of Mercury Containers: _____

Were all temperatures within 0-6°C? (Y) / N or N/A Initial: MGC (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:** MGC 07/28/23

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# 232326 Initial & Date & Time : _____

Comments: _____

Logged by MGC

Reviewed by WCO

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		Principal Chemist	8/10/2023
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: Welsh BASP

Reviewer Name: Tim Arnold

LRC Date: 8/10/2023

Laboratory Job Number: 232326

Prep Batch Number(s): QC2308012

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: Welsh BASP

Reviewer Name: Tim Arnold

LRC Date: 8/10/2023

Laboratory Job Number: 232326

Prep Batch Number(s): QC2308012

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: Welsh BASP

Reviewer Name: Tim Arnold

LRC Date: 8/10/2023

Laboratory Job Number: 232326

Prep Batch Number(s): QC2308012

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	8/23/2023
Name (printed)	Signature	Official Title	Date

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 08/23/2023

Laboratory Job Number: 232326

Prep Batch Number(s): PB23073102 QC2308034

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	

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: Welsh CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 08/23/2023

Laboratory Job Number: 232326

Prep Batch Number(s): PB23073102 QC2308034

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	

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: Welsh CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 08/23/2023

Laboratory Job Number: 232326

Prep Batch Number(s): PB23073102 QC2308034

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: 233094 **Customer: Welsh Power Station** **Date Reported: 11/02/2023**

Customer Sample ID: AD-3
Customer Description:
Lab Number: 233094-001
Preparation:
Date Collected: 10/04/2023 11:30 EDT
Date Received: 10/04/2023 10:30 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	8.65	mg/L	2	0.04	0.01		CRJ	10/18/2023 01:29	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.12	mg/L	2	0.06	0.02		CRJ	10/18/2023 01:29	EPA 300.1 -1997, Rev. 1.0
Sulfate	9.5	mg/L	2	0.6	0.1		CRJ	10/18/2023 01:29	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	100	mg/L	1	50	20		ELT	10/09/2023 13:05	SM 2540C-2015

Customer Sample ID: AD-4c
Customer Description:
Lab Number: 233094-002
Preparation:
Date Collected: 10/04/2023 10:21 EDT
Date Received: 10/04/2023 10:30 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	13.0	mg/L	2	0.04	0.01		CRJ	10/18/2023 02:35	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.13	mg/L	2	0.06	0.02		CRJ	10/18/2023 02:35	EPA 300.1 -1997, Rev. 1.0
Sulfate	115	mg/L	10	3.0	0.6		CRJ	10/17/2023 21:39	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	P1, U1	MGK	10/09/2023 09:44	SM 2320B-2011
Bicarbonate Alkalinity	<5	mg/L	1	20	5	U1	MGK	10/09/2023 09:44	SM 4500 CO2D-2011
TDS, Filterable Residue	320	mg/L	1	50	20		ELT	10/09/2023 13:05	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: 233094 **Customer: Welsh Power Station** **Date Reported: 11/02/2023**

Customer Sample ID: AD-16R
Customer Description:
Lab Number: 233094-003
Preparation:
Date Collected: 10/04/2023 10:14 EDT
Date Received: 10/04/2023 10:30 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	6.85	mg/L	2	0.04	0.01		CRJ	10/18/2023 02:02	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.08	mg/L	2	0.06	0.02		CRJ	10/18/2023 02:02	EPA 300.1 -1997, Rev. 1.0
Sulfate	50.6	mg/L	2	0.6	0.1		CRJ	10/18/2023 02:02	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	10/09/2023 09:44	SM 2320B-2011
Bicarbonate Alkalinity	<5	mg/L	1	20	5	U1	MGK	10/09/2023 09:44	SM 4500 CO2D-2011
TDS, Filterable Residue	170	mg/L	1	50	20		ELT	10/09/2023 13:15	SM 2540C-2015

Customer Sample ID: DUPLICATE - BASP
Customer Description:
Lab Number: 233094-004
Preparation:
Date Collected: 10/04/2023 12:30 EDT
Date Received: 10/04/2023 10:30 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	6.73	mg/L	2	0.04	0.01		CRJ	10/18/2023 03:41	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.09	mg/L	2	0.06	0.02		CRJ	10/18/2023 03:41	EPA 300.1 -1997, Rev. 1.0
Sulfate	52.6	mg/L	2	0.6	0.1		CRJ	10/18/2023 03:41	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	170	mg/L	1	50	20		ELT	10/09/2023 13:29	SM 2540C-2015

233094-001
Comments:

TG-32

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233094 **Customer: Welsh Power Station** **Date Reported: 11/02/2023**

233094-002
Comments:

TG-32

233094-003
Comments:

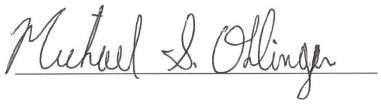
TG-32

233094-004
Comments:

TG-32

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

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233094 **Customer: Welsh Power Station** **Date Reported: 11/02/2023**

Data Qualifer Legend

P1 - The precision between duplicate results was above acceptance limits.

U1 - Not detected at or above method detection limit (MDL).

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL) **4001 Bixby Road** **Groveport, Ohio 43125**	**Site Contact:**
Contacts: **Michael Ohlinger (614-836-4184)**	**Date:**
Project Name: Welsh BASP	**For Lab Use Only:** COC/Order #: 233094
Contact Name: Rebecca Jones	
Contact Phone: (737) 330-3725	
Sampler(s): Matt Hamilton Kenny McDonald	

Analysis Turnaround Time (in Calendar Days)
Routine (28 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	500 mL bottle, pH<2, HNO_3 B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Mo, Se, Tl	1 L bottle, Cool, 0-6°C Total Alkalinity, Bicarbonate Alkalinity, TDS, F, Cl, SO_4	1 L bottle, Cool, 0-6°C TDS, F, Cl, SO_4	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	40 mL GlassvialorPTFE linedbottle, HCL**, pH<2 Hg	filter 500 mL bottle, then pH<2, HNO_3 dissolved Fe and Mn	Sample Specific Notes:
AD-3	10/4/2023	1030	G	GW	1					X				TG-32 needed
AD-4c	10/4/2023	921	G	GW	1				X					
AD-16R	10/4/2023	914	G	GW	1				X					
DUPLICATE - BASP	10/4/2023	1130	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:

Relinquished by: Matt Hamilton	Company: Eagle	Date/Time: 10-5-23 1600	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: 10/6/23 9:50 AM

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Welch **Number of Plastic Containers:** 4

Opened By MSD **Number of Glass Containers:** 1

Date/Time 10/6/23 9:50AM **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? (Y) / N or N/A **Initial:** MSD (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:** MSD 10/6/23

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# 2320914

Comments: _____

Logged by MSD

Reviewed by MJK

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	10/18/2023
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: Welsh CCR

Reviewer Name: Tim Arnold

LRC Date: 10/18/2023

Laboratory Job Number: 233094

Prep Batch Number(s): QC2310142

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: Welsh CCR

Reviewer Name: Tim Arnold

LRC Date: 10/18/2023

Laboratory Job Number: 233094

Prep Batch Number(s): QC2310142

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: Welsh CCR

Reviewer Name: Tim Arnold

LRC Date: 10/18/2023

Laboratory Job Number: 233094

Prep Batch Number(s): QC2310142

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	Michael Ohlinger	Chemist	11/2/23
Name (printed)	Signature	Official Title	Date

TDS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh BASP

Reviewer Name: Michael Ohlinger

LRC Date: 11/02/2023

Laboratory Job Number: 233094

Prep Batch Number(s): QC2310087

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: Welsh BASP

Reviewer Name: Michael Ohlinger

LRC Date: 11/02/2023

Laboratory Job Number: 233094

Prep Batch Number(s): QC2310087

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: Welsh BASP

Reviewer Name: Michael Ohlinger

LRC Date: 11/02/2023

Laboratory Job Number: 233094

Prep Batch Number(s): QC2310087

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."

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233116 **Customer: Welsh Power Station** **Date Reported: 11/28/2023**

Customer Sample ID: AD-3
Customer Description: TG-32
Lab Number: 233116-001
Preparation:
Date Collected: 10/04/2023 11:30 EDT
Date Received: 10/09/2023 12:00 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	10/17/2023 12:55	EPA 200.8-1994, Rev. 5.4
Arsenic	0.56	µg/L	1	0.10	0.03		GES	10/17/2023 12:55	EPA 200.8-1994, Rev. 5.4
Barium	48.0	µg/L	1	0.20	0.05		GES	10/17/2023 12:55	EPA 200.8-1994, Rev. 5.4
Beryllium	0.234	µg/L	1	0.050	0.007		GES	10/17/2023 12:55	EPA 200.8-1994, Rev. 5.4
Boron	0.019	mg/L	1	0.050	0.007	J1	GES	10/17/2023 12:55	EPA 200.8-1994, Rev. 5.4
Cadmium	0.048	µg/L	1	0.020	0.004		GES	10/17/2023 12:55	EPA 200.8-1994, Rev. 5.4
Calcium	1.16	mg/L	1	0.05	0.01		GES	10/17/2023 12:55	EPA 200.8-1994, Rev. 5.4
Chromium	0.64	µg/L	1	0.30	0.07		GES	10/17/2023 12:55	EPA 200.8-1994, Rev. 5.4
Cobalt	1.46	µg/L	1	0.020	0.005		GES	10/17/2023 12:55	EPA 200.8-1994, Rev. 5.4
Lead	0.29	µg/L	1	0.20	0.05		GES	10/17/2023 12:55	EPA 200.8-1994, Rev. 5.4
Lithium	0.0165	mg/L	1	0.00030	0.00007		GES	10/17/2023 12:55	EPA 200.8-1994, Rev. 5.4
Mercury	80	ng/L	10	50	20		RLP	10/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/17/2023 12:55	EPA 200.8-1994, Rev. 5.4
Selenium	0.23	µg/L	1	0.50	0.04	J1	GES	10/17/2023 12:55	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	10/17/2023 12:55	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	0.13	0.13		TTP	10/23/2023 17:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	95.3	%						
Radium-228	-0.44	pCi/L	0.20	0.69	L1, P2	ST	11/07/2023 16:13	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	70.1	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233116 **Customer: Welsh Power Station** **Date Reported: 11/28/2023**

Customer Sample ID: AD-4c
Customer Description: TG-32
Lab Number: 233116-002
Preparation:
Date Collected: 10/04/2023 10:21 EDT
Date Received: 10/09/2023 12:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.034	µg/L	1	0.100	0.008	J1	GES	10/17/2023 13:00	EPA 200.8-1994, Rev. 5.4
Arsenic	0.61	µg/L	1	0.10	0.03		GES	10/17/2023 13:00	EPA 200.8-1994, Rev. 5.4
Barium	88.8	µg/L	1	0.20	0.05		GES	10/17/2023 13:00	EPA 200.8-1994, Rev. 5.4
Beryllium	0.208	µg/L	1	0.050	0.007		GES	10/17/2023 13:00	EPA 200.8-1994, Rev. 5.4
Boron	0.207	mg/L	1	0.050	0.007		GES	10/17/2023 13:00	EPA 200.8-1994, Rev. 5.4
Cadmium	0.999	µg/L	1	0.020	0.004		GES	10/17/2023 13:00	EPA 200.8-1994, Rev. 5.4
Calcium	1.67	mg/L	1	0.05	0.01		GES	10/17/2023 13:00	EPA 200.8-1994, Rev. 5.4
Chromium	0.81	µg/L	1	0.30	0.07		GES	10/17/2023 13:00	EPA 200.8-1994, Rev. 5.4
Cobalt	0.841	µg/L	1	0.020	0.005		GES	10/17/2023 13:00	EPA 200.8-1994, Rev. 5.4
Lead	0.30	µg/L	1	0.20	0.05		GES	10/17/2023 13:00	EPA 200.8-1994, Rev. 5.4
Lithium	0.00644	mg/L	1	0.00030	0.00007		GES	10/17/2023 13:00	EPA 200.8-1994, Rev. 5.4
Magnesium	0.971	mg/L	1	0.100	0.006		GES	10/17/2023 13:00	EPA 200.8-1994, Rev. 5.4
Mercury	47	ng/L	1	5	2		RLP	10/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/17/2023 13:00	EPA 200.8-1994, Rev. 5.4
Potassium	0.256	mg/L	1	0.100	0.008		GES	10/17/2023 13:00	EPA 200.8-1994, Rev. 5.4
Selenium	0.78	µg/L	1	0.50	0.04		GES	10/17/2023 13:00	EPA 200.8-1994, Rev. 5.4
Sodium	61.1	mg/L	1	0.20	0.01		GES	10/17/2023 13:00	EPA 200.8-1994, Rev. 5.4
Thallium	0.04	µg/L	1	0.20	0.02	J1	GES	10/17/2023 13:00	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.89	pCi/L	0.16	0.16		TTP	10/23/2023 17:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	88.2	%						
Radium-228	0.84	pCi/L	0.15	0.49	L1, P2	ST	11/07/2023 16:13	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	72.5	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233116 **Customer: Welsh Power Station** **Date Reported: 11/28/2023**

Customer Sample ID: AD-16R
Customer Description: TG-32
Lab Number: 233116-003
Preparation:
Date Collected: 10/04/2023 10:14 EDT
Date Received: 10/09/2023 12:00 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	10/17/2023 13:05	EPA 200.8-1994, Rev. 5.4
Arsenic	0.47	µg/L	1	0.10	0.03		GES	10/17/2023 13:05	EPA 200.8-1994, Rev. 5.4
Barium	45.3	µg/L	1	0.20	0.05		GES	10/17/2023 13:05	EPA 200.8-1994, Rev. 5.4
Beryllium	0.873	µg/L	1	0.050	0.007		GES	10/17/2023 13:05	EPA 200.8-1994, Rev. 5.4
Boron	0.021	mg/L	1	0.050	0.007	J1	GES	10/17/2023 13:05	EPA 200.8-1994, Rev. 5.4
Cadmium	0.709	µg/L	1	0.020	0.004		GES	10/17/2023 13:05	EPA 200.8-1994, Rev. 5.4
Calcium	0.29	mg/L	1	0.05	0.01		GES	10/17/2023 13:05	EPA 200.8-1994, Rev. 5.4
Chromium	0.56	µg/L	1	0.30	0.07		GES	10/17/2023 13:05	EPA 200.8-1994, Rev. 5.4
Cobalt	24.8	µg/L	1	0.020	0.005		GES	10/17/2023 13:05	EPA 200.8-1994, Rev. 5.4
Lead	0.20	µg/L	1	0.20	0.05		GES	10/17/2023 13:05	EPA 200.8-1994, Rev. 5.4
Lithium	0.0159	mg/L	1	0.00030	0.00007		GES	10/17/2023 13:05	EPA 200.8-1994, Rev. 5.4
Magnesium	0.919	mg/L	1	0.100	0.006		GES	10/17/2023 13:05	EPA 200.8-1994, Rev. 5.4
Mercury	17	ng/L	1	5	2		RLP	10/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/17/2023 13:05	EPA 200.8-1994, Rev. 5.4
Potassium	3.09	mg/L	1	0.100	0.008		GES	10/17/2023 13:05	EPA 200.8-1994, Rev. 5.4
Selenium	0.71	µg/L	1	0.50	0.04		GES	10/17/2023 13:05	EPA 200.8-1994, Rev. 5.4
Sodium	5.46	mg/L	1	0.20	0.01		GES	10/17/2023 13:05	EPA 200.8-1994, Rev. 5.4
Thallium	0.46	µg/L	1	0.20	0.02		GES	10/17/2023 13:05	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	3.01	pCi/L	0.30	0.19		TTP	10/23/2023 17:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	84.9	%						
Radium-228	4.60	pCi/L	0.21	0.53	L1, P2	ST	11/07/2023 16:13	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	74.7	%						

* 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: 233116 **Customer: Welsh Power Station** **Date Reported: 11/28/2023**

Customer Sample ID: DUPLICATE - BASP
Customer Description: TG-32
Lab Number: 233116-004
Preparation:
Date Collected: 10/04/2023 12:30 EDT
Date Received: 10/09/2023 12:00 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	10/17/2023 13:10	EPA 200.8-1994, Rev. 5.4
Arsenic	0.45	µg/L	1	0.10	0.03		GES	10/17/2023 13:10	EPA 200.8-1994, Rev. 5.4
Barium	41.7	µg/L	1	0.20	0.05		GES	10/17/2023 13:10	EPA 200.8-1994, Rev. 5.4
Beryllium	1.08	µg/L	1	0.050	0.007		GES	10/17/2023 13:10	EPA 200.8-1994, Rev. 5.4
Boron	0.023	mg/L	1	0.050	0.007	J1	GES	10/17/2023 13:10	EPA 200.8-1994, Rev. 5.4
Cadmium	0.705	µg/L	1	0.020	0.004		GES	10/17/2023 13:10	EPA 200.8-1994, Rev. 5.4
Calcium	0.31	mg/L	1	0.05	0.01		GES	10/17/2023 13:10	EPA 200.8-1994, Rev. 5.4
Chromium	0.66	µg/L	1	0.30	0.07		GES	10/17/2023 13:10	EPA 200.8-1994, Rev. 5.4
Cobalt	28.8	µg/L	1	0.020	0.005		GES	10/17/2023 13:10	EPA 200.8-1994, Rev. 5.4
Lead	0.25	µg/L	1	0.20	0.05		GES	10/17/2023 13:10	EPA 200.8-1994, Rev. 5.4
Lithium	0.0195	mg/L	1	0.00030	0.00007		GES	10/17/2023 13:10	EPA 200.8-1994, Rev. 5.4
Mercury	41	ng/L	1	5	2		RLP	10/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/17/2023 13:10	EPA 200.8-1994, Rev. 5.4
Selenium	0.80	µg/L	1	0.50	0.04		GES	10/17/2023 13:10	EPA 200.8-1994, Rev. 5.4
Thallium	0.47	µg/L	1	0.20	0.02		GES	10/17/2023 13:10	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: 233116 **Customer: Welsh Power Station** **Date Reported: 11/28/2023**

Customer Sample ID: EQUIPMENT BLANK -BASP
Customer Description: TG-32
Lab Number: 233116-005
Preparation:
Date Collected: 10/04/2023 11:08 EDT
Date Received: 10/09/2023 12:00 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	10/17/2023 13:15	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	10/17/2023 13:15	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	GES	10/17/2023 13:15	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	10/17/2023 13:15	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	10/17/2023 13:15	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	10/17/2023 13:15	EPA 200.8-1994, Rev. 5.4
Calcium	<0.01	mg/L	1	0.05	0.01	U1	GES	10/17/2023 13:15	EPA 200.8-1994, Rev. 5.4
Chromium	0.30	µg/L	1	0.30	0.07		GES	10/17/2023 13:15	EPA 200.8-1994, Rev. 5.4
Cobalt	0.039	µg/L	1	0.020	0.005		GES	10/17/2023 13:15	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	10/17/2023 13:15	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00007	mg/L	1	0.00030	0.00007	U1	GES	10/17/2023 13:15	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/17/2023 13:15	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	10/17/2023 13:15	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	10/17/2023 13:15	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: 233116 **Customer: Welsh Power Station** **Date Reported: 11/28/2023**

Customer Sample ID: FIELD BLANK - BASP
Customer Description: TG-32
Lab Number: 233116-006
Preparation:
Date Collected: 10/04/2023 11:16 EDT
Date Received: 10/09/2023 12:00 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	10/17/2023 13:21	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	10/17/2023 13:21	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	GES	10/17/2023 13:21	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	10/17/2023 13:21	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	10/17/2023 13:21	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	10/17/2023 13:21	EPA 200.8-1994, Rev. 5.4
Calcium	<0.01	mg/L	1	0.05	0.01	U1	GES	10/17/2023 13:21	EPA 200.8-1994, Rev. 5.4
Chromium	0.27	µg/L	1	0.30	0.07	J1	GES	10/17/2023 13:21	EPA 200.8-1994, Rev. 5.4
Cobalt	0.039	µg/L	1	0.020	0.005		GES	10/17/2023 13:21	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	10/17/2023 13:21	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00007	mg/L	1	0.00030	0.00007	U1	GES	10/17/2023 13:21	EPA 200.8-1994, Rev. 5.4
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/17/2023 13:21	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	10/17/2023 13:21	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	10/17/2023 13:21	EPA 200.8-1994, Rev. 5.4

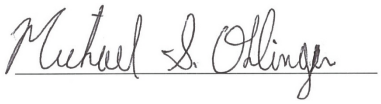
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233116 **Customer: Welsh Power Station** **Date Reported: 11/28/2023**

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

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
U1 - Not detected at or above method detection limit (MDL).
L1 - The associated laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) recovery was outside acceptance limits.
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)

Project Name: Welsh BASP
Contact Name: Rebecca Jones
Contact Phone: (737) 330-3725
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (In Calendar Days)
Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 233116

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, Mg, Na, K	250 mL bottle, pH<2, HNO_3 B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Mo, Se, TL	1 L bottle, Cool, 0-6°C TDS, F, Cl, SO_4	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	125 mL PTFE lined bottle, HCL**, pH<2 Hg	filter 500 mL bottle, then pH<2, HNO_3 dissolved Fe and Mn		Sample Specific Notes:
AD-3	10/4/2023	1030	G	GW	5			X		X	X			TG-32 needed
AD-4c	10/4/2023	921	G	GW	5		X			X	X			
AD-16R	10/4/2023	914	G	GW	8		X			X	X			
DUPLICATE - BASP	10/4/2023	1130	G	GW	2			X			X			
EQUIPMENT BLANK - BASP	10/4/2023	1008	G	GW	2			X			X			
FIELD BLANK - BASP	10/4/2023	1016	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:

Relinquished by: [signature]	Company: Eagle	Date/Time: 10-5-23 1100	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: 10/9 & 10/10/23

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY (UPS) FedEX USPS
	Other _____

Plant/Customer Welsh Power Station **Number of Plastic Containers:** 18

Opened By Misgha **Number of Glass Containers:** _____

Date/Time 10/09/23 11:30 Am **Number of Mercury Containers:** 5

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial:** MGlc 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:** MGlc 10/09/23

pH paper (circle one): MQuant,PN1.09535.0001,LOT#_____ [OR] Lab Rat,PN4801,LOT# X060RWDG21 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# 233116 Initial & Date & Time : _____

Comments: _____

Logged by MSO _____

_____

Reviewed by MGlc _____

_____

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.

Jonathan Barnhill		Lab Supervisor	11/8/2023
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: Welsh CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 11/8/2023

Laboratory Job Number: 233116

Prep Batch Number(s): PB23101209 QC2310150

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	Yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	No	ER1
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

ICP-MS Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	Yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	Yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	Yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	Yes	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	Yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

ICP-MS Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 11/8/2023

Laboratory Job Number: 233116

Prep Batch Number(s): PB23101209 QC2310150

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	

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: Welsh CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 11/8/2023

Laboratory Job Number: 233116

Prep Batch Number(s): PB23101209 QC2310150

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."

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.

Susann Sulzmann	Susann Sulzmann	Senior Chemist	11-02-2023
Name (printed)	Signature	Official Title	Date

Mercury Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh Power Station

Reviewer Name: Susann Sulzmann

LRC Date: 11-03-2023

Laboratory Job Number: 233116

Prep Batch Number(s): PB23101204

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	yes	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Mercury Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	yes	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Mercury Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh Power Station

Reviewer Name: Susann Sulzmann

LRC Date: 11-03-2023

Laboratory Job Number: 233116

Prep Batch Number(s): PB23101204

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: Welsh Power Station

Reviewer Name: Susann Sulzmann

LRC Date: 11-03-2023

Laboratory Job Number: 233116

Prep Batch Number(s): PB23101204

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: 233117 **Customer: Welsh Power Station** **Date Reported: 11/15/2023**

Customer Sample ID: AD-1 Customer Description: TG-32
Lab Number: 233117-001 Preparation:
Date Collected: 10/04/2023 11:11 EDT Date Received: 10/04/2023 10:11 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.029	µg/L	1	0.100	0.008	J1	GES	10/17/2023 13:26	EPA 200.8-1994, Rev. 5.4
Arsenic	0.19	µg/L	1	0.10	0.03		GES	10/17/2023 13:26	EPA 200.8-1994, Rev. 5.4
Barium	80.0	µg/L	1	0.20	0.05		GES	10/17/2023 13:26	EPA 200.8-1994, Rev. 5.4
Beryllium	1.06	µg/L	1	0.050	0.007		GES	10/17/2023 13:26	EPA 200.8-1994, Rev. 5.4
Boron	0.901	mg/L	1	0.050	0.007		GES	10/17/2023 13:26	EPA 200.8-1994, Rev. 5.4
Cadmium	0.027	µg/L	1	0.020	0.004		GES	10/17/2023 13:26	EPA 200.8-1994, Rev. 5.4
Calcium	6.56	mg/L	1	0.05	0.01		GES	10/17/2023 13:26	EPA 200.8-1994, Rev. 5.4
Chromium	0.38	µg/L	1	0.30	0.07		GES	10/17/2023 13:26	EPA 200.8-1994, Rev. 5.4
Cobalt	2.25	µg/L	1	0.020	0.005		GES	10/17/2023 13:26	EPA 200.8-1994, Rev. 5.4
Lead	0.44	µg/L	1	0.20	0.05		GES	10/17/2023 13:26	EPA 200.8-1994, Rev. 5.4
Lithium	0.0103	mg/L	1	0.00030	0.00007		GES	10/17/2023 13:26	EPA 200.8-1994, Rev. 5.4
Mercury	2	ng/L	1	5	2	J1	RLP	10/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/17/2023 13:26	EPA 200.8-1994, Rev. 5.4
Selenium	9.26	µg/L	1	0.50	0.04		GES	10/17/2023 13:26	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.02	J1	GES	10/17/2023 13:26	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.69	pCi/L	0.14	0.14		TTP	10/23/2023 17:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	76.5	%						
Radium-228	1.17	pCi/L	0.15	0.47		ST	11/02/2023 17:52	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: 233117 **Customer: Welsh Power Station** **Date Reported: 11/15/2023**

Customer Sample ID: AD-5 Customer Description: TG-32
Lab Number: 233117-002 Preparation:
Date Collected: 10/04/2023 12:18 EDT Date Received: 10/04/2023 10:11 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	10/17/2023 13:31	EPA 200.8-1994, Rev. 5.4
Arsenic	2.94	µg/L	1	0.10	0.03		GES	10/17/2023 13:31	EPA 200.8-1994, Rev. 5.4
Barium	63.9	µg/L	1	0.20	0.05		GES	10/17/2023 13:31	EPA 200.8-1994, Rev. 5.4
Beryllium	0.049	µg/L	1	0.050	0.007	J1	GES	10/17/2023 13:31	EPA 200.8-1994, Rev. 5.4
Boron	0.042	mg/L	1	0.050	0.007	J1	GES	10/17/2023 13:31	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	10/17/2023 13:31	EPA 200.8-1994, Rev. 5.4
Calcium	35.2	mg/L	1	0.05	0.01		GES	10/17/2023 13:31	EPA 200.8-1994, Rev. 5.4
Chromium	0.30	µg/L	1	0.30	0.07		GES	10/17/2023 13:31	EPA 200.8-1994, Rev. 5.4
Cobalt	12.8	µg/L	1	0.020	0.005		GES	10/17/2023 13:31	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	10/17/2023 13:31	EPA 200.8-1994, Rev. 5.4
Lithium	0.143	mg/L	1	0.00030	0.00007		GES	10/17/2023 13:31	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/17/2023 13:31	EPA 200.8-1994, Rev. 5.4
Selenium	0.05	µg/L	1	0.50	0.04	J1	GES	10/17/2023 13:31	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	10/17/2023 13:31	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	0.18	0.14		TTP	10/23/2023 17:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	88.5	%						
Radium-228	2.29	pCi/L	0.21	0.62		ST	11/02/2023 17:52	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	75.4	%						

* 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: 233117 **Customer: Welsh Power Station** **Date Reported: 11/15/2023**

Customer Sample ID: AD-17
Customer Description: TG-32
Lab Number: 233117-003
Preparation:
Date Collected: 10/04/2023 12:07 EDT
Date Received: 10/04/2023 10:11 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.08	µg/L	10	1.00	0.08	U1	GES	10/17/2023 13:36	EPA 200.8-1994, Rev. 5.4
Arsenic	0.5	µg/L	10	1.0	0.3	J1	GES	10/17/2023 13:36	EPA 200.8-1994, Rev. 5.4
Barium	11.8	µg/L	10	2.0	0.5		GES	10/17/2023 13:36	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.07	µg/L	10	0.50	0.07	U1	GES	10/17/2023 13:36	EPA 200.8-1994, Rev. 5.4
Boron	0.14	mg/L	10	0.50	0.07	J1	GES	10/17/2023 13:36	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.04	µg/L	10	0.20	0.04	U1	GES	10/17/2023 13:36	EPA 200.8-1994, Rev. 5.4
Calcium	176	mg/L	10	0.5	0.1	M1	GES	10/17/2023 13:36	EPA 200.8-1994, Rev. 5.4
Chromium	1.3	µg/L	10	3.0	0.7	J1	GES	10/17/2023 13:36	EPA 200.8-1994, Rev. 5.4
Cobalt	41.2	µg/L	10	0.20	0.05		GES	10/17/2023 13:36	EPA 200.8-1994, Rev. 5.4
Lead	<0.5	µg/L	10	2.0	0.5	U1	GES	10/17/2023 13:36	EPA 200.8-1994, Rev. 5.4
Lithium	0.305	mg/L	10	0.0030	0.0007	M1	GES	10/17/2023 13:36	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<1	µg/L	10	5	1	U1	GES	10/17/2023 13:36	EPA 200.8-1994, Rev. 5.4
Selenium	<0.4	µg/L	10	5.0	0.4	U1	GES	10/17/2023 13:36	EPA 200.8-1994, Rev. 5.4
Thallium	<0.2	µg/L	10	2.0	0.2	U1	GES	10/17/2023 13:36	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	0.12	0.12		TTP	10/23/2023 17:45	SW-846 9315-1986, Rev. 0
Carrier Recovery	94.9	%						
Radium-228	1.40	pCi/L	0.21	0.66		ST	11/02/2023 17:52	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	70.7	%						

* 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: 233117 **Customer: Welsh Power Station** **Date Reported: 11/15/2023**

Customer Sample ID: DUPLICATE - BACKGROUND
Customer Description: TG-32
Lab Number: 233117-004
Preparation:
Date Collected: 10/04/2023 13:00 EDT
Date Received: 10/04/2023 10:11 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.039	µg/L	1	0.100	0.008	J1	GES	10/17/2023 13:51	EPA 200.8-1994, Rev. 5.4
Arsenic	0.22	µg/L	1	0.10	0.03		GES	10/17/2023 13:51	EPA 200.8-1994, Rev. 5.4
Barium	82.9	µg/L	1	0.20	0.05		GES	10/17/2023 13:51	EPA 200.8-1994, Rev. 5.4
Beryllium	0.997	µg/L	1	0.050	0.007		GES	10/17/2023 13:51	EPA 200.8-1994, Rev. 5.4
Boron	0.907	mg/L	1	0.050	0.007		GES	10/17/2023 13:51	EPA 200.8-1994, Rev. 5.4
Cadmium	0.027	µg/L	1	0.020	0.004		GES	10/17/2023 13:51	EPA 200.8-1994, Rev. 5.4
Calcium	6.77	mg/L	1	0.05	0.01		GES	10/17/2023 13:51	EPA 200.8-1994, Rev. 5.4
Chromium	0.35	µg/L	1	0.30	0.07		GES	10/17/2023 13:51	EPA 200.8-1994, Rev. 5.4
Cobalt	2.39	µg/L	1	0.020	0.005		GES	10/17/2023 13:51	EPA 200.8-1994, Rev. 5.4
Lead	0.45	µg/L	1	0.20	0.05		GES	10/17/2023 13:51	EPA 200.8-1994, Rev. 5.4
Lithium	0.00980	mg/L	1	0.00030	0.00007		GES	10/17/2023 13:51	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/17/2023 13:51	EPA 200.8-1994, Rev. 5.4
Selenium	10.0	µg/L	1	0.50	0.04		GES	10/17/2023 13:51	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.02	J1	GES	10/17/2023 13:51	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: 233117 **Customer: Welsh Power Station** **Date Reported: 11/15/2023**

Customer Sample ID: EB - BACKGROUND
Customer Description: TG-32
Lab Number: 233117-005
Preparation:
Date Collected: 10/04/2023 10:49 EDT
Date Received: 10/04/2023 10:11 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	10/17/2023 14:48	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	10/17/2023 14:48	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	GES	10/17/2023 14:48	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	10/17/2023 14:48	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	10/17/2023 14:48	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	10/17/2023 14:48	EPA 200.8-1994, Rev. 5.4
Calcium	<0.01	mg/L	1	0.05	0.01	U1	GES	10/17/2023 14:48	EPA 200.8-1994, Rev. 5.4
Chromium	0.51	µg/L	1	0.30	0.07		GES	10/17/2023 14:48	EPA 200.8-1994, Rev. 5.4
Cobalt	0.085	µg/L	1	0.020	0.005		GES	10/17/2023 14:48	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	10/17/2023 14:48	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00007	mg/L	1	0.00030	0.00007	U1	GES	10/17/2023 14:48	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	10/12/2023 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/17/2023 14:48	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	10/17/2023 14:48	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	10/17/2023 14:48	EPA 200.8-1994, Rev. 5.4

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 233117 **Customer: Welsh Power Station** **Date Reported: 11/15/2023**

Customer Sample ID: FIELD BLANK - BACKGROUND
Customer Description: TG-32
Lab Number: 233117-006
Preparation:
Date Collected: 10/04/2023 12:10 EDT
Date Received: 10/04/2023 10:11 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	10/17/2023 14:53	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	10/17/2023 14:53	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	GES	10/17/2023 14:53	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	10/17/2023 14:53	EPA 200.8-1994, Rev. 5.4
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	10/17/2023 14:53	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	10/17/2023 14:53	EPA 200.8-1994, Rev. 5.4
Calcium	<0.01	mg/L	1	0.05	0.01	U1	GES	10/17/2023 14:53	EPA 200.8-1994, Rev. 5.4
Chromium	0.35	µg/L	1	0.30	0.07		GES	10/17/2023 14:53	EPA 200.8-1994, Rev. 5.4
Cobalt	0.039	µg/L	1	0.020	0.005		GES	10/17/2023 14:53	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	10/17/2023 14:53	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00007	mg/L	1	0.00030	0.00007	U1	GES	10/17/2023 14:53	EPA 200.8-1994, Rev. 5.4
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/17/2023 14:53	EPA 200.8-1994, Rev. 5.4
Selenium	<0.04	µg/L	1	0.50	0.04	U1	GES	10/17/2023 14:53	EPA 200.8-1994, Rev. 5.4
Thallium	<0.02	µg/L	1	0.20	0.02	U1	GES	10/17/2023 14:53	EPA 200.8-1994, Rev. 5.4

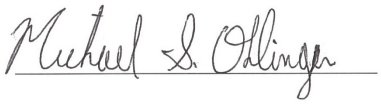
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233117 **Customer: Welsh Power Station** **Date Reported: 11/15/2023**

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

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
U1 - Not detected at or above method detection limit (MDL).
M1 - The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside 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)

Project Name: Welsh Background
Contact Name: Rebecca Jones
Contact Phone: (737) 330-3725
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (In Calendar Days) Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: ~~23H~~ 233117

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	Field-filter 500 mL bottle, then pH<2, HNO_3 dissolved Fe and Mn	1 L bottle, Cool, 0-6°C TDS, F, Cl, SO_4	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	125 mL PTFE lined bottle, HCL^{**}, pH<2 Hg			Sample Specific Notes:
AD-1	10/4/2023	1011	G	GW	8		X			X	X			Routine (28 days)
AD-5	10/4/2023	1118	G	GW	5		X			X	X			TG-32 needed
AD-17	10/4/2023	1107	G	GW	5		X			X	X			
DUPLICATE - BACKGROUND	10/4/2023	1200	G	GW	2		X				X			
EQUIPMENT BLANK - BACKGROUND	10/4/2023	949	G	GW	2		X				X			
FIELD BLANK - BACKGROUND	10/4/2023	1110	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:

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
[signature]	Eqst	10-5-23 1600		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Date/Time: 10/9 + 10/10/23

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY (UPS) FedEX USPS
	Other _____

Plant/Customer Welsh Power Station **Number of Plastic Containers:** 18

Opened By Misgina **Number of Glass Containers:** _____

Date/Time 10/09/23 11:30 Am **Number of Mercury Containers:** 5

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial:** MGK 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:** MGK 10/09/23

pH paper (circle one): MQuant,PN1.09535.0001,LOT#_____ [OR] Lab Rat,PN4801.LOT# X060RWDG21 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# 233117 Initial & Date & Time : _____

Comments: _____

Logged by MSO _____

Reviewed by MGK _____

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.

Susann Sulzmann	Susann Sulzmann	Senior Chemist	11-02-2023
Name (printed)	Signature	Official Title	Date

Mercury Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh Power Station

Reviewer Name: Susann Sulzmann

LRC Date: 11-03-2023

Laboratory Job Number: 233117

Prep Batch Number(s): PB23101204

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
R1	O, I	**Chain-of-custody (COC)**		
	I	Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	Yes	
	I	Were all departures from standard conditions described in an exception report?	Yes	
R2	O, I	**Sample and quality control (QC) identification**		
	I	Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	Yes	
	I	Are all laboratory ID numbers cross-referenced to the corresponding QC data?	Yes	
R3	O, I	**Test reports**		
	I	Were all samples prepared and analyzed within holding times?	yes	
	I	Other than those results < MQL, were all other raw values bracketed by calibration standards?	yes	
	I	Were calculations checked by a peer or supervisor?	Yes	
	I	Were all analyte identifications checked by a peer or supervisor?	Yes	
	I	Were sample quantitation limits reported for all analytes not detected?	Yes	
	I	Were all results for soil and sediment samples reported on a dry weight basis?	NA	
	I	Was % moisture (or solids) reported for all soil and sediment samples?	NA	
	I	If required for the project, TICs reported?	NA	
R4	O	**Surrogate recovery data**		
	I	Were surrogates added prior to extraction?	NA	
	I	Were surrogate percent recoveries in all samples within the laboratory QC limits?	NA	
R5	O, I	**Test reports/summary forms for blank samples**		
	I	Were appropriate type(s) of blanks analyzed?	Yes	
	I	Were blanks analyzed at the appropriate frequency?	Yes	

Mercury Laboratory Review Checklist

Item[1]	Analytes[2]	Description	Result (Yes, No, NA, NR)[3]	Exception Report No.[4]
	I	Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	Yes	
	I	Were blank concentrations < MQL?	yes	
R6	O, I	**Laboratory control samples (LCS):**		
	I	Were all COCs included in the LCS?	Yes	
	I	Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	Yes	
	I	Were LCSs analyzed at the required frequency?	Yes	
	I	Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	yes	
	I	Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SQLs?	Yes	
	I	Was the LCSD RPD within QC limits?	yes	
R7	O, I	**Matrix spike (MS) and matrix spike duplicate (MSD) data**		
	I	Were the project/method specified analytes included in the MS and MSD?	Yes	
	I	Were MS/MSD analyzed at the appropriate frequency?	Yes	
	I	Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	yes	
	I	Were MS/MSD RPDs within laboratory QC limits?	yes	
R8	O, I	**Analytical duplicate data**		
	I	Were appropriate analytical duplicates analyzed for each matrix?	Yes	
	I	Were analytical duplicates analyzed at the appropriate frequency?	Yes	
	I	Were RPDs or relative standard deviations within the laboratory QC limits?	yes	
R9	O, I	**Method quantitation limits (MQLs):**		
	I	Are the MQLs for each method analyte included in the laboratory data package?	Yes	
	I	Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	Yes	
	I	Are unadjusted MQLs included in the laboratory data package?	Yes	
R10	O, I	**Other problems/anomalies**		
	I	Are all known problems/anomalies/special conditions noted in this LRC and ER?	Yes	
	I	Were all necessary corrective actions performed for the reported data?	Yes	
	I	Was applicable and available technology used to lower the SQL minimize the matrix interference affects on the sample results?	Yes	

Mercury Laboratory Review Checklist

Table 2. Supporting Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh Power Station

Reviewer Name: Susann Sulzmann

LRC Date: 11-03-2023

Laboratory Job Number: 233117

Prep Batch Number(s): PB23101204

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: Welsh Power Station

Reviewer Name: Susann Sulzmann

LRC Date: 11-03-2023

Laboratory Job Number: 233117

Prep Batch Number(s): PB23101204

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	11/8/2023
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: Welsh CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 11/8/2023

Laboratory Job Number: 233117

Prep Batch Number(s): PB23101209 QC2310150

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: Welsh CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 11/8/2023

Laboratory Job Number: 233117

Prep Batch Number(s): PB23101209 QC2310150

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	

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: Welsh CCR

Reviewer Name: Jonathan Barnhill

LRC Date: 11/8/2023

Laboratory Job Number: 233117

Prep Batch Number(s): PB23101209 QC2310150

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	Sample 233117-003 failed acceptance criteria on Matrix spike for Calcium and Lithium

[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: 233093 **Customer: Welsh Power Station** **Date Reported: 11/02/2023**

Customer Sample ID: AD-1
Lab Number: 233093-001
Date Collected: 10/04/2023 11:11 EDT
Customer Description:
Preparation:
Date Received: 10/06/2023 09:50 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	3.03	mg/L	2	0.04	0.01		CRJ	10/17/2023 17:15	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.20	mg/L	2	0.06	0.02		CRJ	10/17/2023 17:15	EPA 300.1 -1997, Rev. 1.0
Sulfate	80.7	mg/L	2	0.6	0.1		CRJ	10/17/2023 17:15	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	200	mg/L	1	50	20		ELT	10/09/2023 12:54	SM 2540C-2015

Customer Sample ID: AD-5
Lab Number: 233093-002
Date Collected: 10/04/2023 12:18 EDT
Customer Description:
Preparation:
Date Received: 10/06/2023 09:50 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	17.5	mg/L	2	0.04	0.01		CRJ	10/17/2023 20:00	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.17	mg/L	2	0.06	0.02		CRJ	10/17/2023 20:00	EPA 300.1 -1997, Rev. 1.0
Sulfate	132	mg/L	10	3.0	0.6		CRJ	10/17/2023 18:21	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	290	mg/L	1	50	20		ELT	10/09/2023 12:54	SM 2540C-2015

Customer Sample ID: AD-17
Lab Number: 233093-003
Date Collected: 10/04/2023 12:07 EDT
Customer Description:
Preparation:
Date Received: 10/06/2023 09:50 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	37.9	mg/L	5	0.10	0.03		CRJ	10/17/2023 20:33	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.06	mg/L	5	0.15	0.05	J1	CRJ	10/17/2023 20:33	EPA 300.1 -1997, Rev. 1.0
Sulfate	1180	mg/L	50	15	3		CRJ	10/17/2023 18:54	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	1520	mg/L	2	100	40		ELT	10/09/2023 12:59	SM 2540C-2015

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233093 **Customer: Welsh Power Station** **Date Reported: 11/02/2023**

Customer Sample ID: DUPLICATE - BACKGROUND
Customer Description:
Lab Number: 233093-004
Preparation:
Date Collected: 10/04/2023 13:00 EDT
Date Received: 10/06/2023 09:50 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	3.01	mg/L	2	0.04	0.01		CRJ	10/17/2023 17:48	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.20	mg/L	2	0.06	0.02		CRJ	10/17/2023 17:48	EPA 300.1 -1997, Rev. 1.0
Sulfate	80.3	mg/L	2	0.6	0.1		CRJ	10/17/2023 17:48	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	170	mg/L	2	100	40		ELT	10/09/2023 12:59	SM 2540C-2015

233093-001
Comments:

TG-32

233093-002
Comments:

TG-32

233093-003
Comments:

TG-32

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

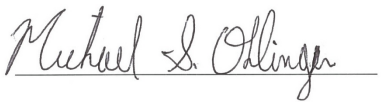
Job ID: 233093 **Customer: Welsh Power Station** **Date Reported: 11/02/2023**

233093-004
Comments:

TG-32

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

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)

Project Name: Welsh Background
Contact Name: Rebecca Jones
Contact Phone: (737) 330-3725
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days) Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 233093

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, Ll, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Mo, Se, TL	Field-filter 500 mL bottle, then pH<2, HNO_3 dissolved Fe and Mn	1 L bottle, Cool, 0-6°C TDS, F, Cl, SO_4	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	40 mL Glass vial or 125 mL PTFE lined bottle, HCL^{**}, pH<2 Hg			Sample Specific Notes:
AD-1	10/4/2023	1011	G	GW	1				X					TG-32 needed
AD-5	10/4/2023	1118	G	GW	1				X					
AD-17	10/4/2023	1107	G	GW	1				X					
DUPLICATE - BACKGROUND	10/4/2023	1200	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:

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
[signature]	Eagle	10-5-23 16:00		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Date/Time: 10/6/23 9:50AM

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 Welch **Number of Plastic Containers:** 4

Opened By MSD **Number of Glass Containers:** –

Date/Time 10/6/23 9:50AM **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? (Y) N or N/A **Initial:** MSD (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:** MSD 10/6/23

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# 233093 Initial & Date & Time : _____

Comments: _____

Logged by MSD _____

Reviewed by MGK _____

_____

_____

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.

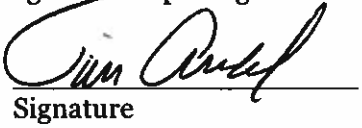
Municipal Solid Waste Laboratory Review Checklist

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	10/18/2023
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: Welsh CCR

Reviewer Name: Tim Arnold

LRC Date: 10/18/2023

Laboratory Job Number: 233093

Prep Batch Number(s): QC2310142

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: Welsh CCR

Reviewer Name: Tim Arnold

LRC Date: 10/18/2023

Laboratory Job Number: 233093

Prep Batch Number(s): QC2310142

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: Welsh CCR

Reviewer Name: Tim Arnold

LRC Date: 10/18/2023

Laboratory Job Number: 233093

Prep Batch Number(s): QC2310142

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."

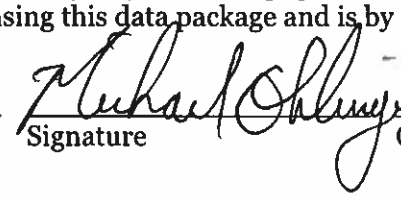
Municipal Solid Waste Laboratory Review Checklist

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	11/2/23
Name (printed)	Signature	Official Title	Date

TDS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh Background

Reviewer Name: Michael Ohlinger

LRC Date: 11/2/23

Laboratory Job Number: 233093

Prep Batch Number(s): QC2310087

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: Welsh Background

Reviewer Name: Michael Ohlinger

LRC Date: 11/2/23

Laboratory Job Number: 233093

Prep Batch Number(s): QC2310087

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: Welsh Background

Reviewer Name: Michael Ohlinger

LRC Date: 11/2/23

Laboratory Job Number: 233093

Prep Batch Number(s): QC2310087

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."

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233797 **Customer: Welsh Power Station** **Date Reported: 12/27/2023**

Customer Sample ID: AD-3
Lab Number: 233797-001
Date Collected: 12/14/2023 12:03 EST

Customer Description:
Preparation:
Date Received: 12/15/2023 10:00 EST

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1.11	pCi/L	0.25	0.31		ST	12/19/2023 16:01	SW-846 9315-1986, Rev. 0
Carrier Recovery	107	%						
Radium-228	1.19	pCi/L	0.18	0.55	P2	TTP	12/21/2023 12:28	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	76.8	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233797 **Customer: Welsh Power Station** **Date Reported: 12/27/2023**

Customer Sample ID: AD-4c
Lab Number: 233797-002
Date Collected: 12/14/2023 10:59 EST

Customer Description:
Preparation:
Date Received: 12/15/2023 10:00 EST

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Sulfate	106	mg/L	10	3.0	0.6		CRJ	12/15/2023 17:52	EPA 300.1 -1997, Rev. 1.0

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.137	mg/L	1	0.050	0.007		ELT	12/20/2023 14:51	EPA 200.8-1994, Rev. 5.4
Calcium	1.08	mg/L	1	0.05	0.01		ELT	12/20/2023 14:51	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	2.64	pCi/L	0.42	0.34		ST	12/19/2023 16:01	SW-846 9315-1986, Rev. 0
Carrier Recovery	97.1	%						
Radium-228	0.43	pCi/L	0.18	0.59	P2	TTP	12/21/2023 12:28	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.

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	330	mg/L	1	50	20		ELT	12/18/2023 11:45	SM 2540C-2015

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233797 **Customer: Welsh Power Station** **Date Reported: 12/27/2023**

Customer Sample ID: AD-16R	Customer Description:
Lab Number: 233797-003	Preparation:
Date Collected: 12/14/2023 10:27 EST	Date Received: 12/15/2023 10:00 EST

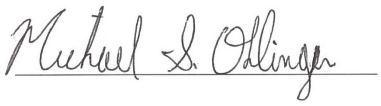
Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	30.10	pCi/L	1.56	0.39		ST	12/19/2023 16:01	SW-846 9315-1986, Rev. 0
Carrier Recovery	95.8	%						
Radium-228	3.63	pCi/L	0.21	0.56	P2	TTP	12/21/2023 12:28	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	79.9	%						

* 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.

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

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 233797 **Customer: Welsh Power Station** **Date Reported: 12/27/2023**

Data Qualifer Legend

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)

Project Name: Welsh BASP
Contact Name: Rebecca Jones
Contact Phone: (737) 330-3725
Sampler(s): Matt Hamilton

Analysis Turnaround Time (in Calendar Days): Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 233797

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	250 mL bottle, pH<2, HNO_3 B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Mo, Se, Tl	1 L bottle, Cool, 0-6°C TDS, SO_4	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	125 mL PTFE lined bottle, HCL**, pH<2 Hg	filter 500 mL bottle, then pH<2, HNO_3 dissolved Fe and Mn	Sample Specific Notes:
AD-3	12/14/2023	1103	G	GW	3					X			TG-32 needed
AD-4c	12/14/2023	959	G	GW	8		X		X	X			
AD-16R	12/14/2023	927	G	GW	3					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:

Relinquished by: Matt Hamilton	Company: Eagle	Date/Time: 12-14-23 1500	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: 12/15 1119 AM

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Welsh Power Station **Number of Plastic Containers:** 14

Opened By Misgina **Number of Glass Containers:** _____

Date/Time 12/15/23 11:19 Am **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? (Y) / N or N/A **Initial:** mGu (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:** mGu 12/15/23

pH paper (circle one): MQuant PN1.09535.0001 LOT# _____ [OR] Lab Rat, PN4801 LOT# X008RNDG21 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# 233797 Initial & Date & Time : _____

Logged by MSO Comments: _____

Reviewed by _____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

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		Chemist Principal	12/27/23
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: Welsh

Reviewer Name: Tim Arnold

LRC Date: 12/27/23

Laboratory Job Number: 233797

Prep Batch Number(s): QC2312122

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: Welsh

Reviewer Name: Tim Arnold

LRC Date: 12/27/23

Laboratory Job Number: 233797

Prep Batch Number(s): QC2312122

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: Welsh

Reviewer Name: Tim Arnold

LRC Date: 12/27/23

Laboratory Job Number: 233797

Prep Batch Number(s): QC2312122

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	Michael Ohlinger	Chemist	12/27/2023
Name (printed)	Signature	Official Title	Date

TDS Laboratory Review Checklist

Table 1. Reportable Data.

Laboratory Name: American Electric Power Dolan Chemical Laboratory

Project Name: Welsh BASP

Reviewer Name: Michael Ohlinger

LRC Date: 12/27/23

Laboratory Job Number: 233797

Prep Batch Number(s): QC2312157

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: Welsh BASP

Reviewer Name: Michael Ohlinger

LRC Date: 12/27/23

Laboratory Job Number: 233797

Prep Batch Number(s): QC2312157

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: Welsh BASP

Reviewer Name: Michael Ohlinger

LRC Date: 12/27/23

Laboratory Job Number: 233797

Prep Batch Number(s): QC2312157

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."