Annual Groundwater Monitoring Report

Southwestern Electric Power Company

J. Robert Welsh Power Plant
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Landfill CCR Management Unit

1187 Country Road 4865

Titus County

Pittsburg, Texas

January 2022

Prepared by:
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SOUTHWESTERN ELECTRIC POWER COMPANY℠

An AEP Company

BOUNDLESS ENERGY™

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Appendix 1: Groundwater Data Tables and Figures
Appendix 2: Statistical Analyses
Appendix 3: Alternative Source Demonstrations - NA
Appendix 4: Notices for Monitoring Program Transitions - NA
Appendix 5: Well Installation/Decommissioning Logs- NA
Appendix 6: Groundwater monitoring field sheets and laboratory reports

Abbreviations:
ASD - Alternate Source Demonstration
CCR – Coal Combustion Residual
GWPS - Groundwater protection standards
LF – Landfill
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. The Texas Commission on Environmental Quality's (TCEQ's) CCR rules require that the Annual Groundwater Monitoring Report be posted to the operating record for the preceding year no later than January 31, 2022.

In general, the following activities were completed:

- At the start of the current annual reporting period, the LF was operating under the Assessment monitoring program.
- At the end of the current annual reporting period, the LF was operating under the Assessment monitoring program.
- The LF initiated an assessment monitoring program on April 13, 2018.
- Data and statistical analysis not available for the previous reporting period indicated that during the 2nd semi-annual 2020 sampling event (October, 2020):
    - Statistically significant increases (SSIs) were determined for:
        - Boron at AD-11, AD-13, and AD-14.
        - Fluoride at AD-11.
        - pH at AD-11.
    - No Statistically significant levels (SSLs) were identified.
- Annual groundwater sampling event was conducted in February 2021;
- During the 1st semi-annual 2021 groundwater sampling event was conducted in June 2021:
    - SSIs were determined for:
        - Boron at AD-11, AD-13, and AD-14;
        - Calcium at AD-11, at AD-13, and at AD-14.
    - No SSLs were identified.
- Statistical evaluation of the 2nd semi-annual 2021 groundwater sampling event conducted in October 2021 is underway.

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 LF CCR management unit, all groundwater monitoring wells and monitoring well identification numbers;
- All of the monitoring data collected, including the rate and direction of groundwater flow, plus a summary showing the number of samples collected per monitoring well, the dates the samples were collected and whether the sample was collected as part of assessment monitoring programs is included in Appendix 1;
- Statistical comparison of monitoring data to determine if there have been SSI(s) and SSLs (Attached as Appendix 2, where applicable);
- A discussion of whether any alternate source demonstrations were performed, and the conclusions (Attached as Appendix 3, where applicable);
- A summary of any transition between monitoring programs or an alternate monitoring frequency (Appendix 4).
- 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 such as field sheets, analytical reports, etc. (Appendix 6)

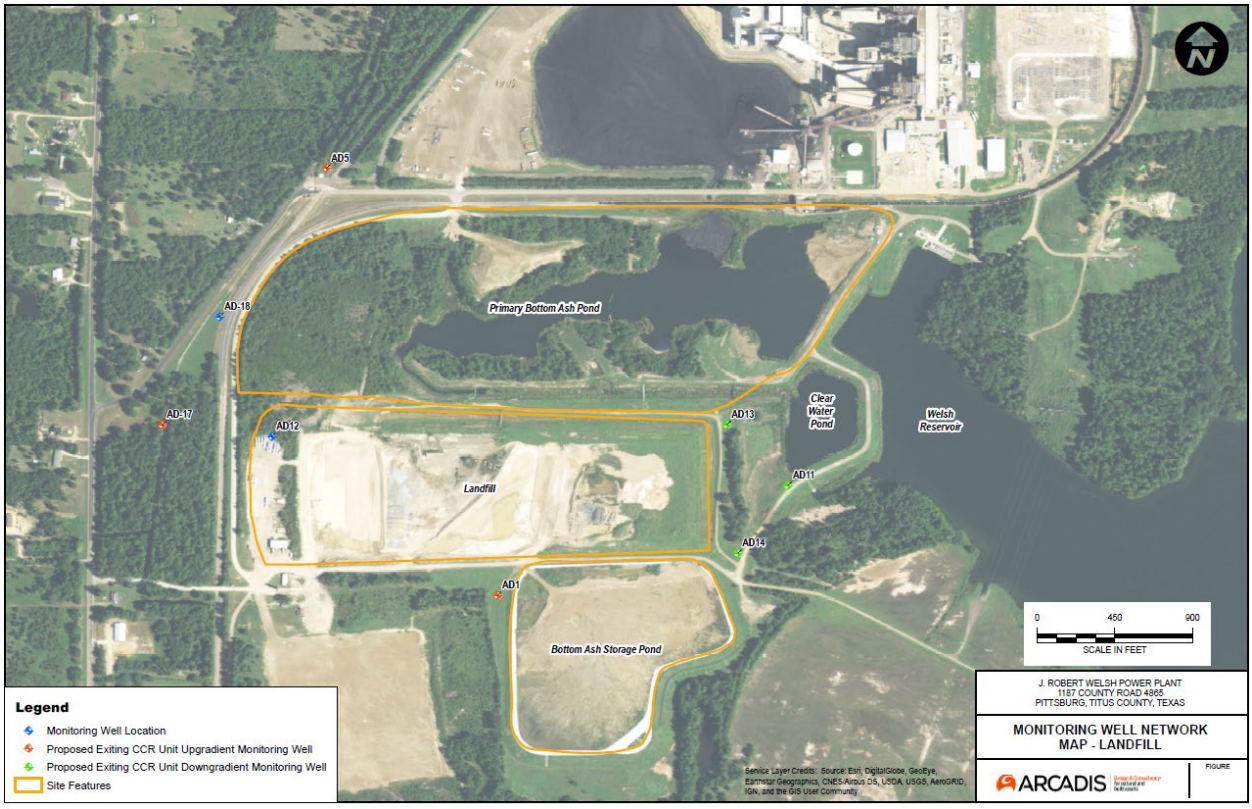
In addition, this report summarizes key actions completed, and where applicable, describes any problems encountered and actions taken to resolve those problems. The report includes a projection of key activities for the upcoming year.

II. Groundwater Monitoring Well Locations and Identification Numbers

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

LF Monitoring Wells	
Up Gradient	Down Gradient
AD-1	AD-11
AD-5	AD-13
AD-17	AD-14

Note: AD-18 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

Appendix 1 contains potentiometric maps with the static water elevation, groundwater flow direction for each monitoring event and tables showing groundwater velocity and the groundwater quality data collected under 30 TAC 352.951.

V. Groundwater Quality Data Statistical Analysis

Appendix 2 contains the statistical analysis reports available for this reporting period.

Data and statistical analysis not available for the previous reporting period indicated that during the 2nd semi-annual 2020 sampling event (October 14, 2020):

- Statistically significant increases (SSIs) were determined for:
  - Boron concentrations exceeded the interwell UPL of 0.700 mg/L at AD-11, AD-13, and AD-14.
  - Fluoride concentrations exceeded the interwell UPL of 0.583 mg/L at AD-11.
  - pH was below the interwell LPL of 4.3 at AD-11.
- No Statistically significant levels (SSLs) were identified.

The annual sampling event for Appendix III and IV was conducted February 23, 2021 and satisfies the requirement of 30 TAC 352.951.

During the 1st semi-annual 2021 groundwater sampling event was conducted in June 1, 2021:

- SSIs were determined for:
  - Boron concentrations exceeded the interwell UPL of 0.700 mg/L at AD-11, AD-13, and AD-14;
  - Calcium concentrations exceeded the intrawell UPL of 17.1 mg/L at AD-11, the intrawell UPL of 28.4 mg/L at AD-13, and the intrawell UPL of 12.2 mg/L at AD-14.
- No SSLs were identified.

Statistical evaluation of 2nd semi-annual 2021 groundwater monitoring event is underway for the groundwater samples collected October 21, 2021.

VI. Alternate Source Demonstrations completed

No ASDs were conducted for the LF's SSIs and no potential SSLs were identified.

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

As of this annual groundwater report, the CCR Unit remains in assessment monitoring and will be sampled on a semi-annual basis.

VIII. Other Information Required

Field sheets and laboratory reports are located 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

- Complete the statistical evaluation of the 2nd semi-annual 2021 groundwater monitoring event;
- Assessment monitoring will continue on a semiannual groundwater sampling schedule for 30 TAC 352 Appendix III and IV constituents;
- Conducted the annual groundwater sampling event for all constituents listed in 30 TAC 352 Appendix III and IV constituents;
- Evaluation of the assessment monitoring results from a statistical analysis viewpoint, looking for SSIs above background levels as well as SSLs above GWPS;
- If needed, ASDs will be conducted to evaluate if the unit can remain in assessment monitoring or the unit will move to an assessment of corrective measures;
- Responding to any new data received in light of TCEQ's CCR rule requirements; and
- Preparation of the next annual groundwater report.

APPENDIX 1

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

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 February 23, 2021) provided by AEP. -AD-2, AD-3, AD-4C, AD-6, AD-7, AD-10, AD-12, AD-16R, and AD-18 were not gauged during the February 2021 event.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluations (Arcadis, 2016).
- Groundwater elevation units are feet above mean sea level.

Geosyntec Consultants
Texas Registered Engineering Firm No. F-1182

500 250 0 500
Feet

STATE OF TEXAS
BETH ANN GROSS
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PROFESSIONAL ENGINEER

July 16, 2021

Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Groundwater Potentiometric Map
February 2021

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2021/06/30

Figure 1

P:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2021\AEP-Welsh_GW_2021-02Feb.mxd. ARevezzo. 6/30/2021. 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 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

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11/22/2021

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Geosyntec Consultants
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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

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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.

Distance between wells.

	AD-1	AD-2	AD-3	AD-4C	AD-5	AD-6	AD-7	AD-8	AD-9	AD-10	AD-11	AD-12	AD-13	AD-14	AD-15	AD-16R	AD-17
AD-1	-	1083.7	1329.8	1304.3	2611.8	2133.7	2515.6	2677.1	1797.4	1961.0	1510.0	1379.4	1445.6	1169.2	2361.0	1558.3	1876.4
AD-2		-	547.2	1044.6	3701.466	3379.7	3372.1	3369.2	2531.5	2422.1	2015.7	2347.6	2148.8	1546.7	3033.9	1737.9	2725.4
AD-3			-	615.0	3888.4	3377.6	3237.9	3149.4	2342.6	2108.7	1751.5	2693.8	2007.4	1295.3	2822.2	1332.8	3176.0
AD-4C				-	3632.5	3077.4	2728.7	2565.9	1795.8	1488.4	1170.2	2657.3	1486.6	758.6	2240.3	718.2	3205.5
AD-5					-	580.0	2141.1	2753.3	2522.0	3128.3	2918.9	1598.5	3024.8	3022.1	2745.3	3418.4	1729.4
AD-6						-	1647.8	2244.4	1935.8	2517.7	2325.1	1392.6	1861.5	2444.5	2198.9	2814.5	1725.5
AD-7							-	644.5	965.3	1473.1	1577.6	2659.6	1250.7	1976.8	734.8	2148.8	3166.7
AD-8								-	861.6	1108.4	1396.9	3090.5	1238.4	1860.4	337.5	1878.6	3645.0
AD-9									-	614.4	633.4	2414.6	376.6	1028.0	567.5	1197.6	3013.3
AD-10										-	455.3	2842.4	708.1	877.6	804.9	791.3	3454.6
AD-11											-	2482.0	456.2	470.4	1059.2	562.4	3085.9
AD-12												-	2148.3	2305.2	2900.6	2740.2	617.1
AD-13													-	754.4	939.5	1002.3	2753.1
AD-14														-	1519.7	429.5	2906.9
AD-15															-	1560.0	3476.1
AD-16R																-	3340.9
AD-17																	-

Hydraulic gradient. Use row **73** 10/20/2021

	AD-1	AD-2	AD-3	AD-4C	AD-5	AD-6	AD-7	AD-8	AD-9	AD-10	AD-11	AD-12	AD-13	AD-14	AD-15	AD-16R	AD-17
AD-1	-		0.2561	0.2539	0.1236	0.1516	0.1339	0.1242	0.1854	0.1659	0.2176	0.2344	0.2263	0.2976	0.1402	0.2116	0.1707
AD-2		-	0.6223	0.3170	0.0872	0.0957	0.0999	0.0987	0.1317	0.1343	0.1630	0.1378	0.1522	0.2250	0.1091	0.1897	0.1175
AD-3			-	0.0154	0.0045	0.0050	0.0012	0.0025	0.0031	0.0073	0.0069	0.0064	0.0067	0.0057	0.0034	0.0081	0.0064
AD-4C				-	0.0023	0.0024	0.0021	0.0006	0.0012	0.0039	0.0022	0.0029	0.0027	0.0223	0.0001	0.0019	0.0034
AD-5					-	0.0012	0.0065	0.0035	0.0041	0.0008	0.0019	0.0003	0.0014	0.0083	0.0029	0.0020	0.0015
AD-6						-	0.0080	0.0040	0.0050	0.0007	0.0021	0.0001	0.0019	0.0100	0.0033	0.0022	0.0019
AD-7							-	-	0.0064	0.0036	0.0078	0.0052	0.0050	0.0077	0.0057	0.0079	0.0033	0.0052
AD-8								-	0.0008	0.0067	0.0029	0.0030	0.0045	0.0082	0.0050	0.0015	0.0034
AD-9									-	0.0131	0.0075	0.0041	0.0165	0.0143	0.0041	0.0030	0.0043
AD-10										-	0.0072	0.0007	0.0026	0.0259	0.0071	0.0057	0.0014
AD-11											-	0.0021	0.0031	0.0414	0.0023	0.0022	0.0027
AD-12												-	0.0017	0.0107	0.0026	0.0023	0.0049
AD-13													-	0.0277	0.0041	0.0026	0.0025
AD-14														-	0.0112	0.0425	0.0095
AD-15															-	0.0008	0.0031
AD-16R																-	0.0028
AD-17																	-

effective porosity(n) = 0.3
Hydraulic conductivity of aquifer (k) = 18.25ft/yr
Max gradient (dh/dl)
0.622

$$v = k\frac{(dh\ /\ dl)}{n}$$

Welsh CCR Unit monitoring wells

	up		BASP	BASP	up			PBAP	PBAP		LF		LF	LF	PBAP	BASP	up			
	AD-1	**AD-2**	**AD-3**	**AD-4c**	**AD-5**	**AD-6**	**AD-7**	**AD-8**	**AD-9**	**AD-10**	**AD-11**	**AD-12**	**AD-13**	**AD-14**	**AD-15**	**AD-16R***	**AD-17**	**AD-18**	**AD-22**	**AD-23**
TOC, ft	357.57	346.16	333.10	333.28	351.00	346.33	350.82	340.01	343.09	343.01	342.18	369.33	347.00	345.43	343.29	353.55	357.10	346.17	360.22	368.82
TD(ft bgs)	25.00	25.00	17.00	15.00	30.00	33.00	38.00	26.00	35.00	35.00	20.00	30.00	16.00	18.00	46.00	27.00	40.00	29.00	20.00	20.00
1/17/17	16.39		8.06	6.89	12.66			13.25	12.59		13.28		12.46	12.8	20.48		23.16			
2/23/17	17.83		8.18	8.39	14.83			15.74	15.04		13.93		15.17	14.56	21.36		23.16			
6/6/17	16.96		9.03	7.65	14			14	13.33		14.11		14.75	14.23	21.26	25.16	22.55			
8/18/17	17.19	15.06	9.01	7.87	13.76	13.25	16.51	13.49	13.15	18.85	13.84	21.43	14.98	14.66	21.05	26.18	22.86			
10/6/17	17.87	NG	9.86	9.08	13.6	13.89	NG	NG	13.62	NG	14.33	NG	15.58	15.52	21.22	26.37	22.93			
5/23/18	17.26		11.31	8.74	15.44			14.29	13.77		15.82		16.62	14.86	23.03	24.83	24.25			
8/14/18	18.41		10.08	9.85	14.63			14.17	13.51		14.51		15.99	16.05	21.72	26.64	23.15			
2/20/19	15.62	12.69	7.13	6.78	12.85	12.76	16.52	13.64	13.06	19.09	13.38	18.97	13.4	11.18	20.69	22.16	22.24			
5/30/19	11.89		7.45	7.13	13.46			13.92	13.26		14.1		13.54	10.66	21.26	14.53	21.97			
7/24/19	13.62	13.61	8.38	8.55	14.11		16.21	14.21	13.52	19.25	14.21		14.77	13.58	21.86	21.38	22.16			
2/17/20	15.69				12.44			13.97	13.51		14.08		13.62	11.99	21.17		22.16			
5/20/20	13.48	12.94	7.72	7.08	13.21	12.71	16.56	3.69	13.34	19.4	13.85	19.11	13.71	11.46	21.12	23.13	22	5.41	2.29	4.21
7/22/20	15.39		8.62	8.65	13.96			14.01	13.95		14.25		15.23	14.26	21.52	23.99	22.25			
10/14/20	17.01	14.94	9.53	9.09	13.65	13.18	17.41	14.65	14.49	19.39	14.69	20.84	16.03	5.39	22.17	25.88	22.41	7.85	10.38	11.19
12/10/20	17.53		9.59	8.11	13.39											26.43	22.47			
2/23/21	15.89				12.84			13.63	13.54		13.72		13.65	11.7	21.09		22.38			
06/02/21	11.75	11.45	6.74	6.41	13.85	10.37	16.92	13.17	13.17	19.14	13.48	18.21	12.31	9.55	20.84	22.96	22.17	4.58	1.13	1.00
07/20/21	14.69		8.36	7.83	14.4											23.75	22.28			
10/20/21	17.03	15.07	10.24	9.7	14.25	13.7	17.54	14.78	14.58	19.63	15.1	21.36	16.06	15.7	22.96	25.97	22.57			

Groundwater elevations, sea level

	BKG	aux	BASP	BASP	BKG	aux	aux	PBAP	PBAP	aux	LF	aux	LF	LF	PBAP	BASP	BKG	aux	aux	aux				
	AD-1	**AD-2**	**AD-3**	**AD-4c**	**AD-5**	**AD-6**	**AD-7**	**AD-8**	**AD-9**	**AD-10**	**AD-11**	**AD-12**	**AD-13**	**AD-14**	**AD-15**	**AD-16R**	**AD-17**	**AD-18**	**AD-22**	**AD-23**	**Max**	**Min**		gw velocity	
TOC, ft	357.57	346.16	333.10	333.28	351.00	346.33	350.82	340.01	343.09	343.01	342.18	369.33	347.00	345.43	343.29	353.55	357.10	346.17	360.22	368.82				
01/17/17	341.18		325.04	326.39	338.34			326.76	330.50		328.90		334.54	332.63	322.81		333.94				338.34	322.81	0.774	50.85	
02/23/17	339.74		324.92	324.89	336.17			324.27	328.05		328.25		331.83	330.87	321.93		333.94				336.17	321.93	0.770	50.59	
06/06/17	340.61		324.07	325.63	337.00			326.01	329.76		328.07		332.25	331.20	322.03	328.39	334.55				337.00	322.03	0.720	47.30	
08/18/17	340.38	331.10	324.09	325.41	337.24	333.08	334.31	326.52	329.94	324.16	328.34	347.90	332.02	330.77	322.24	327.37	334.24				347.90	322.24	0.022	1.45	
10/06/17	339.70		323.24	324.20	337.40	332.44			329.47		327.85		331.42	329.91	322.07	327.18	334.17				337.40	322.07	0.954	62.68	
05/23/18	340.31		321.79	324.54	335.56			325.72	329.32		326.36		330.38	330.57	320.26	328.72	332.85				335.56	320.26	0.717	47.09	
08/14/18	339.16		323.02	323.43	336.37			325.84	329.58		327.67		331.01	329.38	321.57	326.91	333.95				336.37	321.57	0.720	47.30	
02/20/19	341.95	333.47	325.97	326.50	338.15	333.57	334.30	326.37	330.03	323.92	328.80	350.36	333.60	334.25	322.60	331.39	334.86				350.36	322.60	0.025	1.65	
05/30/19	345.68		325.65	326.15	337.54			326.09	329.83		328.08		333.46	334.77	322.03	339.02	335.13				339.02	322.03	0.720	47.30	
07/24/19	343.95	332.55	324.72	324.73	336.89		334.61	325.80	329.57	323.76	327.97		332.23	331.85	321.43	332.17	334.94				336.89	321.43	0.580	38.11	
02/17/20	341.88				338.56			326.04	329.58		328.10		333.38	333.44	322.12		334.94				338.56	322.12	0.9879	64.91	
05/20/20	344.09	333.22	325.38	326.20	337.79	333.62	334.26	336.32	329.75	323.61	328.33	350.22	333.29	333.97	322.17	330.42	335.10	340.76	357.93	364.61	350.22	322.17	0.9877	64.89	
07/22/20	342.18		324.48	324.63	337.04			326.00	329.14		327.93		331.77	331.17	321.77	329.56	334.85				337.04	321.77	0.983	64.58	
10/14/20	340.56	331.22	323.57	324.19	337.35	333.15	333.41	325.36	328.60	323.62	327.49	348.49	330.97	340.04	321.12	327.67	334.69	338.32	349.84	357.63	348.49	321.12	0.622	40.87	
12/10/20	340.04		323.51	325.17	337.61												334.63				337.61	325.17	0.621	40.80	
02/23/21	341.68				338.16			326.38	329.55		328.46		333.35	333.73	322.20		334.72				338.16	322.20	0.9879	64.91	annual
06/02/21	345.82	334.71	326.36	326.87	337.15	335.96	333.90	326.84	329.92	323.87	328.70	351.12	334.69	335.88	322.45	330.59	334.93	341.59	359.09	367.82	351.12	322.45	0.6319	41.52	1H
07/20/21	342.88		324.74	325.45	336.60											329.80	334.82				336.60	325.45	0.6266	41.17	2 of 2
10/20/21	340.54	331.09	322.86	323.58	336.75	332.63	333.28	325.23	328.51	323.38	327.08	347.97	330.94	329.73	320.33	327.58	334.53				347.97	320.33	0.622	40.87	2H

average 46.15

Residence Time Calculation Summary
Welsh Landfill

Geosyntec Consultants, Inc.

			2021-02		2021-06		2021-10	
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)
Landfill	AD-5 [1]	2.0	0.9	67.8	2.1	28.7	1.2	52.6
	AD-11 [2]	2.0	4.9	12.5	7.6	8.1	3.4	17.9
	AD-13 [2]	0.0	4.5	13.5	5.6	10.8	3.4	17.9
	AD-14 [2]	0.0	3.8	15.9	5.0	12.2	1.7	35.6
	AD-1 [1]	2.0	2.0	29.7	3.8	16.2	3.0	20.5
	AD-17 [1]	2.0	1.4	43.7	8.7	7.0	7.3	8.3

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

Table 1 - Groundwater Data Summary: AD-1
Welsh - LF
Appendix III Constituents

Geosyntec Consultants, Inc.

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	Assessment	0.345	10.2	4	< 0.083 U1	2.2	43	150
8/14/2018	Assessment	0.443	5.95	5	< 0.083 U1	5.2	44	160
2/20/2019	Assessment	0.504	142	2.82	0.24	7.3	49.2	522
5/30/2019	Assessment	0.689	138	1.59	0.29	6.7	43.3	588
7/24/2019	Assessment	0.644	62.7	2	0.106 J1	6.0	58	180
2/17/2020	Assessment	0.626	115	3.41	0.31	5.8	56.3	488
5/20/2020	Assessment	0.801	126	1.83	0.20	7.2	51.4	508
10/14/2020	Assessment	0.670	3.88	2.16	0.25	4.5	66.9	183
2/23/2021	Assessment	0.617	113	--	0.31	6.6	--	--
6/2/2021	Assessment	0.786	97.1	2.26	0.30	6.2	61.4	400
10/20/2021	Assessment	0.732	4.8	2.21	0.22	4.4	72.4	190

Notes:
mg/L: milligrams per liter
SU: standard unit
<: 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.
- -: Not analyzed
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.

Table 1 - Groundwater Data Summary: AD-1
Welsh - LF
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
5/24/2018	Assessment	3.17 J1	< 1.05 U1	79.9	0.39 J1	< 0.07 U1	< 0.23 U1	0.35 J1	1.983	< 0.083 U1	< 0.68 U1	0.00814	0.006 J1	< 0.29 U1	1.38 J1	< 0.86 U1
8/14/2018	Assessment	0.03 J1	0.21	63.0	0.482	0.02	--	--	1.102	< 0.083 U1	0.238	0.00708	0.013 J1	0.21	1.7	0.03 J1
2/20/2019	Assessment	0.16	0.46	457	0.09 J1	0.01 J1	0.306	0.399	3.159	0.24	0.124	0.00155	< 0.005 U1	1 J1	0.7	< 0.1 U1
5/30/2019	Assessment	0.16	0.60	512	0.244	0.01 J1	0.1 J1	0.756	2.717	0.29	0.197	< 0.009 U1	< 0.005 U1	2.43	1.4	< 0.1 U1
7/24/2019	Assessment	0.08 J1	0.39	245	0.540	0.02 J1	0.1 J1	0.789	1.819	0.106 J1	0.1 J1	0.00557	< 0.005 U1	2 J1	3.4	< 0.1 U1
2/17/2020	Assessment	0.33	0.49	303	0.07 J1	0.02 J1	0.1 J1	0.28	2.665	0.31	0.1 J1	0.00105	< 0.002 U1	1 J1	2.3	< 0.1 U1
5/20/2020	Assessment	0.15	0.53	394	0.270	0.02 J1	0.1 J1	0.490	2.312	0.20	0.1 J1	0.00301	< 0.002 U1	2 J1	2.8	< 0.1 U1
10/14/2020	Assessment	< 0.1 U1	0.3 J1	84.7	0.984	< 0.05 U1	0.9 J1	2.12	1.552	0.25	0.3 J1	0.00932	0.003 J1	< 2 U1	5.3	< 0.5 U1
2/23/2021	Assessment	0.24	0.74	338	0.136	0.03 J1	0.338	0.477	1.737	0.31	0.852	0.00155	< 0.002 U1	1 J1	2.5	< 0.1 U1
6/2/2021	Assessment	0.18	0.66	349	0.088	0.01 J1	0.32	0.474	2.15	0.30	0.09 J1	0.00052	0.002 J1	4.8	1.26	< 0.04 U1
10/20/2021	Assessment	0.04 J1	0.20	86.1	0.932	0.026	0.33	2.44	0.99	0.22	0.23	0.00756	0.003 J1	< 0.1 U1	7.39	< 0.04 U1

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
pCi/L: picocuries per liter
<: 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.
- -: Not analyzed
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.

Table 1 - Groundwater Data Summary: AD-5
Welsh - LF
Appendix III Constituents

Geosyntec Consultants, Inc.

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	Assessment	0.05007	28.1	22	< 0.083 U1	6.2	60	242
8/15/2018	Assessment	0.050	--	19	< 0.083 U1	6.2	240	428
2/21/2019	Assessment	0.033	33.9	24.7	0.21	5.4	46.5	220
5/30/2019	Assessment	0.03 J1	30.0	22.3	0.29	6.3	51.3	238
7/24/2019	Assessment	0.04 J1	41.1	18	0.112 J1	6.3	90	354
2/17/2020	Assessment	0.03 J1	39.8	19.8	0.22	5.5	43.7	248
5/20/2020	Assessment	0.03 J1	40.2	22.3	0.18	6.8	55.5	264
10/14/2020	Assessment	0.04 J1	36.6	18.8	0.18	6.5	148	338
2/23/2021	Assessment	0.03 J1	30.9	--	0.23	6.0	--	--
6/2/2021	Assessment	0.027 J1	24.4	19.6	0.21	5.8	53.8	220
10/20/2021	Assessment	0.038 J1	38.4	17.4	0.17	5.6	155	370

Notes:
mg/L: milligrams per liter
SU: standard unit
<: 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.
- -: Not analyzed
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.

Table 1 - Groundwater Data Summary: AD-5
Welsh - LF
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	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
5/24/2018	Assessment	< 0.93 U1	< 1.05 U1	71.16	< 0.02 U1	0.23 J1	0.8 J1	14.24	1.946	< 0.083 U1	< 0.68 U1	0.121	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/15/2018	Assessment	0.01 J1	1.69	63.7	0.055	0.008 J1	0.072	11.4	0.316	< 0.083 U1	0.079	0.147	< 0.005 U1	0.13	0.08 J1	< 0.01 U1
2/21/2019	Assessment	0.02 J1	1.59	69.4	0.08 J1	< 0.01 U1	0.432	8.58	1.267	0.21	0.147	0.0807	< 0.005 U1	< 0.4 U1	0.1 J1	< 0.1 U1
5/30/2019	Assessment	< 0.02 U1	3.05	60.5	0.08 J1	< 0.01 U1	0.06 J1	11.8	1.431	0.29	0.05 J1	0.104	0.006 J1	< 0.4 U1	0.05 J1	< 0.1 U1
7/24/2019	Assessment	< 0.02 U1	2.48	77.4	0.05 J1	< 0.01 U1	0.05 J1	8.38	2.533	0.112 J1	< 0.05 U1	0.108	< 0.005 U1	< 0.4 U1	0.06 J1	< 0.1 U1
2/17/2020	Assessment	0.03 J1	2.17	109	0.09 J1	0.02 J1	0.336	4.52	2.393	0.22	0.227	0.0732	< 0.002 U1	0.9 J1	0.2	< 0.1 U1
5/20/2020	Assessment	< 0.02 U1	1.78	93.1	0.05 J1	0.01 J1	0.1 J1	7.65	1.612	0.18	0.07 J1	0.0740	< 0.002 U1	< 0.4 U1	0.09 J1	< 0.1 U1
10/14/2020	Assessment	< 0.02 U1	6.28	71.7	0.09 J1	< 0.01 U1	0.09 J1	14.9	2.7	0.18	0.05 J1	0.134	< 0.002 U1	< 0.4 U1	0.1 J1	< 0.1 U1
2/23/2021	Assessment	< 0.02 U1	2.06	68.3	0.03 J1	< 0.01 U1	0.1 J1	6.31	1.397	0.23	< 0.05 U1	0.0705	< 0.002 U1	< 0.4 U1	0.03 J1	< 0.1 U1
6/2/2021	Assessment	< 0.02 U1	1.72	49.3	0.018 M1, J1	< 0.004 U1	0.26	10.5	2.47	0.21	< 0.05 U1	0.0764 M1	< 0.002 U1	0.1 J1	< 0.09 U1	< 0.04 U1
10/20/2021	Assessment	< 0.02 U1	1.44	53.2	0.018 J1	< 0.004 U1	0.23	6.85	2.68	0.17	< 0.05 U1	0.133 M1	< 0.002 U1	< 0.1 U1	< 0.09 U1	< 0.04 U1

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
pCi/L: picocuries per liter
<: 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.
- -: Not analyzed
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.

Table 1 - Groundwater Data Summary: AD-11
Welsh - LF
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	2.47	8.47	9	2	5.2	518	388
7/28/2016	Background	2.83	8.88	10	2	3.8	596	1,000
9/29/2016	Background	3.4	10.7	12	2	4.1	683	1,065
10/19/2016	Background	3.77	8.78	11	3	3.7	706	1,024
12/12/2016	Background	3.36	8.98	10	2	3.8	548	1,044
1/17/2017	Background	2.81	10.3	11	2	4.4	760	1,048
2/22/2017	Background	2.88	9.31	10	2	4.3	558	876
6/6/2017	Background	2.79	9.93	10	1.366	3.9	556	960
10/5/2017	Detection	2.58	6.99	10	< 0.083 U1	4.4	527	752
1/18/2018	Detection	1.9	--	--	--	4.5	377	564
5/23/2018	Assessment	--	--	--	< 0.083 U1	4.1	--	--
8/15/2018	Assessment	--	--	--	< 0.083 U1	4.7	--	--
9/17/2018	Assessment	1.84	6.61	15	--	--	410	720
2/5/2019	Assessment	1.47	4.56	9.47	0.47	4.3	225	--
2/21/2019	Assessment	1.63	19.1	9.23	0.41	4.9	306	542
4/30/2019	Assessment	1.34	7.53	--	--	5.3	--	--
5/29/2019	Assessment	1.40	5.78	6.96	0.47	4.2	367	680
7/23/2019	Assessment	1.56	7.19	6	0.338 J1	4.5	342	700
2/17/2020	Assessment	1.47	20.5	8.19	0.42	4.9	350	622
5/19/2020	Assessment	1.54	24.3	6.83	0.51	6.3	419	720
7/22/2020	Assessment	1.81	9.45	--	--	4.0	--	--
10/12/2020	Assessment	1.69	8.57	8.16	0.63	3.9	604	764
2/23/2021	Assessment	1.15	23.3	--	0.52	6.3	--	--
6/1/2021	Assessment	1.64	22.0	6.52	0.62	5.7	485	790
10/19/2021	Assessment	1.95	8.1	9.73	0.66	3.6	488	800

Notes:
mg/L: milligrams per liter
SU: standard unit
<: 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.
- -: Not analyzed
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.

Table 1 - Groundwater Data Summary: AD-11
Welsh - LF
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	14	4	0.325877 J1	3	26	1.773	2	< 0.68 U1	0.032	0.02258 J1	< 0.29 U1	1.54658 J1	< 0.86 U1
7/28/2016	Background	< 0.93 U1	< 1.05 U1	12	4	0.453906 J1	0.581828 J1	26	2.23	2	< 0.68 U1	0.047	0.00624 J1	< 0.29 U1	1.63477 J1	1.31673 J1
9/29/2016	Background	< 0.93 U1	1.77308 J1	52	5	0.579196 J1	7	30	3.92	2	4.25302 J1	0.047	0.01924 J1	< 0.29 U1	2.09096 J1	1.07034 J1
10/19/2016	Background	< 0.93 U1	< 1.05 U1	20	5	0.515668 J1	2	27	2.56	3	< 0.68 U1	0.047	0.0156 J1	1.51918 J1	< 0.99 U1	< 0.86 U1
12/12/2016	Background	< 0.93 U1	< 1.05 U1	13	4	0.366319 J1	0.365212 J1	25	1.569	2	< 0.68 U1	0.041	0.01212 J1	< 0.29 U1	1.57203 J1	< 0.86 U1
1/17/2017	Background	< 0.93 U1	< 1.05 U1	13	4	0.394925 J1	0.749253 J1	25	1.082	2	< 0.68 U1	0.046	< 0.005 U1	< 0.29 U1	< 0.99 U1	1.23139 J1
2/22/2017	Background	< 0.93 U1	< 1.05 U1	19	4	0.430668 J1	2	24	1.45	2	1.18289 J1	0.035	0.01613 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/6/2017	Background	< 0.93 U1	1.23 J1	10.12	2.79	0.41 J1	0.32 J1	22.16	1.902	1.366	< 0.68 U1	0.03654	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
5/23/2018	Assessment	< 0.93 U1	2.6 J1	16.27	0.89 J1	0.18 J1	0.8 J1	8.63	1.912	< 0.083 U1	< 0.68 U1	0.01875	0.007 J1	< 0.29 U1	1.34 J1	46
8/15/2018	Assessment	0.02 J1	1.05	11.9	1.18	0.37	0.257	15.3	2.568	< 0.083 U1	1.42	0.0175	< 0.005 U1	0.05 J1	2.4	0.200
2/21/2019	Assessment	0.03 J1	0.51	40.3	0.824	0.19	0.259	8.58	1.506	0.41	0.523	0.0157	< 0.005 U1	< 0.4 U1	1.5	0.1 J1
5/29/2019	Assessment	< 0.02 U1	0.78	19.1	1.05	0.20	0.369	9.82	1.473	0.47	0.847	0.02 J1	< 0.005 U1	< 0.4 U1	2.2	0.1 J1
7/23/2019	Assessment	< 0.02 U1	0.59	16.4	0.987	0.24	0.413	10.5	2.246	0.338 J1	0.976	0.0153	< 0.005 U1	< 0.4 U1	1.0	0.2 J1
2/17/2020	Assessment	0.03 J1	0.39	57.9	0.431	0.21	0.334	8.41	2.106	0.42	0.493	0.0142	0.007	2 J1	0.8	0.1 J1
5/19/2020	Assessment	0.04 J1	0.55	35.7	0.782	0.26	0.254	11.4	2.352	0.51	0.427	0.0138	0.006	< 0.4 U1	1.4	0.1 J1
10/12/2020	Assessment	0.02 J1	0.64	14.1	1.52	0.31	0.306	14.0	2.651	0.63	1.25	0.0246	0.006	< 0.4 U1	1.8	0.2 J1
2/23/2021	Assessment	0.04 J1	0.47	38.2	0.515	0.18	0.276	8.63	1.298	0.52	0.435	0.0102	0.011	< 0.4 U1	1.0	0.1 J1
6/1/2021	Assessment	0.03 J1	0.50	36.3	0.896	0.325	0.39	13.8	5.93	0.62	0.69	0.0145	0.007	0.2 J1	1.31	0.14 J1
10/19/2021	Assessment	0.02 J1	0.64	12.3	1.31	0.320	0.62	15.2	2.15	0.66	1.37	0.0211	0.007	< 0.1 U1	2.12	0.18 J1

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
pCi/L: picocuries per liter
<: 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.
- -: Not analyzed
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.

Table 1 - Groundwater Data Summary: AD-13
Welsh - LF
Appendix III Constituents

Geosyntec Consultants, Inc.

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	1.19	8.02	12	0.4948 J1	6.1	177	900
7/27/2016	Background	1.23	3.7	15	0.7416 J1	4.5	187	404
9/29/2016	Background	1.37	2.7	17	0.6464 J1	4.6	207	431
10/19/2016	Background	1.67	3.66	19	1.1263	4.3	226	482
12/13/2016	Background	1.96	3.77	18	0.4149 J1	4.8	287	596
1/19/2017	Background	0.402	33.5	7	< 0.083 U1	5.4	90	222
2/23/2017	Background	1.27	10.3	13	< 0.083 U1	5.1	183	392
6/6/2017	Background	1.68	3.03	15	0.6679 J1	4.2	244	494
10/6/2017	Detection	2.23	5.11	13	< 0.083 U1	4.6	345	564
1/18/2018	Detection	2.13	--	--	--	4.7	383	588
5/23/2018	Assessment	--	--	--	0.6534 J1	4.5	--	--
8/14/2018	Assessment	--	--	--	0.7442 J1	4.8	--	--
9/17/2018	Assessment	1.49	10.1	18	--	--	316	620
2/5/2019	Assessment	0.656	5.85	5.43	0.39	4.5	130	--
2/20/2019	Assessment	0.484	17.7	3.95	0.28	4.9	96.3	234
4/30/2019	Assessment	0.483	--	--	--	4.9	--	--
5/30/2019	Assessment	0.477	9.88	3.60	0.53	5.2	94.0	196
7/23/2019	Assessment	0.780	6.16	5	0.169 J1	4.8	146	334
2/17/2020	Assessment	0.929	17.6	7.79	0.69	4.9	236	442
5/19/2020	Assessment	0.936	19.2	8.38	0.44	5.5	193	390
7/22/2020	Assessment	1.44	--	--	--	4.8	--	--
10/12/2020	Assessment	1.52	8.03	18.1	0.33	4.5	278	522
2/23/2021	Assessment	0.581	46.4	--	0.27	5.9	--	--
6/1/2021	Assessment	0.831	41.3	3.70	0.43	6.1	94.6	280
10/19/2021	Assessment	1.36	5.5	10.9	0.19	4.3	201	400

Notes:
mg/L: milligrams per liter
SU: standard unit
<: 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.
- -: Not analyzed
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.

Table 1 - Groundwater Data Summary: AD-13
Welsh - LF
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	62	0.682114 J1	< 0.07 U1	0.690428 J1	4.11633 J1	1.223	0.4948 J1	< 0.68 U1	0.011	0.01797 J1	< 0.29 U1	1.4772 J1	< 0.86 U1
7/27/2016	Background	< 0.93 U1	< 1.05 U1	36	0.922975 J1	0.0850015 J1	< 0.23 U1	4.46011 J1	1.601	0.7416 J1	< 0.68 U1	0.026	0.00515 J1	< 0.29 U1	2.00998 J1	< 0.86 U1
9/29/2016	Background	< 0.93 U1	< 1.05 U1	40	0.827513 J1	0.0965393 J1	0.77177 J1	4.59287 J1	2.213	0.6464 J1	< 0.68 U1	0.02	< 0.005 U1	< 0.29 U1	1.03137 J1	< 0.86 U1
10/19/2016	Background	< 0.93 U1	< 1.05 U1	30	0.934335 J1	0.0913657 J1	0.581648 J1	4.91926 J1	3.662	1.1263	< 0.68 U1	0.022	< 0.005 U1	0.870491 J1	1.03637 J1	0.97358 J1
12/13/2016	Background	< 0.93 U1	3.69546 J1	51	1	0.185393 J1	7	7	2.27	0.4149 J1	1.09698 J1	0.025	0.01565 J1	0.353324 J1	1.64297 J1	< 0.86 U1
1/19/2017	Background	< 0.93 U1	6	112	0.198035 J1	< 0.07 U1	4	1.76949 J1	2.228	< 0.083 U1	2.72659 J1	0.004	0.00673 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
2/23/2017	Background	< 0.93 U1	< 1.05 U1	41	0.612394 J1	< 0.07 U1	< 0.23 U1	4.55541 J1	1.556	< 0.083 U1	< 0.68 U1	0.015	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/6/2017	Background	1.53 J1	< 1.05 U1	17.12	0.89 J1	0.14 J1	< 0.23 U1	6.24	1.565	0.6679 J1	< 0.68 U1	0.02082	< 0.005 U1	< 0.29 U1	1.03 J1	< 0.86 U1
5/23/2018	Assessment	< 0.93 U1	< 1.05 U1	26.53	0.87 J1	< 0.07 U1	0.73 J1	9.37	2.16	0.6534 J1	< 0.68 U1	0.0291	0.008 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/14/2018	Assessment	0.03 J1	1.37	16.9	0.971	0.31	0.503	13.1	4.073	0.7442 J1	1.00	0.0321	< 0.005 U1	0.06 J1	1.7	0.277
2/20/2019	Assessment	0.02 J1	0.38	55.2	0.302	0.05	0.2 J1	2.35	2.534	0.28	0.05 J1	0.0094	< 0.005 U1	< 0.4 U1	0.4	< 0.1 U1
5/30/2019	Assessment	0.03 J1	0.32	60.9	0.385	0.07	0.310	3.15	3.15	0.53	0.05 J1	0.009 J1	< 0.005 U1	< 0.4 U1	0.4	< 0.1 U1
7/23/2019	Assessment	0.02 J1	0.37	23.6	0.443	0.09	0.283	3.82	1.748	0.169 J1	0.204	0.0175	< 0.005 U1	< 0.4 U1	0.3	0.1 J1
2/17/2020	Assessment	0.03 J1	0.59	59.4	0.528	0.12	0.354	3.84	3.79	0.69	0.1 J1	0.0132	0.012	0.5 J1	1.1	< 0.1 U1
5/19/2020	Assessment	0.05 J1	0.53	50.3	0.533	0.09	0.261	3.87	1.977	0.44	0.06 J1	0.0147	0.034	1 J1	1.3	< 0.1 U1
10/12/2020	Assessment	< 0.02 U1	0.55	18.5	0.834	0.17	0.410	8.50	1.546	0.33	0.324	0.0480	< 0.002 U1	< 0.4 U1	0.5	0.2 J1
2/23/2021	Assessment	0.06 J1	0.67	115	0.04 J1	0.03 J1	0.243	0.717	2.264	0.27	0.1 J1	0.00302	0.002 J1	2.34	0.5	< 0.1 U1
6/1/2021	Assessment	0.09 J1	0.73	116	0.103	0.032	0.41	0.971	2.27	0.43	0.06 J1	0.00211	0.003 J1	2.6	1.04	< 0.04 U1
10/19/2021	Assessment	< 0.02 U1	0.34	14.6	0.505	0.146	0.34	6.75	1.22	0.19	0.36	0.0330	0.002 J1	< 0.1 U1	0.37 J1	0.19 J1

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
pCi/L: picocuries per liter
<: 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.
- -: Not analyzed
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.

Table 1 - Groundwater Data Summary: AD-14
Welsh - LF
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	1.28	2.88	4	< 0.083 U1	4.8	115	285
7/27/2016	Background	1.14	2.51	5	< 0.083 U1	4.2	111	267
9/29/2016	Background	1.14	1.19	5	< 0.083 U1	4.2	111	252
10/19/2016	Background	1.25	2.48	4	< 0.083 U1	3.9	118	276
12/12/2016	Background	1.25	2.41	5	< 0.083 U1	4.1	101	296
1/17/2017	Background	0.915	10.3	4	< 0.083 U1	6.1	92	254
2/22/2017	Background	1.06	9.48	4	< 0.083 U1	5.4	90	212
6/6/2017	Background	1.26	7.69	6	< 0.083 U1	4.8	108	256
10/6/2017	Detection	1.63	3.55	10	< 0.083 U1	4.6	143	288
1/18/2018	Detection	1.57	--	6.43	--	5.7	--	--
5/23/2018	Assessment	--	--	--	< 0.083 U1	4.2	--	--
8/14/2018	Assessment	--	--	--	< 0.083 U1	4.3	--	--
9/17/2018	Assessment	1.51	4.51	12	--	--	204	384
2/5/2019	Assessment	1.10	4.13	3.13	0.15	4.3	99.9	--
2/20/2019	Assessment	1.2	10.3	2.2	0.14	4.3	90.4	236
4/30/2019	Assessment	1.04	--	--	--	4.4	--	--
5/29/2019	Assessment	1.21	9.80	3.65	0.19	4.5	122	274
7/23/2019	Assessment	1.25	9.93	8	0.162 J1	5.5	171	440
2/17/2020	Assessment	1.12	38.7	2.00	0.24	5.2	85.6	294
5/19/2020	Assessment	1.22	15.1	1.46	0.15	5.4	88.5	263
7/22/2020	Assessment	1.24	17.3	--	--	5.2	--	--
10/12/2020	Assessment	1.14	9.63	8.59	0.24	4.3	246	469
2/23/2021	Assessment	1.09	13.1	--	0.20	5.3	--	--
6/1/2021	Assessment	1.33	29.5	1.10	0.20	5.9	91.8	280
10/19/2021	Assessment	1.05	8.2	8.22	0.23	4.0	223	430

Notes:
mg/L: milligrams per liter
SU: standard unit
<: 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.
- -: Not analyzed
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.

Table 1 - Groundwater Data Summary: AD-14
Welsh - LF
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	1.89384 J1	31	0.65845 J1	0.99504 J1	0.536293 J1	10	0.871	< 0.083 U1	< 0.68 U1	0.012	0.03	< 0.29 U1	2.91711 J1	< 0.86 U1
7/27/2016	Background	< 0.93 U1	< 1.05 U1	84	0.653837 J1	0.976466 J1	1	9	1.487	< 0.083 U1	< 0.68 U1	0.024	0.02159 J1	< 0.29 U1	1.93417 J1	< 0.86 U1
9/29/2016	Background	< 0.93 U1	1.45308 J1	30	0.473938 J1	0.975306 J1	0.775009 J1	9	4.817	< 0.083 U1	< 0.68 U1	0.015	0.02217 J1	< 0.29 U1	2.73939 J1	< 0.86 U1
10/19/2016	Background	< 0.93 U1	< 1.05 U1	39	0.543258 J1	1	0.640984 J1	9	1.972	< 0.083 U1	< 0.68 U1	0.014	0.02024 J1	0.49697 J1	2.46916 J1	< 0.86 U1
12/12/2016	Background	< 0.93 U1	< 1.05 U1	47	0.536415 J1	1	1	9	1.271	< 0.083 U1	< 0.68 U1	0.013	0.037	< 0.29 U1	3.32013 J1	< 0.86 U1
1/17/2017	Background	< 0.93 U1	< 1.05 U1	38	0.215525 J1	0.226476 J1	0.700394 J1	2.91252 J1	1.825	< 0.083 U1	< 0.68 U1	0.013	0.01863 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
2/22/2017	Background	< 0.93 U1	< 1.05 U1	42	0.286071 J1	0.187588 J1	< 0.23 U1	3.50056 J1	0.512	< 0.083 U1	< 0.68 U1	0.012	0.01443 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/6/2017	Background	< 0.93 U1	< 1.05 U1	44.83	0.38 J1	0.67 J1	1.27	6.78	1.138	< 0.083 U1	< 0.68 U1	0.0127	0.021 J1	< 0.29 U1	2.61 J1	< 0.86 U1
5/23/2018	Assessment	< 0.93 U1	< 1.05 U1	28.17	0.78 J1	1.61	< 0.23 U1	14.34	1.601	< 0.083 U1	< 0.68 U1	0.0152	0.145	< 0.29 U1	3.62 J1	< 0.86 U1
8/14/2018	Assessment	0.01 J1	0.39	24.0	0.854	1.99	0.276	17.6	1.502	< 0.083 U1	0.174	0.0110	0.181	0.03 J1	3.7	0.242
2/20/2019	Assessment	0.03 J1	0.34	41.2	0.387	0.35	0.247	4.37	1.172	0.14	0.09 J1	0.0114	< 0.005 U1	< 0.4 U1	0.8	< 0.1 U1
5/29/2019	Assessment	0.03 J1	0.40	44.8	0.556	0.81	0.2 J1	7.82	1.946	0.19	0.137	0.02 J1	0.181	< 0.4 U1	2.0	< 0.1 U1
7/23/2019	Assessment	< 0.02 U1	0.43	36.2	0.934	2.49	0.286	18.5	2.731	0.162 J1	0.200	0.0155	0.123	< 0.4 U1	2.7	0.2 J1
2/17/2020	Assessment	0.07 J1	0.43	44.4	0.179	0.2	0.2 J1	2.32	2.552	0.24	0.07 J1	0.0063	0.003 J1	2 J1	2.5	0.1 J1
5/19/2020	Assessment	0.03 J1	0.32	35.3	0.396	0.32	0.307	3.81	0.778	0.15	0.1 J1	0.00875	0.002 J1	1 J1	1.5	< 0.1 U1
10/12/2020	Assessment	< 0.02 U1	0.44	22.9	1.46	3.21	0.357	26.0	4.259	0.24	0.307	0.0195	0.391	< 0.4 U1	2.0	0.3 J1
2/23/2021	Assessment	0.03 J1	0.31	36.5	0.4 J1	0.36	0.2 J1	4.18	1.032	0.20	0.1 J1	0.00900	< 0.02 U1	< 0.4 U1	1.3	< 0.1 U1
6/1/2021	Assessment	0.06 J1	0.35	48.6	0.253	0.318	0.41	3.60	1.61	0.20	0.11 J1	0.00676	< 0.002 U1	0.6	2.61	0.05 J1
10/19/2021	Assessment	< 0.02 U1	0.41	23.8	1.24	2.72	0.58	23.4	2.42	0.23	0.35	0.0151	0.308	< 0.1 U1	2.34	0.28

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
pCi/L: picocuries per liter
<: 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.
- -: Not analyzed
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.

Table 1 - Groundwater Data Summary: AD-17
Welsh - LF
Appendix III Constituents

Geosyntec Consultants, Inc.

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	Assessment	0.239	193	39	< 0.083 U1	6.3	1,067	1,836
8/15/2018	Assessment	0.118	187	40	< 0.083 U1	5.6	1,168	1,748
2/21/2019	Assessment	0.151	207	43.2	0.18	6.9	1,060	1,722
5/30/2019	Assessment	0.158	202	41.7	< 0.04 U1	6.1	1,120	1,546
7/24/2019	Assessment	0.113	216	37	0.085 J1	6.0	1,127	1,864
2/17/2020	Assessment	0.104	184	36.0	0.16	5.9	1,070	1,750
5/20/2020	Assessment	0.115	250	47.7	0.15	5.7	1,190	1,890
10/14/2020	Assessment	0.100	185	35.7	0.17	5.4	1,060	1,720
2/23/2021	Assessment	0.098	168	--	0.17	5.6	--	--
6/2/2021	Assessment	0.124	233	44.9	0.31	5.7	1,210	1,890
10/20/2021	Assessment	0.104	164	37.3	0.16	5.1	1,040	1,710

Notes:
mg/L: milligrams per liter
SU: standard unit
<: 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.
- -: Not analyzed
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.

Table 1 - Groundwater Data Summary: AD-17
Welsh - LF
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	1.37501 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
5/24/2018	Assessment	< 0.93 U1	< 1.05 U1	9.65	< 0.02 U1	6.46	< 0.23 U1	71.73	1.939	< 0.083 U1	< 0.68 U1	0.308	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/15/2018	Assessment	0.02 J1	1.83	12.8	0.069	0.25	0.604	43.5	2.35	< 0.083 U1	1.10	0.243	0.011 J1	0.35	0.3	--
2/21/2019	Assessment	0.08 J1	2.51	120	0.24	0.27	3.34	64.5	2.657	0.18	2.49	0.268	0.007 J1	0.7 J1	0.8	< 0.1 U1
5/30/2019	Assessment	< 0.02 U1	0.41	19.6	0.02 J1	0.03 J1	0.246	51.1	2.508	< 0.04 U1	0.03 J1	0.341	< 0.005 U1	< 0.4 U1	0.06 J1	< 0.1 U1
7/24/2019	Assessment	< 0.02 U1	1.07	14.3	0.130	0.03 J1	0.228	57.7	3.45	0.085 J1	0.263	0.283	< 0.005 U1	< 0.4 U1	0.1 J1	< 0.1 U1
2/17/2020	Assessment	< 0.02 U1	0.72	9.6	0.04 J1	< 0.01 U1	0.08 J1	42.3	3.46	0.16	< 0.05 U1	0.273	< 0.004 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
5/20/2020	Assessment	< 0.02 U1	0.86	11.4	0.07 J1	0.02 J1	0.231	70.0	2.76	0.15	0.08 J1	0.302	< 0.002 U1	< 0.4 U1	0.09 J1	< 0.1 U1
10/14/2020	Assessment	< 0.02 U1	0.84	10.9	0.04 J1	0.01 J1	0.327	45.4	2.169	0.17	0.2 J1	0.274	< 0.002 U1	< 0.4 U1	0.06 J1	< 0.1 U1
2/23/2021	Assessment	< 0.02 U1	0.61	10.6	0.03 J1	0.03 J1	0.1 J1	41.1	1.433	0.17	0.08 J1	0.249	< 0.002 U1	< 0.4 U1	0.04 J1	< 0.1 U1
6/2/2021	Assessment	< 0.02 U1	0.84	10.9	0.066	0.026	0.38	72.9	2.4	0.31	0.09 J1	0.311	< 0.002 U1	0.2 J1	< 0.09 U1	< 0.04 U1
10/20/2021	Assessment	< 0.02 U1	0.57	10.2	0.035 J1	0.019 J1	0.38	42.9	1.73	0.16	0.07 J1	0.250	< 0.002 U1	< 0.1 U1	< 0.09 U1	0.05 J1

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
pCi/L: picocuries per liter
<: 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.
- -: Not analyzed
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.

APPENDIX 2

Where applicable, show in this appendix are the results from statistical analyses, and a description of the statistical analysis method chosen.

STATISTICAL ANALYSIS SUMMARY
LANDFILL
J. Robert Welsh Plant
Pittsburg, Texas

Submitted to

1 Riverside Plaza
Columbus, Ohio 43215-2372

Submitted by

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February 5, 2021

CHA8500

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LIST OF ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
CCR	Coal Combustion Residuals
CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
GWPS	Groundwater Protection Standard
LCL	Lower Confidence Limit
LF	Landfill
LFB	Laboratory Fortified Blanks
LRB	Laboratory Reagent Blanks
MCL	Maximum Contaminant Level
NELAP	National Environmental Laboratory Accreditation Program
QA	Quality Assurance
QC	Quality Control
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
TDS	Total Dissolved Solids
UPL	Upper Prediction Limit
USEPA	United States Environmental Protection Agency
UTL	Upper Tolerance Limit

SECTION 1

EXECUTIVE SUMMARY

In accordance with the United States Environmental Protection Agency's (USEPA's) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (40 CFR 257.90-257.98, "CCR rule"), groundwater monitoring has been conducted at the Landfill (LF), an existing CCR unit at the Welsh Power Plant located in Pittsburg, Texas.

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for boron, total dissolved solids (TDS), and sulfate at the LF. An alternative source was not identified at the time, so the LF has been in assessment monitoring since. Groundwater protection standards (GWPS) were set in accordance with 40 CFR 257.95(d)(2) and a statistical evaluation of the assessment monitoring data was conducted. During the most recent assessment monitoring events, completed in February and May 2020, no statistically significant levels (SSLs) were identified during this event, and the unit remained in assessment monitoring (Geosyntec, 2020a). One assessment monitoring event was conducted at the LF in October 2020, in accordance with 40 CFR 257.95. The results of the October 2020 assessment event are documented in this report.

Groundwater data underwent several validation tests, including those for completeness, sample tracking accuracy, transcription errors, and consistent use of measurement units. No data quality issues were identified which would impact data usability.

The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. GWPSs were re-established for the Appendix IV parameters. Confidence intervals were calculated for Appendix IV parameters at the compliance wells to assess whether Appendix IV parameters were present at an SSL above the GWPS. No SSLs were identified; however, concentrations of Appendix III parameters remained above background. Thus, the unit will remain in assessment monitoring. Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A. The statistical analysis and certification of the selected methods were completed within 90 days of obtaining the data.

SECTION 2

LANDFILL EVALUATION

2.1 Data Validation & QA/QC

During the assessment monitoring program, one set of samples was collected for analysis from each upgradient and downgradient well to meet the requirements of 40 CFR 257.95(d)(1) in October 2020. Samples from this sampling event were analyzed for all Appendix III and Appendix IV parameters. A summary of data collected during this assessment monitoring event may be found in Table 1.

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

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.9.6.27b statistics software. The export file was checked against the analytical data for transcription errors and completeness. No QA/QC issues were noted which would impact data usability.

2.2 Statistical Analysis

Statistical analyses for the LF were conducted in accordance with the October 2020 *Statistical Analysis Plan* (Geosyntec, 2020b), except where noted below. Time series plots and results for all completed statistical tests are provided in Attachment B.

The data obtained in October 2020 were screened for potential outliers. No outliers were identified for these events.

2.2.1 Establishment of GWPSs

A GWPS was established for each Appendix IV parameter in accordance with 40 CFR 257.95(h) and the *Statistical Analysis Plan* (Geosyntec, 2020b). The established GWPS was determined to be the greater value of the background concentration and the maximum contaminant level (MCL) or risk-based level specified in 40 CFR 257.95(h)(2) for each Appendix IV parameter. To determine background concentrations, an upper tolerance limit (UTL) was calculated using pooled data from the background wells collected during the background monitoring and assessment monitoring events. Tolerance limits were calculated parametrically with 95% coverage and 95% confidence for barium, beryllium, and combined radium. Non-parametric tolerance limits were

calculated for antimony, arsenic, cadmium, chromium, cobalt, fluoride, lead, lithium, mercury, molybdenum, and selenium due to apparent non-normal distributions and for thallium due to a high non-detect frequency. Tolerance limits and the final GWPSs are summarized in Table 2.

2.2.2 Evaluation of Potential Appendix IV SSLs

A confidence interval was constructed for each Appendix IV parameter at each compliance well. Confidence limits were generally calculated parametrically ($\alpha = 0.01$); however, non-parametric confidence limits were calculated in some cases (e.g., when the data did not appear to be normally distributed or when the non-detect frequency was too high). An SSL was concluded if the lower confidence limit (LCL) exceeded the GWPS (i.e., if the entire confidence interval exceeded the GWPS). Calculated confidence limits are shown in Attachment B.

No SSLs were identified at the Welsh LF.

2.2.3 Establishment of Appendix III Prediction Limits

Upper prediction limits (UPL) for Appendix III parameters were previously updated after sufficient data was collected following the background monitoring period (Geosyntec, 2019). Intrawell tests were used to evaluate potential SSIs for calcium, chloride, sulfate, and TDS whereas interwell tests were used to evaluate potential SSIs for boron, fluoride, and pH. Prediction limits were updated using data through May 2020 for intrawell prediction limits and October 2020 for interwell prediction limits.

Mann-Whitney (Wilcoxon rank-sum) tests were performed to determine whether the newer data are affected by a release from the LF. Because the interwell Appendix III limits and the Appendix IV GWPSs are based on data from upgradient wells which we would not expect to have been impacted by a release, these tests were used for intrawell Appendix III tests only. Mann-Whitney tests were used to compare the medians of historical data (May 2016 – February 2019) to the new compliance samples (May 2019 – May 2020) for calcium, chloride, sulfate, and TDS. Results were evaluated to determine if 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 between the medians of the two groups, the data were reviewed to evaluate the cause of the difference and to determine if adding newer data to the background dataset, replacing the background dataset with the newer data, or continuing to use the existing background dataset was most appropriate. If the differences appeared to have been caused by a release, then the previous background dataset would have continued to be used.

The complete Mann-Whitney test results and a summary of the significant findings can be found in Appendix B. Significant differences were found between the two groups for chloride in upgradient well AD-1 and at downgradient well AD-11. However, because AD-1 is an upgradient monitoring well and more recent data are similar to background and better represent the groundwater quality upgradient of the facility, the background dataset was updated to include the compliance data for chloride at AD-1. Because concentrations for chloride at downgradient well

AD-11 are lower in the more recent sampling events, the background dataset was updated to include all available information, which will result in a more conservative prediction limit.

After the revised background set was established, a parametric or non-parametric analysis was selected based on the distribution of the data and the frequency of non-detect data. Estimated results less than the practical quantitation limit (PQL) – i.e., "J-flagged" data – were considered detections and the estimated results were used in the statistical analyses. Non-parametric analyses were selected for datasets with at least 50% non-detect 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 non-detect adjustment was applied to datasets with between 15% and 50% non-detect data. For datasets with fewer than 15% non-detect data, non-detect data were replaced with one half of the PQL. The selected analysis (i.e., parametric or non-parametric) and transformation (where applicable) for each background dataset are shown in Attachment B.

Intrawell UPLs were updated using all historical data through May 2020 to represent background values. Interwell UPLs were updated using all historical data through October 2020 to represent background values. LPLs were also updated for pH. The updated prediction limits are summarized in Table 3. Intrawell tests continued to be used to evaluate potential SSIs for calcium, chloride, sulfate, and TDS, whereas interwell tests continued to be used to evaluate potential SSIs for boron, fluoride, and pH. The UPLs were calculated for a one-of-two retesting procedure; i.e., if at least one sample in a series of two does not exceed the UPL, then it can be concluded that an SSI has not occurred. The retesting procedures allowed achieving an acceptably high statistical power to detect changes at downgradient wells for constituents evaluated using intrawell prediction limits.

2.2.4 Evaluation of Potential Appendix III SSIs

The Appendix III results were analyzed to assess whether concentrations of Appendix III parameters at the compliance wells exceeded background concentrations. Data collected during the October 2020 assessment monitoring events from each compliance well were compared to the prediction limits to evaluate results above background values. The results from these events and the prediction limits are summarized in Table 3. The following exceedances of the upper prediction limits (UPLs) and of the lower prediction limits (LPLs) were noted:

- Boron concentrations exceeded the interwell UPL of 0.700 mg/L at AD-11 (1.69 mg/L), AD-13 (1.52 mg/L), and AD-14 (1.14 mg/L).
- Fluoride concentrations exceeded the interwell UPL of 0.583 mg/L at AD-11 (0.63 mg/L).
- pH was below the interwell LPL of 4.3 at AD-11 (3.9).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the initial (October 2020) sample was above the UPL or below the LPL.

Based on these results, concentrations of boron, and fluoride appear to be above background concentrations, and pH appears to be below background concentrations, and the unit will remain in assessment monitoring.

2.3 Conclusions

A semi-annual assessment monitoring event was conducted in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, with no QA/QC issues identified that impacted data usability. A review of outliers identified no potential outliers in the October 2020 data. GWPSs were re-established for the Appendix IV parameters. A confidence interval was constructed at each compliance well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval exceeded the GWPS. No SSLs were identified.

The Appendix III results were evaluated to assess whether concentrations of Appendix III parameters exceeded background levels. Boron and fluoride results exceeded background levels and pH levels were below background levels at select downgradient wells.

Based on this evaluation, the Welsh LF CCR unit will remain in assessment monitoring.

SECTION 3

REFERENCES

Geosyntec Consultants (Geosyntec). 2019. Statistical Analysis Summary -Landfill. J. Robert Welsh Plant. December 16, 2019.

Geosyntec. 2020a. Statistical Analysis Summary -Landfill. J. Robert Welsh Plant. September 1, 2020.

Geosyntec. 2020b. Statistical Analysis Plan. October 2020.

TABLES

Table 1 - Groundwater Data Summary
Welsh Plant - Landfill

Geosyntec Consultants, Inc.

Parameter	Unit	AD-1	AD-5	AD-11	AD-13	AD-14	AD-17
		10/14/2020	10/14/2020	10/12/2020	10/12/2020	10/12/2020	10/14/2020
Antimony	µg/L	0.5 U	0.1 U	0.02 J	0.1 U	0.1 U	0.1 U
Arsenic	µg/L	0.3 J	6.28	0.64	0.55	0.44	0.84
Barium	µg/L	84.7	71.7	14.1	18.5	22.9	10.9
Beryllium	µg/L	0.984	0.09 J	1.52	0.834	1.46	0.04 J
Boron	mg/L	0.670	0.04 J	1.69	1.52	1.14	0.100
Cadmium	µg/L	0.2 U	0.05 U	0.31	0.17	3.21	0.01 J
Calcium	mg/L	3.88	36.6	8.57	8.03	9.63	185
Chloride	mg/L	2.16	18.8	8.16	18.1	8.59	35.7
Chromium	µg/L	0.9 J	0.09 J	0.306	0.410	0.357	0.327
Cobalt	µg/L	2.12	14.9	14.0	8.50	26.0	45.4
Combined Radium	pCi/L	1.552	2.7	2.651	1.546	4.259	2.169
Fluoride	mg/L	0.25	0.18	0.63	0.33	0.24	0.17
Lead	µg/L	0.3 J	0.05 J	1.25	0.324	0.307	0.2 J
Lithium	mg/L	0.00932	0.134	0.0246	0.0480	0.0195	0.274
Mercury	µg/L	0.003 J	0.005 U	0.006	0.005 U	0.391	0.005 U
Molybdenum	µg/L	10 U	2 U	2 U	2 U	2 U	2 U
Selenium	µg/L	5.3	0.1 J	1.8	0.5	2.0	0.06 J
Sulfate	mg/L	66.9	148	604	278	246	1,060
Thallium	µg/L	2 U	0.5 U	0.2 J	0.2 J	0.3 J	0.5 U
Total Dissolved Solids	mg/L	183	338	764	522	469	1,720
pH	SU	4.5	6.5	3.9	4.5	4.3	5.4

Notes:
mg/L: milligrams per liter
µg/L: micrograms per liter
SU: standard unit
pCi/L: picocuries per liter
U: Parameter was not present in concentrations above method detection limit and is reported as the reporting limit
J: Estimated value. Parameter was detected in concentrations below the reporting limit

Table 2: Groundwater Protection Standards
Welsh Plant - Landfill

Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.006		0.0032	0.006
Arsenic, Total (mg/L)	0.01		0.006	0.010
Barium, Total (mg/L)	2		0.65	2
Beryllium, Total (mg/L)	0.004		0.00077	0.004
Cadmium, Total (mg/L)	0.005		0.0065	0.0065
Chromium, Total (mg/L)	0.1		0.0040	0.1
Cobalt, Total (mg/L)	n/a	0.006	0.075	0.075
Combined Radium, Total (pCi/L)	5		4.01	5
Fluoride, Total (mg/L)	4		0.58	4
Lead, Total (mg/L)	n/a	0.015	0.0034	0.015
Lithium, Total (mg/L)	n/a	0.04	0.39	0.39
Mercury, Total (mg/L)	0.002		0.000033	0.002
Molybdenum, Total (mg/L)	n/a	0.1	0.0024	0.1
Selenium, Total (mg/L)	0.05		0.005	0.05
Thallium, Total (mg/L)	0.002		0.0013	0.002

Notes:
MCL: Maximum Contaminant Level
CCR: Coal Combustion Residual
Calculated UTL (Upper Tolerance Limit) represents site-specific background values.
GWPS: Groundwater Protection Standard
Grey cells indicate GWPS based upon calculated UTLs are higher than either the MCL or CCR-Rule Specified value.

Table 3 - Appendix III Data Summary
Welsh - Landfill

Geosyntec Consultants, Inc.

Analyte	Unit	Description	AD-11	AD-13	AD-14
			10/12/2020	10/12/2020	10/12/2020
Boron	mg/L	Interwell Background Value (UPL)	0.700		
		Analytical Result	**1.69**	**1.52**	**1.14**
Calcium	mg/L	Intrawell Background Value (UPL)	17.1	28.4	12.2
		Analytical Result	8.57	8.03	9.63
Chloride	mg/L	Intrawell Background Value (UPL)	14.3	24.0	11.5
		Analytical Result	8.16	18.1	8.59
Fluoride	mg/L	Interwell Background Value (UPL)	0.583		
		Analytical Result	**0.63**	0.33	0.24
pH	SU	Interwell Background Value (UPL)	7.1		
		Interwell Background Value (LPL)	4.3		
		Analytical Result	**3.9**	4.5	4.3
Sulfate	mg/L	Intrawell Background Value (UPL)	829	422	189
		Analytical Result	604	278	**246**
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	1,330	881	369
		Analytical Result	764	522	**469**

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

ATTACHMENT A
Certification by Qualified Professional Engineer

Certification by Qualified Professional Engineer

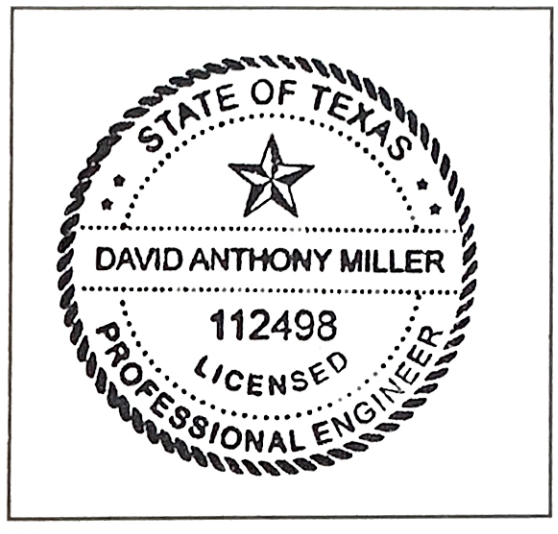
I certify that the selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Welsh Landfill CCR management area and that the requirements of 40 CFR 257.93(f) have been met.

DAVID ANTHONY MILLER

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



112498	TEXAS	02.05.21
License Number	Licensing State	Date

ATTACHMENT B

Statistical Analysis Output

GROUNDWATER STATS CONSULTING

December 31, 2020

Geosyntec Consultants
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941 Chatham Lane, #103
Columbus, OH 43221

Re: Welsh Landfill - Assessment Monitoring Event & Background Update 2020

Dear Ms. Kreinberg,

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the statistical analysis of groundwater data and the background update of prediction limits for American Electric Power Inc.'s Welsh Landfill. The analysis complies with the federal rule for the Disposal of Coal Combustion Residuals from Electric Utilities (CCR Rule, 2015) as well as with the USEPA Unified Guidance (2009).

Sampling began at the site for the CCR program in 2016. Below is a list of the monitoring wells, as provided by Geosyntec Consultants. Note that originally the network included upgradient well AD-18; however, further research, reportedly, identified that this well was not providing adequate representation of the groundwater quality upgradient of this site and exhibited different chemical properties from the neighboring upgradient wells. Therefore, data from this well are no longer included in the statistical analysis.

- **Upgradient wells:** AD-1, AD-5, and AD-17
- **Downgradient wells:** AD-11, AD-13, and AD-14

Data were sent electronically, and the statistical analysis was reviewed by Dr. Jim Loftis, Senior Advisor to GSC. The analysis was conducted according to the Statistical Analysis Plan prepared by GSC and approved by Dr. Kirk Cameron with MacStat Consulting.

The CCR program consists of the following constituents:

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

Time series plots for Appendix III and IV parameters are provided for all wells and constituents; and are used to evaluate concentrations over the entire record (Figure A). Additionally, box plots are included for all constituents at upgradient and downgradient wells (Figure B). 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 flagged as outliers may be seen in the Outlier Summary following this letter (Figure C). These values are plotted in a lighter font and disconnected symbol on the time series graphs.

Summary of Statistical Methods:

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

Parametric prediction limits are utilized when the screened historical data follow a normal or transformed-normal distribution. Parametric limits are based on a significance level of 0.05 for each semi-annual event. When data cannot be normalized or the majority of data are nondetects, a nonparametric test is utilized. The significance level of a nonparametric tests depends on the background sample size. The distribution of data is tested using the Shapiro-Wilk/Shapiro-Francia test for normality. After testing for normality and performing any adjustments as discussed below (US EPA, 2009), data are analyzed using either parametric or non-parametric prediction limits as appropriate. Nondetects are handled as follows:

- No statistical analyses are required on wells and analytes containing 100% nondetects (USEPA Unified Guidance, 2009, Chapter 6).
- When data contain <15% nondetects in background, simple substitution of one-half the reporting limit is utilized in the statistical analysis. The reporting limit utilized for nondetects is the practical quantification limit (PQL) as reported by the laboratory.

- When data contain between 15-50% nondetects, the Kaplan-Meier nondetect adjustment is applied to the background data. 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% nondetects.

Summary of Background Screening Conducted December 2017

Appendix III – Determination of Spatial Variation

The Analysis of Variance (ANOVA) was 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; when statistical limits constructed from upgradient wells would not be conservative from a regulatory perspective; and when downgradient water quality is unimpacted compared to upgradient water quality for the same parameter.

The ANOVA identified variation for the following Appendix III parameters: boron, calcium, chloride, sulfate, and TDS, suggesting that intrawell methods should be considered for those constituents. No differences were noted for fluoride and pH; therefore, these parameters were eligible for interwell prediction limits. Boron, calcium, chloride, sulfate, and TDS data were further evaluated as described below for the appropriateness of intrawell testing to accommodate the groundwater quality. A summary table of the ANOVA results was included with the reports.

Appendix III - Statistical Limits

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 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 natural spatial variation for a release from the facility. Prior to performing intrawell prediction limits, several steps are required to reasonably demonstrate that downgradient water quality does not have existing impacts from the practices of the facility.

For all Appendix III parameters recommended for intrawell analyses, exploratory data analysis was used for comparison of average concentrations in downgradient wells to the upper range of concentrations in the upgradient wells. Specifically, upper tolerance limits were used in conjunction with confidence intervals to determine whether the estimated averages in downgradient wells were higher than observed levels upgradient of the facility. The upper tolerance limits were constructed to represent the upper range of probable background levels at the site.

In cases where downgradient average concentrations are higher than observed upgradient concentrations for a given constituent, an independent study and hydrogeological investigation would be required to identify local geochemical conditions and expected groundwater quality for the region to justify an intrawell approach. Such an assessment is beyond the scope of services provided by Groundwater Stats Consulting. When there is not an obvious explanation for observed differences in concentration between the downgradient wells and the upgradient wells, interwell prediction limits will initially be selected for the statistical method until further evidence shows that concentrations are due to natural variation rather than a result of the facility.

Parametric upper tolerance limits were constructed with a target of 99% confidence and 95% coverage using pooled upgradient well data for each of the Appendix III parameters. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples. As more data are collected, the background population is better represented, and the confidence and coverage levels increase.

Confidence intervals were constructed on downgradient wells for each of the Appendix III parameters, and compared to the upper tolerance limits discussed above, to determine intrawell eligibility. When the entire confidence interval is above the upgradient upper tolerance limit for a given parameter, interwell methods are initially recommended. Therefore, only parameters with confidence intervals which did not exceed background limits are eligible for intrawell methods.

Confidence intervals for the above parameters were found to be within their respective background limit for all parameters except boron. Therefore, intrawell methods were recommended for calcium, chloride, sulfate, and TDS; and interwell methods were recommended for boron, fluoride, and pH.

All available data through June 2017 at each well were used to establish intrawell background limits for the parameters identified above, based on a 1-of-2 resample plan, to be used for future comparisons. Interwell prediction limits, combined with a 1 of-2

resample plan, were constructed using pooled data from upgradient wells AD-1, AD-5, and AD-17. Intrawell background data sets remain the same until the next update, while interwell background data are continually updated to include the most recent sampling event. An update can be performed when a minimum of four new data points are available.

December 2020 - Update of Background Data and Statistical Limits

Background limits were last updated in 2019 using data through February 2019. Data are evaluated in this report for updating background limits through May 2020 for intrawell prediction limits, and through October 2020 for interwell prediction limits.

Data were re-evaluated using Tukey's outlier test and visual screening of all data. Interwell prediction limits are used for boron, fluoride, and pH; therefore, pooled upgradient well data were tested for outliers for these constituents (Figure C). All other Appendix III parameters, which use intrawell prediction limits, were tested for outliers at each well (Figure C). Tukey's test identified outliers for calcium in upgradient well AD-17, TDS in downgradient well AD-14, and for fluoride which uses interwell prediction limits. None of these values were flagged as they do not differ greatly from the rest of the data. The following values were not identified as outliers by Tukey's test; however, these values were flagged as outliers in the database because they do not appear to represent the population at these wells: calcium in AD-14, chloride in AD-1, and TDS in AD-13.

For constituents requiring intrawell prediction limits, the Mann-Whitney (Wilcoxon Rank Sum) test at the 99% confidence level was used to compare the median of historical data through February 2019 to the median of new compliance samples at each well through May 2020 (Figure D). Statistically significant differences were noted for chloride in upgradient well AD-1 and downgradient well AD-11, with the median of the more recent group of data slightly lower than the background median.

Typically, when the test concludes that the medians of the two groups are significantly different, particularly in the downgradient wells, the background are not updated to include the newer data but will be reconsidered in the future. Chloride, however, was updated to include more recent data in upgradient well AD-1 as those data represent groundwater quality upgradient of the facility. Downgradient well AD-11 was updated due to the small difference in values between the two time periods. When one or both of the time periods being compared is short, statistically significant differences may result from natural year-to-year variation rather than more persistent changes. All data will be re-evaluated during the next background update, and earlier measurements will be deselected if they no longer represent present-day groundwater quality. A summary of

these results follows this letter, and the test results are included with the Mann Whitney test section at the end of this report.

Intrawell prediction limits using all historical data reported through May 2020, combined with a 1-of-2 resample plan, were constructed, and a summary of the updated limits follows this letter (Figure E).

The Sen's Slope/Mann Kendall trend test was used to evaluate data at upgradient wells for boron, fluoride, and pH to identify statistically significant increasing or decreasing trends. The results of the trend analyses showed only one statistically significant increasing trend, for boron at upgradient well AD-1, and two statistically significant decreasing trends, for fluoride in upgradient wells AD-1 and AD-17 (Figure F). These trends did not require any adjustment of the background time periods for the upgradient wells.

Interwell prediction limits, combined with a 1-of-2 resample plan, were updated using pooled data from the upgradient wells for the entire period of record for boron, fluoride, and pH . A summary table of the updated limits may be found following this letter (Figure G).

Evaluation of Appendix IV Parameters

Interwell Upper Tolerance limits were used to calculate background limits from all available pooled upgradient well data for each Appendix IV parameter (Figure H). Background data are screened for outliers and extreme trending patterns that would lead to artificially elevated statistical limits. High outliers are also cautiously flagged in the downgradient wells when they are clearly much different from the rest of the data. This is generally a regulatory conservative approach in that it will reduce the variance and thus reduce the width of parametric confidence intervals, although it will also reduce the mean and thus lower the entire interval. The intent is to better represent the actual downgradient mean. Flagging high outliers should have no effect on the lower limit of nonparametric confidence intervals. Flagged values may be seen on the Outlier Summary following this letter.

Parametric tolerance limits use a target of 95% confidence and 95% coverage. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples. These limits were compared to the Maximum Contaminant Levels (MCLs) and CCR-Rule specified levels in the Groundwater Protection Standard (GWPS) table following this letter to determine the highest limit for use as the GWPS in the Confidence Interval comparisons (Figure I).

Confidence intervals were then constructed on downgradient wells for each of the Appendix IV parameters and compared to the corresponding GWPS as discussed above (Figure J). Only when the entire confidence interval is above a GWPS is the well/constituent pair considered to exceed its respective standard. No confidence intervals exceedances were found for any of the downgradient wells. A summary of the confidence interval results follows this letter.

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

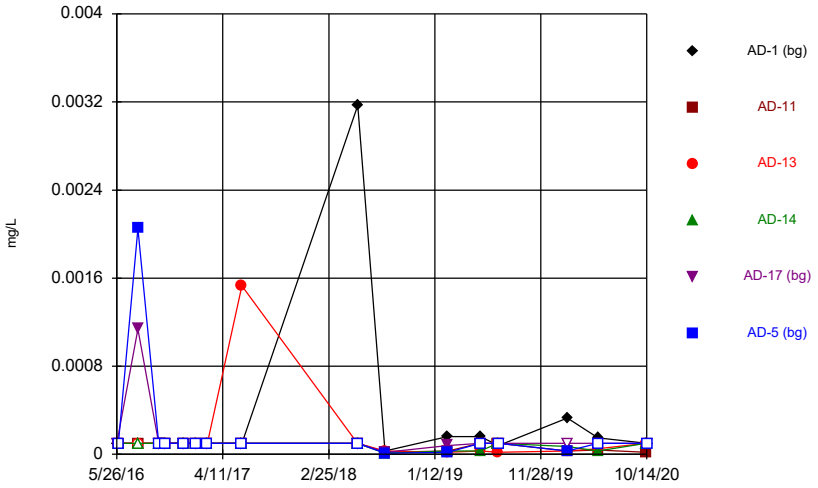
For Groundwater Stats Consulting,

Easton Rayner
Groundwater Analyst

Kristina L. Rayner
Groundwater Statistician

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

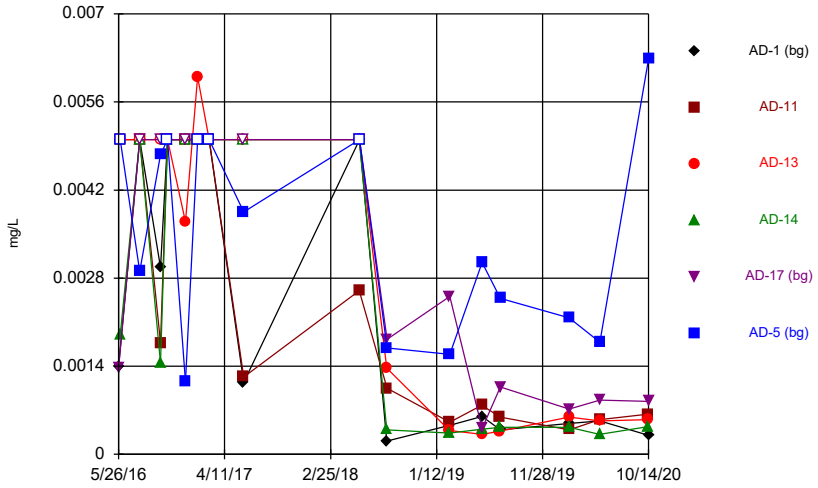
Time Series



Constituent: Antimony, total Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

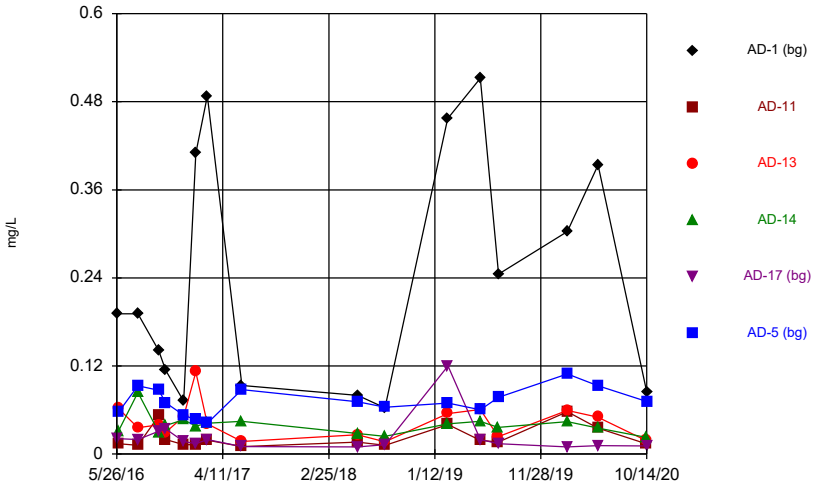
Time Series



Constituent: Arsenic, total Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

Time Series



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Welsh Landfill Client: Geosyntec Data: Welsh LF

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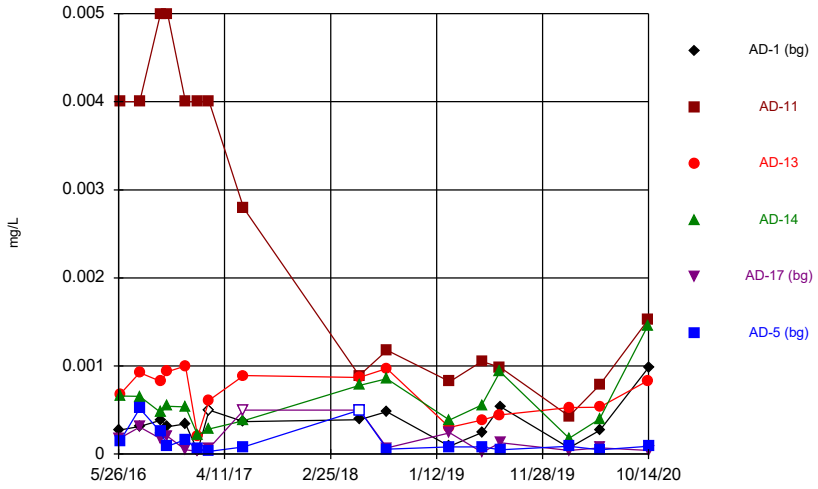
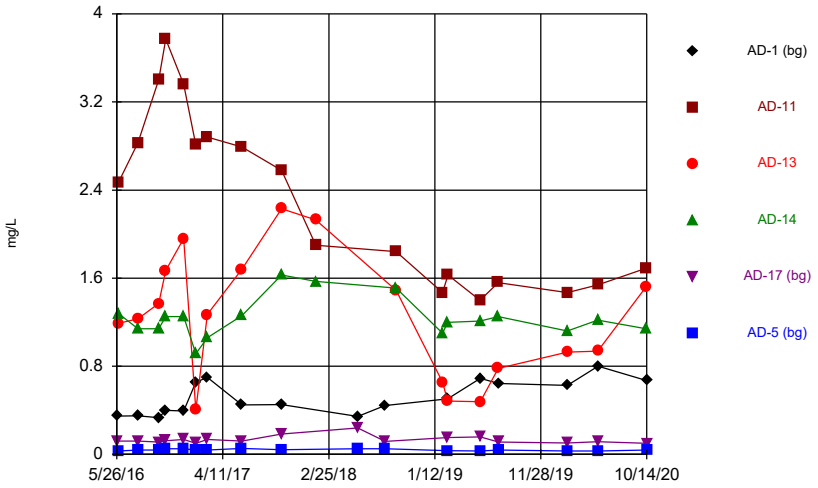
Time Series



Constituent: Beryllium, total Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

Time Series



Constituent: Boron, total Analysis Run 12/30/2020 9:26 AM View: Descriptive
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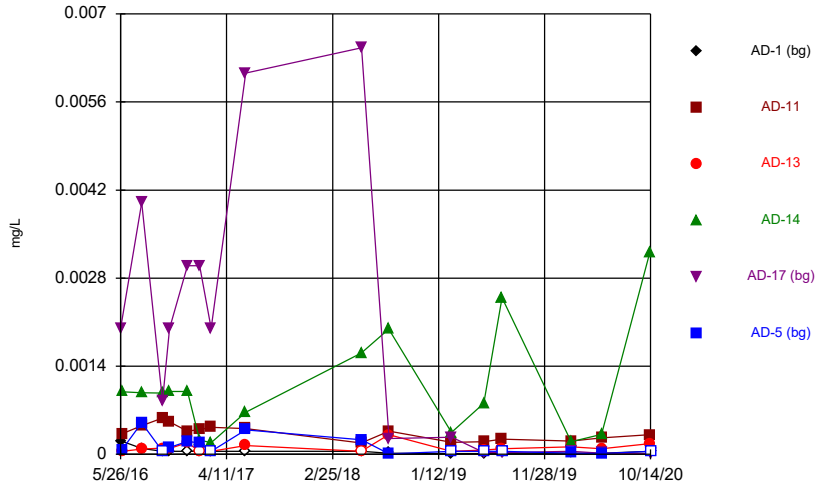
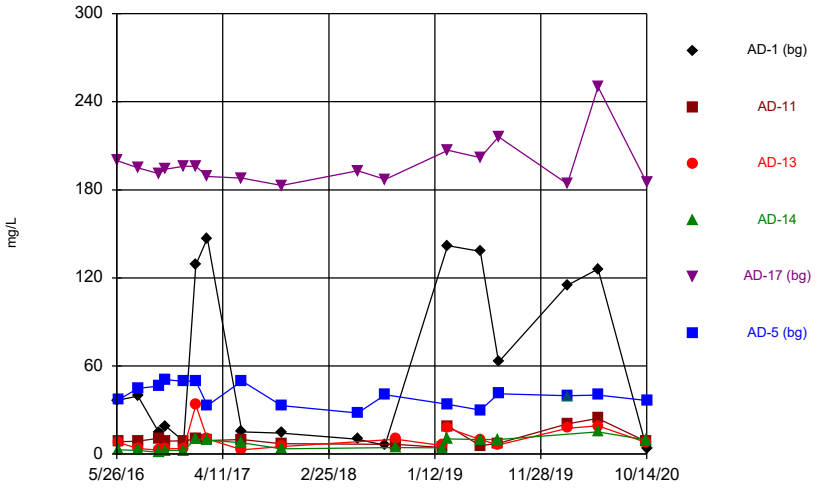


Constituent: Cadmium, total Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

Time Series



Constituent: Calcium, total Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

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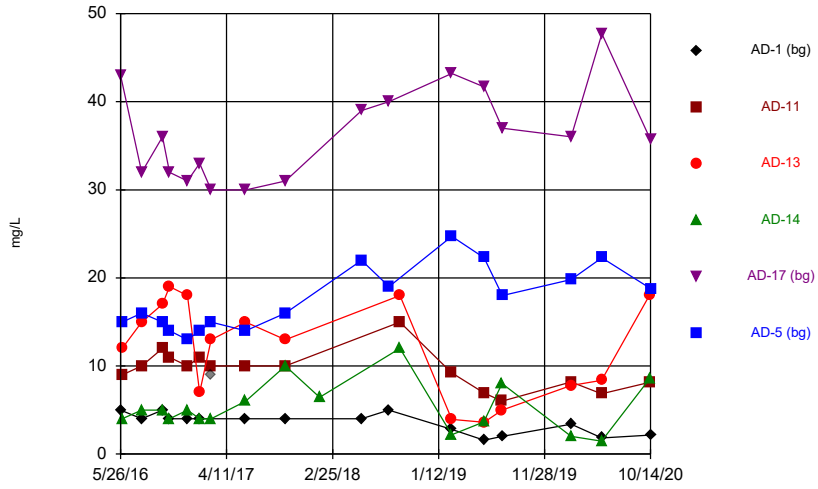
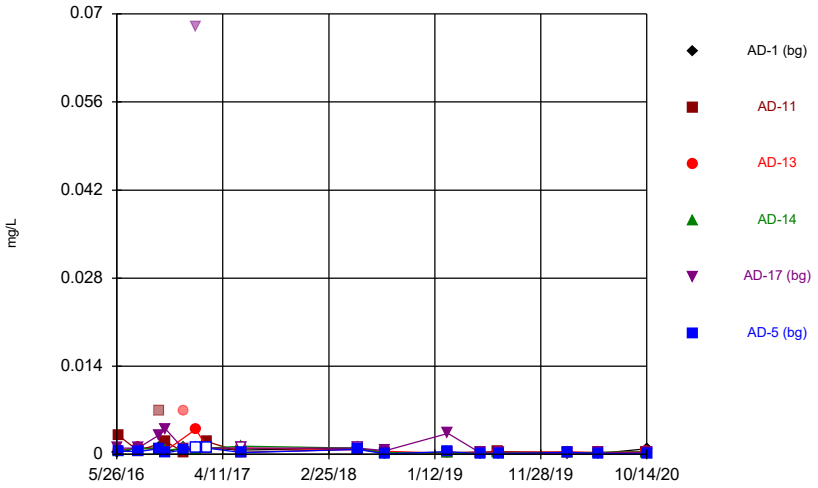
Time Series



Constituent: Chloride, total Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

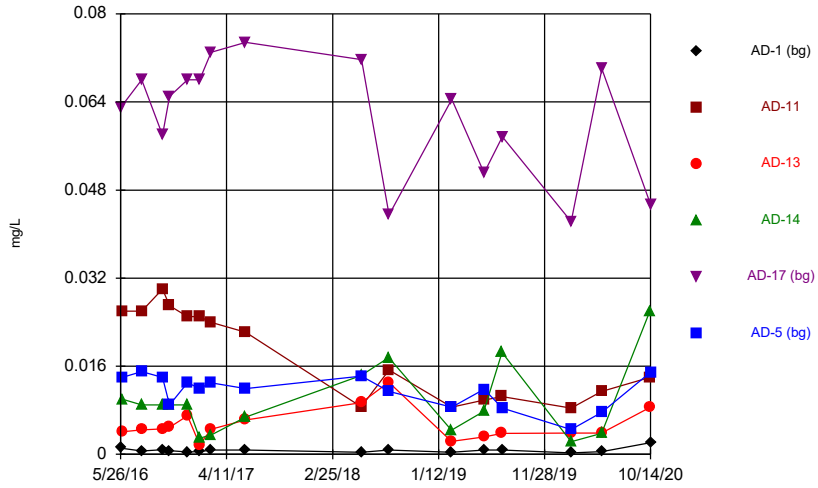
Time Series



Constituent: Chromium, total Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

Time Series



Constituent: Cobalt, total Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

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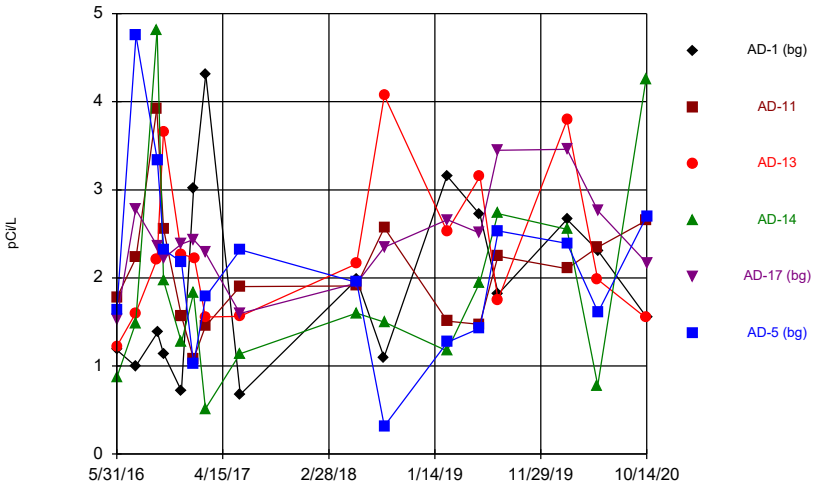
Time Series



Constituent: Combined Radium 226 + 228 Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

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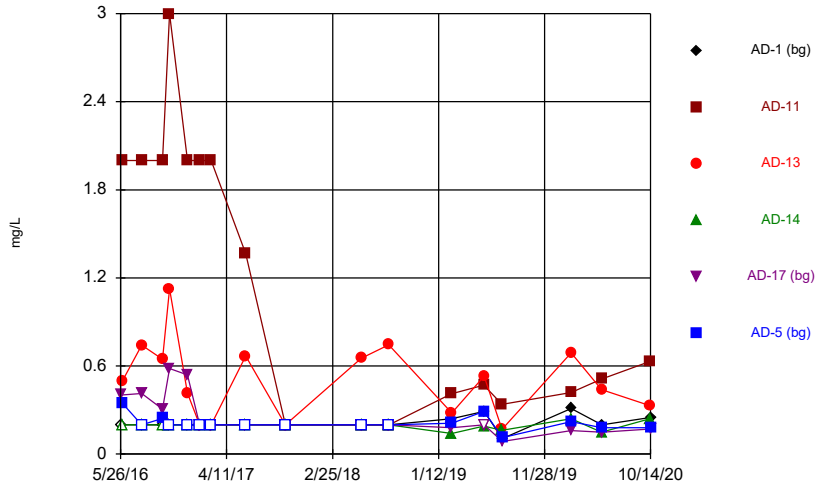
Time Series



Constituent: Fluoride, total Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

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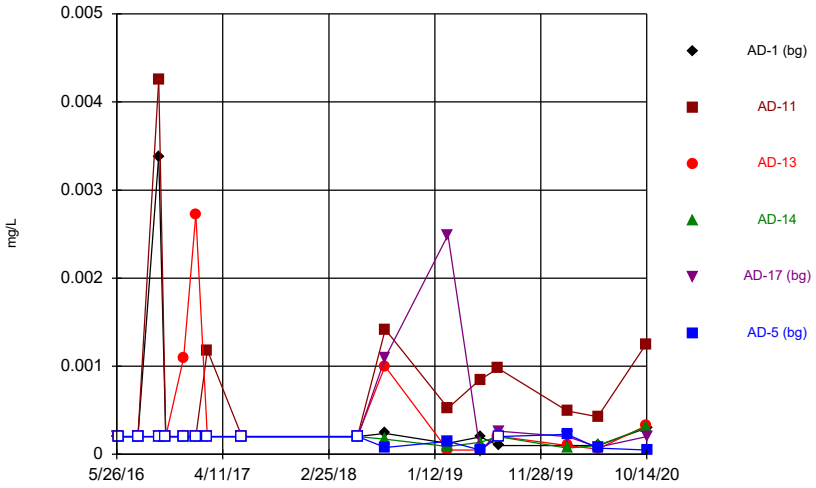
Time Series



Constituent: Lead, total Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

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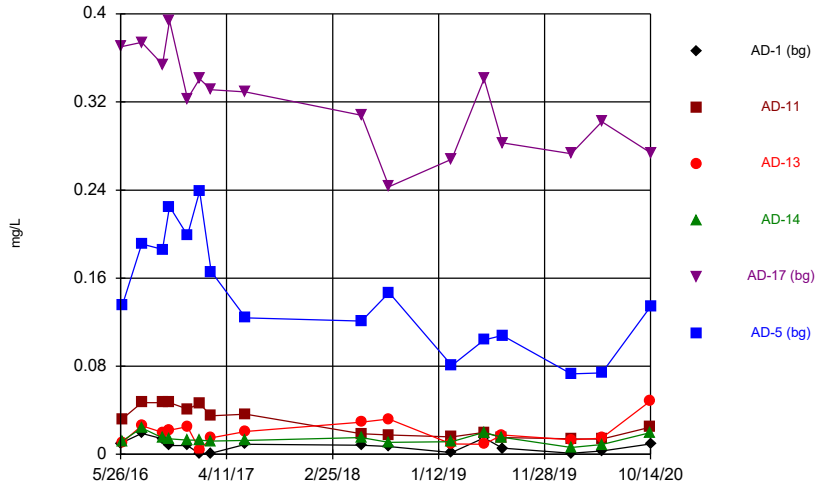
Time Series



Constituent: Lithium, total Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

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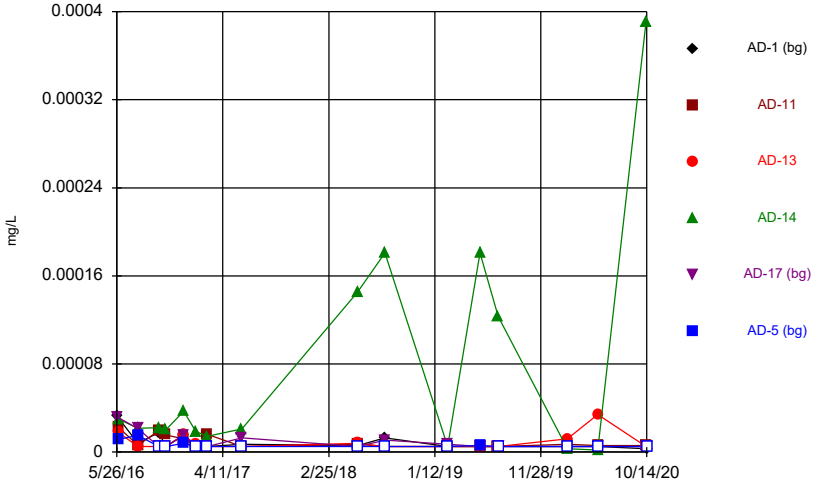
Time Series



Constituent: Mercury, total Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

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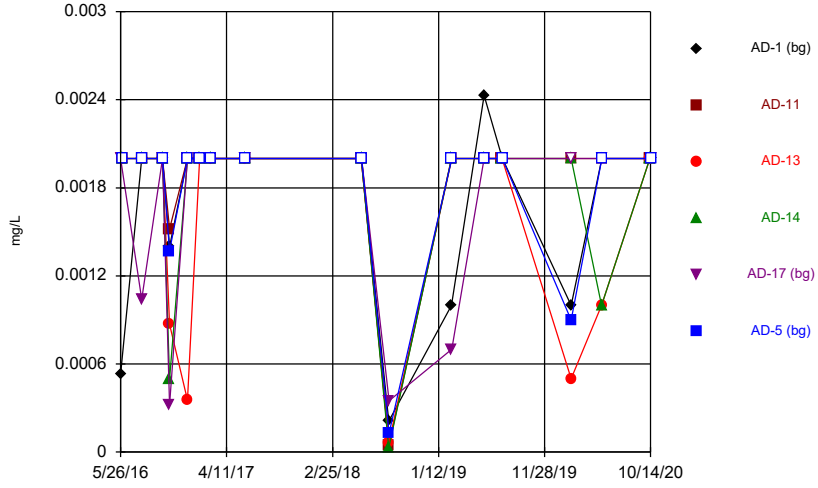
Hollow symbols indicate censored values.

Time Series



Constituent: Molybdenum, total Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

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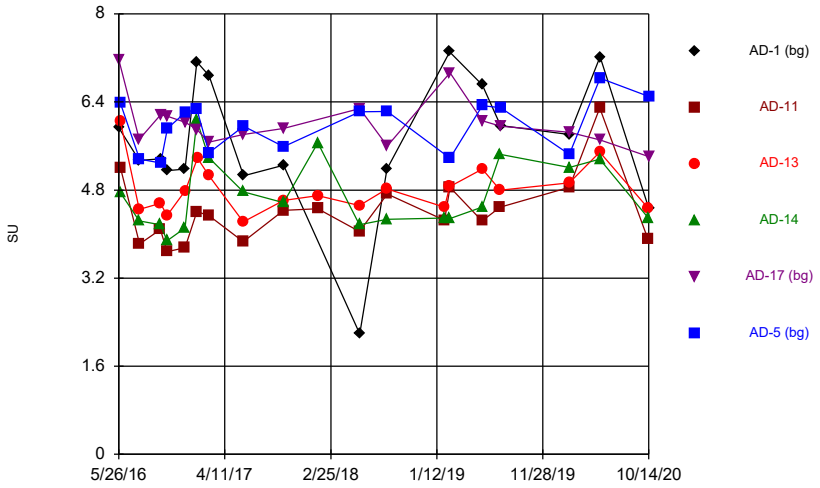
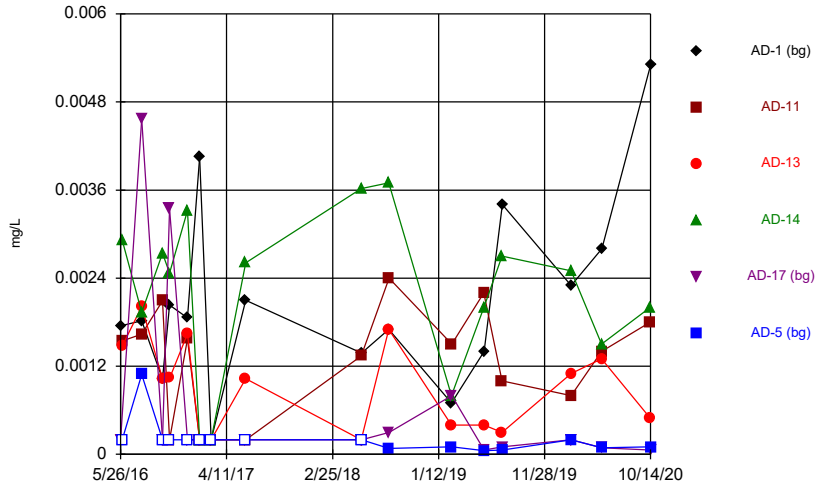
Time Series



Constituent: pH, field Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Selenium, total Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

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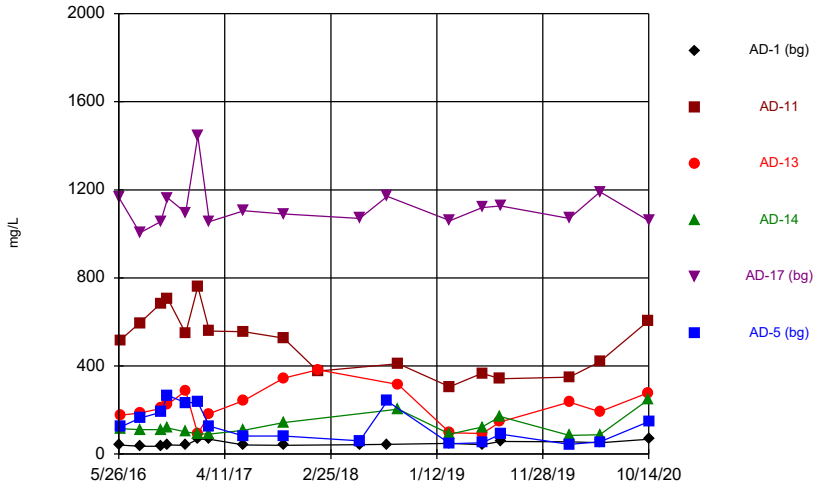
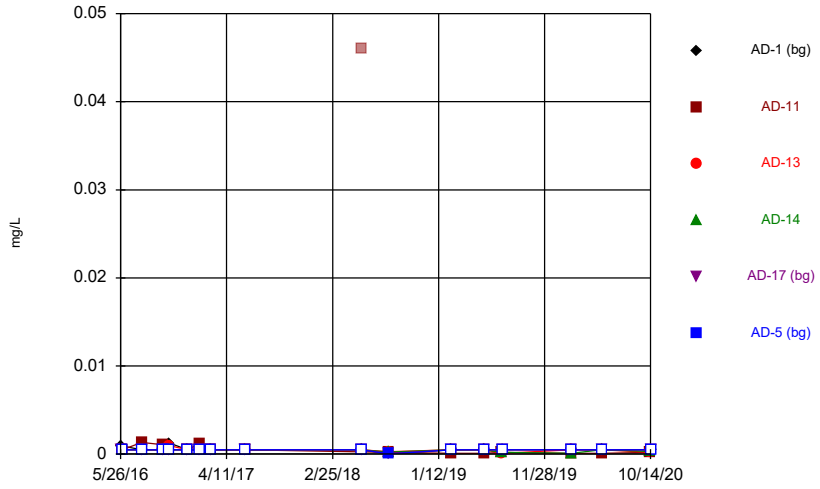
Time Series



Constituent: Sulfate, total Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

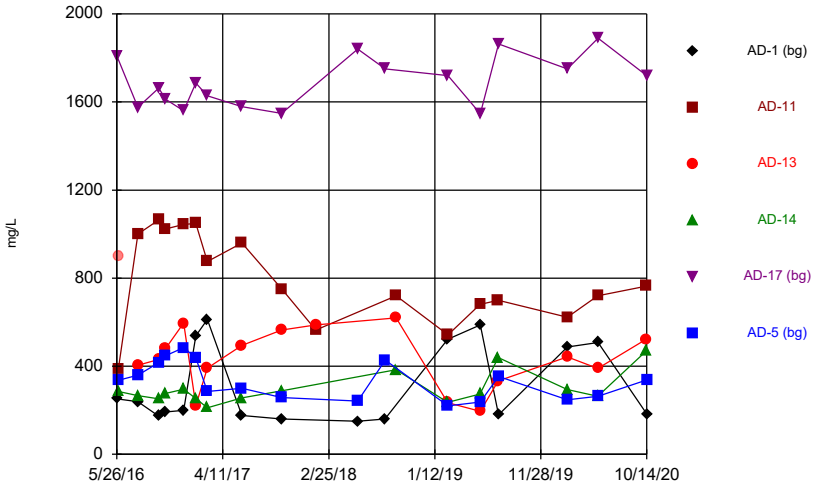
Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Thallium, total Analysis Run 12/30/2020 9:26 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

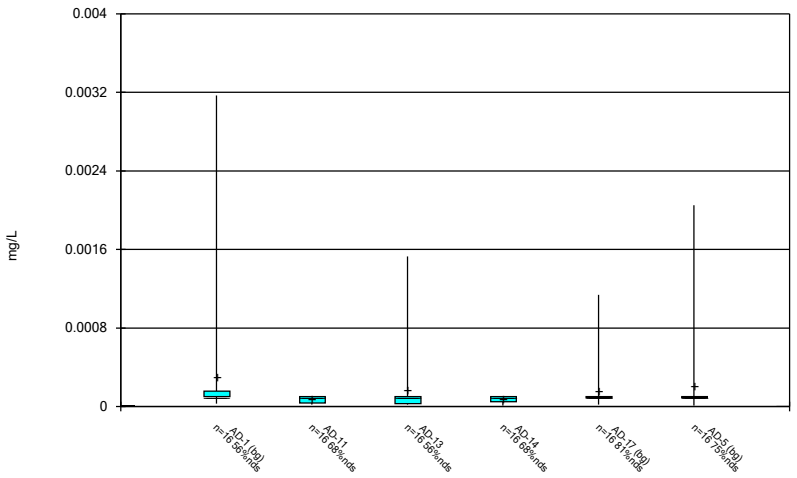
Time Series



Constituent: Total Dissolved Solids Analysis Run 12/30/2020 9:26 AM View: Descriptive

Welsh Landfill Client: Geosyntec Data: Welsh LF

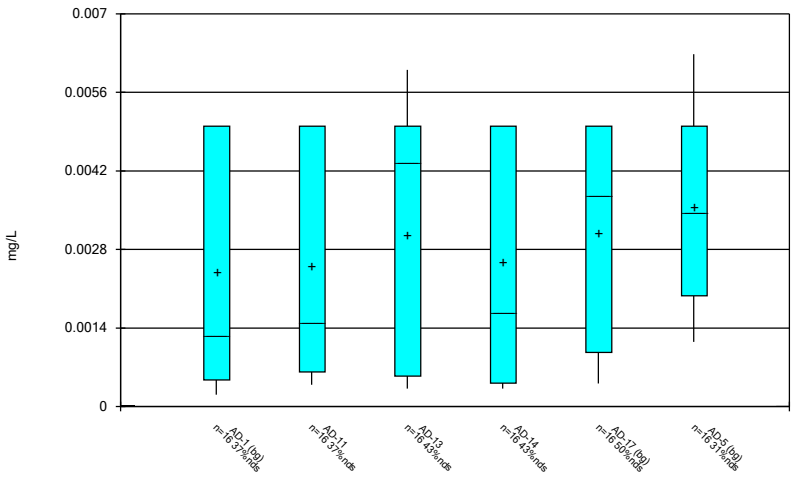
Box & Whiskers Plot



Constituent: Antimony, total Analysis Run 12/30/2020 9:29 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

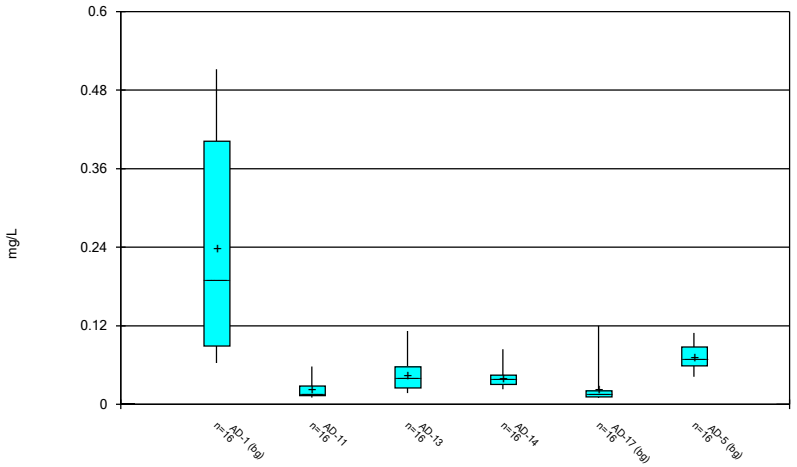
Box & Whiskers Plot



Constituent: Arsenic, total Analysis Run 12/30/2020 9:29 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

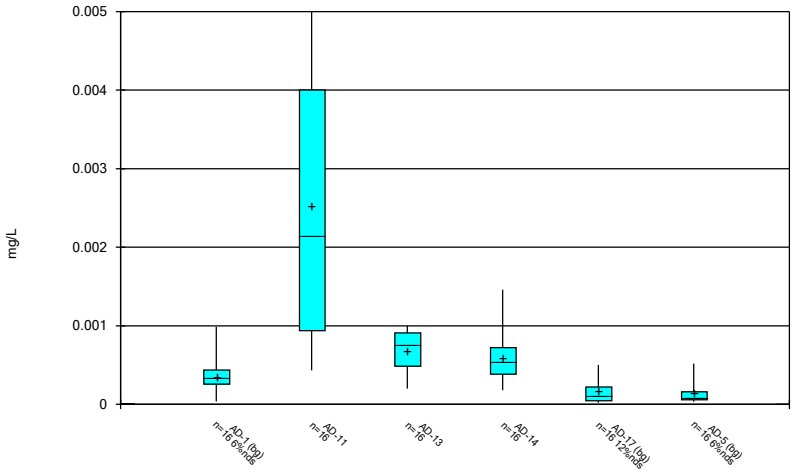
Box & Whiskers Plot



Constituent: Barium, total Analysis Run 12/30/2020 9:29 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

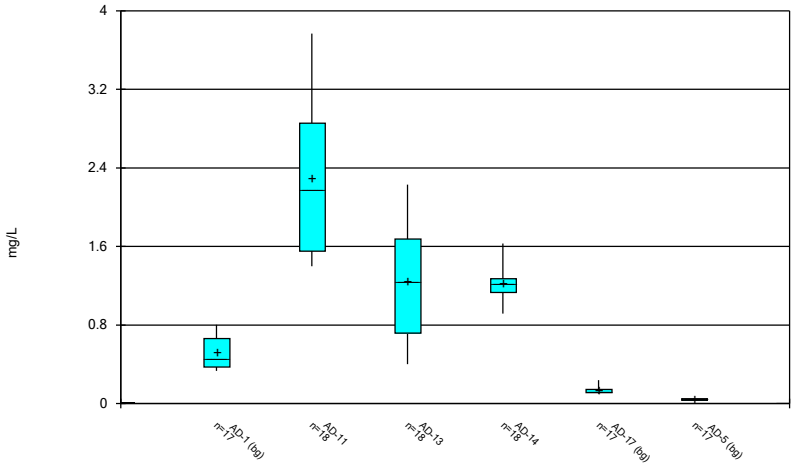
Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

Box & Whiskers Plot



Constituent: Beryllium, total Analysis Run 12/30/2020 9:29 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

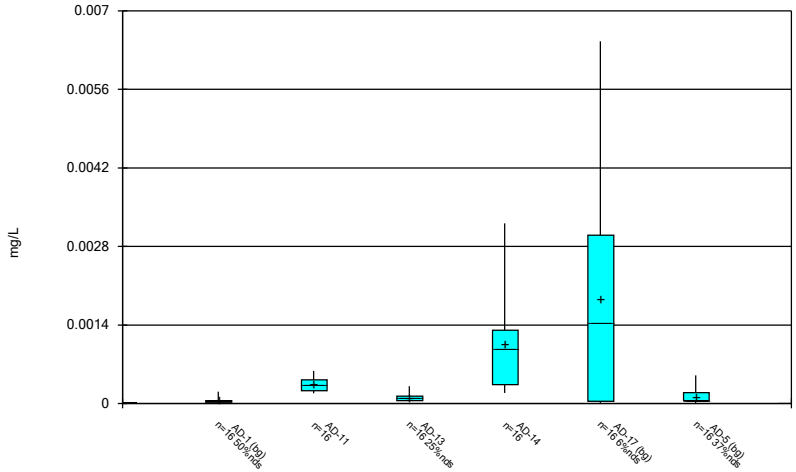
Box & Whiskers Plot



Constituent: Boron, total Analysis Run 12/30/2020 9:29 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

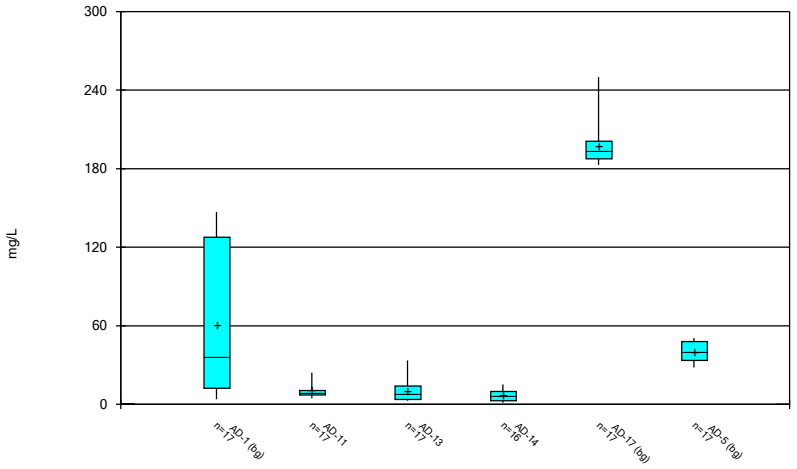
Box & Whiskers Plot



Constituent: Cadmium, total Analysis Run 12/30/2020 9:29 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

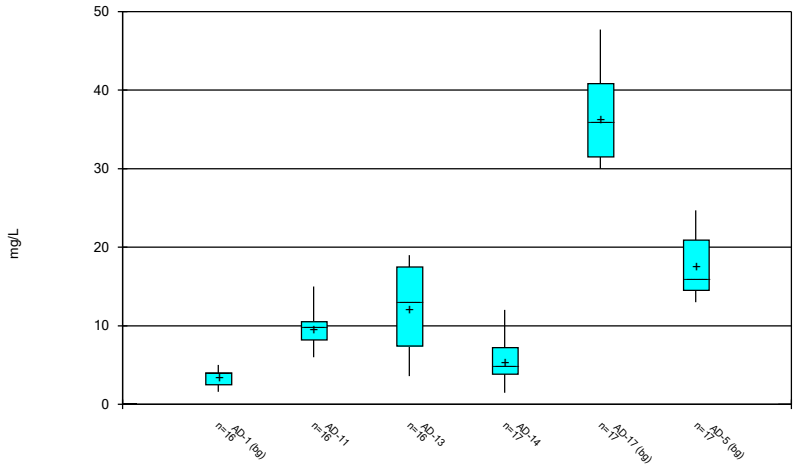
Box & Whiskers Plot



Constituent: Calcium, total Analysis Run 12/30/2020 9:29 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

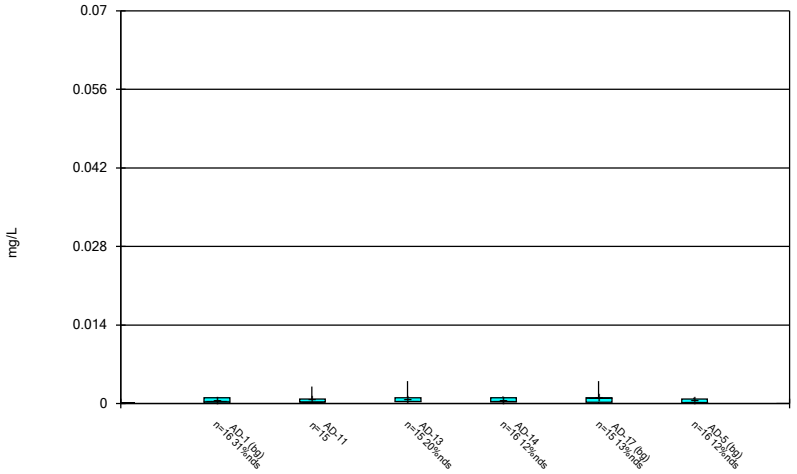
Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

Box & Whiskers Plot



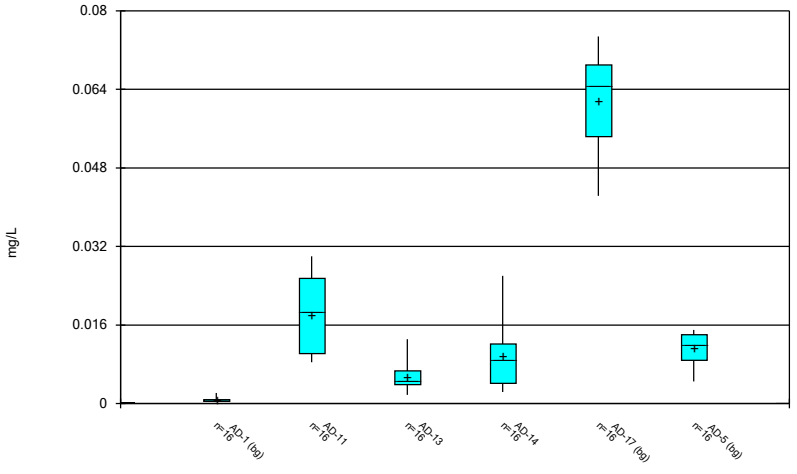
Constituent: Chloride, total Analysis Run 12/30/2020 9:29 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Box & Whiskers Plot



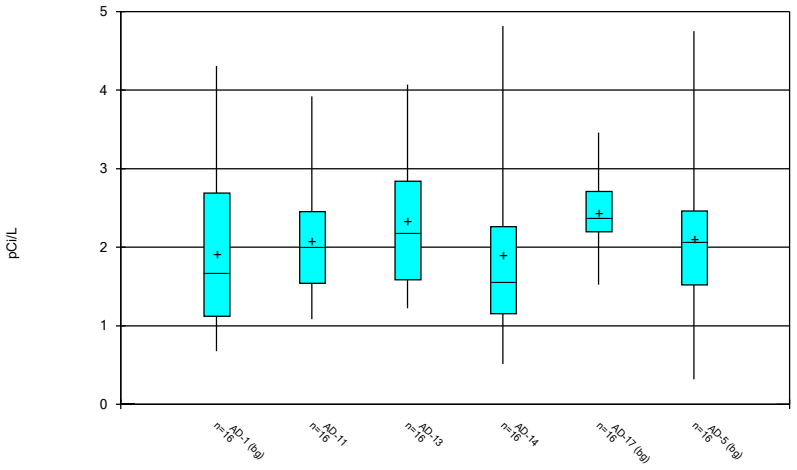
Constituent: Chromium, total Analysis Run 12/30/2020 9:29 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Box & Whiskers Plot



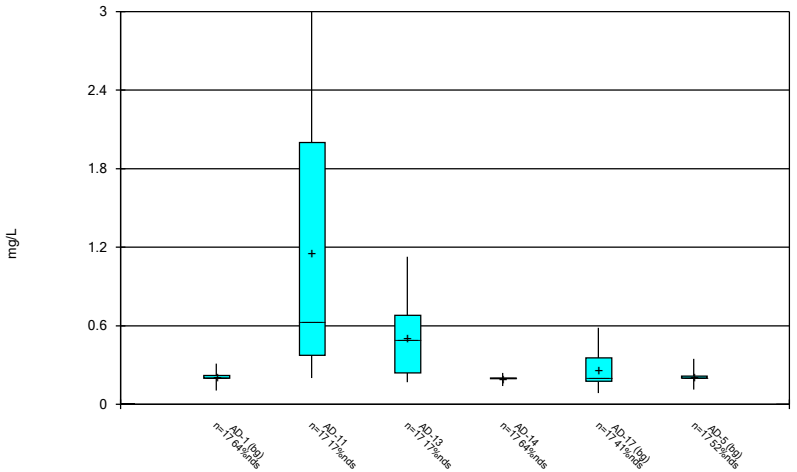
Constituent: Cobalt, total Analysis Run 12/30/2020 9:29 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Box & Whiskers Plot



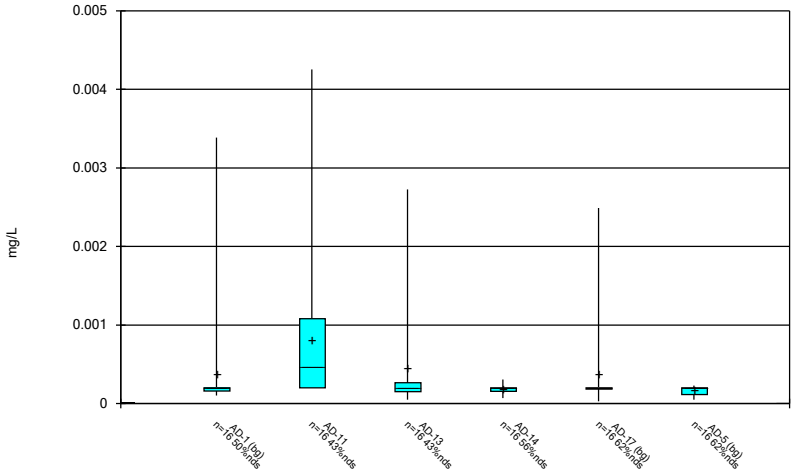
Constituent: Combined Radium 226 + 228 Analysis Run 12/30/2020 9:29 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Box & Whiskers Plot



Constituent: Fluoride, total Analysis Run 12/30/2020 9:29 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

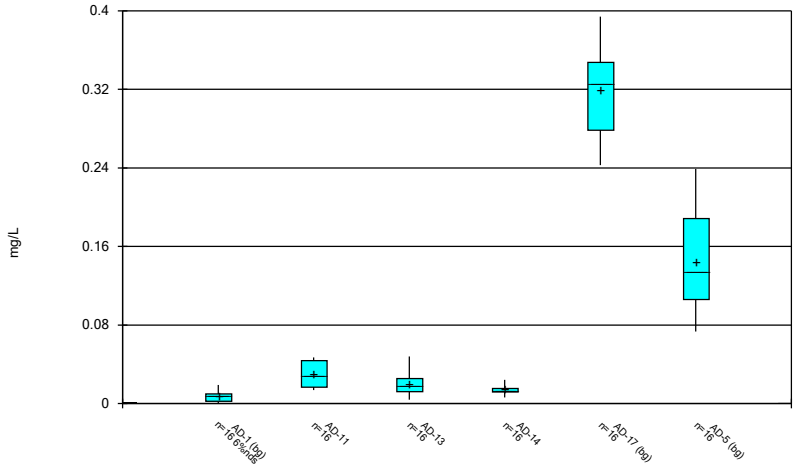
Box & Whiskers Plot



Constituent: Lead, total Analysis Run 12/30/2020 9:30 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

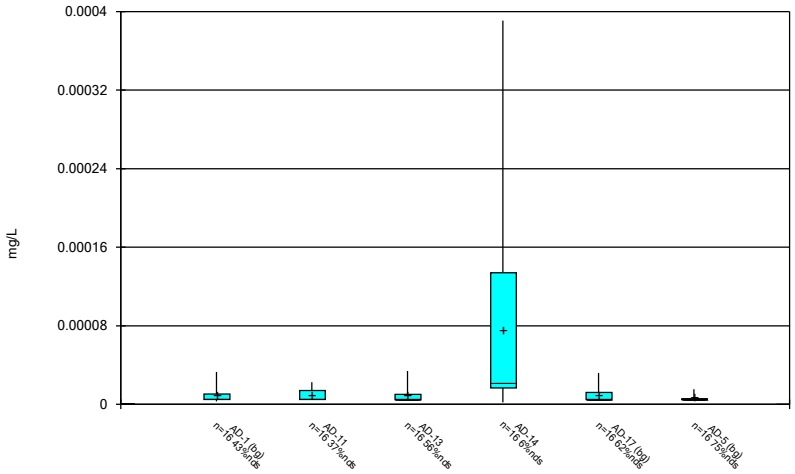
Box & Whiskers Plot



Constituent: Lithium, total Analysis Run 12/30/2020 9:30 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

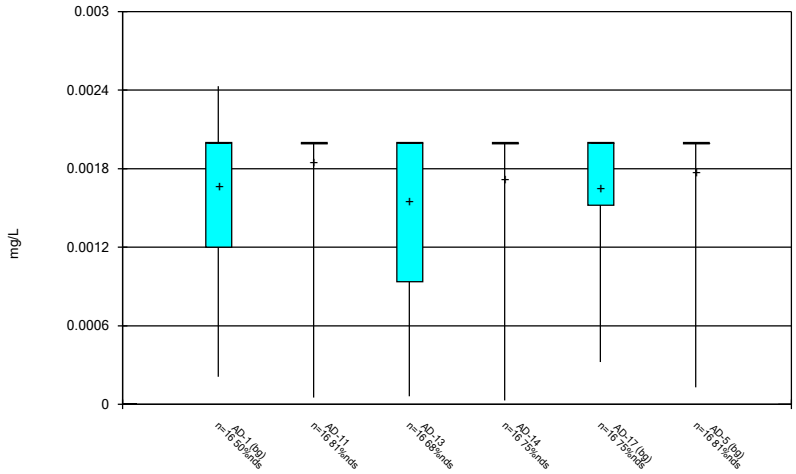
Box & Whiskers Plot



Constituent: Mercury, total Analysis Run 12/30/2020 9:30 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

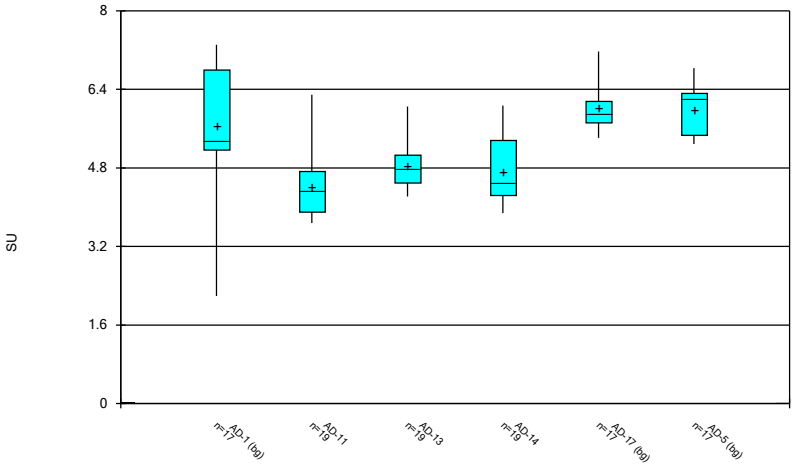
Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

Box & Whiskers Plot



Constituent: Molybdenum, total Analysis Run 12/30/2020 9:30 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

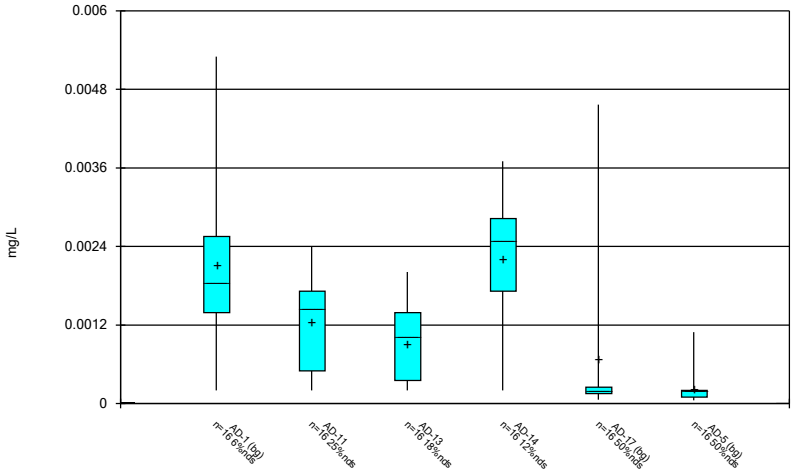
Box & Whiskers Plot



Constituent: pH, field Analysis Run 12/30/2020 9:30 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

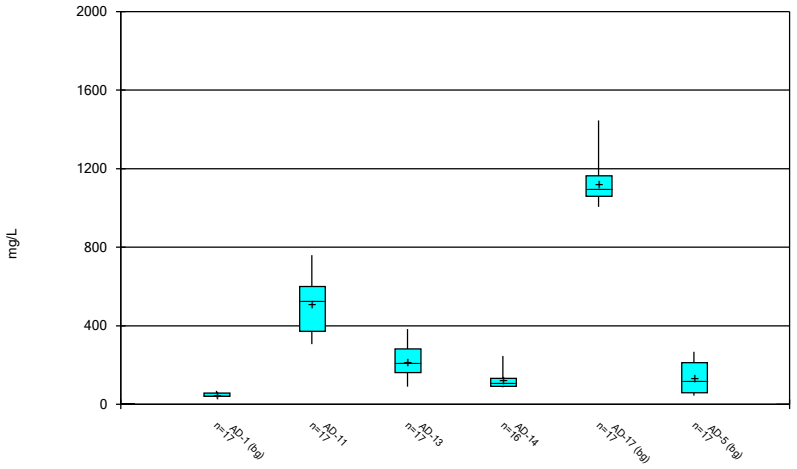
Box & Whiskers Plot



Constituent: Selenium, total Analysis Run 12/30/2020 9:30 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

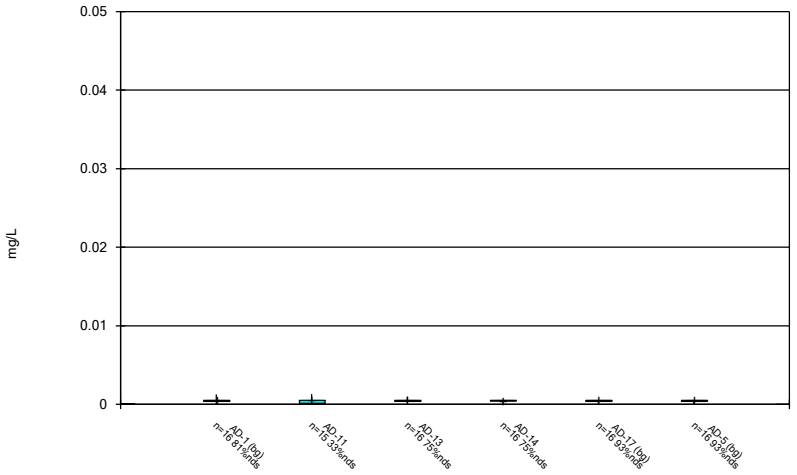
Box & Whiskers Plot



Constituent: Sulfate, total Analysis Run 12/30/2020 9:30 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

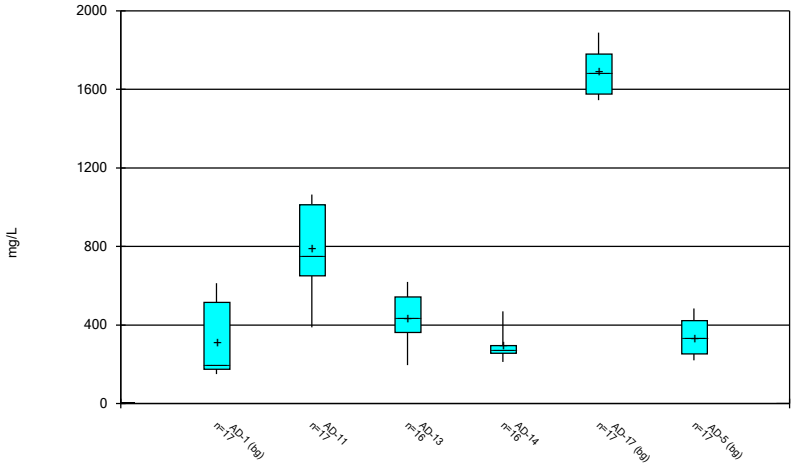
Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 12/30/2020 9:30 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Box & Whiskers Plot



Constituent: Total Dissolved Solids Analysis Run 12/30/2020 9:30 AM View: Descriptive
Welsh Landfill Client: Geosyntec Data: Welsh LF

Outlier Summary

Welsh Landfill Client: Geosyntec Data: Welsh LF Printed 12/30/2020, 9:24 AM

	AD-14 Calcium, total (mg/L)	AD-1 Chloride, total (mg/L)	AD-11 Chromium, total (mg/L)	AD-13 Chromium, total (mg/L)	AD-17 Chromium, total (mg/L)	AD-11 Thallium, total (mg/L)	AD-13 Total Dissolved Solids (mg/L)
5/31/2016							900 (o)
9/30/2016			0.007 (o)				
12/14/2016				0.007 (o)			
1/20/2017					0.068 (O)		
2/24/2017		9 (o)					
5/23/2018						0.046 (o)	
2/17/2020	38.7 (o)						

Intrawell Outlier Analysis - Significant Results

Welsh Landfill Client: Geosyntec Data: Welsh LF Printed 12/15/2020, 1:21 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Calcium, total (mg/L)	**AD-17 (bg)**	**Yes**	**250**	**5/20/2020**	**NP**	**NaN**	**17**	**197.4**	**16.05**	**ln(x)**	**ShapiroWilk**
Total Dissolved Solids (mg/L)	**AD-14**	**Yes**	**469**	**10/12/2020**	**NP**	**NaN**	**16**	**296.6**	**71.82**	**ln(x)**	**ShapiroWilk**

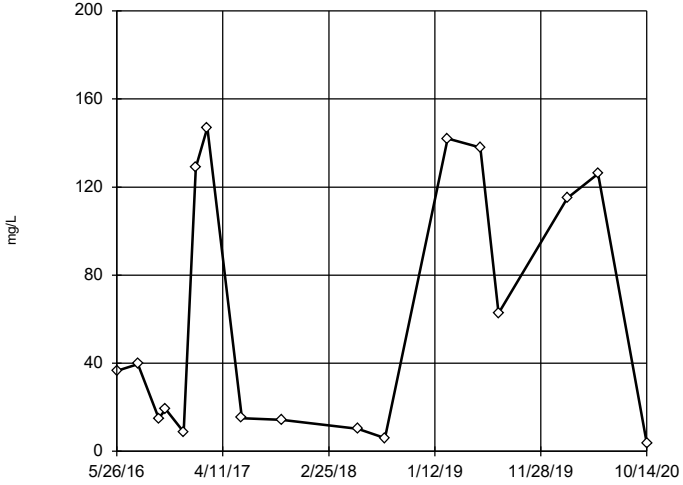
Intrawell Outlier Analysis - All Results

Welsh Landfill Client: Geosyntec Data: Welsh LF Printed 12/15/2020, 1:21 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Calcium, total (mg/L)	AD-1 (bg)	No	n/a	n/a	NP	NaN	17	60.47	57.27	ln(x)	ShapiroWilk
Calcium, total (mg/L)	AD-11	No	n/a	n/a	NP	NaN	17	10.53	5.465	ln(x)	ShapiroWilk
Calcium, total (mg/L)	AD-13	No	n/a	n/a	NP	NaN	17	9.901	8.055	ln(x)	ShapiroWilk
Calcium, total (mg/L)	AD-14	No	n/a	n/a	NP	NaN	17	8.505	8.741	ln(x)	ShapiroWilk
Calcium, total (mg/L)	**AD-17 (bg)**	**Yes**	**250**	**5/20/2020**	**NP**	**NaN**	**17**	**197.4**	**16.05**	**ln(x)**	**ShapiroWilk**
Calcium, total (mg/L)	AD-5 (bg)	No	n/a	n/a	NP	NaN	17	40.24	7.313	x^(1/3)	ShapiroWilk
Chloride, total (mg/L)	AD-1 (bg)	No	n/a	n/a	NP	NaN	17	3.871	1.72	ln(x)	ShapiroWilk
Chloride, total (mg/L)	AD-11	No	n/a	n/a	NP	NaN	16	9.586	2.188	ln(x)	ShapiroWilk
Chloride, total (mg/L)	AD-13	No	n/a	n/a	NP	NaN	16	12.11	5.436	normal	ShapiroWilk
Chloride, total (mg/L)	AD-14	No	n/a	n/a	NP	NaN	17	5.372	2.87	x^(1/3)	ShapiroWilk
Chloride, total (mg/L)	AD-17 (bg)	No	n/a	n/a	NP	NaN	17	36.37	5.344	ln(x)	ShapiroWilk
Chloride, total (mg/L)	AD-5 (bg)	No	n/a	n/a	NP	NaN	17	17.58	3.604	ln(x)	ShapiroWilk
Sulfate, total (mg/L)	AD-1 (bg)	No	n/a	n/a	NP	NaN	17	48.54	11.03	ln(x)	ShapiroWilk
Sulfate, total (mg/L)	AD-11	No	n/a	n/a	NP	NaN	17	507.5	138.1	sqrt(x)	ShapiroWilk
Sulfate, total (mg/L)	AD-13	No	n/a	n/a	NP	NaN	17	217	86.14	normal	ShapiroWilk
Sulfate, total (mg/L)	AD-14	No	n/a	n/a	NP	NaN	16	124.8	45.56	ln(x)	ShapiroWilk
Sulfate, total (mg/L)	AD-17 (bg)	No	n/a	n/a	NP	NaN	17	1120	97.66	ln(x)	ShapiroWilk
Sulfate, total (mg/L)	AD-5 (bg)	No	n/a	n/a	NP	NaN	17	131.5	76.89	ln(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	AD-1 (bg)	No	n/a	n/a	NP	NaN	17	313	178.7	ln(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	AD-11	No	n/a	n/a	NP	NaN	17	792.3	205.6	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	AD-13	No	n/a	n/a	NP	NaN	17	459.5	172.8	sqrt(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	**AD-14**	**Yes**	**469**	**10/12/2020**	**NP**	**NaN**	**16**	**296.6**	**71.82**	**ln(x)**	**ShapiroWilk**
Total Dissolved Solids (mg/L)	AD-17 (bg)	No	n/a	n/a	NP	NaN	17	1691	114.6	ln(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	AD-5 (bg)	No	n/a	n/a	NP	NaN	17	332.9	84.84	ln(x)	ShapiroWilk

Tukey's Outlier Screening

AD-1 (bg)



n = 17

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

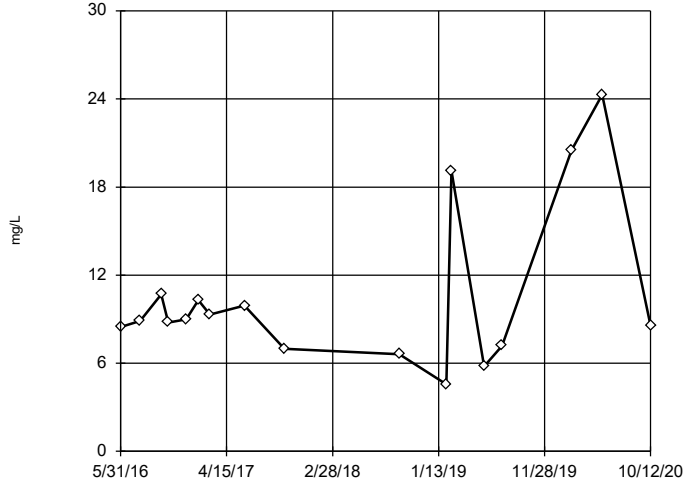
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 149974, low cutoff = 0.01027, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Tukey's Outlier Screening

AD-11



n = 17

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

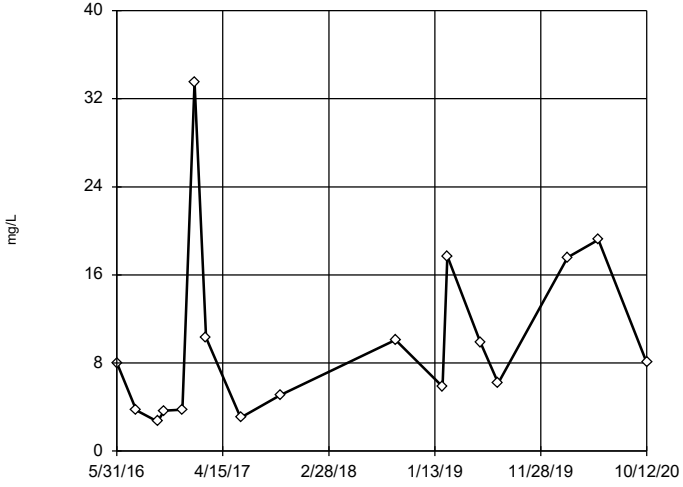
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 34.09, low cutoff = 2.183, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Tukey's Outlier Screening

AD-13



n = 17

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

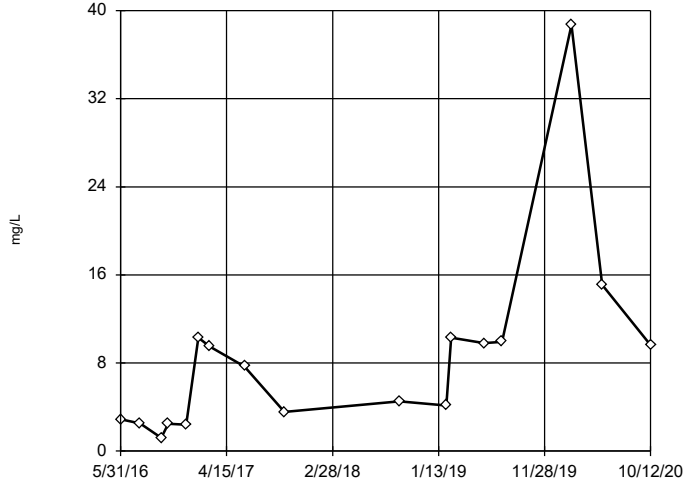
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 630.8, low cutoff = 0.07972, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Tukey's Outlier Screening

AD-14



n = 17

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

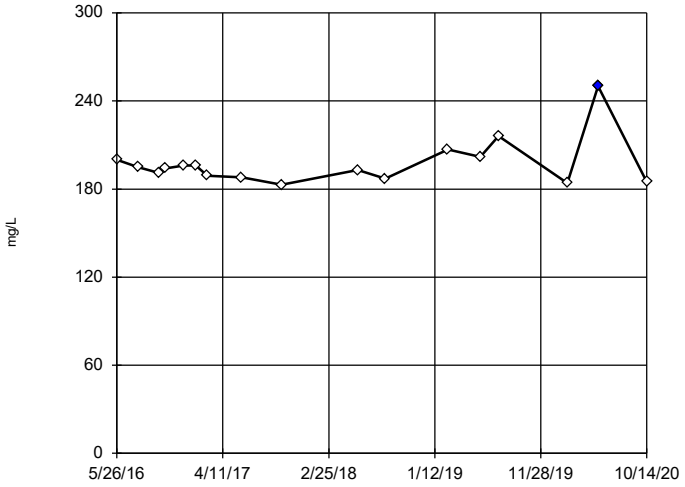
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 538.2, low cutoff = 0.05052, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Tukey's Outlier Screening

AD-17 (bg)



n = 17

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).

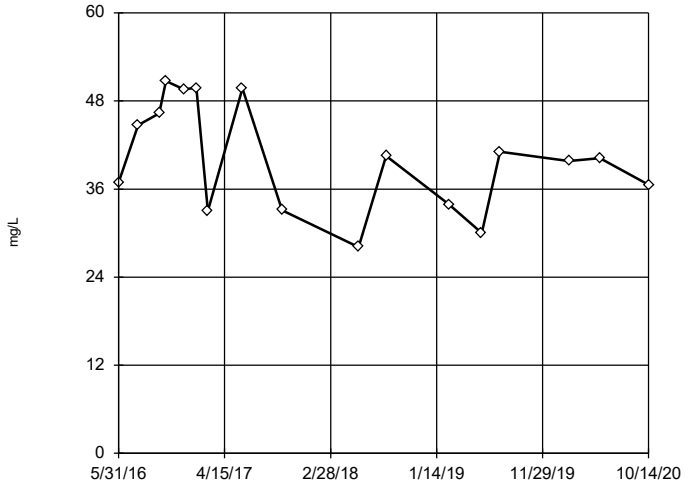
High cutoff = 247.6, low cutoff = 152.2, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening

AD-5 (bg)



n = 17

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

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

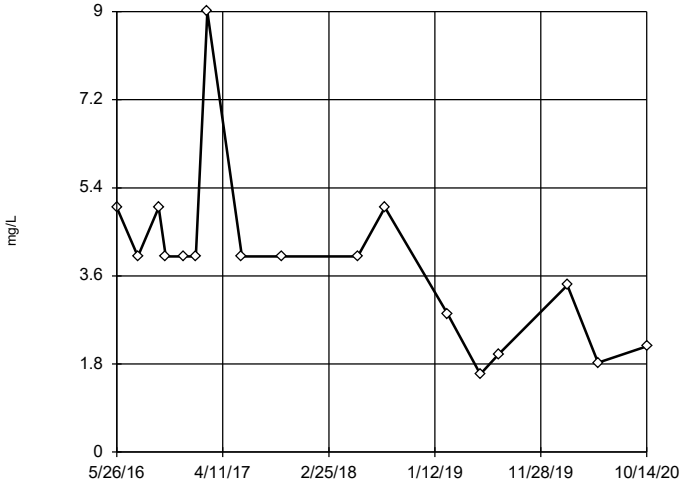
High cutoff = 114.7, low cutoff = 7.963, based on IQR multiplier of 3.

Constituent: Calcium, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening

AD-1 (bg)



n = 17

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

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

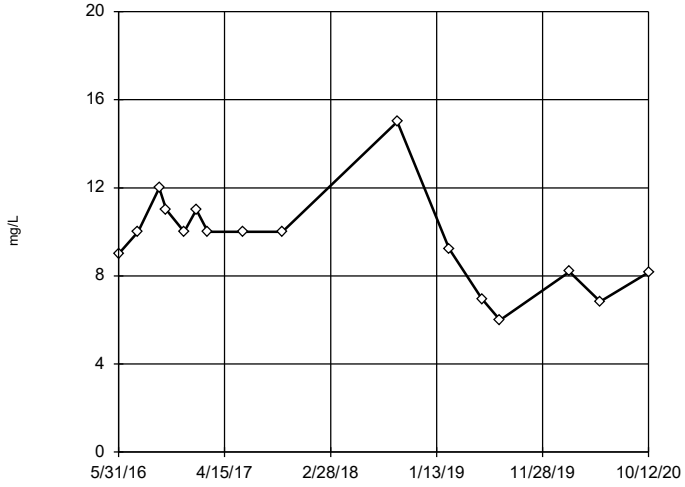
High cutoff = 26.61, low cutoff = 0.4148, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening

AD-11



n = 16

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

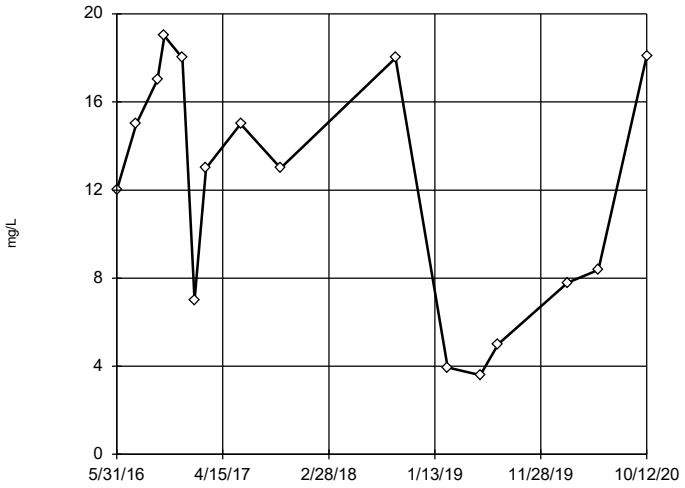
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 22.15, low cutoff = 3.871, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Tukey's Outlier Screening

AD-13



n = 16

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

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

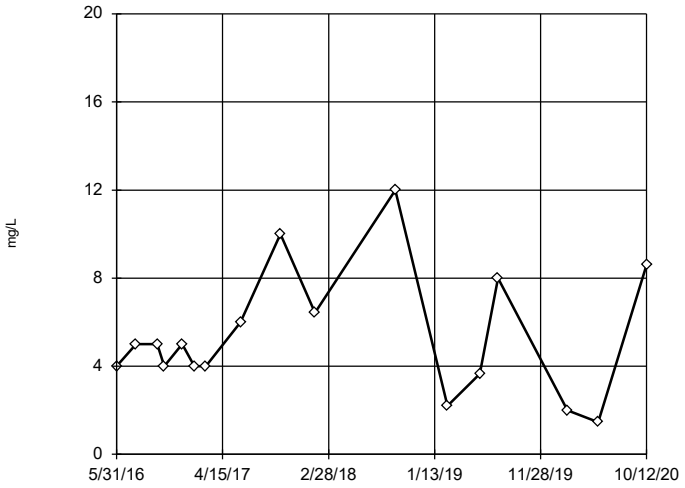
High cutoff = 47.82, low cutoff = -22.92, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening

AD-14



n = 17

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

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

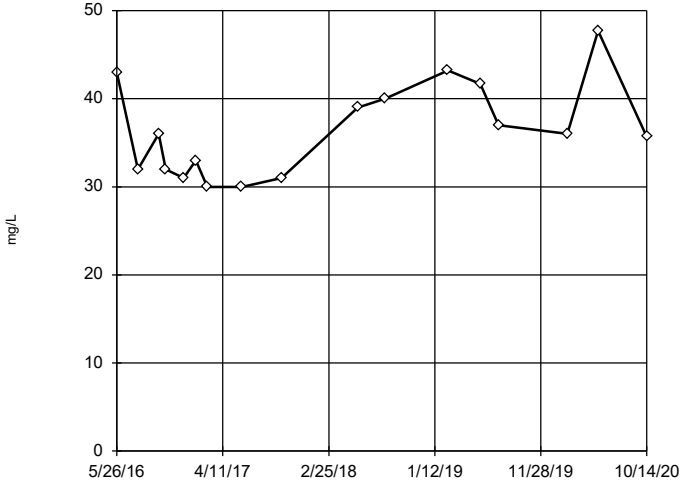
High cutoff = 27.78, low cutoff = 0.1005, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening

AD-17 (bg)



n = 17

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

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

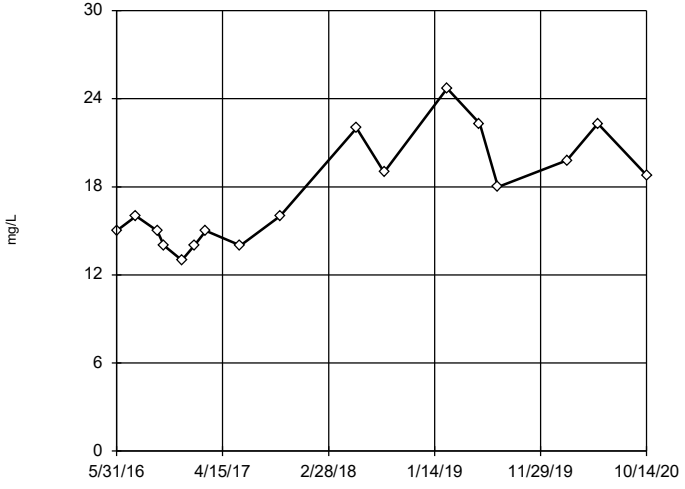
High cutoff = 89.05, low cutoff = 14.45, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening

AD-5 (bg)



n = 17

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

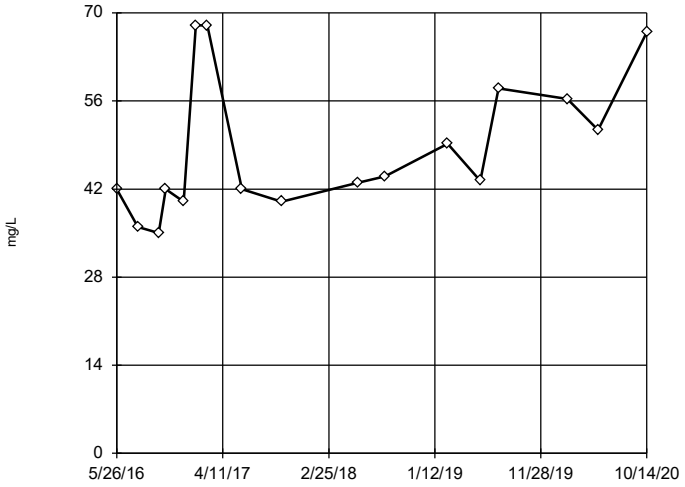
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 62.35, low cutoff = 4.851, based on IQR multiplier of 3.

Constituent: Chloride, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Tukey's Outlier Screening

AD-1 (bg)



n = 17

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

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

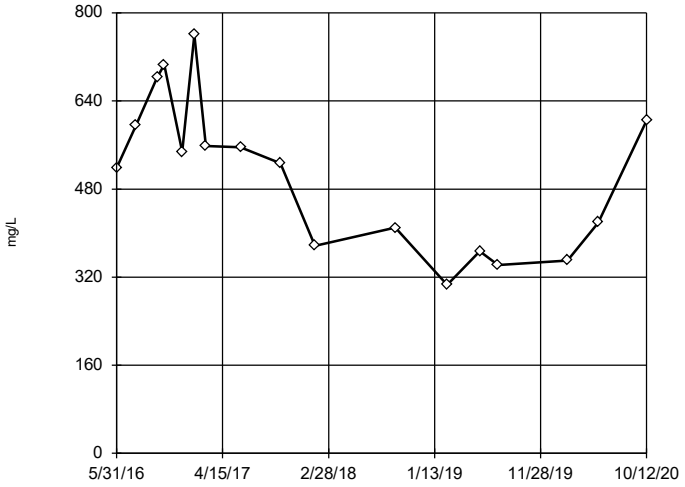
High cutoff = 154.8, low cutoff = 15.13, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening

AD-11



n = 17

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

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

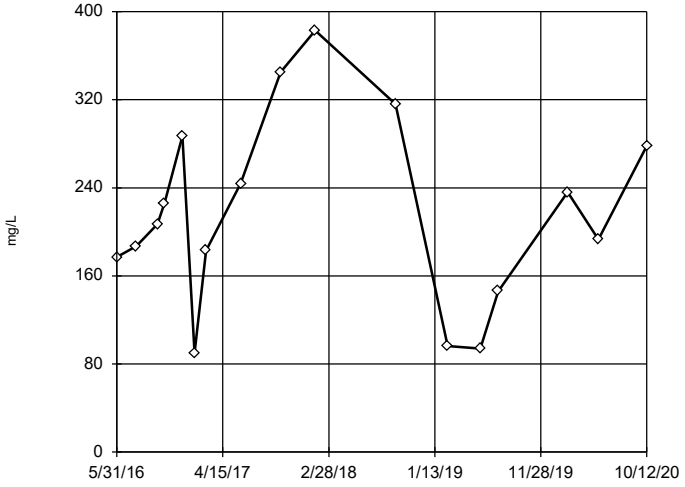
High cutoff = 1609, low cutoff = 13.42, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening

AD-13



n = 17

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

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

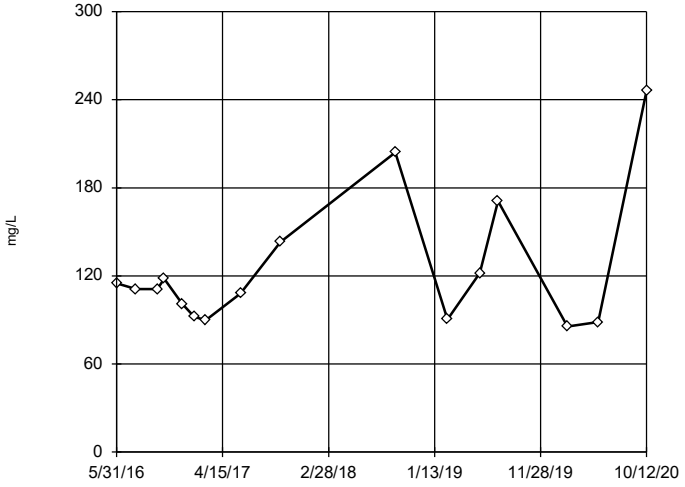
High cutoff = 645.5, low cutoff = -201.5, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening

AD-14



n = 16

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

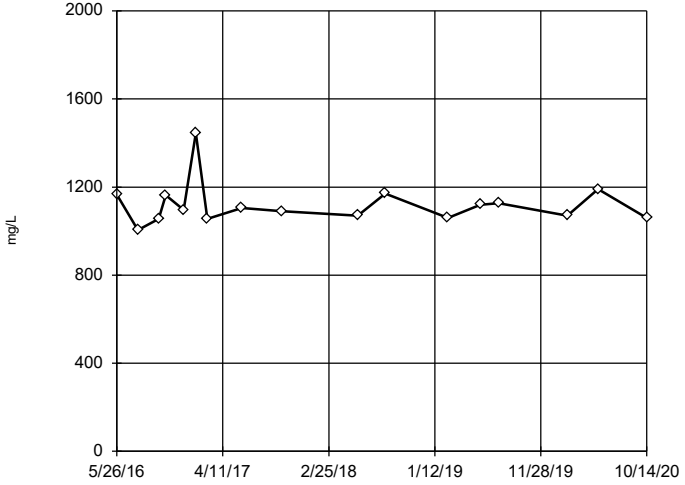
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 401.3, low cutoff = 30.02, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Tukey's Outlier Screening

AD-17 (bg)



n = 17

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

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

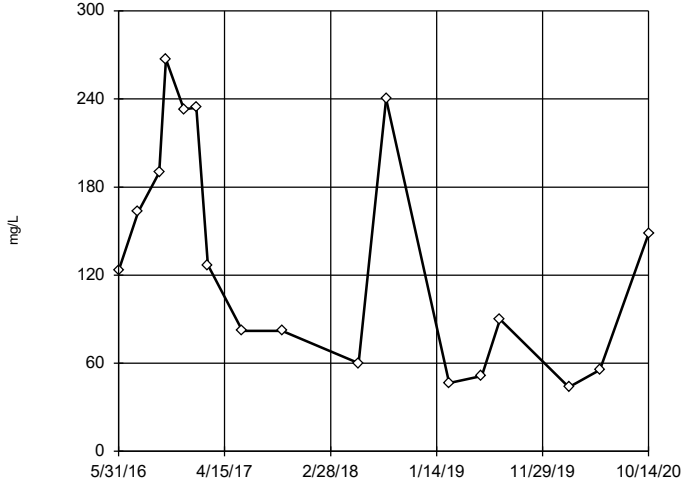
High cutoff = 1544, low cutoff = 799.5, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening

AD-5 (bg)



n = 17

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

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

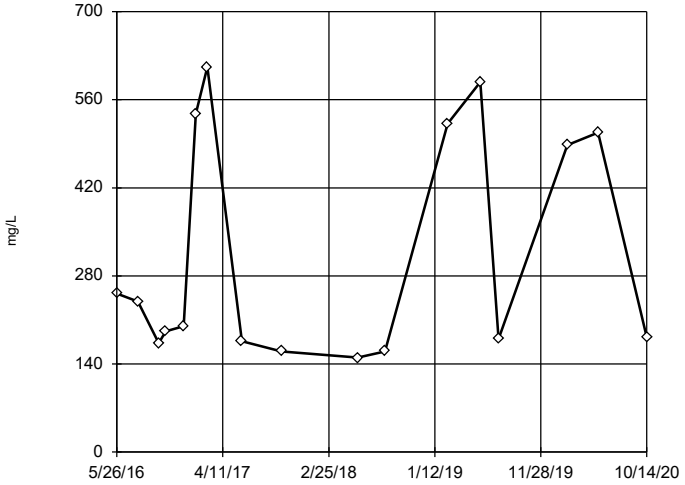
High cutoff = 10199, low cutoff = 1.19, based on IQR multiplier of 3.

Constituent: Sulfate, total Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening

AD-1 (bg)



n = 17

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

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

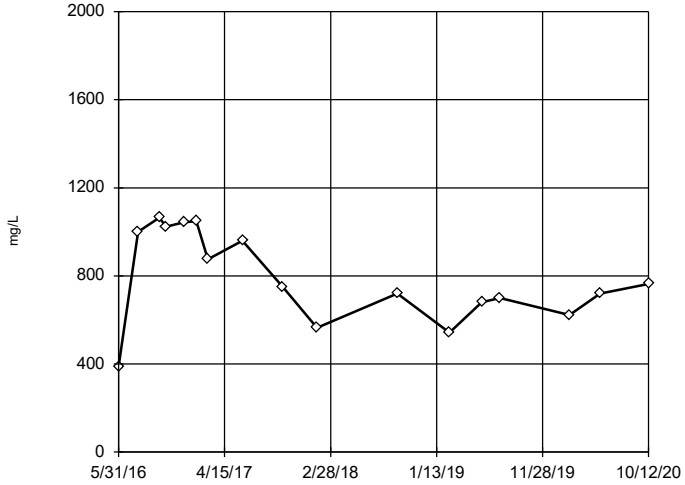
High cutoff = 13235, low cutoff = 6.789, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening

AD-11



n = 17

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

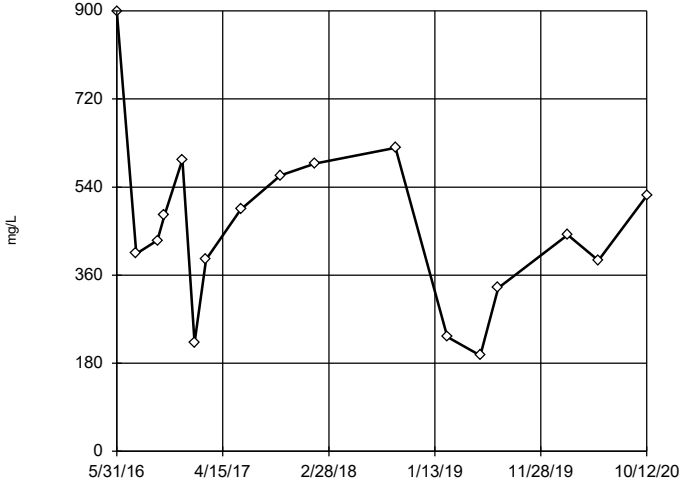
Ladder of Powers transformations did not improve normality; analysis run on raw data.

High cutoff = 2095, low cutoff = -432, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Tukey's Outlier Screening

AD-13



n = 17

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

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

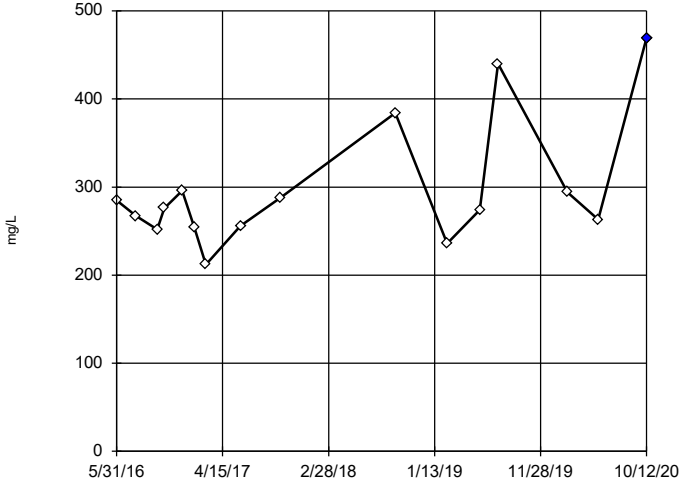
High cutoff = 1518, low cutoff = 16.42, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening

AD-14



n = 16

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).

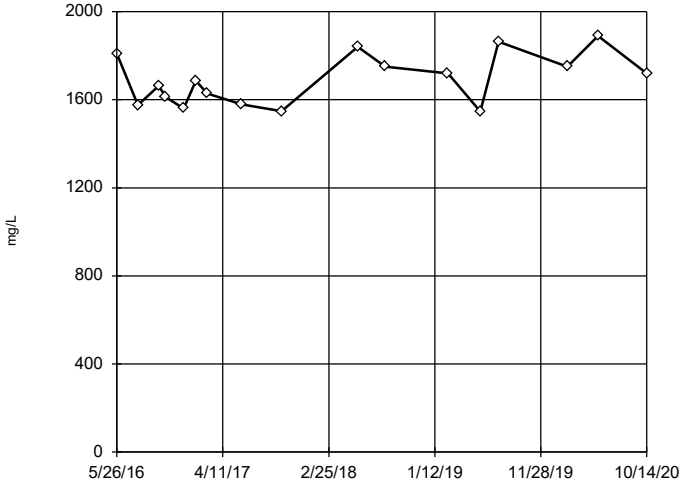
High cutoff = 456.7, low cutoff = 164.7, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening

AD-17 (bg)



n = 17

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

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

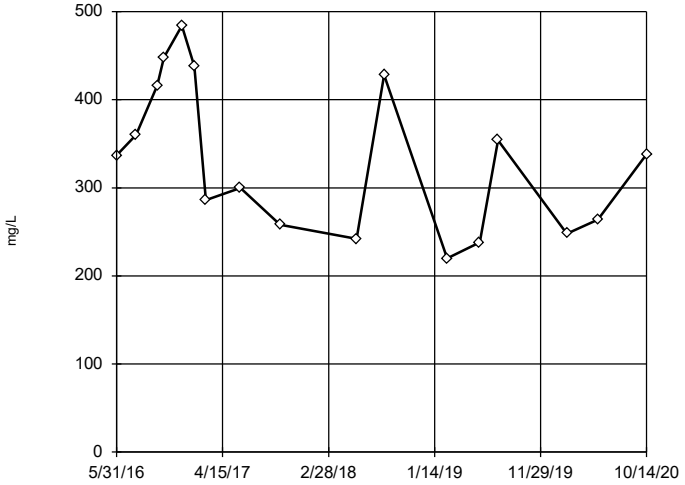
High cutoff = 2558, low cutoff = 1097, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening

AD-5 (bg)



n = 17

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 = 1959, low cutoff = 54.49, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 12/15/2020 1:19 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Interwell Outlier Analysis - Significant Results

Welsh Landfill Client: Geosyntec Data: Welsh LF Printed 12/15/2020, 1:25 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Fluoride, total (mg/L)	**AD-1,AD-17,AD-5**	**Yes**	**0.106,0.31,0.4023,0.4135,0.3055,0.583,0.5399,0.08**	**n/a w/combined bg**	**NP**	**NaN**	**51**	**0.2268**	**0.09117**	**ln(x)**	**ShapiroFrancia**

Interwell Outlier Analysis - All Results

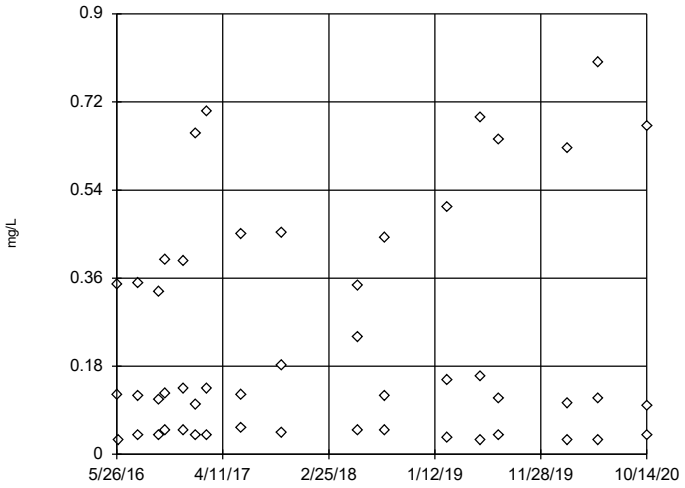
Welsh Landfill Client: Geosyntec Data: Welsh LF Printed 12/15/2020, 1:25 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Boron, total (mg/L)	AD-1,AD-17,AD-5	No	n/a	n/a w/combined bg	NP	NaN	51	0.2301	0.2271	ln(x)	ShapiroFrancia
Fluoride, total (mg/L)	**AD-1,AD-17,AD-5**	**Yes**	**0.106,0.31,0.4023,0.4135,0.3055,0.583,0.5399,0.08**	**n/a w/combined bg**	**NP**	**NaN**	**51**	**0.2268**	**0.09117**	**ln(x)**	**ShapiroFrancia**
pH, field (SU)	AD-1,AD-17,AD-5	No	n/a	n/a w/combined bg	NP	NaN	51	5.886	0.8137	x^3	ShapiroFrancia

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening, Pooled Background

AD-1,AD-17,AD-5



n = 51

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

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

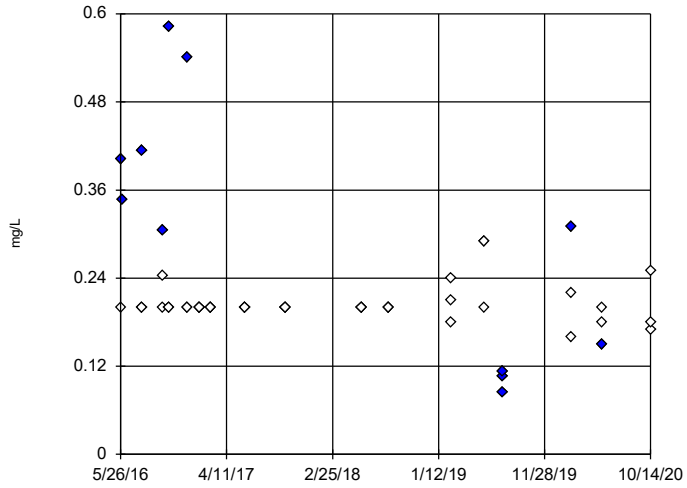
High cutoff = 192.8, low cutoff = 0.0001022, based on IQR multiplier of 3.

Constituent: Boron, total Analysis Run 12/15/2020 1:22 PM View: Appendix III Interwell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening, Pooled Background

AD-1,AD-17,AD-5



n = 51

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).

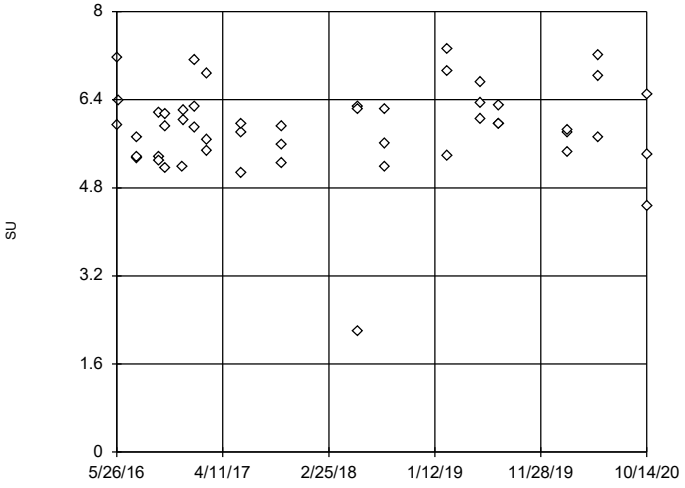
High cutoff = 0.2928, low cutoff = 0.1503, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 12/15/2020 1:22 PM View: Appendix III Interwell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Tukey's Outlier Screening, Pooled Background

AD-1,AD-17,AD-5



n = 51

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 = 8.019, low cutoff = -4.786, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 12/15/2020 1:22 PM View: Appendix III Interwell
Welsh Landfill Client: Geosyntec Data: Welsh LF

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

Welsh Landfill Client: Geosyntec Data: Welsh LF Printed 12/29/2020, 11:47 AM

Constituent	Well	Calc.	0.01	Sig.	Method
Chloride, total (mg/L)	**AD-1 (bg)**	**-2.971**	**Yes**	**Yes**	**Mann-W**
Chloride, total (mg/L)	**AD-11**	**-2.994**	**Yes**	**Yes**	**Mann-W**

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

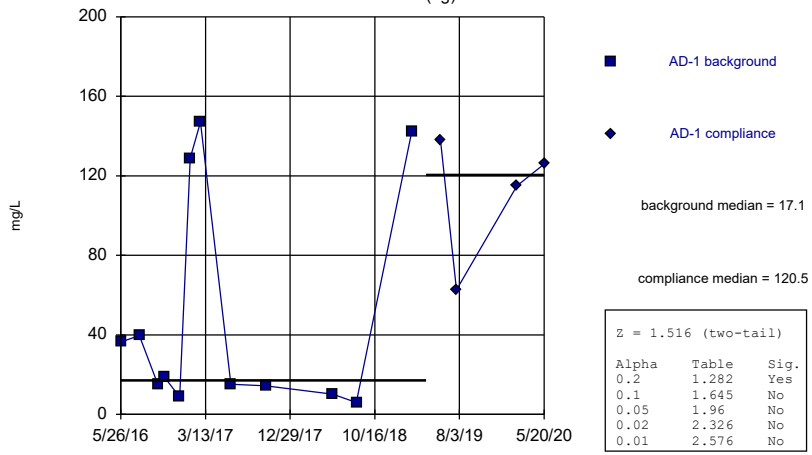
Welsh Landfill Client: Geosyntec Data: Welsh LF Printed 12/29/2020, 11:47 AM

Constituent	Well	Calc.	0.01	Sig.	Method
Calcium, total (mg/L)	AD-1 (bg)	1.516	No	No	Mann-W
Calcium, total (mg/L)	AD-11	0.4244	No	No	Mann-W
Calcium, total (mg/L)	AD-13	1.395	No	No	Mann-W
Calcium, total (mg/L)	AD-14	1.95	No	No	Mann-W
Calcium, total (mg/L)	AD-17 (bg)	1.396	No	No	Mann-W
Calcium, total (mg/L)	AD-5 (bg)	-0.9095	No	No	Mann-W
Chloride, total (mg/L)	**AD-1 (bg)**	**-2.971**	**Yes**	**Yes**	**Mann-W**
Chloride, total (mg/L)	**AD-11**	**-2.994**	**Yes**	**Yes**	**Mann-W**
Chloride, total (mg/L)	AD-13	-2.291	No	No	Mann-W
Chloride, total (mg/L)	AD-14	-1.654	No	No	Mann-W
Chloride, total (mg/L)	AD-17 (bg)	1.581	No	No	Mann-W
Chloride, total (mg/L)	AD-5 (bg)	2.016	No	No	Mann-W
Sulfate, total (mg/L)	AD-1 (bg)	1.644	No	No	Mann-W
Sulfate, total (mg/L)	AD-11	-2.243	No	No	Mann-W
Sulfate, total (mg/L)	AD-13	-1.152	No	No	Mann-W
Sulfate, total (mg/L)	AD-14	-0.4574	No	No	Mann-W
Sulfate, total (mg/L)	AD-17 (bg)	0.8501	No	No	Mann-W
Sulfate, total (mg/L)	AD-5 (bg)	-2.245	No	No	Mann-W
Total Dissolved Solids (mg/L)	AD-1 (bg)	1.153	No	No	Mann-W
Total Dissolved Solids (mg/L)	AD-11	-1.456	No	No	Mann-W
Total Dissolved Solids (mg/L)	AD-13	-1.763	No	No	Mann-W
Total Dissolved Solids (mg/L)	AD-14	1.11	No	No	Mann-W
Total Dissolved Solids (mg/L)	AD-17 (bg)	1.092	No	No	Mann-W
Total Dissolved Solids (mg/L)	AD-5 (bg)	-1.516	No	No	Mann-W

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-1 (bg)



Z = 1.516 (two-tail)

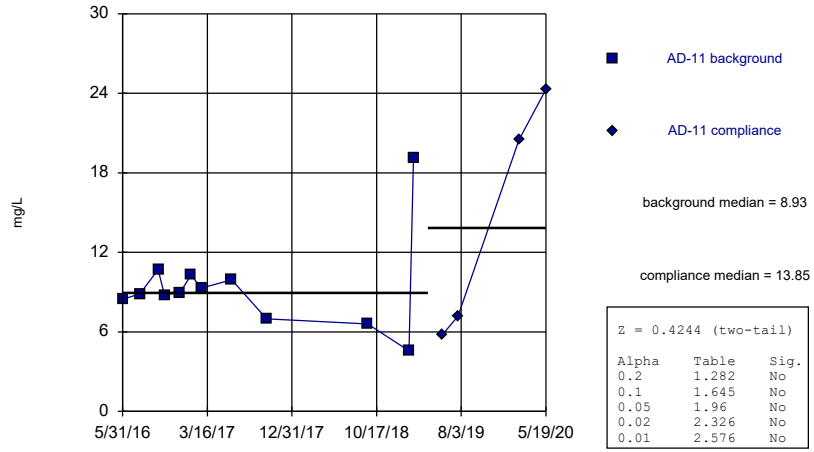
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-11



Z = 0.4244 (two-tail)

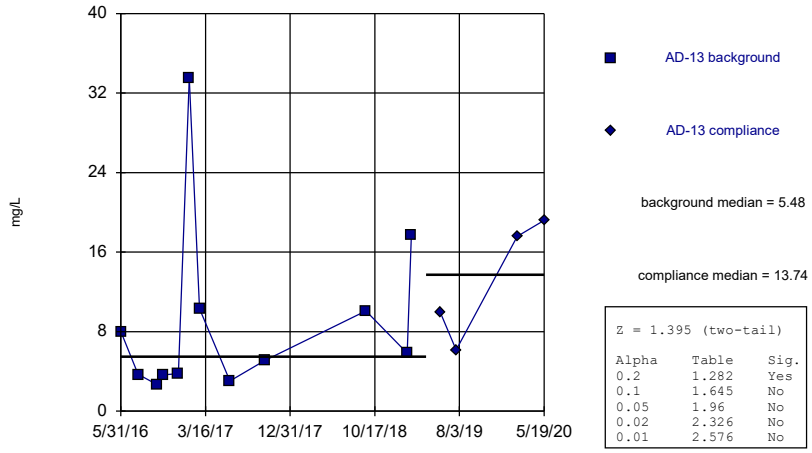
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-13



Z = 1.395 (two-tail)

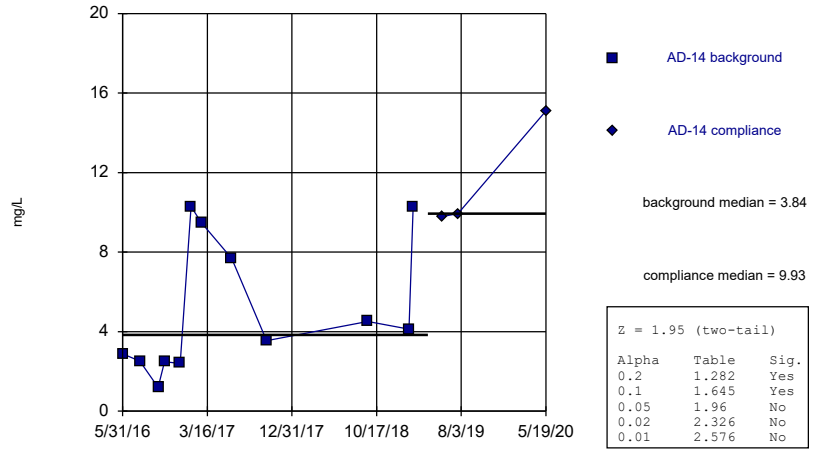
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-14



Z = 1.95 (two-tail)

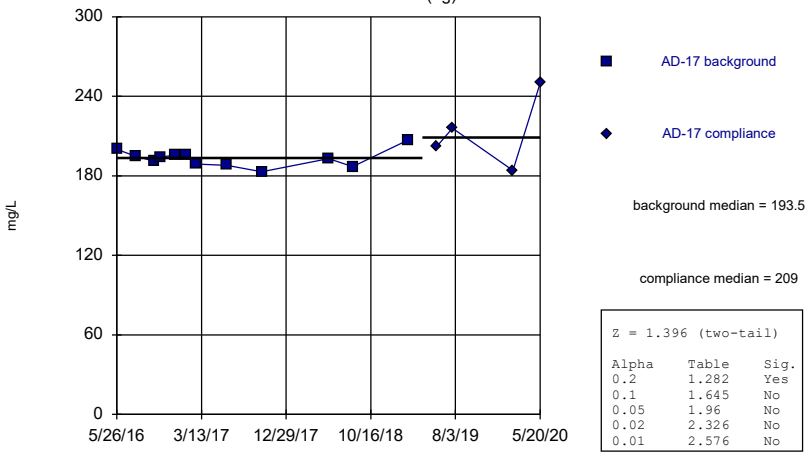
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-17 (bg)



Z = 1.396 (two-tail)

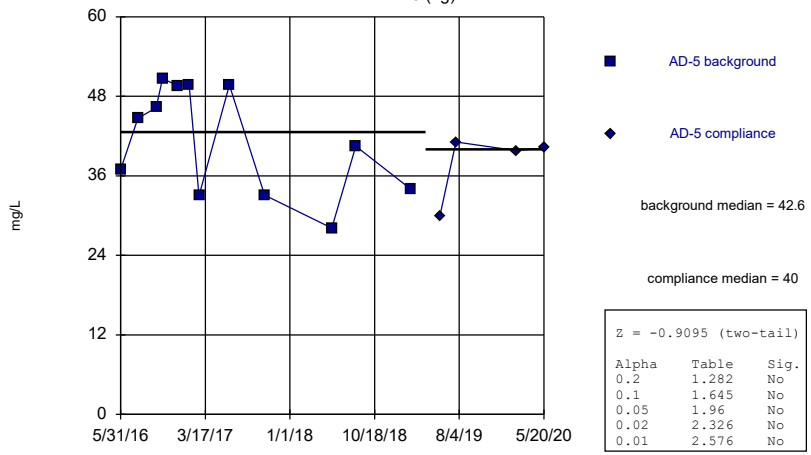
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-5 (bg)



Z = -0.9095 (two-tail)

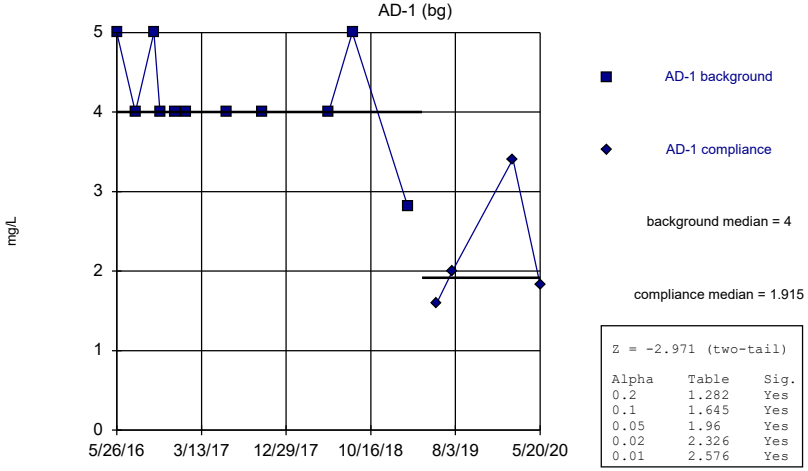
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Calcium, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-1 (bg)



Z = -2.971 (two-tail)

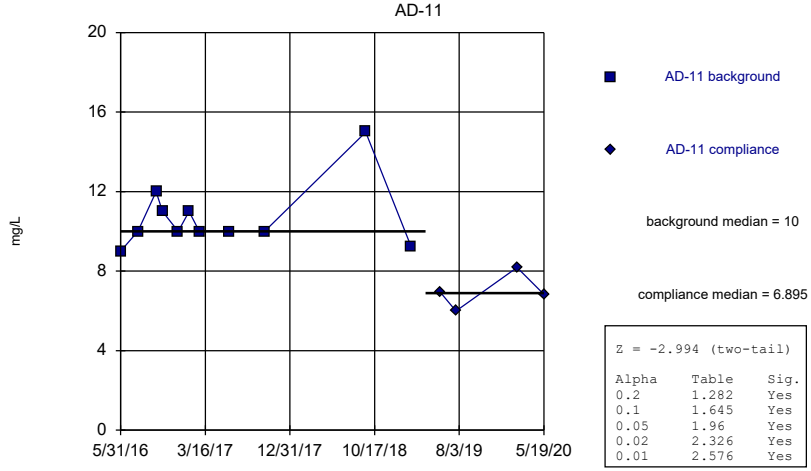
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	Yes

Constituent: Chloride, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-11



Z = -2.994 (two-tail)

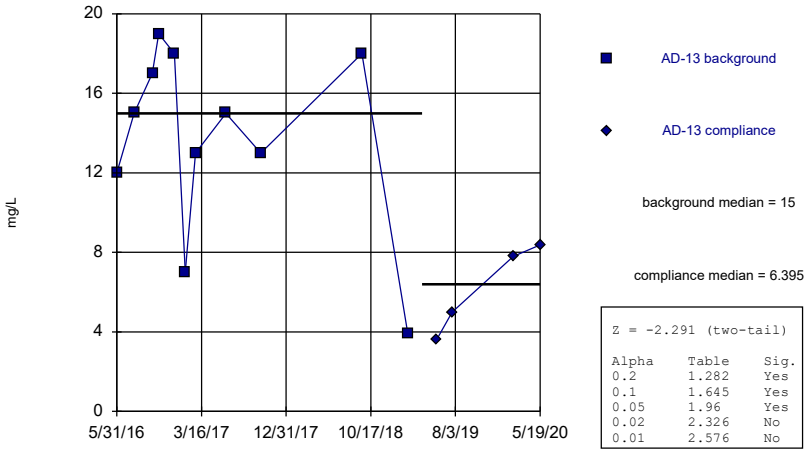
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	Yes

Constituent: Chloride, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-13



Z = -2.291 (two-tail)

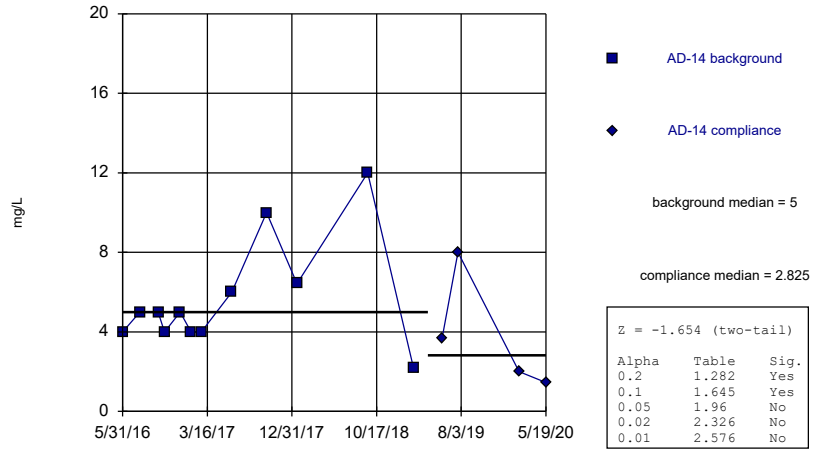
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	No
0.01	2.576	No

Constituent: Chloride, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-14



Z = -1.654 (two-tail)

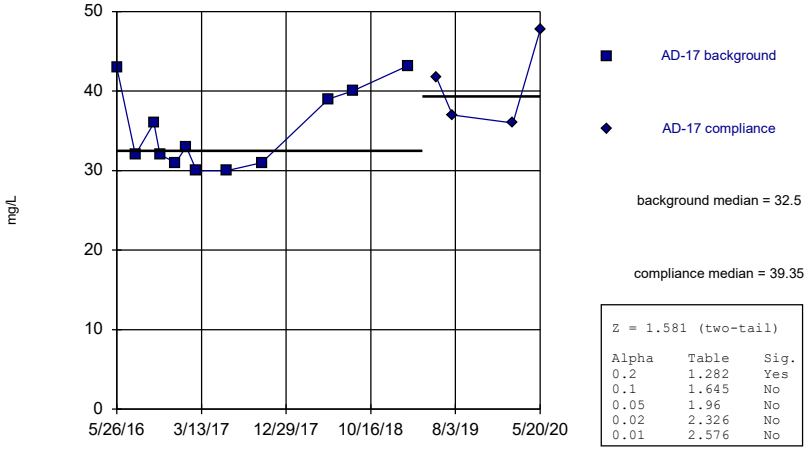
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Chloride, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-17 (bg)



Z = 1.581 (two-tail)

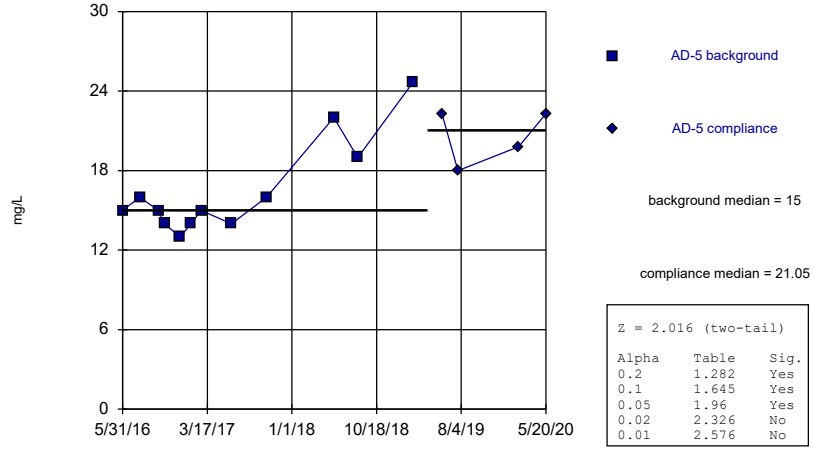
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Chloride, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-5 (bg)



Z = 2.016 (two-tail)

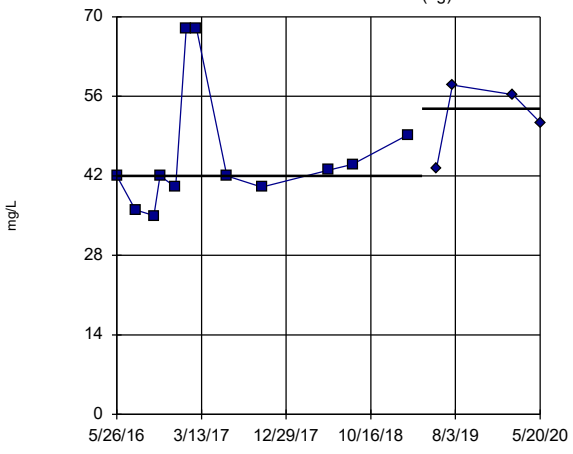
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	No
0.01	2.576	No

Constituent: Chloride, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-1 (bg)



AD-1 background

AD-1 compliance

background median = 42

compliance median = 53.85

Z = 1.644 (two-tail)

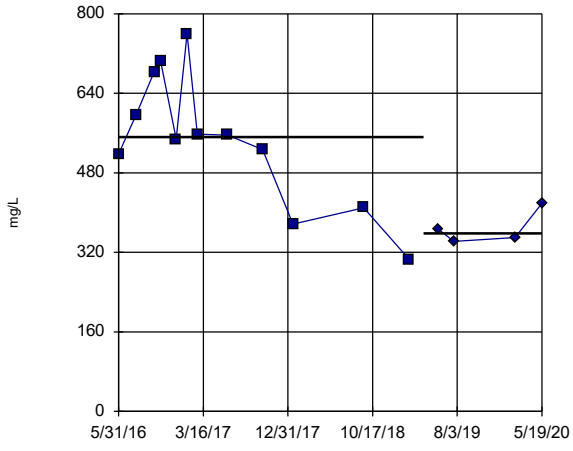
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Sulfate, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-11



AD-11 background

AD-11 compliance

background median = 552

compliance median = 358.5

Z = -2.243 (two-tail)

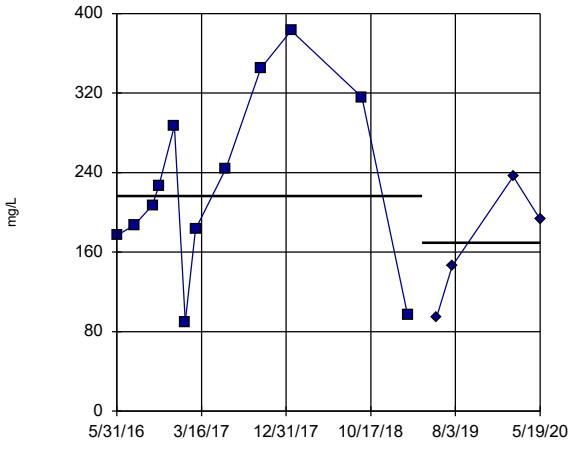
Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	No
0.01	2.576	No

Constituent: Sulfate, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-13



AD-13 background

AD-13 compliance

background median = 216.5

compliance median = 169.5

Z = -1.152 (two-tail)

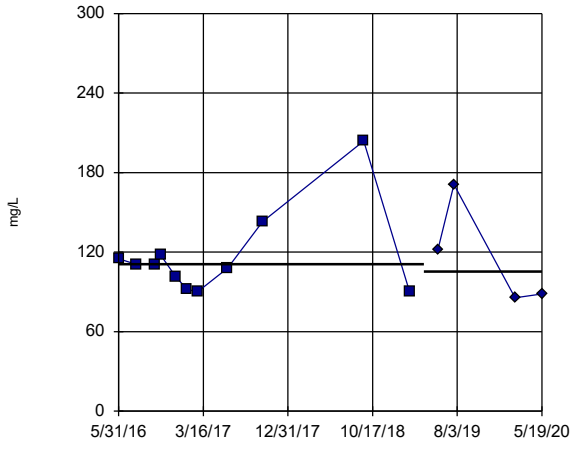
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Sulfate, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-14



AD-14 background

AD-14 compliance

background median = 111

compliance median = 105.3

Z = -0.4574 (two-tail)

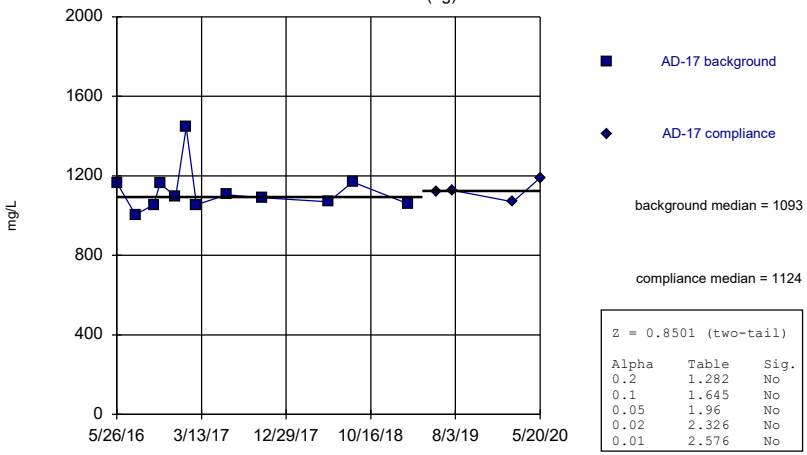
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

Constituent: Sulfate, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-17 (bg)

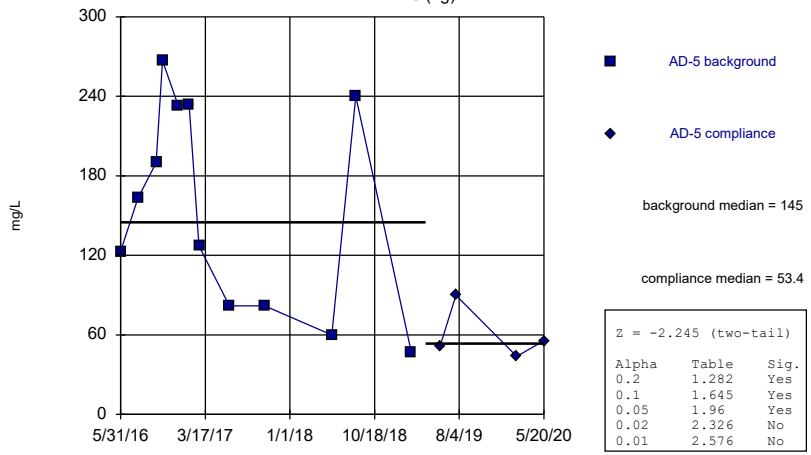


Constituent: Sulfate, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-5 (bg)

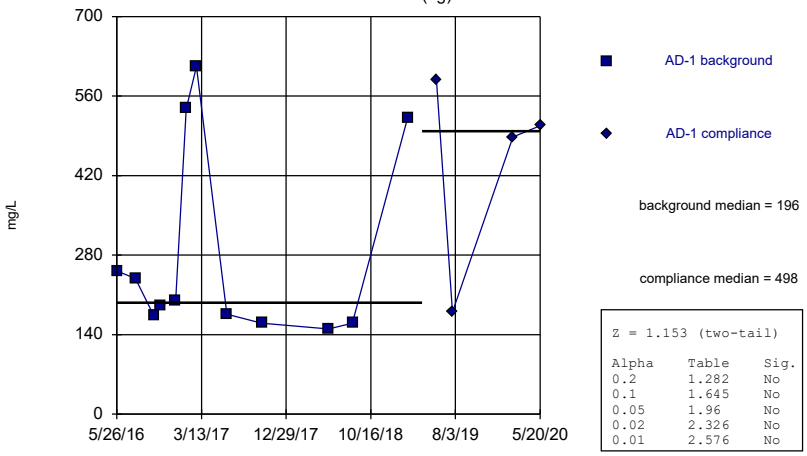


Constituent: Sulfate, total Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-1 (bg)

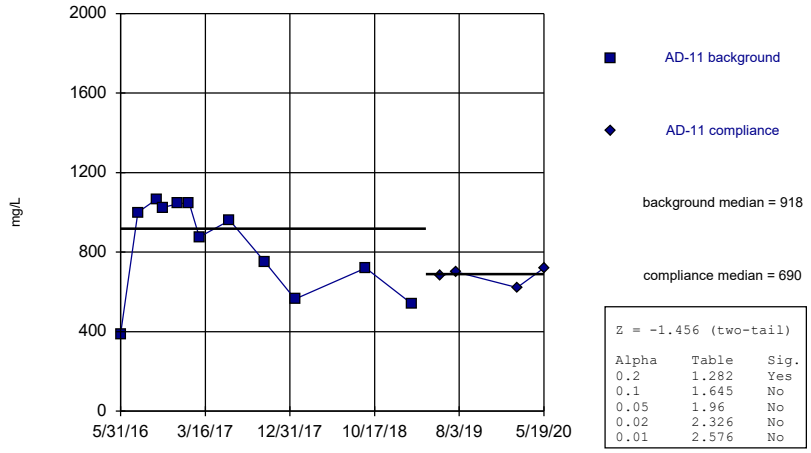


Constituent: Total Dissolved Solids Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-11

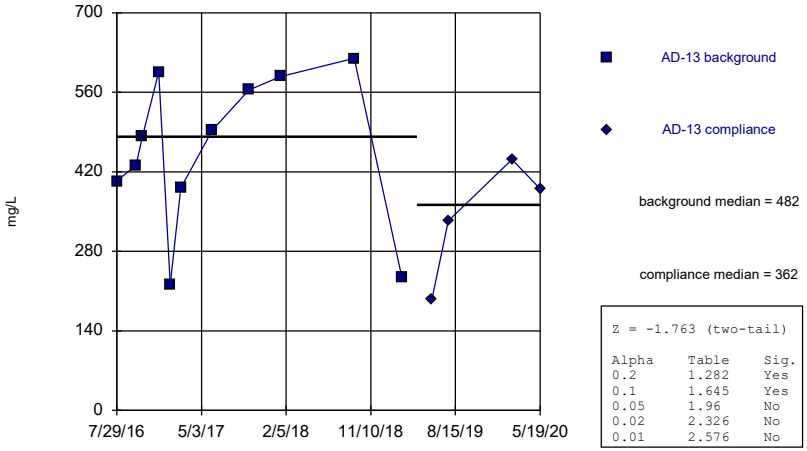


Constituent: Total Dissolved Solids Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-13

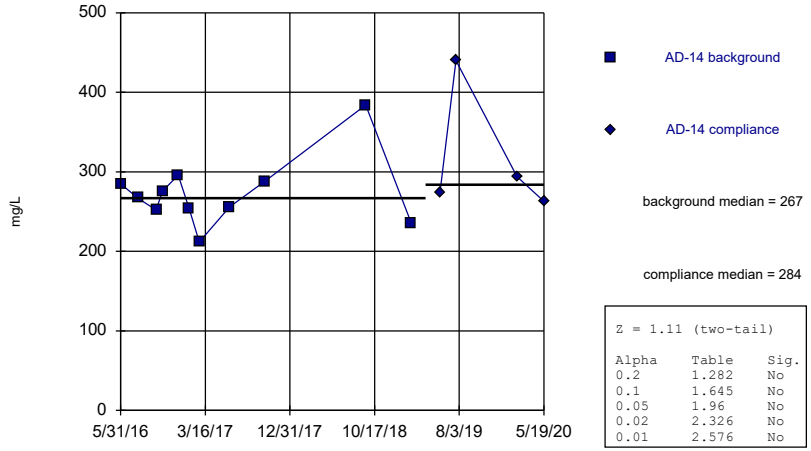


Constituent: Total Dissolved Solids Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-14

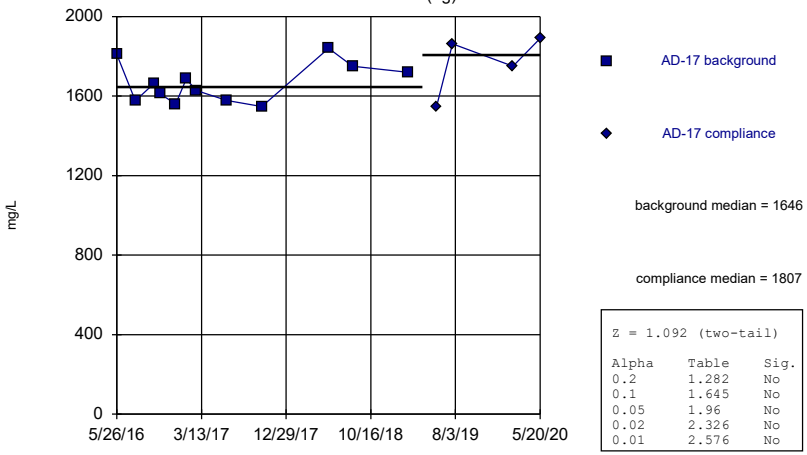


Constituent: Total Dissolved Solids Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-17 (bg)

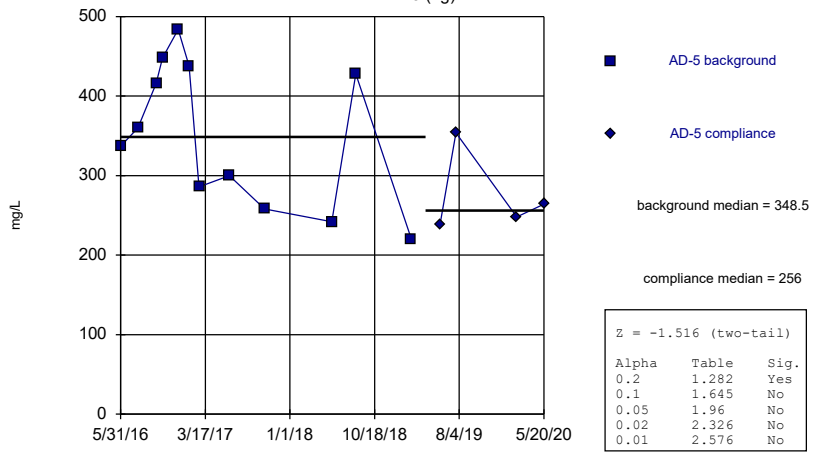


Constituent: Total Dissolved Solids Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Mann-Whitney (Wilcoxon Rank Sum)

AD-5 (bg)



Constituent: Total Dissolved Solids Analysis Run 12/29/2020 11:46 AM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Intrawell Prediction Limit Summary

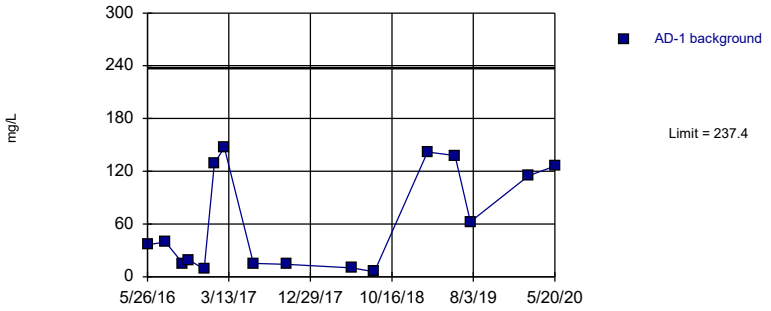
Welsh Landfill Client: Geosyntec Data: Welsh LF Printed 12/29/2020, 12:40 PM

Constituent	Well	Upper Lim.	Date	Sig.	Bg N	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Calcium, total (mg/L)	AD-1	237.4	n/a	n/a	16	1.323	0	None	x^(1/3)	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-11	22.19	n/a	n/a	16	0.7795	0	None	sqrt(x)	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-13	27.75	n/a	n/a	16	1.175	0	None	sqrt(x)	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-14	14.79	n/a	n/a	15	4.175	0	None	No	0.002505	Param Intra 1 of 2
Calcium, total (mg/L)	AD-17	250	n/a	n/a	16	n/a	0	n/a	n/a	0.006456	NP Intra (normality) 1 of 2
Calcium, total (mg/L)	AD-5	55.22	n/a	n/a	16	7.491	0	None	No	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-1	5.876	n/a	n/a	15	1.113	0	None	No	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-11	14.15	n/a	n/a	15	2.23	0	None	No	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-13	22.5	n/a	n/a	15	5.378	0	None	No	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-14	10.76	n/a	n/a	16	2.837	0	None	No	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-17	47.28	n/a	n/a	16	5.517	0	None	No	0.002505	Param Intra 1 of 2
Chloride, total (mg/L)	AD-5	24.81	n/a	n/a	16	3.708	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-1	67.66	n/a	n/a	16	10.29	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-11	777.8	n/a	n/a	16	140.3	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-13	385.5	n/a	n/a	16	87.47	0	None	No	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-14	184.5	n/a	n/a	15	1.431	0	None	sqrt(x)	0.002505	Param Intra 1 of 2
Sulfate, total (mg/L)	AD-17	1445	n/a	n/a	16	n/a	0	n/a	n/a	0.006456	NP Intra (normality) 1 of 2
Sulfate, total (mg/L)	AD-5	286.7	n/a	n/a	16	79.29	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	AD-1	612	n/a	n/a	16	n/a	0	n/a	n/a	0.006456	NP Intra (normality) 1 of 2
Total Dissolved Solids (mg/L)	AD-11	1212	n/a	n/a	16	212.2	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	AD-13	700.6	n/a	n/a	15	137	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	AD-14	400.4	n/a	n/a	15	1.593	0	None	sqrt(x)	0.002505	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	AD-17	1921	n/a	n/a	16	118.1	0	None	No	0.002505	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	AD-5	505.2	n/a	n/a	16	87.61	0	None	No	0.002505	Param Intra 1 of 2

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-1 (bg)



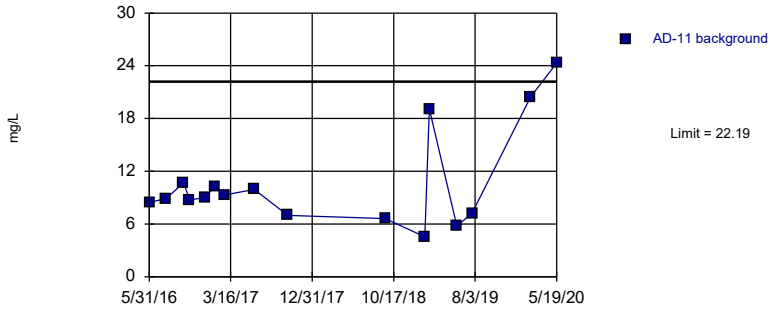
Background Data Summary (based on cube root transformation): Mean=3.586, Std. Dev.=1.323, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8572, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-11



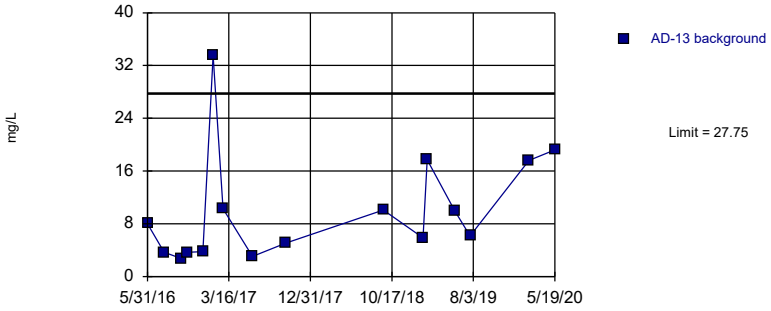
Background Data Summary (based on square root transformation): Mean=3.175, Std. Dev.=0.7795, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8558, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-13



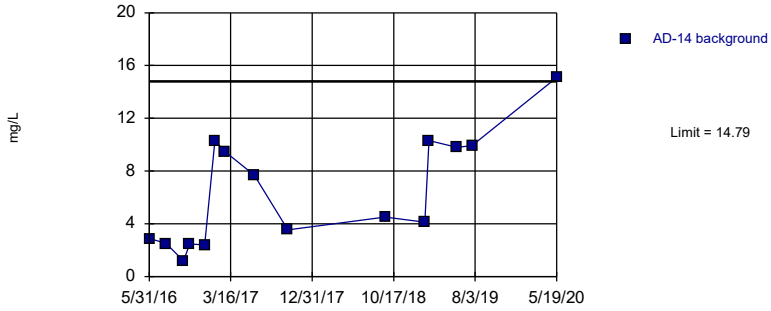
Background Data Summary (based on square root transformation): Mean=2.954, Std. Dev.=1.175, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.897, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-14

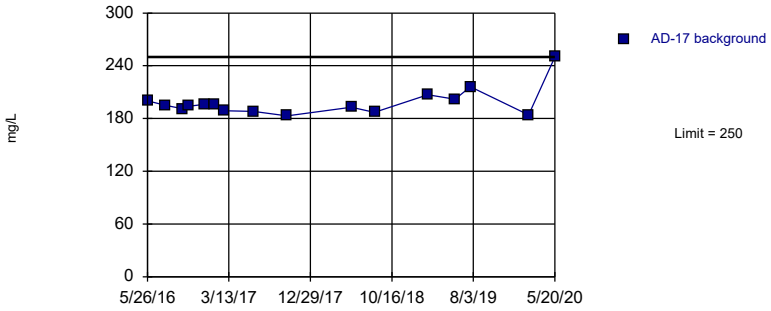


Background Data Summary: Mean=6.417, Std. Dev.=4.175, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8888, critical = 0.835. Kappa = 2.006 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Prediction Limit

Intrawell Non-parametric, AD-17 (bg)



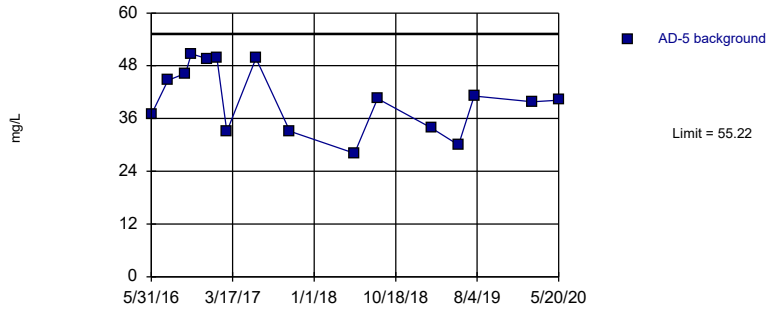
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 16 background values. Well-constituent pair annual alpha = 0.01287. Individual comparison alpha = 0.006456 (1 of 2). Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-5 (bg)



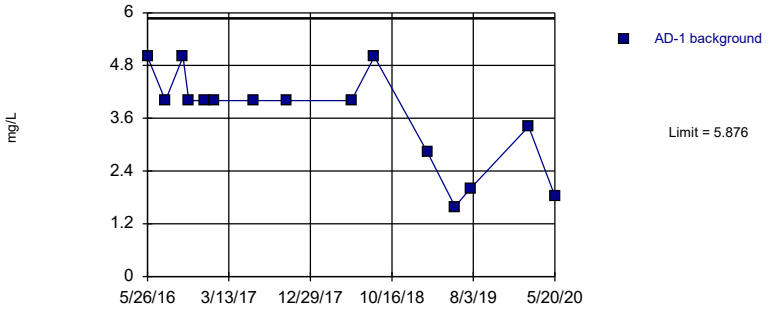
Background Data Summary: Mean=40.46, Std. Dev.=7.491, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9322, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Calcium, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-1 (bg)



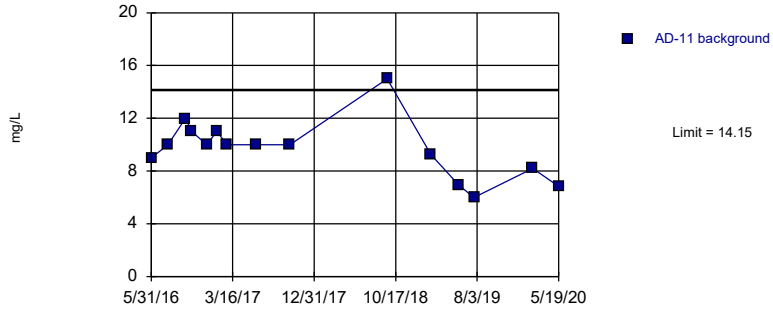
Background Data Summary: Mean=3.643, Std. Dev.=1.113, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8562, critical = 0.835. Kappa = 2.006 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-11



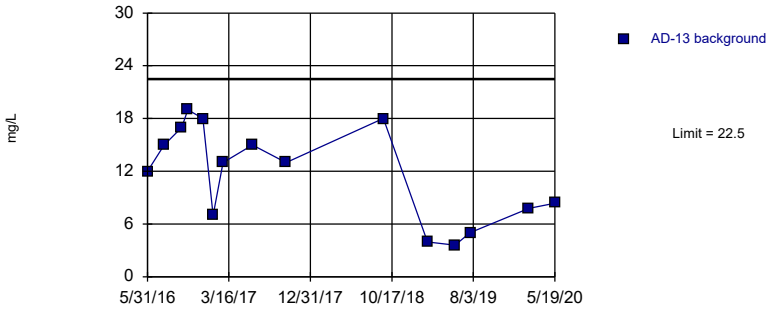
Background Data Summary: Mean=9.681, Std. Dev.=2.23, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9383, critical = 0.835. Kappa = 2.006 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-13



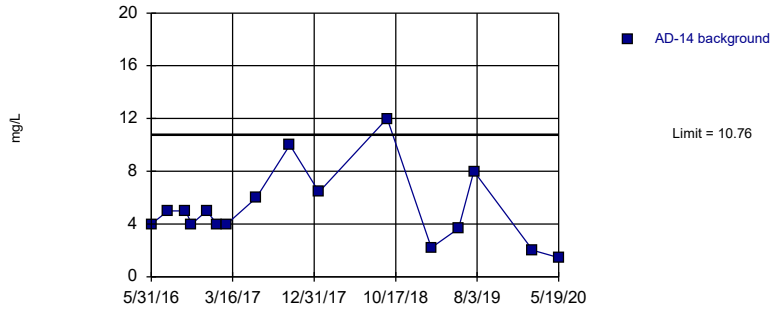
Background Data Summary: Mean=11.71, Std. Dev.=5.378, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9197, critical = 0.835. Kappa = 2.006 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-14



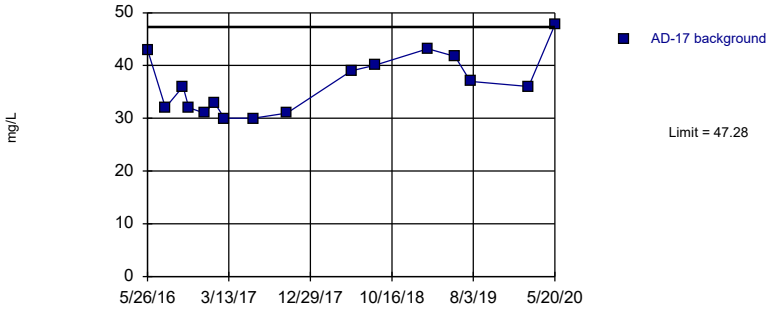
Background Data Summary: Mean=5.171, Std. Dev.=2.837, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9009, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-17 (bg)



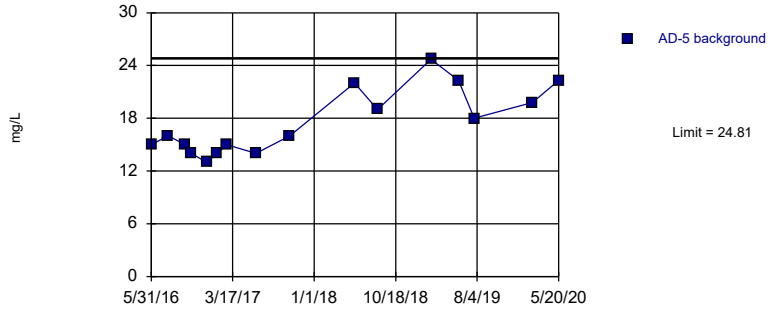
Background Data Summary: Mean=36.41, Std. Dev.=5.517, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9197, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-5 (bg)

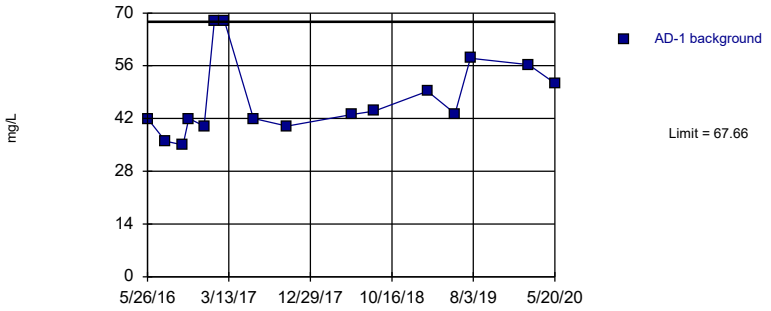


Background Data Summary: Mean=17.51, Std. Dev.=3.708, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8923, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Chloride, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Prediction Limit

Intrawell Parametric, AD-1 (bg)



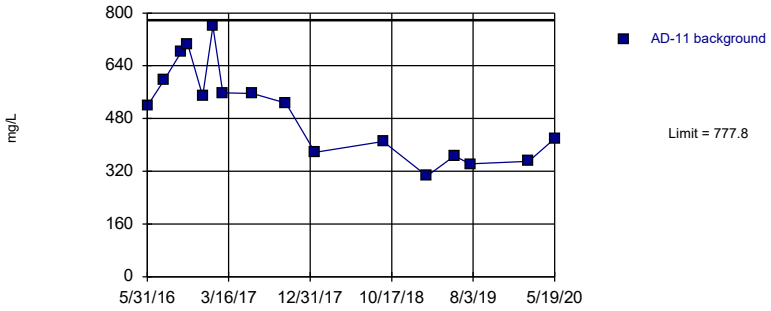
Background Data Summary: Mean=47.39, Std. Dev.=10.29, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8677, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-11



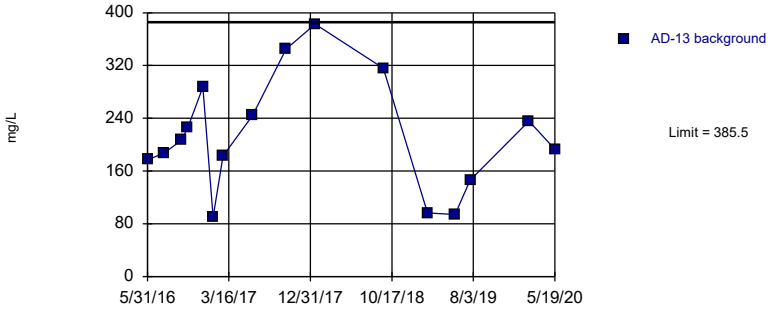
Background Data Summary: Mean=501.4, Std. Dev.=140.3, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9386, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-13



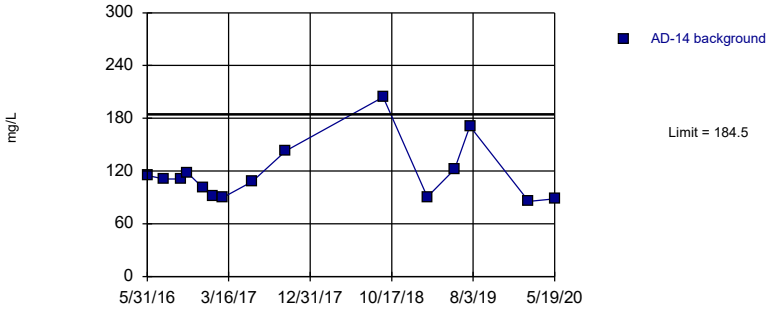
Background Data Summary: Mean=213.1, Std. Dev.=87.47, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9549, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-14

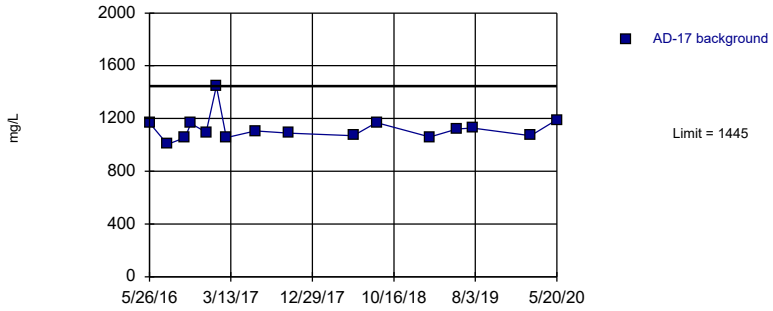


Background Data Summary (based on square root transformation): Mean=10.71, Std. Dev.=1.431, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8535, critical = 0.835. Kappa = 2.006 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Prediction Limit

Intrawell Non-parametric, AD-17 (bg)



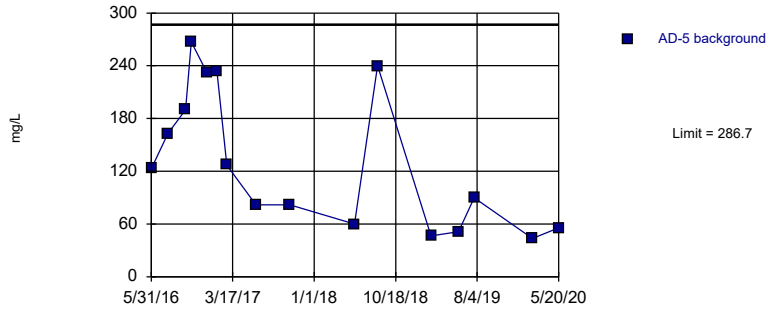
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 16 background values. Well-constituent pair annual alpha = 0.01287. Individual comparison alpha = 0.006456 (1 of 2). Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-5 (bg)



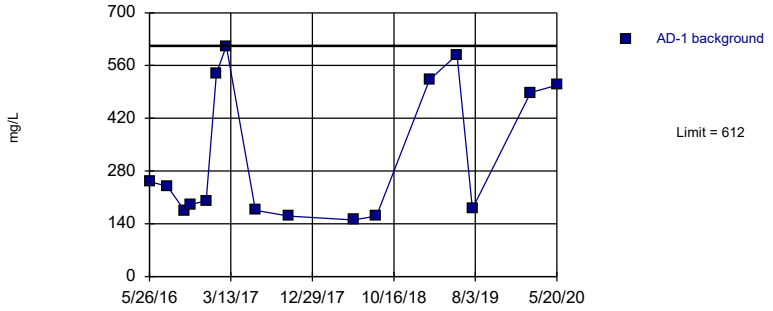
Background Data Summary: Mean=130.5, Std. Dev.=79.29, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8753, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Sulfate, total Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Non-parametric, AD-1 (bg)



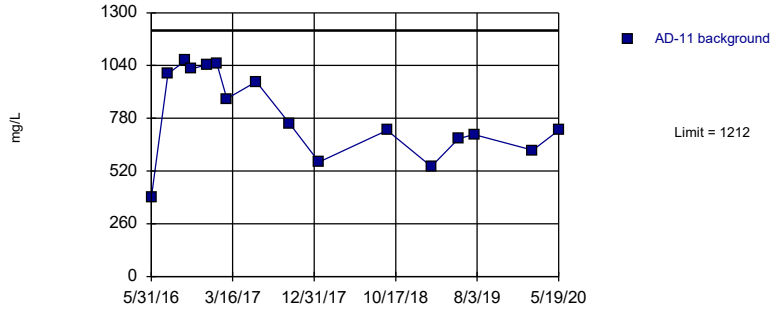
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 16 background values. Well-constituent pair annual alpha = 0.01287. Individual comparison alpha = 0.006456 (1 of 2). Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-11

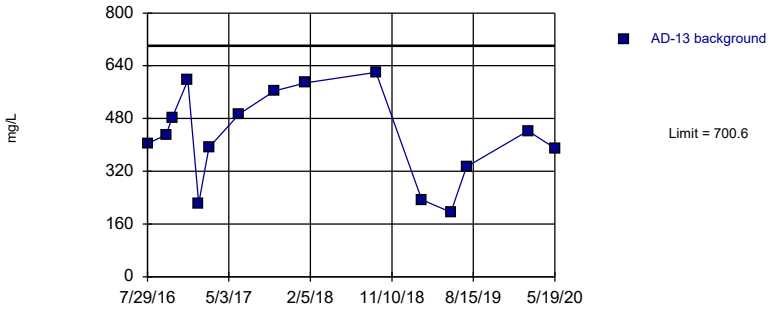


Background Data Summary: Mean=794.1, Std. Dev.=212.2, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9241, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Prediction Limit

Intrawell Parametric, AD-13



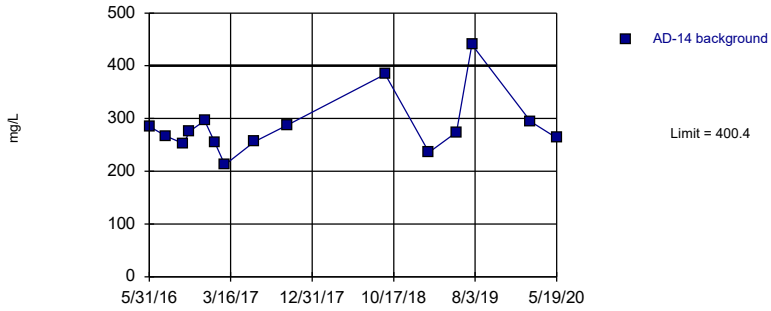
Background Data Summary: Mean=425.9, Std. Dev.=137, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9411, critical = 0.835. Kappa = 2.006 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-14



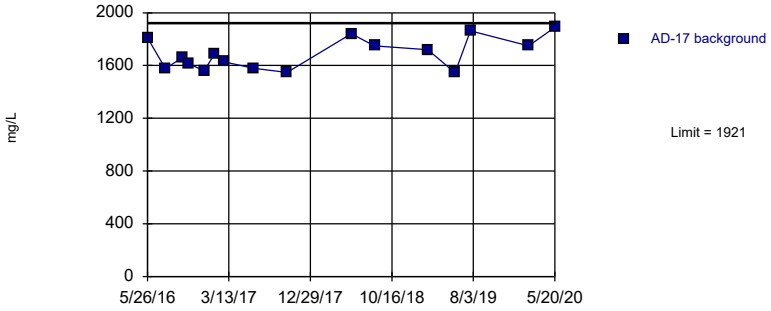
Background Data Summary (based on square root transformation): Mean=16.82, Std. Dev.=1.593, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8401, critical = 0.835. Kappa = 2.006 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-17 (bg)



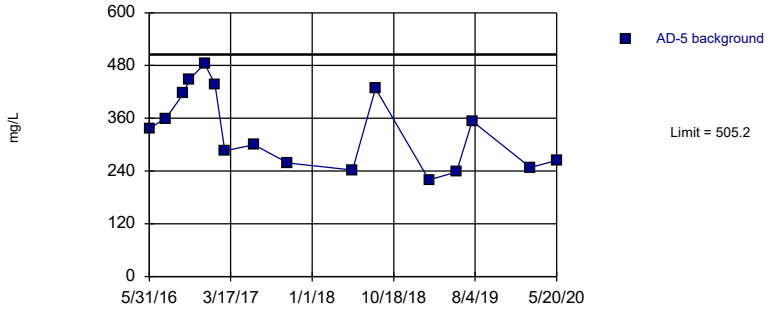
Background Data Summary: Mean=1689, Std. Dev.=118.1, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9189, critical = 0.844. Kappa = 1.97 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Prediction Limit

Intrawell Parametric, AD-5 (bg)



Background Data Summary: Mean=332.6, Std. Dev.=87.61, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9126, critical = 0.844. Kappa = 1.97 (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 12/29/2020 12:39 PM View: Appendix III Intrawell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Trend Test - Significant Results

Welsh Landfill Client: Geosyntec Data: Welsh LF Printed 12/29/2020, 12:28 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron, total (mg/L)	**AD-1 (bg)**	**0.07968**	**72**	**63**	**Yes**	**17**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Fluoride, total (mg/L)	**AD-1 (bg)**	**-0.1744**	**-65**	**-63**	**Yes**	**17**	**64.71**	**n/a**	**n/a**	**0.01**	**NP**
Fluoride, total (mg/L)	**AD-17 (bg)**	**-0.04679**	**-89**	**-63**	**Yes**	**17**	**41.18**	**n/a**	**n/a**	**0.01**	**NP**

Trend Test - All Results

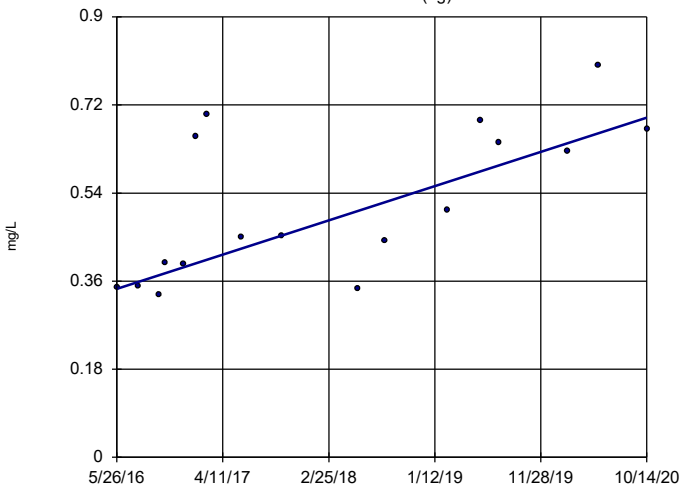
Welsh Landfill Client: Geosyntec Data: Welsh LF Printed 12/29/2020, 12:28 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron, total (mg/L)	**AD-1 (bg)**	**0.07968**	**72**	**63**	**Yes**	**17**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Boron, total (mg/L)	AD-17 (bg)	-0.001855	-14	-63	No	17	0	n/a	n/a	0.01	NP
Boron, total (mg/L)	AD-5 (bg)	0	-22	-63	No	17	0	n/a	n/a	0.01	NP
Fluoride, total (mg/L)	**AD-1 (bg)**	**-0.1744**	**-65**	**-63**	**Yes**	**17**	**64.71**	**n/a**	**n/a**	**0.01**	**NP**
Fluoride, total (mg/L)	**AD-17 (bg)**	**-0.04679**	**-89**	**-63**	**Yes**	**17**	**41.18**	**n/a**	**n/a**	**0.01**	**NP**
Fluoride, total (mg/L)	AD-5 (bg)	-0.03614	-53	-63	No	17	52.94	n/a	n/a	0.01	NP
pH, field (SU)	AD-1 (bg)	0.02172	5	63	No	17	0	n/a	n/a	0.01	NP
pH, field (SU)	AD-17 (bg)	-0.09386	-42	-63	No	17	0	n/a	n/a	0.01	NP
pH, field (SU)	AD-5 (bg)	0.124	44	63	No	17	0	n/a	n/a	0.01	NP

Sanitas™ v.9.6.27 . UG

Sen's Slope Estimator

AD-1 (bg)



n = 17

Slope = 0.07968 units per year.

Mann-Kendall statistic = 72 critical = 63

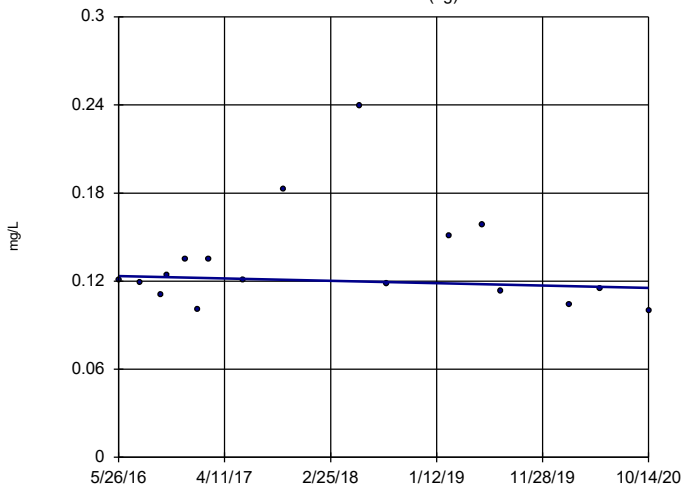
Increasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 12/29/2020 12:27 PM View: Appendix III Interwell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Sen's Slope Estimator

AD-17 (bg)



n = 17

Slope = -0.001855 units per year.

Mann-Kendall statistic = -14 critical = -63

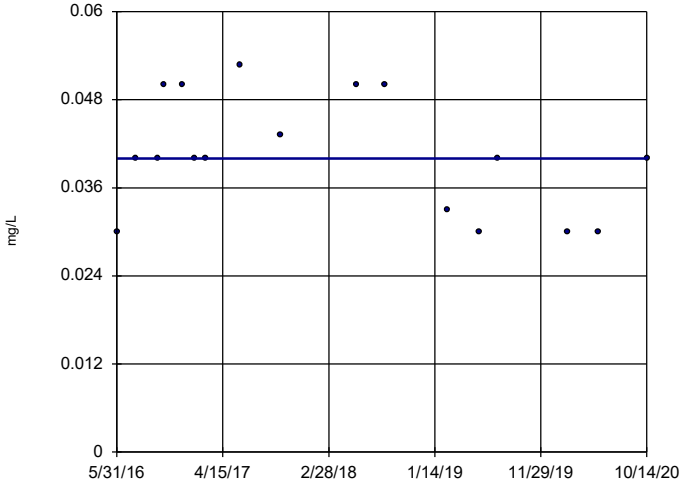
Trend not sig-nificant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 12/29/2020 12:27 PM View: Appendix III Interwell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Sen's Slope Estimator

AD-5 (bg)



n = 17

Slope = 0 units per year.

Mann-Kendall statistic = -22 critical = -63

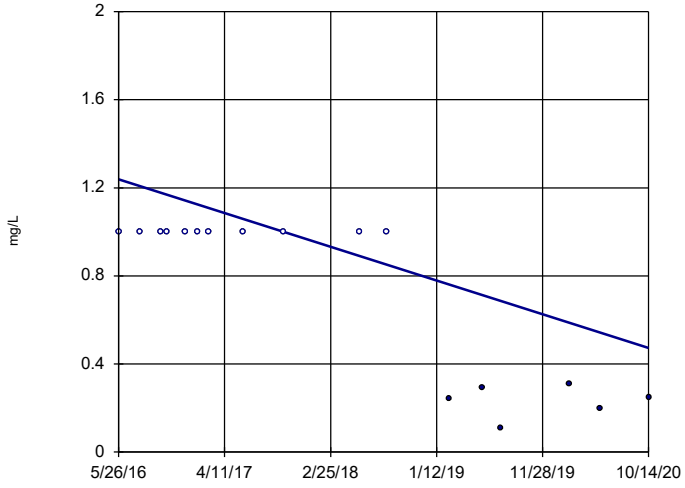
Trend not sig-nificant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, total Analysis Run 12/29/2020 12:27 PM View: Appendix III Interwell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

AD-1 (bg)



n = 17

Slope = -0.1744 units per year.

Mann-Kendall statistic = -65 critical = -63

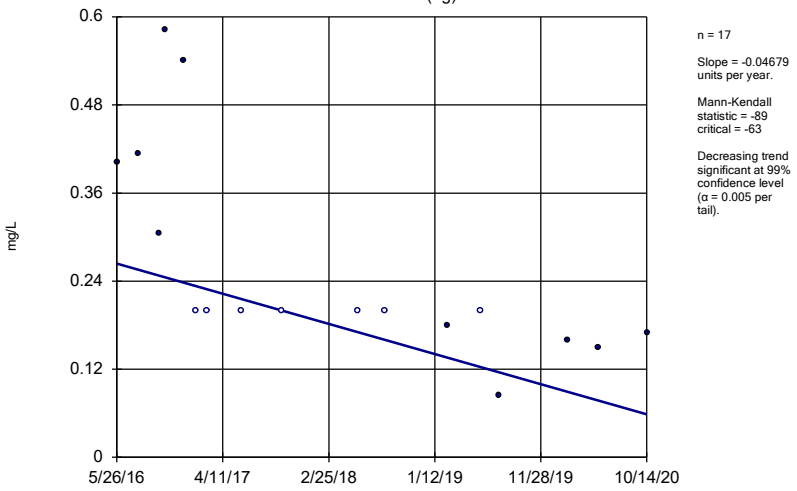
Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Fluoride, total Analysis Run 12/29/2020 12:27 PM View: Appendix III Interwell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

AD-17 (bg)



n = 17

Slope = -0.04679 units per year.

Mann-Kendall statistic = -89
critical = -63

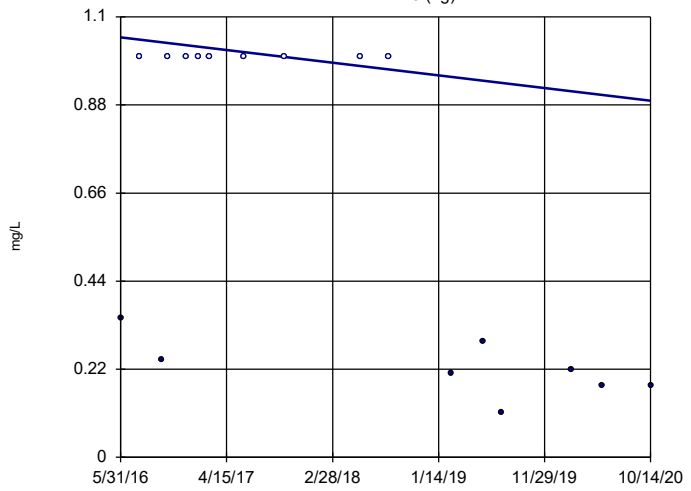
Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Fluoride, total Analysis Run 12/29/2020 12:27 PM View: Appendix III Interwell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

AD-5 (bg)



n = 17

Slope = -0.03614 units per year.

Mann-Kendall statistic = -53
critical = -63

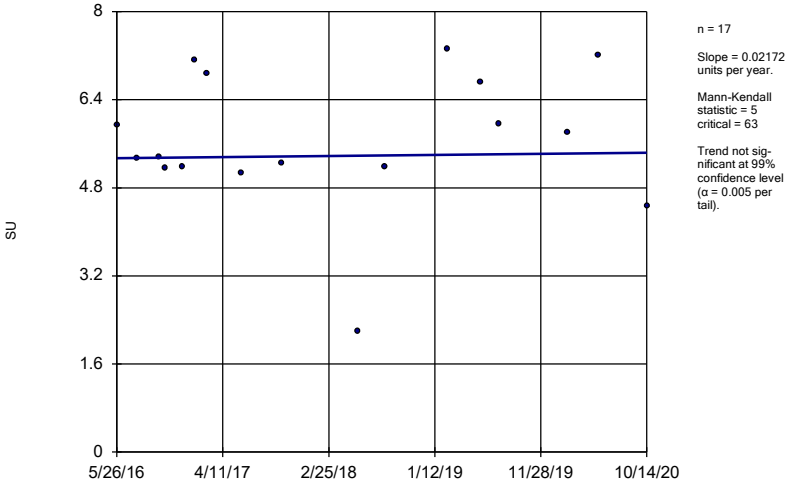
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Fluoride, total Analysis Run 12/29/2020 12:27 PM View: Appendix III Interwell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Sen's Slope Estimator

AD-1 (bg)



n = 17

Slope = 0.02172 units per year.

Mann-Kendall statistic = 5
critical = 63

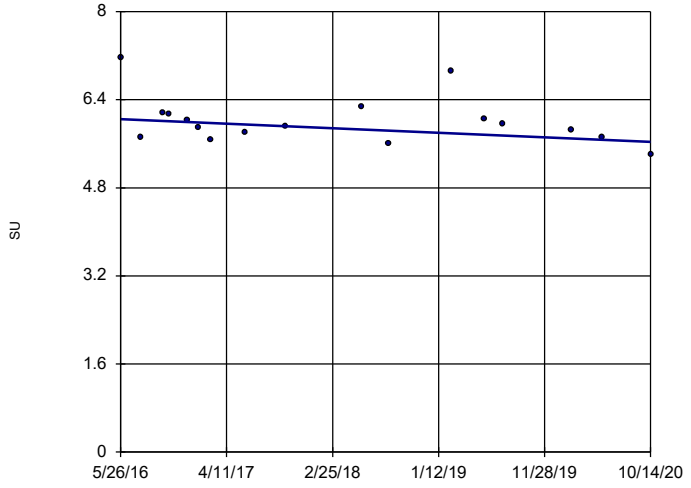
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: pH, field Analysis Run 12/29/2020 12:27 PM View: Appendix III Interwell
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27 . UG

Sen's Slope Estimator

AD-17 (bg)



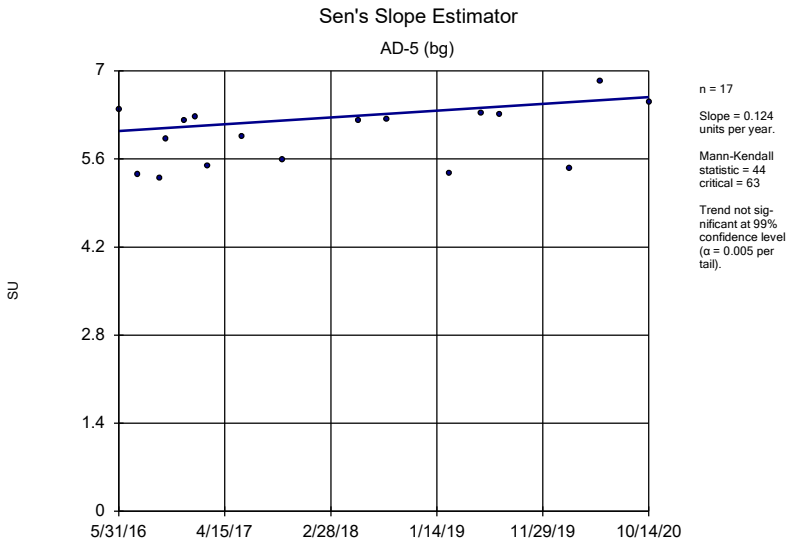
n = 17

Slope = -0.09386 units per year.

Mann-Kendall statistic = -42
critical = -63

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

Constituent: pH, field Analysis Run 12/29/2020 12:27 PM View: Appendix III Interwell
Welsh Landfill Client: Geosyntec Data: Welsh LF



Constituent: pH, field Analysis Run 12/29/2020 12:27 PM View: Appendix III Interwell

Welsh Landfill Client: Geosyntec Data: Welsh LF

Interwell Prediction Limit

Welsh Landfill Client: Geosyntec Data: Welsh LF Printed 12/30/2020, 9:34 AM

Constituent	Well	Upper Lim.	Lower Lim.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron, total (mg/L)	n/a	0.862	n/a	51	-1.991	1.069	0	None	ln(x)	0.002505	Param Inter 1 of 2
Fluoride, total (mg/L)	n/a	0.583	n/a	51	n/a	n/a	52.94	n/a	n/a	0.000725	NP Inter (NDs) 1 of 2
pH, field (SU)	n/a	7.007	4.397	51	214.5	75.12	0	None	x^3	0.001253	Param Inter 1 of 2

Upper Tolerance Limits

Welsh Landfill Client: Geosyntec Data: Welsh LF Printed 12/15/2020, 3:18 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Bg N	Std. Dev.	%NDs	Transform	Alpha	Method
Antimony, total (mg/L)	n/a	0.00317	n/a	n/a	n/a	48	n/a	70.83	n/a	0.08526	NP Inter(normal...
Arsenic, total (mg/L)	n/a	0.00628	n/a	n/a	n/a	48	n/a	39.58	n/a	0.08526	NP Inter(normal...
Barium, total (mg/L)	n/a	0.6453	n/a	n/a	n/a	48	1.132	0	ln(x)	0.05	Inter
Beryllium, total (mg/L)	n/a	0.0007729	n/a	n/a	n/a	48	0.01767	8.333	x^(1/3)	0.05	Inter
Cadmium, total (mg/L)	n/a	0.00646	n/a	n/a	n/a	48	n/a	31.25	n/a	0.08526	NP Inter(normal...
Chromium, total (mg/L)	n/a	0.004	n/a	n/a	n/a	47	n/a	19.15	n/a	0.08974	NP Inter(normal...
Cobalt, total (mg/L)	n/a	0.0748	n/a	n/a	n/a	48	n/a	0	n/a	0.08526	NP Inter(normal...
Combined Radium 226 + 228 (pCi/L)	n/a	4.007	n/a	n/a	n/a	48	0.895	0	No	0.05	Inter
Fluoride, total (mg/L)	n/a	0.583	n/a	n/a	n/a	51	n/a	52.94	n/a	0.0731	NP Inter(normal...
Lead, total (mg/L)	n/a	0.003384	n/a	n/a	n/a	48	n/a	58.33	n/a	0.08526	NP Inter(normal...
Lithium, total (mg/L)	n/a	0.394	n/a	n/a	n/a	48	n/a	2.083	n/a	0.08526	NP Inter(normal...
Mercury, total (mg/L)	n/a	0.000033	n/a	n/a	n/a	48	n/a	60.42	n/a	0.08526	NP Inter(normal...
Molybdenum, total (mg/L)	n/a	0.00243	n/a	n/a	n/a	48	n/a	68.75	n/a	0.08526	NP Inter(normal...
Selenium, total (mg/L)	n/a	0.0053	n/a	n/a	n/a	48	n/a	35.42	n/a	0.08526	NP Inter(normal...
Thallium, total (mg/L)	n/a	0.001251	n/a	n/a	n/a	48	n/a	89.58	n/a	0.08526	NP Inter(NDs)

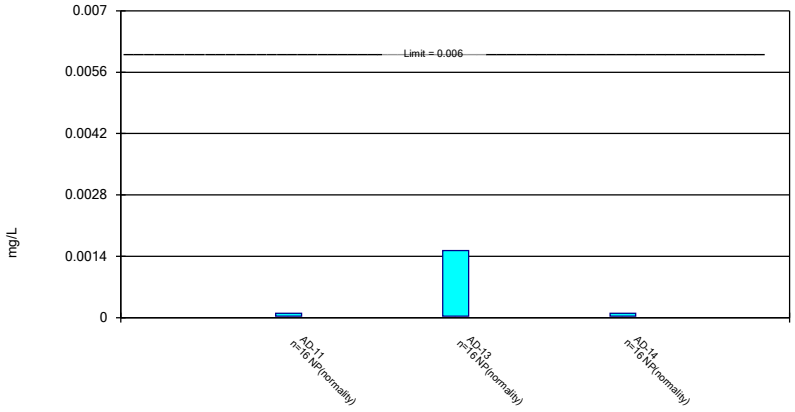
Confidence Interval Summary Table - All Results (No Significant)

Welsh Landfill Client: Geosyntec Data: Welsh LF Printed 12/30/2020, 9:39 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	AD-11	0.0001	0.00003	0.006	No	16	0.0000775	0.00003474	68.75	None	No	0.01	NP (normality)
Antimony, total (mg/L)	AD-13	0.00153	0.00003	0.006	No	16	0.0001631	0.0003662	56.25	None	No	0.01	NP (normality)
Antimony, total (mg/L)	AD-14	0.0001	0.00003	0.006	No	16	0.00007937	0.00003356	68.75	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	AD-11	0.005	0.00055	0.01	No	16	0.002507	0.002066	37.5	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	AD-13	0.005	0.00038	0.01	No	16	0.00305	0.002295	43.75	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	AD-14	0.005	0.00039	0.01	No	16	0.002569	0.002254	43.75	None	No	0.01	NP (normality)
Barium, total (mg/L)	AD-11	0.0403	0.012	2	No	16	0.0228	0.0151	0	None	No	0.01	NP (normality)
Barium, total (mg/L)	AD-13	0.05668	0.02778	2	No	16	0.04378	0.02422	0	None	sqrt(x)	0.01	Param.
Barium, total (mg/L)	AD-14	0.04683	0.03083	2	No	16	0.03955	0.01405	0	None	x^(1/3)	0.01	Param.
Beryllium, total (mg/L)	AD-11	0.004	0.000824	0.004	No	16	0.002528	0.001704	0	None	No	0.01	NP (normality)
Beryllium, total (mg/L)	AD-13	0.0008517	0.000515	0.004	No	16	0.0006833	0.0002587	0	None	No	0.01	Param.
Beryllium, total (mg/L)	AD-14	0.0007888	0.0003729	0.004	No	16	0.0005808	0.0003196	0	None	No	0.01	Param.
Cadmium, total (mg/L)	AD-11	0.0004187	0.0002608	0.0065	No	16	0.0003398	0.0001213	0	None	No	0.01	Param.
Cadmium, total (mg/L)	AD-13	0.0005	0.000085	0.0065	No	16	0.0002186	0.0001783	25	None	No	0.01	NP (normality)
Cadmium, total (mg/L)	AD-14	0.001482	0.0004755	0.0065	No	16	0.001063	0.0008688	0	None	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	AD-11	0.002	0.000259	0.1	No	15	0.0008006	0.0008397	0	None	No	0.01	NP (normality)
Chromium, total (mg/L)	AD-13	0.00073	0.000283	0.1	No	15	0.0007063	0.0009274	20	None	No	0.01	NP (normality)
Chromium, total (mg/L)	AD-14	0.0007614	0.000338	0.1	No	16	0.0005497	0.0003254	12.5	None	No	0.01	Param.
Cobalt, total (mg/L)	AD-11	0.026	0.00863	0.075	No	16	0.01824	0.008008	0	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	AD-13	0.006884	0.003471	0.075	No	16	0.005353	0.002908	0	None	sqrt(x)	0.01	Param.
Cobalt, total (mg/L)	AD-14	0.01297	0.005217	0.075	No	16	0.00962	0.006546	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-11	2.52	1.643	5	No	16	2.081	0.6737	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-13	2.836	1.746	5	No	16	2.331	0.8839	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-14	2.509	1.13	5	No	16	1.902	1.194	0	None	sqrt(x)	0.01	Param.
Fluoride, total (mg/L)	AD-11	2	0.338	4	No	17	1.141	0.9388	17.65	None	No	0.01	NP (normality)
Fluoride, total (mg/L)	AD-13	0.6621	0.2386	4	No	17	0.481	0.2887	17.65	Cohen`s	No	0.01	Param.
Fluoride, total (mg/L)	AD-14	0.162	0.083	4	No	17	0.1197	0.05691	64.71	None	No	0.01	NP (normality)
Lead, total (mg/L)	AD-11	0.005	0.000523	0.015	No	16	0.002898	0.002098	43.75	None	No	0.01	NP (normality)
Lead, total (mg/L)	AD-13	0.005	0.00006	0.015	No	16	0.002538	0.002334	43.75	None	No	0.01	NP (normality)
Lead, total (mg/L)	AD-14	0.005	0.0001	0.015	No	16	0.00288	0.002483	56.25	None	No	0.01	NP (normality)
Lithium, total (mg/L)	AD-11	0.046	0.0153	0.39	No	16	0.02947	0.0133	0	None	No	0.01	NP (normality)
Lithium, total (mg/L)	AD-13	0.02684	0.01277	0.39	No	16	0.0198	0.01081	0	None	No	0.01	Param.
Lithium, total (mg/L)	AD-14	0.0168	0.01112	0.39	No	16	0.01396	0.004361	0	None	No	0.01	Param.
Mercury, total (mg/L)	AD-11	0.00001613	0.000005	0.002	No	16	0.000009244	0.0000059	37.5	None	No	0.01	NP (normality)
Mercury, total (mg/L)	AD-13	0.00001565	0.000005	0.002	No	16	0.000009031	0.0000078475	56.25	None	No	0.01	NP (normality)
Mercury, total (mg/L)	AD-14	0.00009909	0.00001308	0.002	No	16	0.000076	0.0001055	6.25	None	x^(1/3)	0.01	Param.
Molybdenum, total (mg/L)	AD-11	0.002	0.002	0.1	No	16	0.001848	0.0004943	81.25	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	AD-13	0.002	0.0005	0.1	No	16	0.001549	0.0007186	68.75	None	No	0.01	NP (normality)
Molybdenum, total (mg/L)	AD-14	0.002	0.001	0.1	No	16	0.00172	0.0006266	75	None	No	0.01	NP (normality)
Selenium, total (mg/L)	AD-11	0.005	0.00134	0.05	No	16	0.002455	0.001569	25	None	No	0.01	NP (normality)
Selenium, total (mg/L)	AD-13	0.00201	0.0005	0.05	No	16	0.001808	0.001659	18.75	None	No	0.01	NP (Cohens/xfrm)
Selenium, total (mg/L)	AD-14	0.003541	0.00206	0.05	No	16	0.002801	0.001138	12.5	None	No	0.01	Param.
Thallium, total (mg/L)	AD-11	0.00107	0.0001	0.002	No	15	0.0004746	0.0004164	33.33	None	No	0.01	NP (normality)
Thallium, total (mg/L)	AD-13	0.0009736	0.000277	0.002	No	16	0.0004719	0.0001846	75	None	No	0.01	NP (normality)
Thallium, total (mg/L)	AD-14	0.0005	0.000242	0.002	No	16	0.0004276	0.0001348	75	None	No	0.01	NP (normality)

Non-Parametric Confidence Interval

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

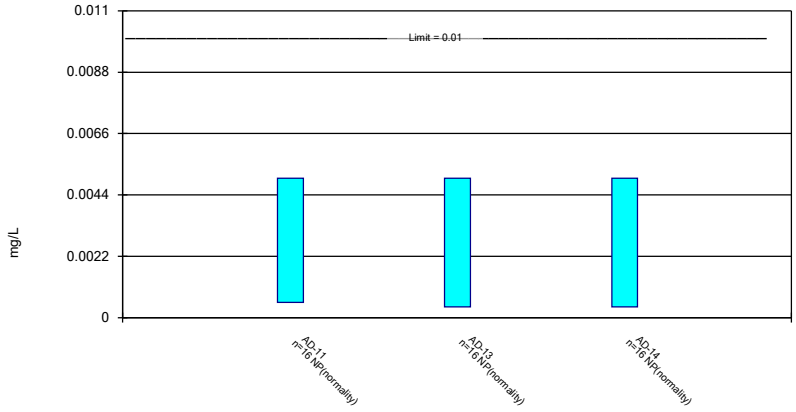


Constituent: Antimony, total Analysis Run 12/30/2020 9:37 AM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

Non-Parametric Confidence Interval

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

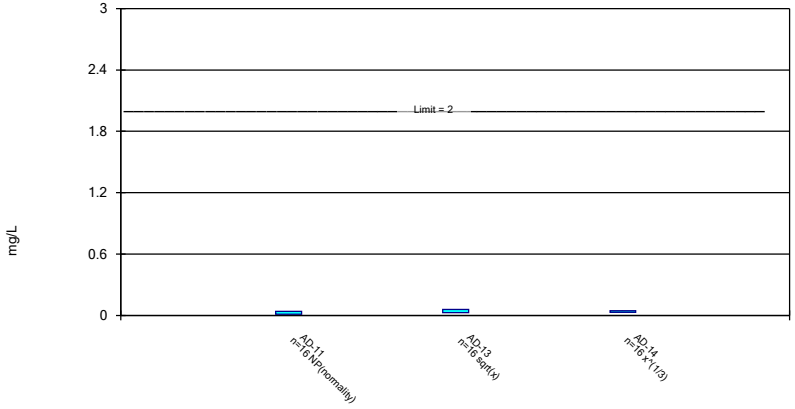


Constituent: Arsenic, total Analysis Run 12/30/2020 9:37 AM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

Parametric and Non-Parametric (NP) Confidence Interval

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

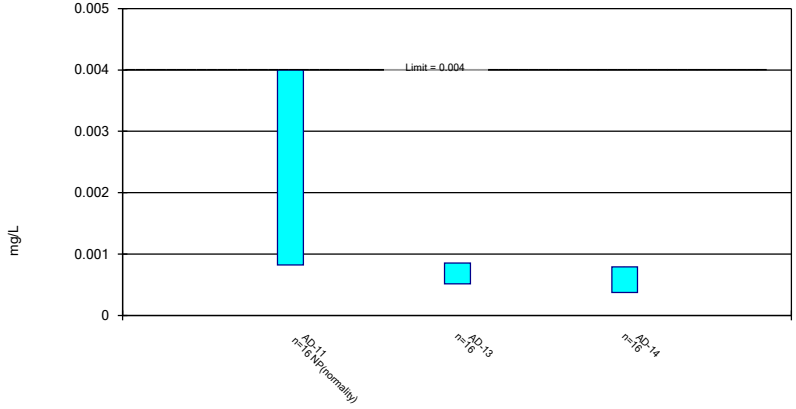


Constituent: Barium, total Analysis Run 12/30/2020 9:37 AM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

Parametric and Non-Parametric (NP) Confidence Interval

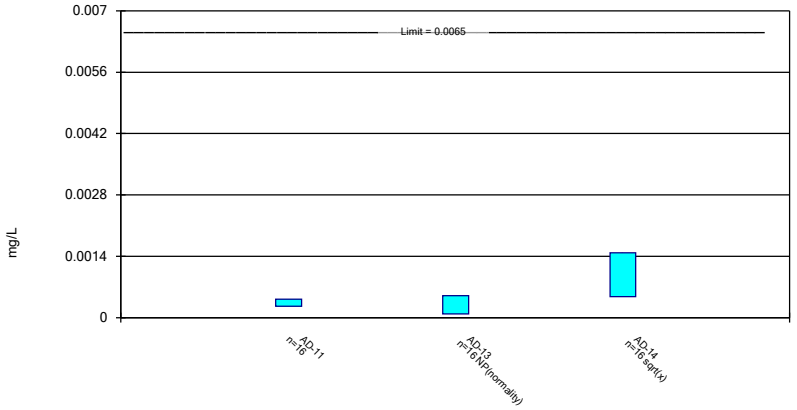
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total Analysis Run 12/30/2020 9:37 AM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Parametric and Non-Parametric (NP) Confidence Interval

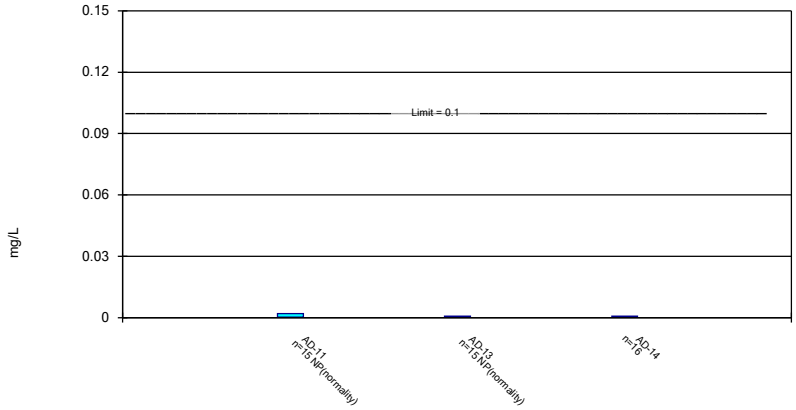
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 12/30/2020 9:37 AM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Parametric and Non-Parametric (NP) Confidence Interval

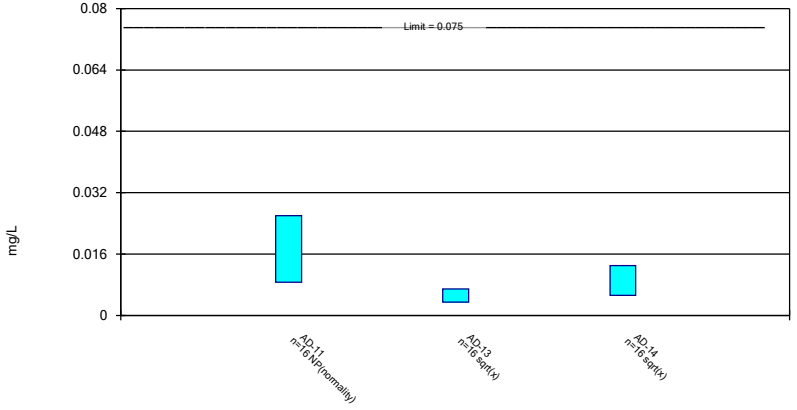
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 12/30/2020 9:37 AM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Parametric and Non-Parametric (NP) Confidence Interval

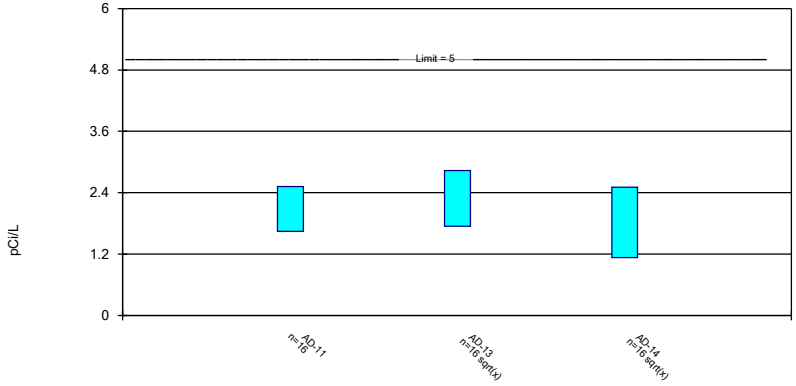
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 12/30/2020 9:37 AM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Parametric Confidence Interval

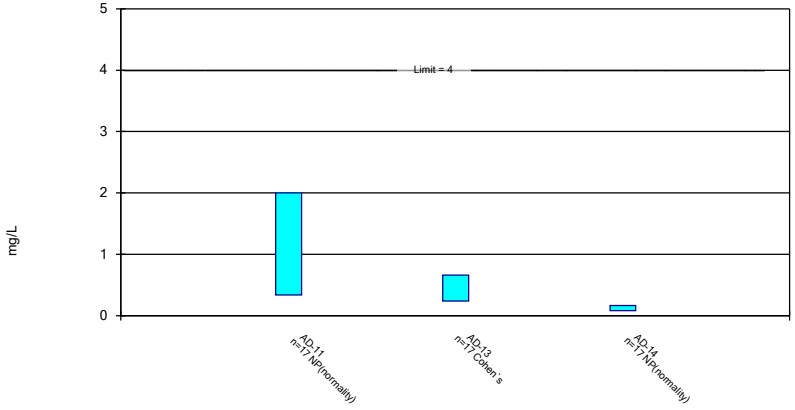
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 12/30/2020 9:37 AM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Parametric and Non-Parametric (NP) Confidence Interval

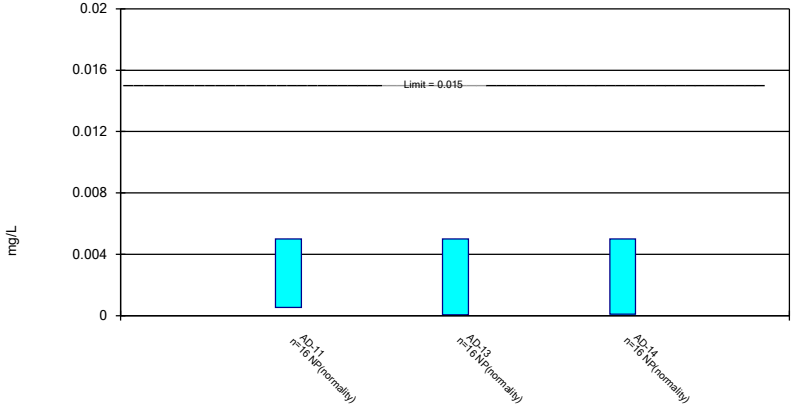
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 12/30/2020 9:37 AM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Non-Parametric Confidence Interval

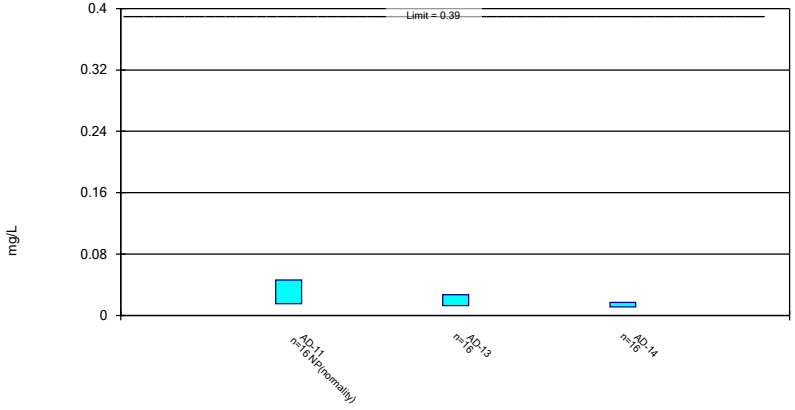
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Lead, total Analysis Run 12/30/2020 9:37 AM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Parametric and Non-Parametric (NP) Confidence Interval

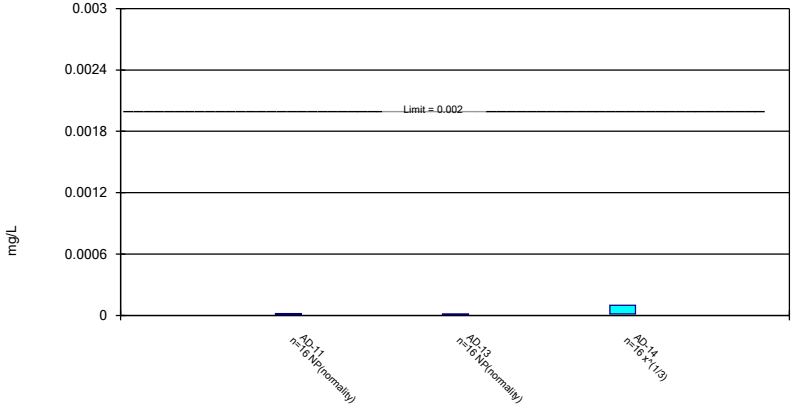
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 12/30/2020 9:37 AM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Parametric and Non-Parametric (NP) Confidence Interval

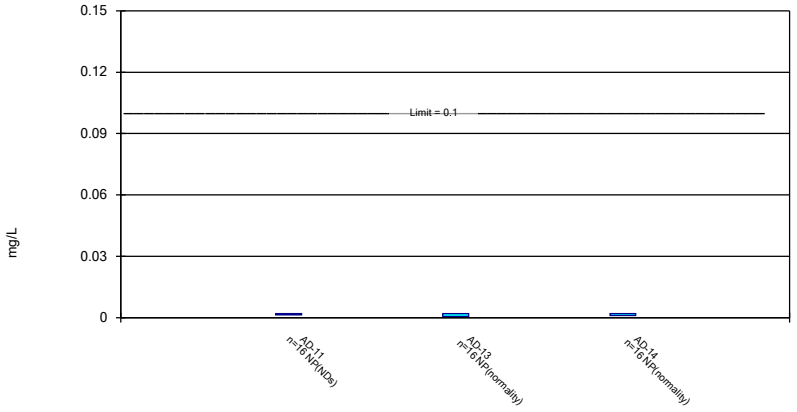
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Mercury, total Analysis Run 12/30/2020 9:37 AM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Non-Parametric Confidence Interval

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

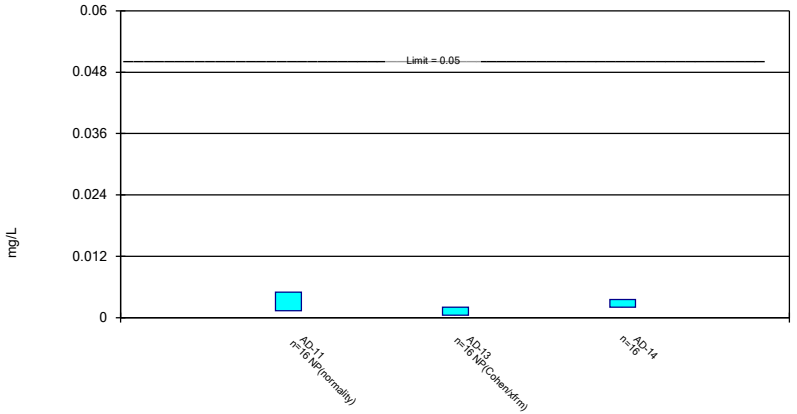


Constituent: Molybdenum, total Analysis Run 12/30/2020 9:37 AM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

Parametric and Non-Parametric (NP) Confidence Interval

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

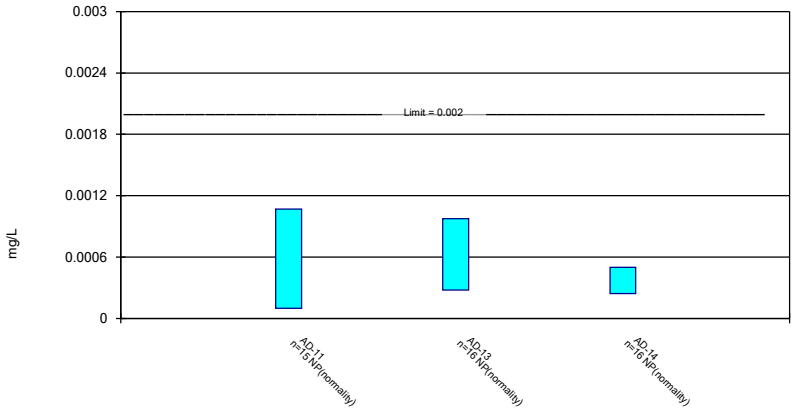


Constituent: Selenium, total Analysis Run 12/30/2020 9:37 AM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.27b Sanitas software utilized by Groundwater Stats Consulting. UG

Non-Parametric Confidence Interval

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



Constituent: Thallium, total Analysis Run 12/30/2020 9:37 AM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

STATISTICAL ANALYSIS SUMMARY
LANDFILL
J. Robert Welsh Plant
Pittsburg, Texas

Submitted to

AMERICAN ELECTRIC POWER℠

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Columbus, Ohio 43215-2372

Submitted by

Geosyntec consultants

engineers | scientists | innovators

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September 29, 2021

CHA8500

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LIST OF ATTACHMENTS

Attachment A Certification by Qualified Professional Engineer
Attachment B Statistical Analysis Output

LIST OF ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
CCR	Coal Combustion Residuals
CCV	Continuing Calibration Verification
GWPS	Groundwater Protection Standard
LCL	Lower Confidence Limit
LF	Landfill
LFB	Laboratory Fortified Blanks
LRB	Laboratory Reagent Blanks
MCL	Maximum Contaminant Level
NELAP	National Environmental Laboratory Accreditation Program
QA	Quality Assurance
QC	Quality Control
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
TCEQ	Texas Commission on Environmental Quality
TDS	Total Dissolved Solids
UPL	Upper Prediction Limit

SECTION 1

EXECUTIVE SUMMARY

In accordance 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"), groundwater monitoring has been conducted at the Landfill (LF), an existing CCR unit at the Welsh Power Plant located in Pittsburg, Texas.

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for boron, total dissolved solids (TDS), and sulfate at the LF. An alternative source was not identified at the time, so the LF entered assessment monitoring. Groundwater protection standards (GWPS) were set in accordance with § 352.951(b) and a statistical evaluation of the assessment monitoring data was conducted. Two assessment monitoring events were conducted at the LF in February and June 2021 in accordance with § 352.951(a). The results of these assessment events are documented in this report.

Groundwater data underwent several validation tests, including those for completeness, sample tracking accuracy, transcription errors, and consistent use of measurement units. No data quality issues were identified which would impact data usability.

The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. Confidence intervals were calculated for Appendix IV parameters at the compliance wells to assess whether Appendix IV parameters were present at an SSL above previously established GWPS. No SSLs were identified; however, concentrations of Appendix III parameters remained above background. Thus, the unit will remain in assessment monitoring. Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A. The statistical analysis and certification of the selected methods were completed within 90 days of obtaining the data.

SECTION 2

LANDFILL EVALUATION

2.1 Data Validation & QA/QC

During the assessment monitoring program, two sets of samples (February 2021 and June 2021) were collected for analysis from each upgradient and downgradient well to meet the requirements of § 352.951(a). Samples from the June 2021 event were analyzed for all Appendix III and Appendix IV parameters, whereas the February 2021 event was analyzed for Appendix IV and select Appendix III parameters only. A summary of data collected during these assessment monitoring events may be found in Table 1.

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

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.9.6.30 statistics software. The export file was checked against the analytical data for transcription errors and completeness. No QA/QC issues were noted which would impact data usability.

2.2 Statistical Analysis

Time series plots and results for all completed statistical tests are provided in Attachment B. The data obtained in February 2021 and June 2021 were screened for potential outliers. No outliers were identified for these events.

2.2.1 Evaluation of Potential Appendix IV SSLs

A confidence interval was constructed for each Appendix IV parameter at each compliance well. Confidence limits were generally calculated parametrically ($\alpha = 0.01$); however, non-parametric confidence limits were calculated in some cases (e.g., when the data did not appear to be normally distributed or when the non-detect frequency was too high). An SSL was concluded if the lower confidence limit (LCL) exceeded the GWPS (i.e., if the entire confidence interval exceeded the GWPS). Calculated confidence limits are shown in Attachment B. The calculated confidence limits were compared to the GWPSs provided in Table 2. The GWPSs were established as either the greater value of the background concentration calculated during a previous statistical analysis (Geosyntec, 2021) or the maximum contaminant level (MCL).

No SSLs were identified at the Welsh LF.

2.2.2 Evaluation of Potential Appendix III SSIs

A review of the Appendix III results was also completed to assess whether concentrations of Appendix III parameters at the compliance wells exceeded background concentrations. Data collected during the June 2021 assessment monitoring event from each compliance well were compared to previously established prediction limits to evaluate results above background values. The results from this event and the prediction limits are summarized in Table 3. The following exceedances of the upper prediction limits (UPLs) were noted:

- Boron concentrations exceeded the interwell UPL of 0.700 mg/L at AD-11 (1.64 mg/L), AD-13 (0.831mg/L), and AD-14 (1.33 mg/L).

- Calcium concentrations exceeded the intrawell UPL of 17.1 mg/L at AD-11 (22.0 mg/L), the intrawell UPL of 28.4 mg/L at AD-13 (41.3 mg/L), and the intrawell UPL of 12.2 mg/L at AD-14 (29.5 mg/L).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the initial (June 2021) sample was above the UPL or below the LPL. Based on these results, concentrations of boron and calcium appear to be above background concentrations, and the unit will remain in assessment monitoring.

2.3 Conclusions

A semi-annual assessment monitoring event was conducted in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, with no QA/QC issues identified that impacted data usability. A review of outliers identified no potential outliers in the February or June 2021 data. A confidence interval was constructed at each compliance well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval exceeded the GWPS. No SSLs were identified.

The Appendix III results were evaluated to assess whether concentrations of Appendix III parameters exceeded background levels. Boron and calcium results exceeded background levels at select downgradient wells.

Based on this evaluation, the Welsh LF CCR unit will remain in assessment monitoring.

SECTION 3

REFERENCES

Geosyntec Consultants (Geosyntec). 2021. Statistical Analysis Summary – Landfill, J. Robert Welsh Plant. February 5, 2021

TABLES

Table 1 - Groundwater Data Summary
Welsh Plant - Landfill

Geosyntec Consultants, Inc.

Well ID		AD-1		AD-5		AD-11		AD-13		AD-14		AD-17	
Well Classification		Background		Background		Compliance		Compliance		Compliance		Background	
Parameter	Unit	2/23/2021	6/2/2021	2/23/2021	6/2/2021	2/23/2021	6/1/2021	2/23/2021	6/1/2021	2/23/2021	6/1/2021	2/23/2021	6/2/2021
Antimony	µg/L	0.24	0.18	0.1 U	0.1 U	0.04 J	0.03 J	0.06 J	0.09 J	0.03 J	0.06 J	0.1 U	0.1 U
Arsenic	µg/L	0.74	0.66	2.06	1.72	0.47	0.50	0.67	0.73	0.31	0.35	0.61	0.84
Barium	µg/L	338	349	68.3	49.3	38.2	36.3	115	116	36.5	48.6	10.6	10.9
Beryllium	µg/L	0.136	0.088	0.03 J	0.018 J	0.515	0.896	0.04 J	0.103	0.4 J	0.253	0.03 J	0.066
Boron	mg/L	0.617	0.786	0.03 J	0.027 J	1.15	1.64	0.581	0.831	1.09	1.33	0.098	0.124
Cadmium	µg/L	0.03 J	0.01 J	0.05 U	0.02 U	0.18	0.325	0.03 J	0.032	0.36	0.318	0.03 J	0.026
Calcium	mg/L	113	97.1	30.9	24.4	23.3	22.0	46.4	41.3	13.1	29.5	168	233
Chloride	mg/L	-	2.26	-	19.6	-	6.52	-	3.70	-	1.10	-	44.9
Chromium	µg/L	0.338	0.32	0.1 J	0.26	0.276	0.39	0.243	0.41	0.2 J	0.41	0.1 J	0.38
Cobalt	µg/L	0.477	0.474	6.31	10.5	8.63	13.8	0.717	0.971	4.18	3.60	41.1	72.9
Combined Radium	pCi/L	1.737	2.15	1.397	2.47	1.298	5.93	2.264	2.27	1.032	1.61	1.433	2.4
Fluoride	mg/L	0.31	0.30	0.23	0.21	0.52	0.62	0.27	0.43	0.20	0.20	0.17	0.31
Lead	µg/L	0.852	0.09 J	0.2 U	0.2 U	0.435	0.69	0.1 J	0.06 J	0.1 J	0.11 J	0.08 J	0.09 J
Lithium	mg/L	0.00155	0.00052	0.0705	0.0764	0.0102	0.0145	0.00302	0.00211	0.00900	0.00676	0.249	0.311
Mercury	µg/L	0.005 U	0.002 J	0.005 U	0.005 U	0.011	0.007	0.002 J	0.003 J	0.05 U	0.005 U	0.005 U	0.005 U
Molybdenum	µg/L	1 J	4.8	2 U	0.1 J	2 U	0.2 J	2.34	2.6	2 U	0.6	2 U	0.2 J
Selenium	µg/L	2.5	1.26	0.03 J	0.5 U	1.0	1.31	0.5	1.04	1.3	2.61	0.04 J	0.5 U
Sulfate	mg/L	-	61.4	-	53.8	-	485	-	94.6	-	91.8	-	1,210
Thallium	µg/L	0.5 U	0.2 U	0.5 U	0.2 U	0.1 J	0.14 J	0.5 U	0.2 U	0.5 U	0.05 J	0.5 U	0.2 U
Total Dissolved Solids	mg/L	-	400	-	220	-	790	-	280	-	280	-	1,890
pH	SU	6.6	6.2	6.0	5.8	6.3	5.7	5.9	6.1	5.3	5.9	5.6	5.7

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
pCi/L: picocuries per liter
SU: standard unit
U: Non-detect value. For statistical analysis, parameters which were not detected were replaced with the reporting limit.
J: Estimated value. Parameter was detected in concentrations below the reporting limit.
-: Not analyzed

Table 2: Appendix IV Groundwater Protection Standards
Welsh Plant - Landfill

Constituent Name	MCL	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.006	0.0032	0.006
Arsenic, Total (mg/L)	0.01	0.006	0.010
Barium, Total (mg/L)	2	0.65	2
Beryllium, Total (mg/L)	0.004	0.00077	0.004
Cadmium, Total (mg/L)	0.005	0.0065	0.0065
Chromium, Total (mg/L)	0.1	0.0040	0.1
Cobalt, Total (mg/L)	n/a	0.075	0.075
Combined Radium, Total (pCi/L)	5	4.01	5
Fluoride, Total (mg/L)	4	0.58	4
Lead, Total (mg/L)	n/a	0.0034	0.0034
Lithium, Total (mg/L)	n/a	0.39	0.39
Mercury, Total (mg/L)	0.002	0.000033	0.002
Molybdenum, Total (mg/L)	n/a	0.0024	0.0024
Selenium, Total (mg/L)	0.05	0.005	0.05
Thallium, Total (mg/L)	0.002	0.0013	0.002

Notes:
MCL = Maximum Contaminant Level
GWPS = Groundwater Protection Standard
Calculated UTL (Upper Tolerance Limit) represents site-specific background values.
Grey cells indicate the GWPS is based on the calculated UTL, which is either higher than the MCL or an MCL does not exist.

Table 3: Appendix III Data Evaluation
Welsh Plant - Landfill

Geosyntec Consultants, Inc.

Analyte	Unit	Description	AD-11	AD-13	AD-14
			6/1/2021	6/1/2021	6/1/2021
Boron	mg/L	Interwell Background Value (UPL)	0.700		
		Analytical Result	**1.64**	**0.831**	**1.33**
Calcium	mg/L	Intrawell Background Value (UPL)	17.1	28.4	12.2
		Analytical Result	**22.0**	**41.3**	**29.5**
Chloride	mg/L	Intrawell Background Value (UPL)	14.3	24.0	11.5
		Analytical Result	6.52	3.70	1.10
Fluoride	mg/L	Interwell Background Value (UPL)	0.583		
		Analytical Result	0.62	0.43	0.20
pH	SU	Interwell Background Value (UPL)	7.1		
		Interwell Background Value (LPL)	4.3		
		Analytical Result	5.7	6.1	5.9
Sulfate	mg/L	Intrawell Background Value (UPL)	829	422	189
		Analytical Result	485	94.6	91.8
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	1330	881	369
		Analytical Result	790	280	280

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

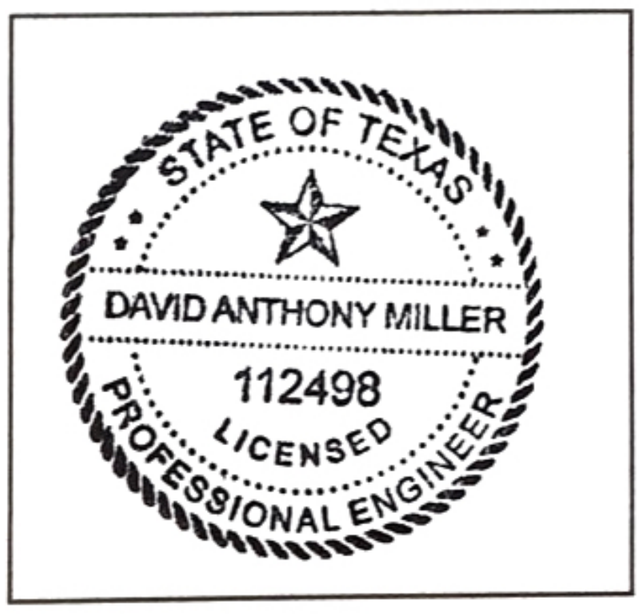
ATTACHMENT A
Certification by Qualified Professional Engineer

Certification by Qualified Professional Engineer

I certify that the selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Welsh Landfill 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	10.04.21
License Number	Licensing State	Date

ATTACHMENT B

Statistical Analysis Output

GROUNDWATER STATS CONSULTING

August 26, 2021

Geosyntec Consultants
Attn: Ms. Allison Kreinberg
941 Chatham Lane, #103
Columbus, OH 43221

Re: Welsh Landfill – June 2021 Assessment Monitoring Report

Dear Ms. Kreinberg,

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the statistical analysis of groundwater data for the June 2021 Assessment Monitoring report for American Electric Power Inc.'s Welsh Landfill. The analysis complies with the Texas Commission of Environmental Quality Rule 30 TAC 352 as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

Sampling began at the site for the Coal Combustion Residual (CCR) program in 2016. Below is a list of the monitoring well network, as provided by Geosyntec Consultants. Note that originally the network included upgradient well AD-18; however, further research, reportedly, identified that this well was not providing adequate representation of the groundwater quality upgradient of this site and exhibited different chemical properties from the neighboring upgradient wells. Therefore, data from this well is no longer included in the statistical analysis.

- **Upgradient wells:** AD-1, AD-5, and AD-17
- **Downgradient wells:** AD-11, AD-13, and AD-14

Data were sent electronically, and the statistical analysis was reviewed by Kristina Rayner, Groundwater Statistician and Founder of Groundwater Stats Consulting (GSC). The analysis was conducted according to the Statistical Analysis Plan prepared by GSC and approved by Dr. Cameron, PhD Statistician with MacStat Consulting, primary author of the USEPA Unified Guidance, and Senior Advisor to GSC.

The CCR Assessment Monitoring program consists of the following constituents:

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

Time series plots for Appendix IV parameters are provided for all wells and constituents, and are used to evaluate concentrations over the entire record (Figure A). Additionally, box plots are included for all constituents at upgradient and downgradient wells (Figure B). For all constituents, a substitution of the most recent reporting limit is used for non-detect data. While the reporting limits may vary from well to well, a single reporting limit substitution is used across all wells for a given parameter in the time series plots since the wells are plotted as a group.

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 previously identified and flagged as outliers may be seen in the Outlier Summary following this letter (Figure C) and are plotted in a lighter font and disconnected symbol on the time series graphs. While the reporting limits may vary from well to well, a single reporting limit substitution is used across all wells for a given parameter in the time series plots since the wells are plotted as a group.

Summary of Statistical Methods – Appendix IV Parameters

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

- 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. This technique adjusts the mean

and standard deviation of the historical concentrations to account for concentrations below the reporting limit.
- Nonparametric tolerance limits are used on data containing greater than 50% non-detects.

Background Update – Conducted in December 2020

Outlier Analysis

Prior to evaluating Appendix IV parameters, background (upgradient) data were screened through visual screening and Tukey's outlier test for potential outliers and extreme trending patterns that would lead to artificially elevated statistical limits. Background data are screened for outliers and extreme trending patterns that would lead to artificially elevated statistical limits. High outliers are also cautiously flagged in the downgradient wells when they are clearly much different from the rest of the data. This is generally a regulatory conservative approach in that it will reduce the variance and thus reduce the width of parametric confidence intervals, although it will also reduce the mean and thus lower the entire interval. The intent is to better represent the actual downgradient mean.

Tukey's outlier test results for Appendix IV parameters were included with the background update conducted in December 2020. As mentioned above, a list of flagged values follows this report (Figure C).

Tolerance Limits

Interwell Upper Tolerance limits were used to calculate background limits from all available pooled upgradient well data for each Appendix IV parameter through October 2020 (Figure D). Parametric tolerance limits use a target of 95% confidence and 95% coverage. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples. These background limits were then compared to the Maximum Contaminant Levels (MCLs) to determine the highest limit for use as the Groundwater Protection Standard (GWPS) in the confidence interval comparisons (Figure E). GWPS will be updated during Fall 2021.

Evaluation of Appendix IV Parameters – June 2021

Confidence intervals were then constructed with data through June 2021 on downgradient wells for each of the Appendix IV parameters using the highest limit of the MCL, CCR-Rule specified levels, or background limit as the GWPS as discussed above (Figure F). Only when the entire confidence interval is above a GWPS is the

well/constituent pair considered to exceed its respective standard. No exceedances were noted for any of the well/constituent pairs. A summary of the confidence interval results follows this letter.

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

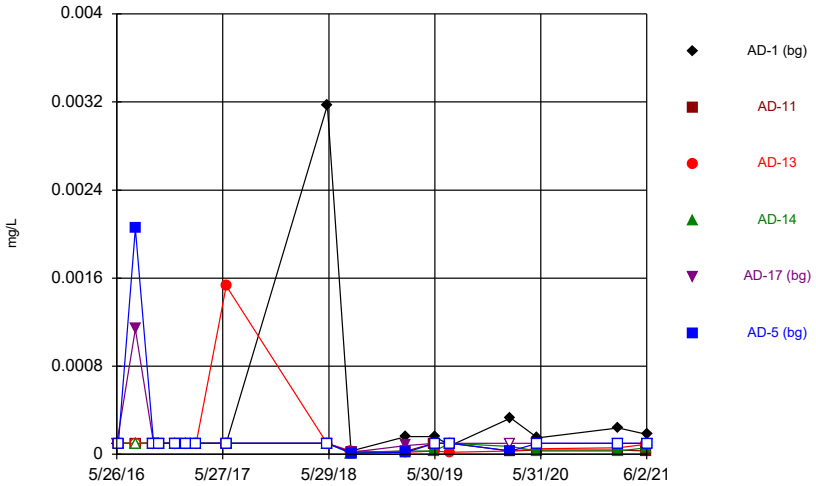
For Groundwater Stats Consulting,

Andrew Collins
Project Manager

Kristina Rayner
Groundwater Statistician

Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

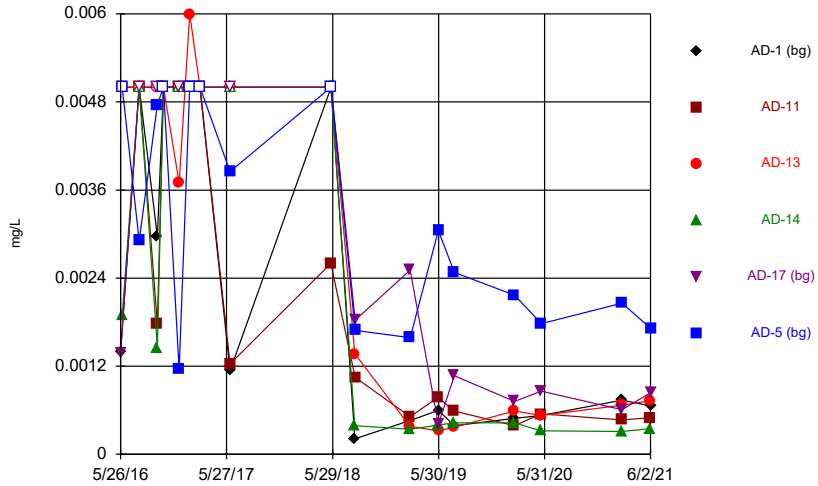
Time Series



Constituent: Antimony, total Analysis Run 7/28/2021 9:39 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

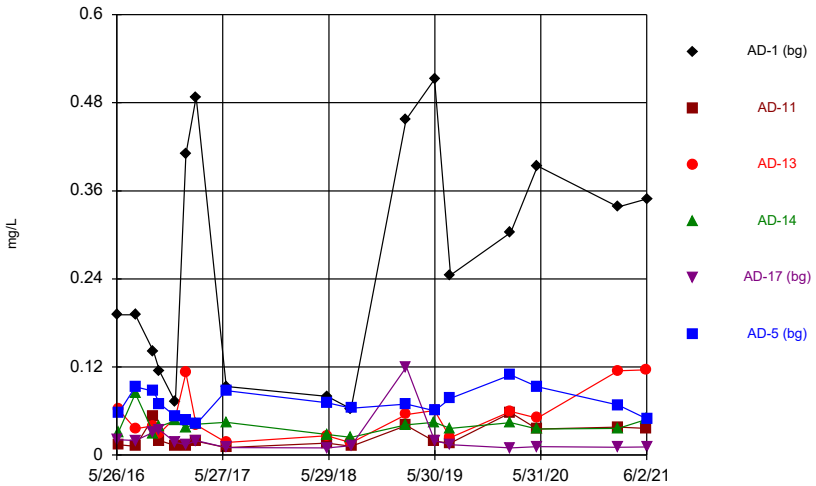
Time Series



Constituent: Arsenic, total Analysis Run 7/28/2021 9:39 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG

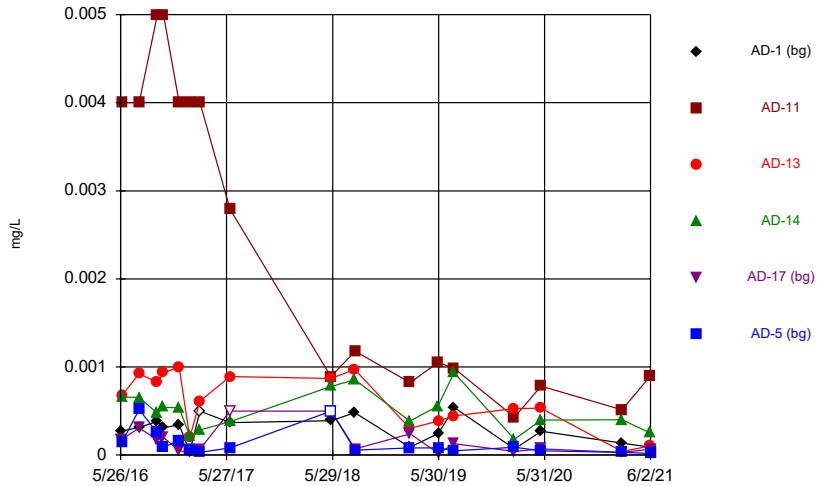
Time Series



Constituent: Barium, total Analysis Run 7/28/2021 9:39 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

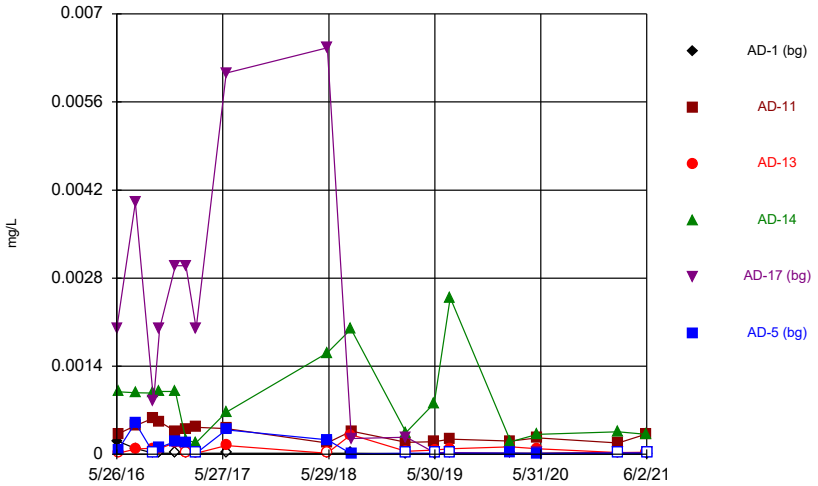
Time Series



Constituent: Beryllium, total Analysis Run 7/28/2021 9:39 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

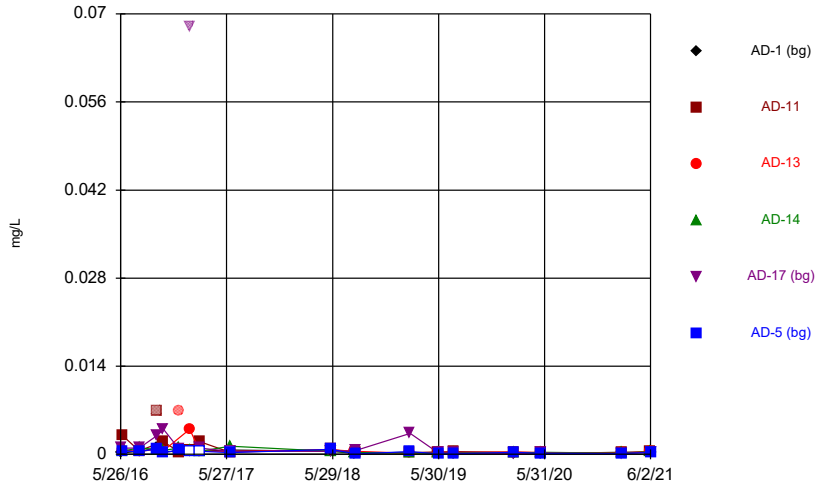
Time Series



Constituent: Cadmium, total Analysis Run 7/28/2021 9:39 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

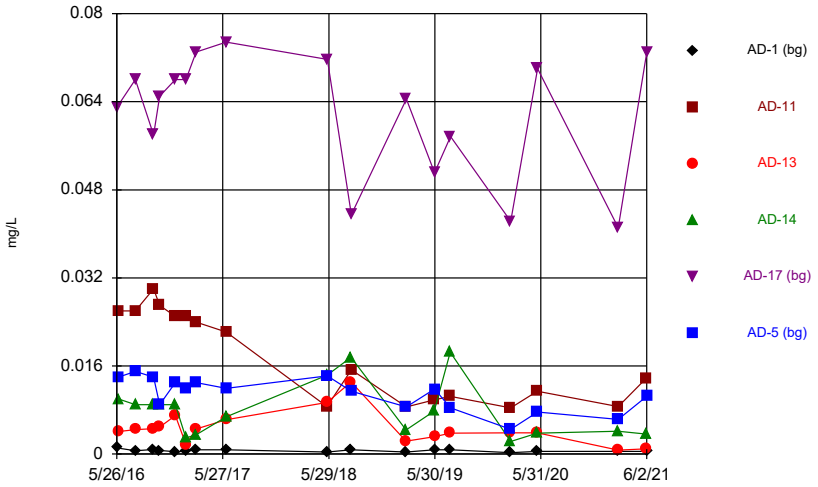
Time Series



Constituent: Chromium, total Analysis Run 7/28/2021 9:39 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG

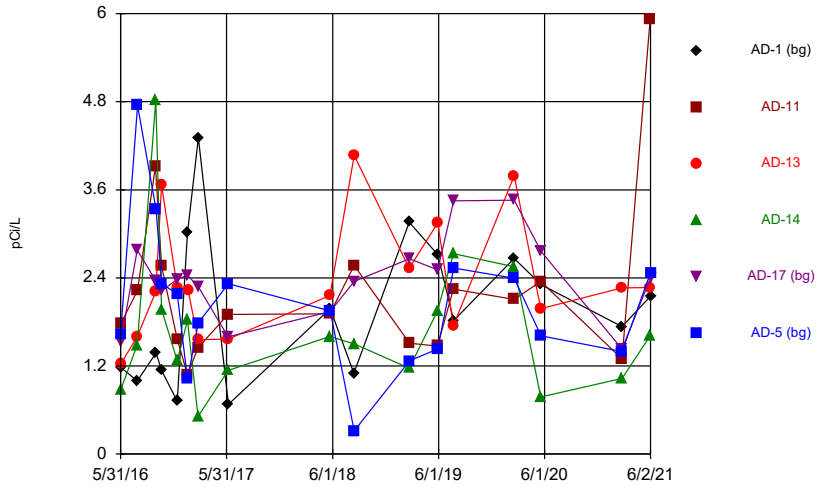
Time Series



Constituent: Cobalt, total Analysis Run 7/28/2021 9:39 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG

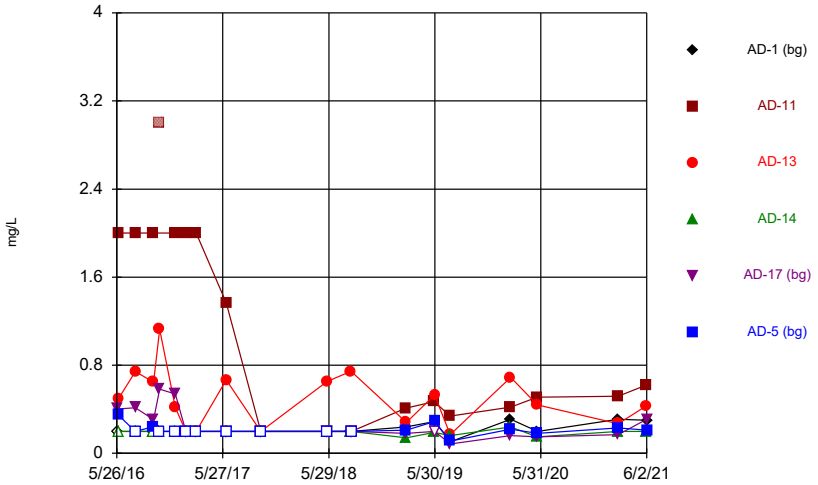
Time Series



Constituent: Combined Radium 226 + 228 Analysis Run 7/28/2021 9:39 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

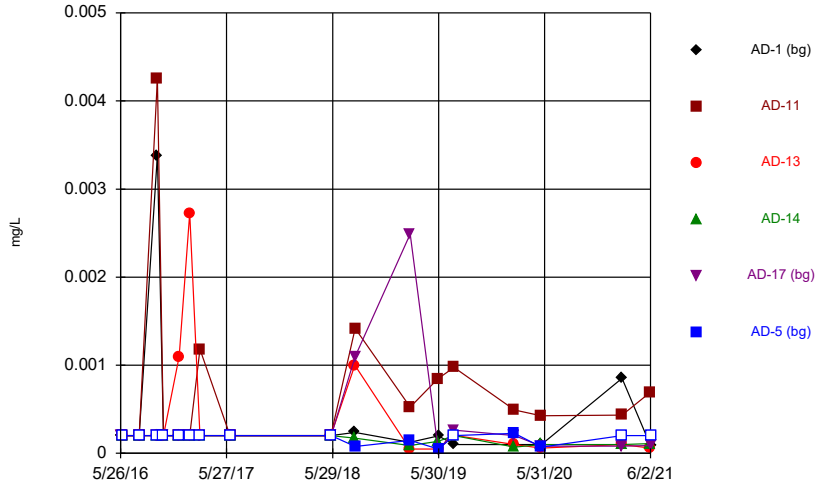
Time Series



Constituent: Fluoride, total Analysis Run 7/28/2021 9:39 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

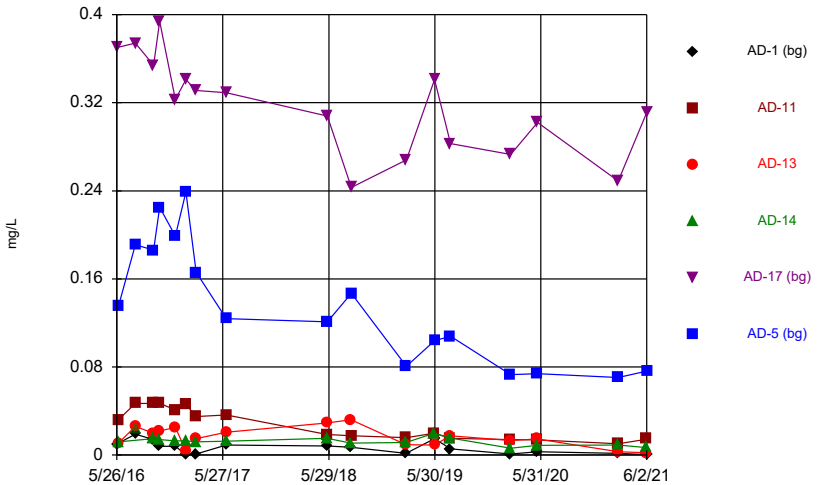
Time Series



Constituent: Lead, total Analysis Run 7/28/2021 9:39 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

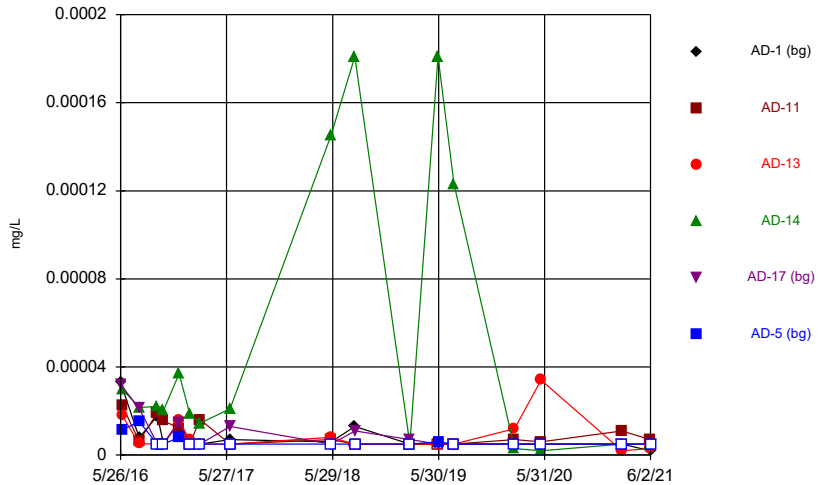
Time Series



Constituent: Lithium, total Analysis Run 7/28/2021 9:39 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

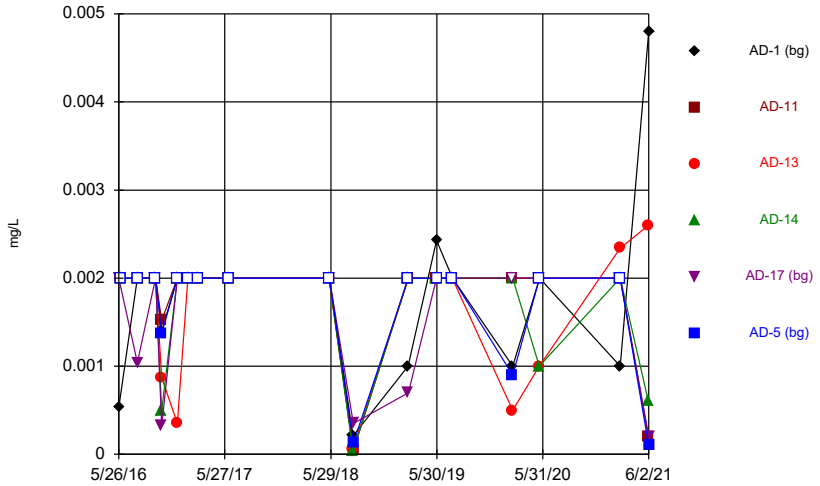
Time Series



Constituent: Mercury, total Analysis Run 7/28/2021 9:39 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

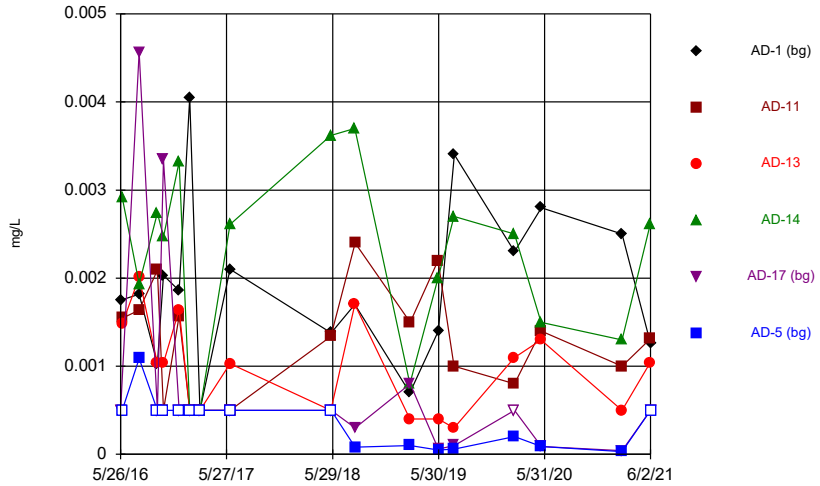
Time Series



Constituent: Molybdenum, total Analysis Run 7/28/2021 9:39 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

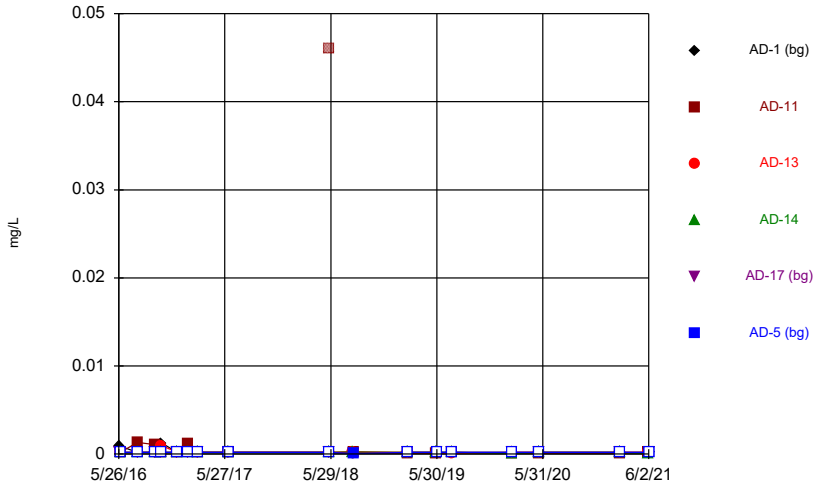
Time Series



Constituent: Selenium, total Analysis Run 7/28/2021 9:39 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

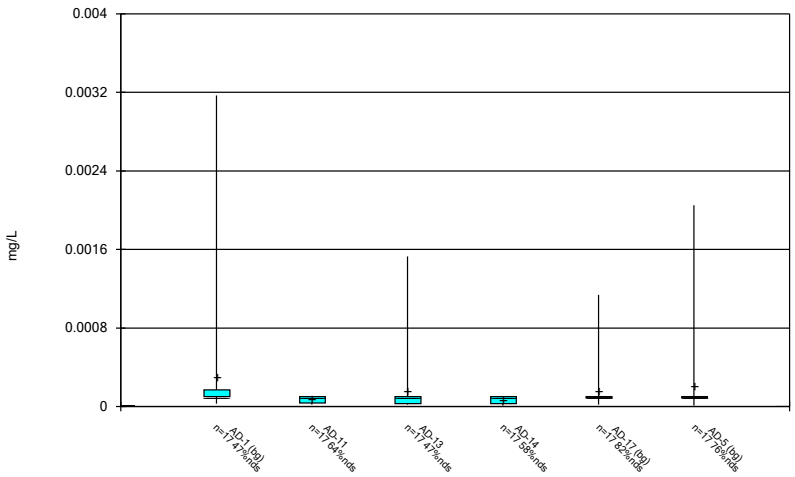
Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Thallium, total Analysis Run 7/28/2021 9:39 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

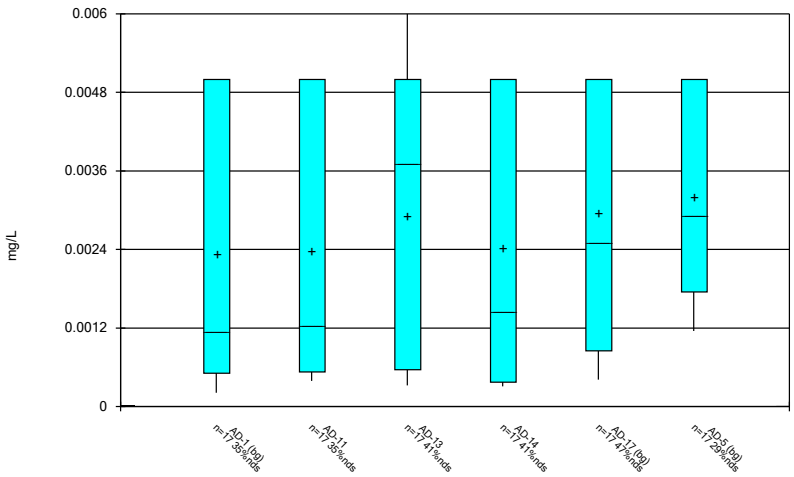
Box & Whiskers Plot



Constituent: Antimony, total Analysis Run 7/28/2021 9:41 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG

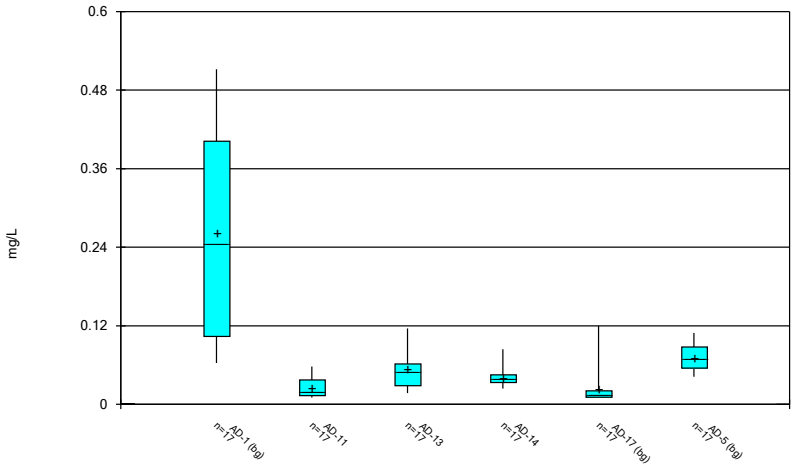
Box & Whiskers Plot



Constituent: Arsenic, total Analysis Run 7/28/2021 9:41 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG

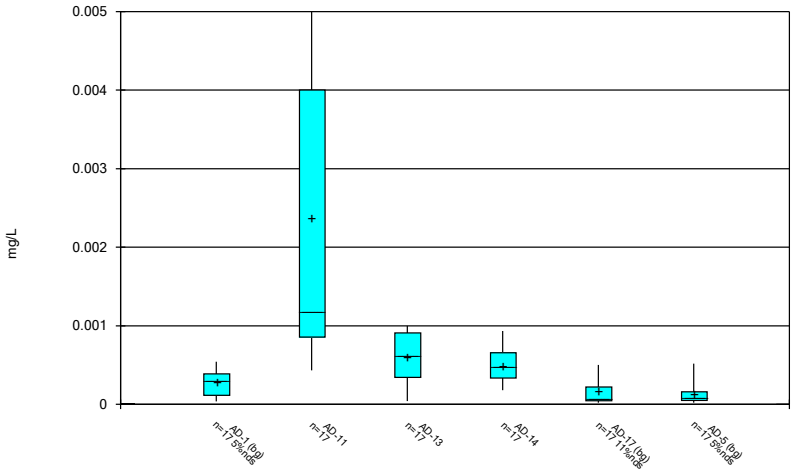
Box & Whiskers Plot



Constituent: Barium, total Analysis Run 7/28/2021 9:41 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Sanitas™ v.9.6.30 Groundwater Stats Consulting. UG

Box & Whiskers Plot



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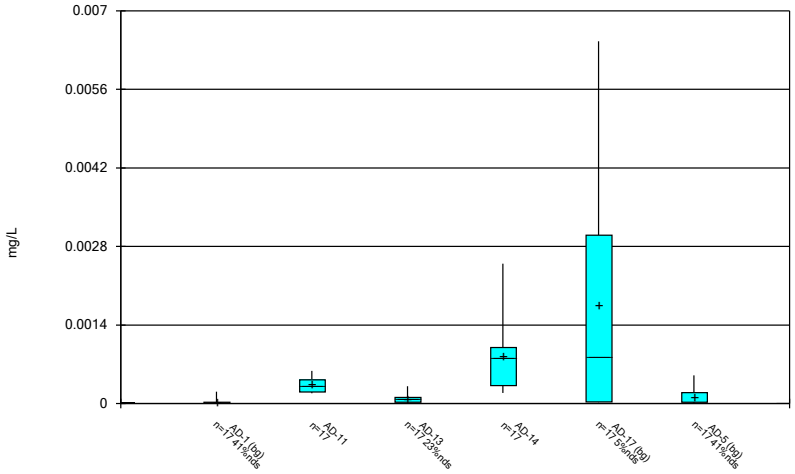
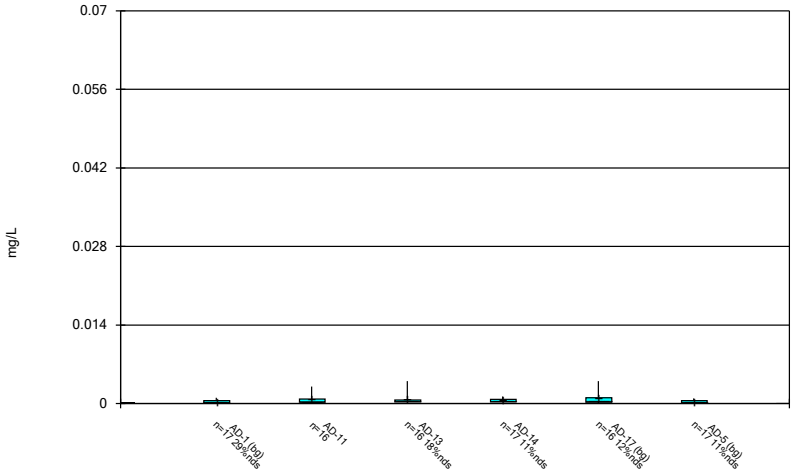
Welsh Landfill Client: Geosyntec Data: Welsh LF

Box & Whiskers Plot



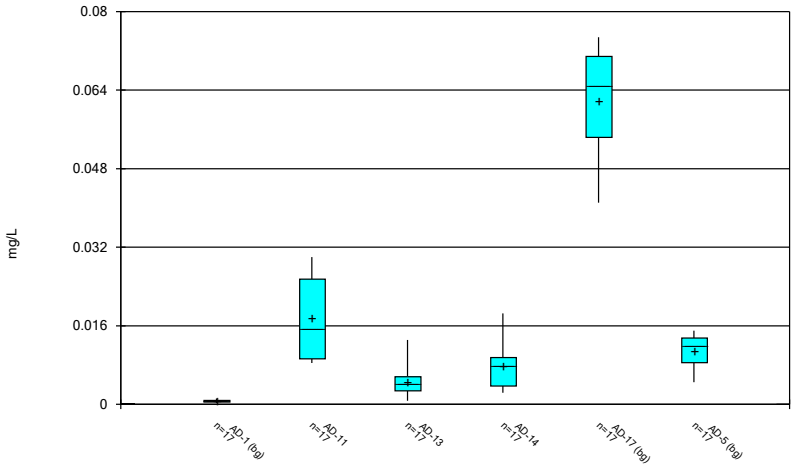
Constituent: Cadmium, total Analysis Run 7/28/2021 9:41 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Box & Whiskers Plot



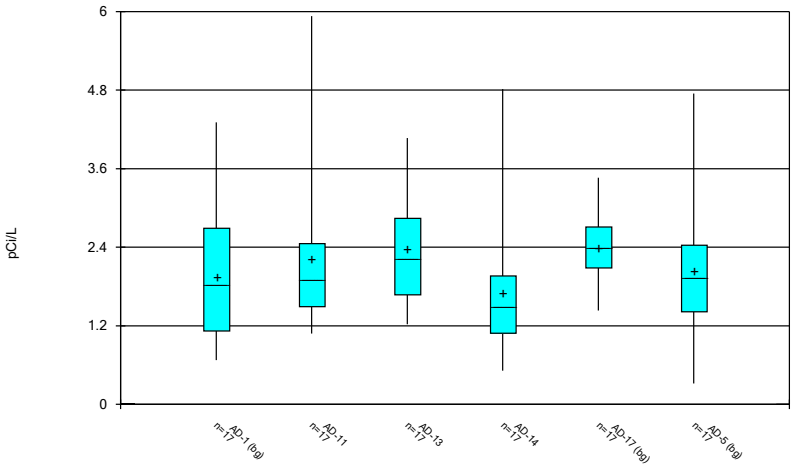
Constituent: Chromium, total Analysis Run 7/28/2021 9:41 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Box & Whiskers Plot



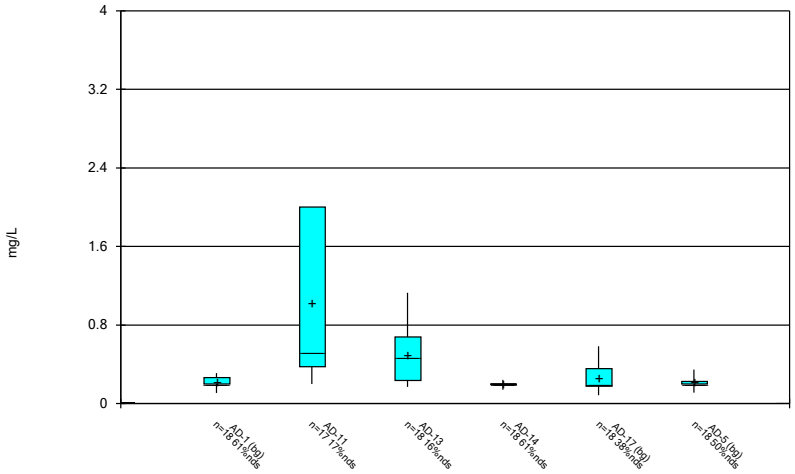
Constituent: Cobalt, total Analysis Run 7/28/2021 9:41 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Box & Whiskers Plot



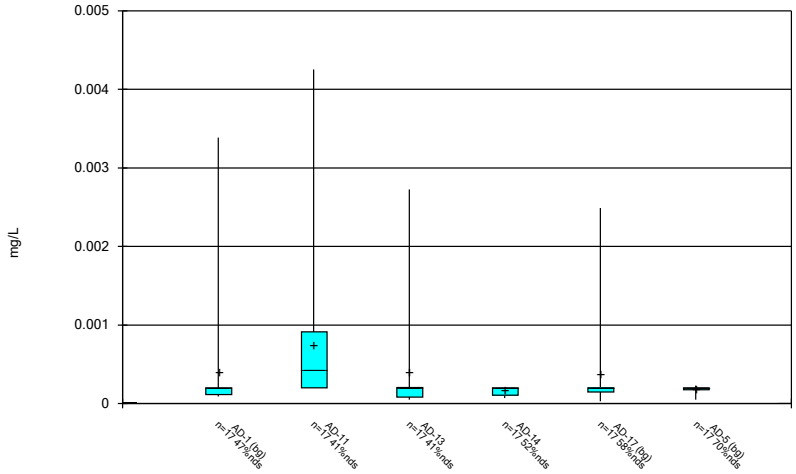
Constituent: Combined Radium 226 + 228 Analysis Run 7/28/2021 9:41 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Box & Whiskers Plot



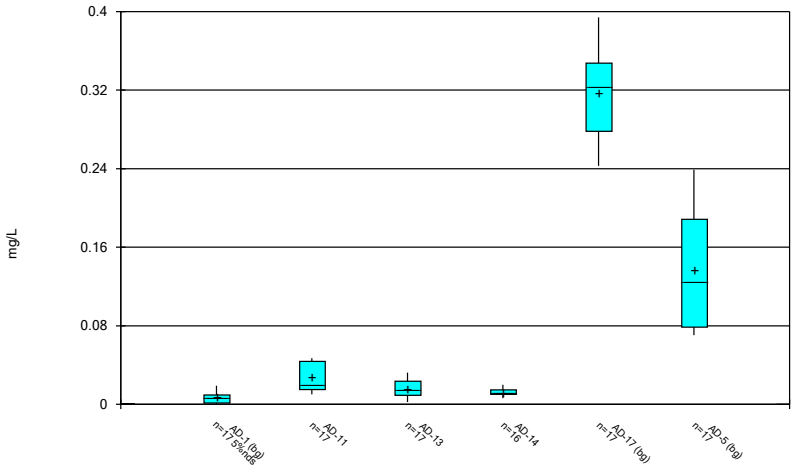
Constituent: Fluoride, total Analysis Run 7/28/2021 9:42 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Box & Whiskers Plot



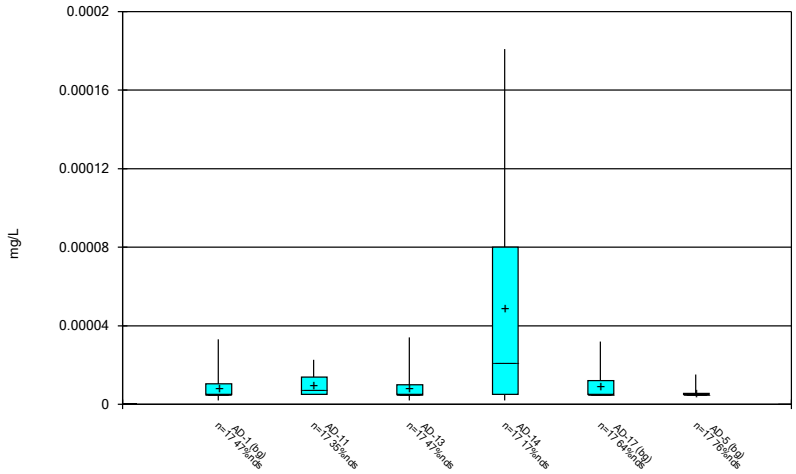
Constituent: Lead, total Analysis Run 7/28/2021 9:42 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Box & Whiskers Plot



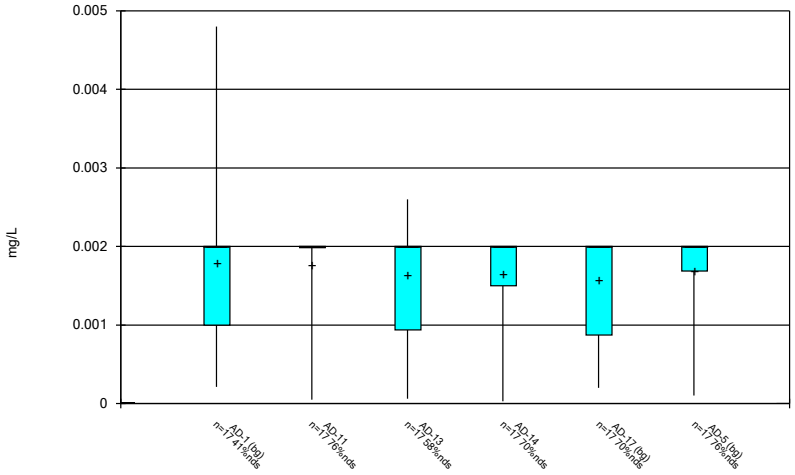
Constituent: Lithium, total Analysis Run 7/28/2021 9:42 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Box & Whiskers Plot



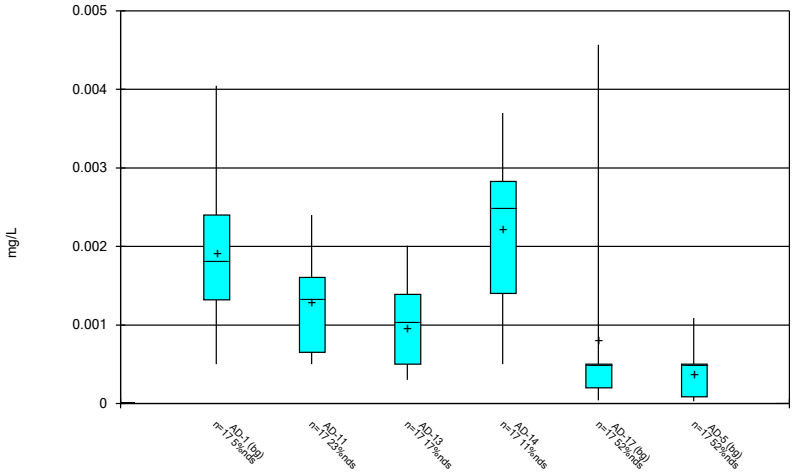
Constituent: Mercury, total Analysis Run 7/28/2021 9:42 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Box & Whiskers Plot



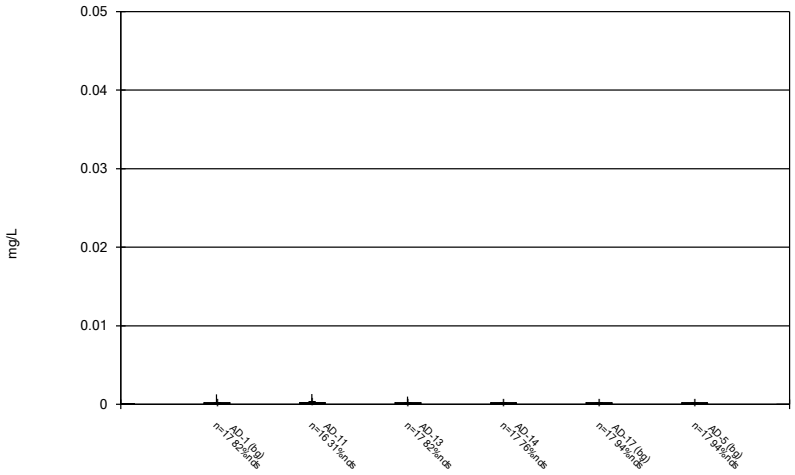
Constituent: Molybdenum, total Analysis Run 7/28/2021 9:42 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Box & Whiskers Plot



Constituent: Selenium, total Analysis Run 7/28/2021 9:42 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Box & Whiskers Plot



Constituent: Thallium, total Analysis Run 7/28/2021 9:42 AM
Welsh Landfill Client: Geosyntec Data: Welsh LF

Outlier Summary

Welsh Landfill Client: Geosyntec Data: Welsh LF Printed 7/28/2021, 9:43 AM

	AD-11 Chromium, total (mg/L)	AD-13 Chromium, total (mg/L)	AD-17 Chromium, total (mg/L)	AD-11 Fluoride, total (mg/L)	AD-14 Lithium, total (mg/L)	AD-11 Thallium, total (mg/L)
7/29/2016					0.024 (o)	
9/30/2016	0.007 (o)					
10/21/2016				3 (o)		
12/14/2016		0.007 (o)				
1/20/2017			0.068 (O)			
5/23/2018						0.046 (o)

Upper Tolerance Limits

Welsh Landfill Client: Geosyntec Data: Welsh LF Printed 12/15/2020, 3:18 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Bg N	Std. Dev.	%NDs	Transform	Alpha	Method
Antimony, total (mg/L)	n/a	0.00317	n/a	n/a	n/a	48	n/a	70.83	n/a	0.08526	NP Inter(normal...
Arsenic, total (mg/L)	n/a	0.00628	n/a	n/a	n/a	48	n/a	39.58	n/a	0.08526	NP Inter(normal...
Barium, total (mg/L)	n/a	0.6453	n/a	n/a	n/a	48	1.132	0	ln(x)	0.05	Inter
Beryllium, total (mg/L)	n/a	0.0007729	n/a	n/a	n/a	48	0.01767	8.333	x^(1/3)	0.05	Inter
Cadmium, total (mg/L)	n/a	0.00646	n/a	n/a	n/a	48	n/a	31.25	n/a	0.08526	NP Inter(normal...
Chromium, total (mg/L)	n/a	0.004	n/a	n/a	n/a	47	n/a	19.15	n/a	0.08974	NP Inter(normal...
Cobalt, total (mg/L)	n/a	0.0748	n/a	n/a	n/a	48	n/a	0	n/a	0.08526	NP Inter(normal...
Combined Radium 226 + 228 (pCi/L)	n/a	4.007	n/a	n/a	n/a	48	0.895	0	No	0.05	Inter
Fluoride, total (mg/L)	n/a	0.583	n/a	n/a	n/a	51	n/a	52.94	n/a	0.0731	NP Inter(normal...
Lead, total (mg/L)	n/a	0.003384	n/a	n/a	n/a	48	n/a	58.33	n/a	0.08526	NP Inter(normal...
Lithium, total (mg/L)	n/a	0.394	n/a	n/a	n/a	48	n/a	2.083	n/a	0.08526	NP Inter(normal...
Mercury, total (mg/L)	n/a	0.000033	n/a	n/a	n/a	48	n/a	60.42	n/a	0.08526	NP Inter(normal...
Molybdenum, total (mg/L)	n/a	0.00243	n/a	n/a	n/a	48	n/a	68.75	n/a	0.08526	NP Inter(normal...
Selenium, total (mg/L)	n/a	0.0053	n/a	n/a	n/a	48	n/a	35.42	n/a	0.08526	NP Inter(normal...
Thallium, total (mg/L)	n/a	0.001251	n/a	n/a	n/a	48	n/a	89.58	n/a	0.08526	NP Inter(NDs)

WELSH LANDFILL GWPS			
Constituent Name	**MCL**	**Background Limit**	**GWPS**
Antimony, Total (mg/L)	0.006	0.0032	0.006
Arsenic, Total (mg/L)	0.01	0.0063	0.01
Barium, Total (mg/L)	2	0.65	2
Beryllium, Total (mg/L)	0.004	0.00077	0.004
Cadmium, Total (mg/L)	0.005	0.0065	0.0065
Chromium, Total (mg/L)	0.1	0.004	0.1
Cobalt, Total (mg/L)	n/a	0.075	0.075
Combined Radium, Total (pCi/L)	5	4.01	5
Fluoride, Total (mg/L)	4	0.58	4
Lead, Total (mg/L)	n/a	0.0034	0.0034
Lithium, Total (mg/L)	n/a	0.39	0.39
Mercury, Total (mg/L)	0.002	0.000033	0.002
Molybdenum, Total (mg/L)	n/a	0.0024	0.0024
Selenium, Total (mg/L)	0.05	0.0053	0.05
Thallium, Total (mg/L)	0.002	0.0013	0.002

**Grey cell indicates Background Limit is higher than MCL*

**MCL = Maximum Contaminant Level*

**GWPS = Groundwater Protection Standard*

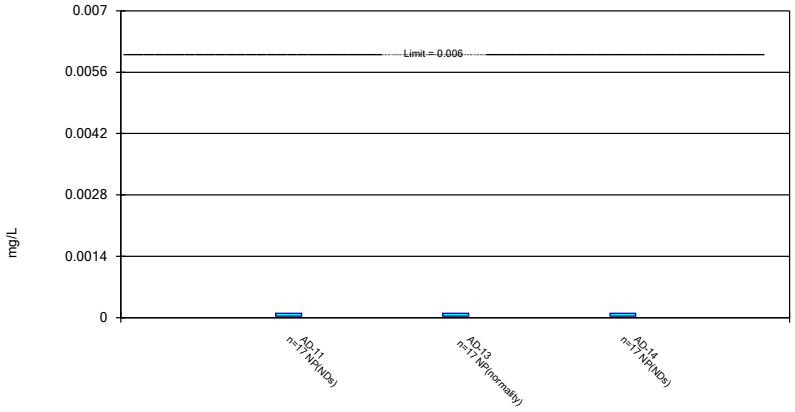
Confidence Intervals - All Results (No Significant)

Welsh Landfill Client: Geosyntec Data: Welsh LF Printed 8/26/2021, 3:29 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony, total (mg/L)	AD-11	0.0001	0.00003	0.006	No	17	0.00007588	0.00003392	64.71	None	No	0.01	NP (NDs)
Antimony, total (mg/L)	AD-13	0.0001	0.00003	0.006	No	17	0.0001565	0.0003555	47.06	None	No	0.01	NP (normality)
Antimony, total (mg/L)	AD-14	0.0001	0.00003	0.006	No	17	0.00007412	0.00003429	58.82	None	No	0.01	NP (NDs)
Arsenic, total (mg/L)	AD-11	0.005	0.00051	0.01	No	17	0.002379	0.002068	35.29	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	AD-13	0.005	0.00053	0.01	No	17	0.002921	0.002284	41.18	None	No	0.01	NP (normality)
Arsenic, total (mg/L)	AD-14	0.005	0.00035	0.01	No	17	0.00243	0.002256	41.18	None	No	0.01	NP (normality)
Barium, total (mg/L)	AD-11	0.03047	0.01496	2	No	17	0.02501	0.01516	0	None	ln(x)	0.01	Param.
Barium, total (mg/L)	AD-13	0.06991	0.03258	2	No	17	0.0537	0.03238	0	None	sqrt(x)	0.01	Param.
Barium, total (mg/L)	AD-14	0.04675	0.03309	2	No	17	0.04088	0.0131	0	None	ln(x)	0.01	Param.
Beryllium, total (mg/L)	AD-11	0.004	0.000824	0.004	No	17	0.002373	0.001747	0	None	No	0.01	NP (normality)
Beryllium, total (mg/L)	AD-13	0.0008019	0.0004031	0.004	No	17	0.0006025	0.0003183	0	None	No	0.01	Param.
Beryllium, total (mg/L)	AD-14	0.0006381	0.0003603	0.004	No	17	0.0004992	0.0002217	0	None	No	0.01	Param.
Cadmium, total (mg/L)	AD-11	0.0004087	0.0002538	0.0065	No	17	0.0003313	0.0001236	0	None	No	0.01	Param.
Cadmium, total (mg/L)	AD-13	0.0001266	0.00005603	0.0065	No	17	0.0001994	0.0001835	23.53	Kaplan-Meier	ln(x)	0.01	Param.
Cadmium, total (mg/L)	AD-14	0.001158	0.0004158	0.0065	No	17	0.0008517	0.0006616	0	None	sqrt(x)	0.01	Param.
Chromium, total (mg/L)	AD-11	0.0008	0.000259	0.1	No	16	0.000773	0.0008189	0	None	No	0.01	NP (normality)
Chromium, total (mg/L)	AD-13	0.00073	0.000261	0.1	No	16	0.0006774	0.0009034	18.75	None	No	0.01	NP (normality)
Chromium, total (mg/L)	AD-14	0.0006953	0.0003184	0.1	No	17	0.0005323	0.0003248	11.76	None	sqrt(x)	0.01	Param.
Cobalt, total (mg/L)	AD-11	0.026	0.00863	0.075	No	17	0.01766	0.008102	0	None	No	0.01	NP (normality)
Cobalt, total (mg/L)	AD-13	0.006142	0.002615	0.075	No	17	0.004638	0.003051	0	None	sqrt(x)	0.01	Param.
Cobalt, total (mg/L)	AD-14	0.01047	0.004698	0.075	No	17	0.007982	0.004967	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-11	2.633	1.57	5	No	17	2.228	1.16	0	None	ln(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-13	2.891	1.848	5	No	17	2.369	0.8324	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	AD-14	2.171	1.089	5	No	17	1.695	0.9979	0	None	sqrt(x)	0.01	Param.
Fluoride, total (mg/L)	AD-11	2	0.338	4	No	17	0.9943	0.8168	17.65	None	No	0.01	NP (normality)
Fluoride, total (mg/L)	AD-13	0.6821	0.4107	4	No	18	0.4748	0.2826	16.67	Kaplan-Meier	No	0.01	Param.
Fluoride, total (mg/L)	AD-14	0.19	0.083	4	No	18	0.1219	0.05432	61.11	Kaplan-Meier	No	0.01	NP (NDs)
Lead, total (mg/L)	AD-11	0.005	0.000523	0.0034	No	17	0.00272	0.002147	41.18	None	No	0.01	NP (normality)
Lead, total (mg/L)	AD-13	0.005	0.00006	0.0034	No	17	0.002379	0.002352	41.18	None	No	0.01	NP (normality)
Lead, total (mg/L)	AD-14	0.005	0.0001	0.0034	No	17	0.002705	0.00251	52.94	None	No	0.01	NP (NDs)
Lithium, total (mg/L)	AD-11	0.046	0.0145	0.39	No	17	0.02774	0.01409	0	None	No	0.01	NP (normality)
Lithium, total (mg/L)	AD-13	0.02181	0.01042	0.39	No	17	0.01611	0.009092	0	None	No	0.01	Param.
Lithium, total (mg/L)	AD-14	0.01449	0.009959	0.39	No	16	0.01223	0.003484	0	None	No	0.01	Param.
Mercury, total (mg/L)	AD-11	0.0000156	0.000005	0.002	No	17	0.000009406	0.000005697	35.29	None	No	0.01	NP (normality)
Mercury, total (mg/L)	AD-13	0.000012	0.000003	0.002	No	17	0.0000085	0.00000786	47.06	None	No	0.01	NP (normality)
Mercury, total (mg/L)	AD-14	0.00004399	0.000008221	0.002	No	17	0.00004912	0.00006392	17.65	Kaplan-Meier	ln(x)	0.01	Param.
Molybdenum, total (mg/L)	AD-11	0.002	0.002	0.0024	No	17	0.001751	0.0006235	76.47	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	AD-13	0.00234	0.0008705	0.0024	No	17	0.001631	0.0007566	58.82	None	No	0.01	NP (NDs)
Molybdenum, total (mg/L)	AD-14	0.002	0.001	0.0024	No	17	0.001655	0.0006648	70.59	None	No	0.01	NP (NDs)
Selenium, total (mg/L)	AD-11	0.005	0.00131	0.05	No	17	0.002341	0.001576	23.53	None	No	0.01	NP (normality)
Selenium, total (mg/L)	AD-13	0.001331	0.0006144	0.05	No	17	0.001763	0.001617	17.65	Kaplan-Meier	ln(x)	0.01	Param.
Selenium, total (mg/L)	AD-14	0.003466	0.00203	0.05	No	17	0.002748	0.001146	11.76	None	No	0.01	Param.
Thallium, total (mg/L)	AD-11	0.00107	0.0001	0.002	No	16	0.0003537	0.0004277	31.25	None	No	0.01	NP (normality)
Thallium, total (mg/L)	AD-13	0.000277	0.0001	0.002	No	17	0.0002442	0.0001906	82.35	None	No	0.01	NP (NDs)
Thallium, total (mg/L)	AD-14	0.0002	0.0001	0.002	No	17	0.0001878	0.00004452	76.47	None	No	0.01	NP (NDs)

Non-Parametric Confidence Interval

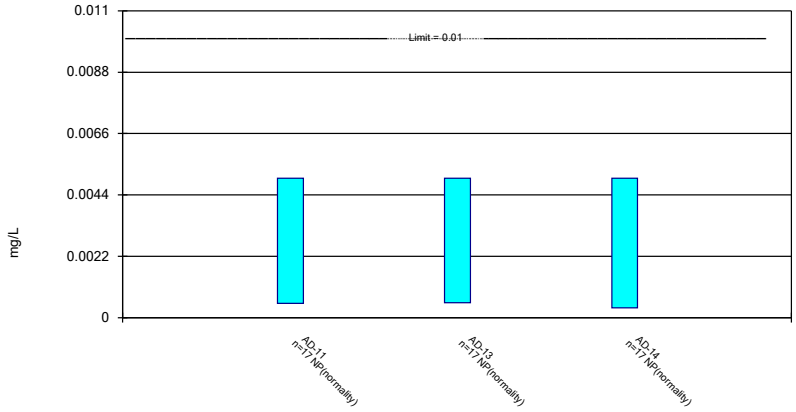
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Antimony, total Analysis Run 8/26/2021 3:29 PM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Non-Parametric Confidence Interval

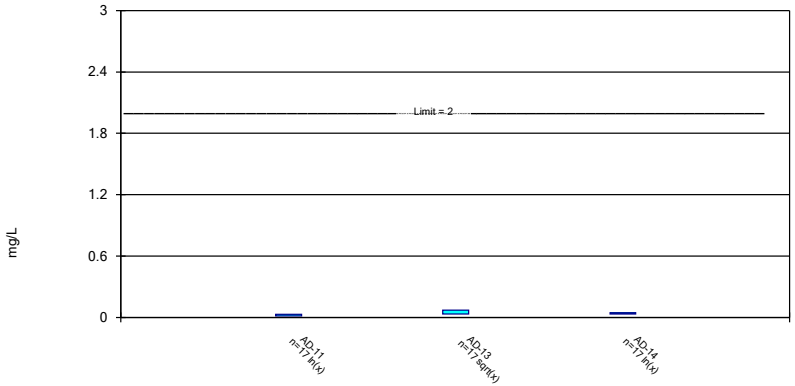
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Arsenic, total Analysis Run 8/26/2021 3:29 PM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Parametric Confidence Interval

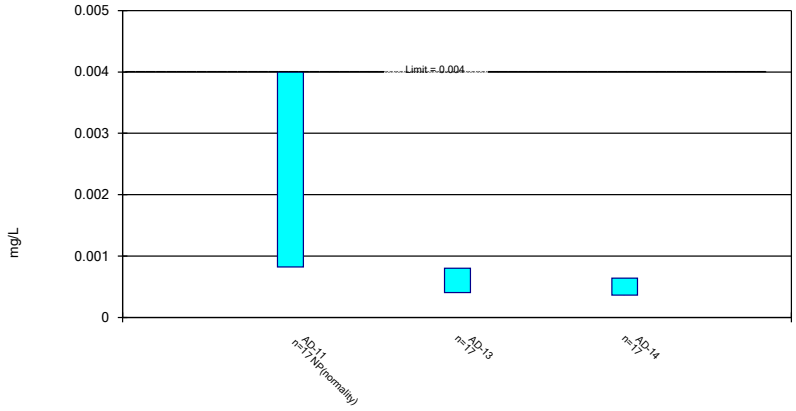
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 8/26/2021 3:29 PM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Parametric and Non-Parametric (NP) Confidence Interval

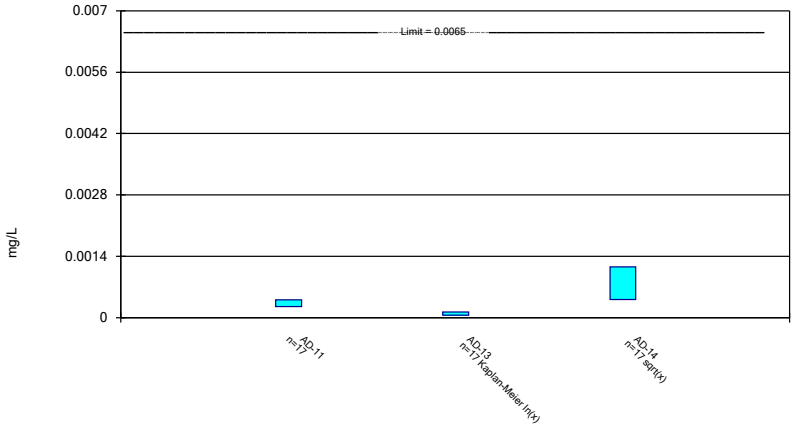
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total Analysis Run 8/26/2021 3:29 PM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Parametric Confidence Interval

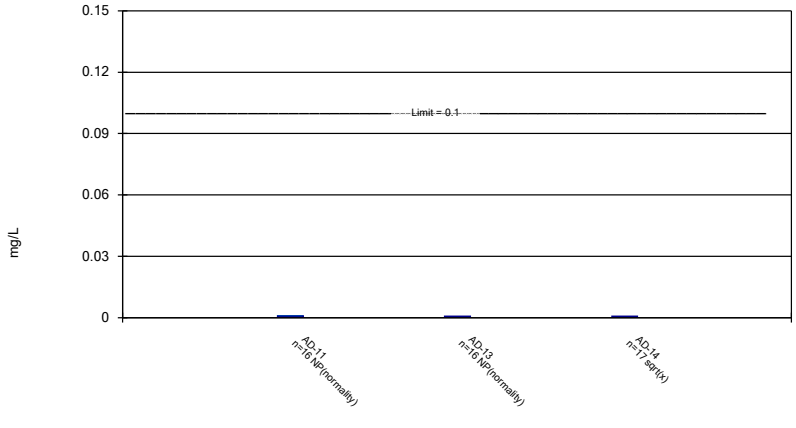
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 8/26/2021 3:29 PM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Parametric and Non-Parametric (NP) Confidence Interval

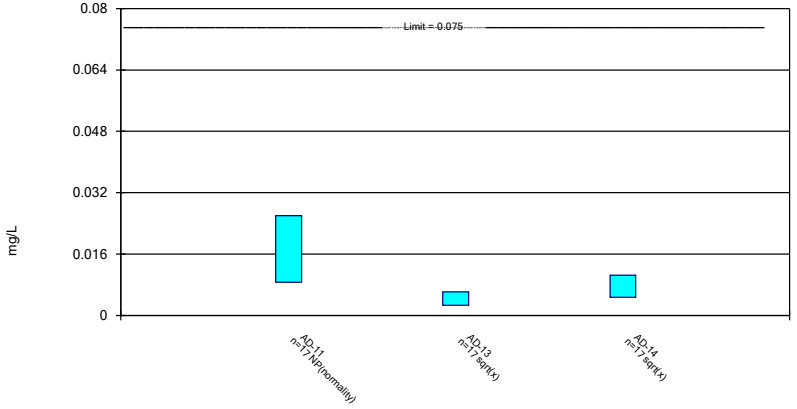
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 8/26/2021 3:29 PM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Parametric and Non-Parametric (NP) Confidence Interval

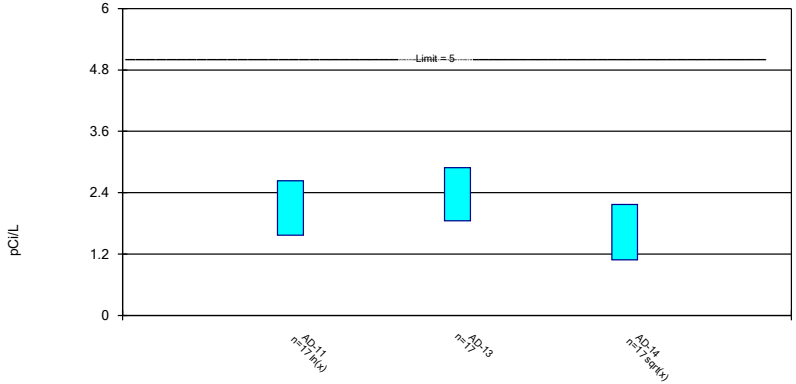
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 8/26/2021 3:29 PM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Parametric Confidence Interval

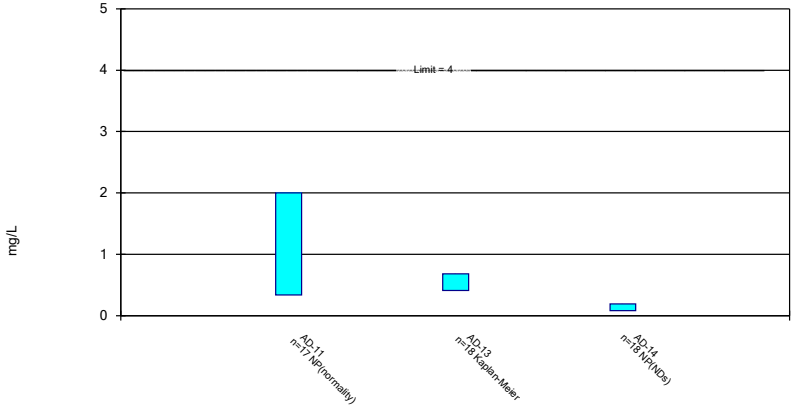
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 8/26/2021 3:29 PM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Parametric and Non-Parametric (NP) Confidence Interval

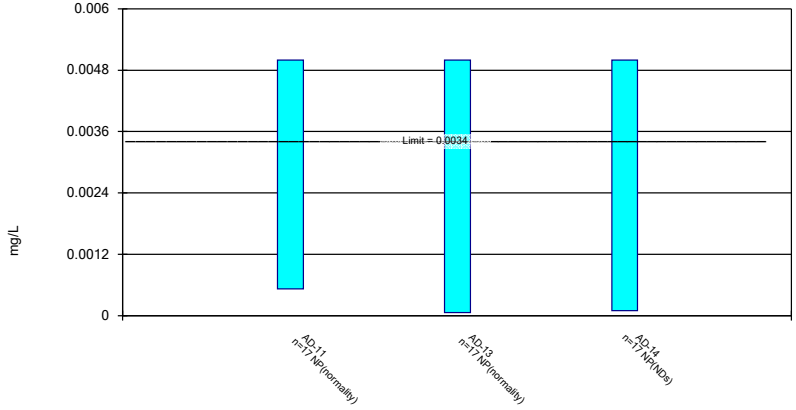
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride, total Analysis Run 8/26/2021 3:29 PM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Non-Parametric Confidence Interval

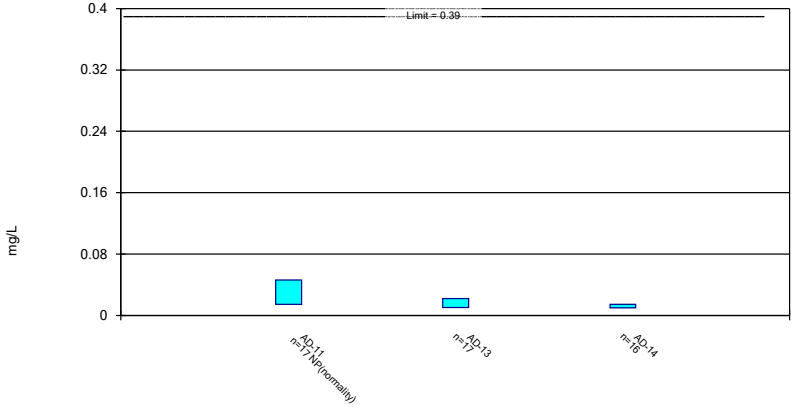
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Lead, total Analysis Run 8/26/2021 3:29 PM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Parametric and Non-Parametric (NP) Confidence Interval

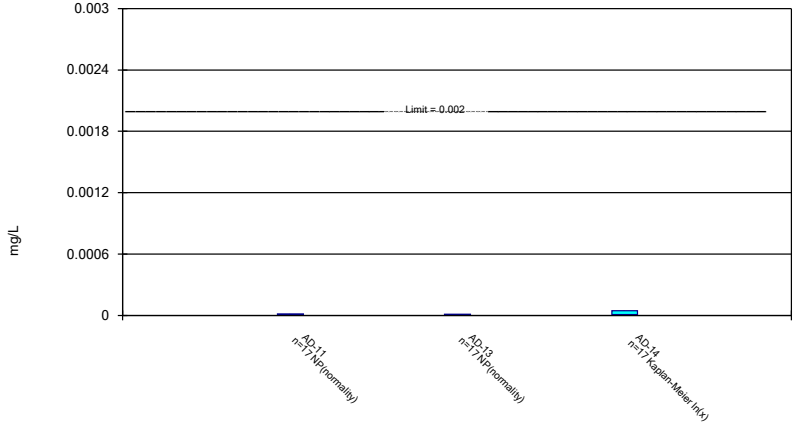
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 8/26/2021 3:29 PM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Parametric and Non-Parametric (NP) Confidence Interval

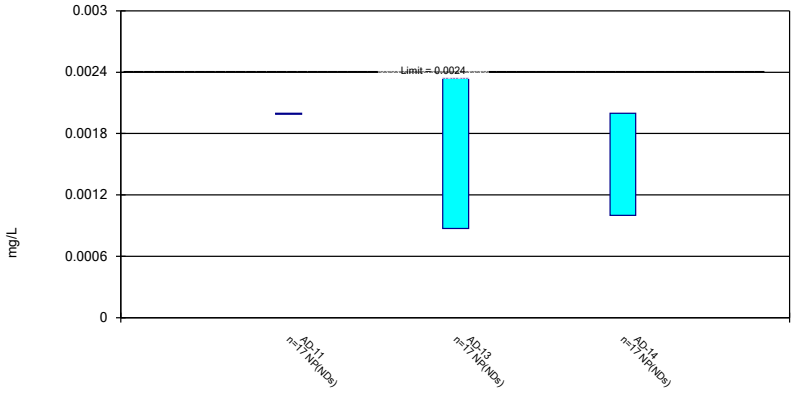
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Mercury, total Analysis Run 8/26/2021 3:29 PM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Non-Parametric Confidence Interval

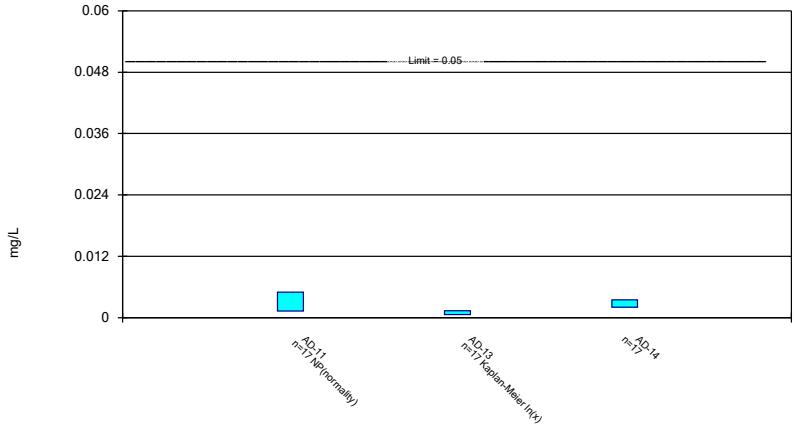
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Molybdenum, total Analysis Run 8/26/2021 3:29 PM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Parametric and Non-Parametric (NP) Confidence Interval

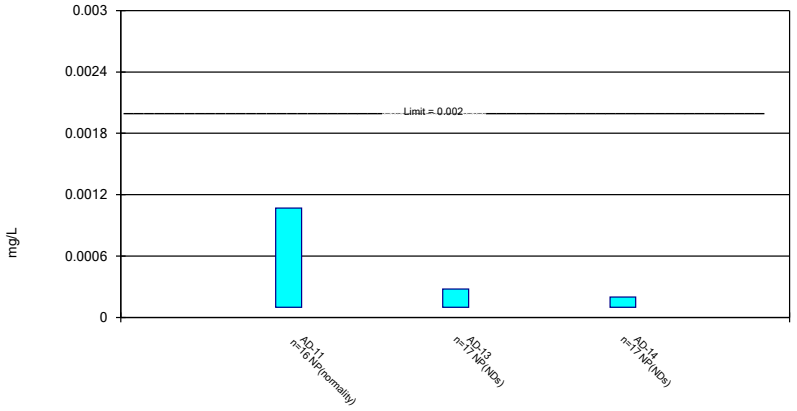
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 8/26/2021 3:29 PM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

Non-Parametric Confidence Interval

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



Constituent: Thallium, total Analysis Run 8/26/2021 3:29 PM View: Confidence Intervals
Welsh Landfill Client: Geosyntec Data: Welsh LF

APPENDIX 3 - NA

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

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: Welsh

Sampling Period: Feb. 2021

Sampling Contractor: Eagle Environmental

Signature:

Well No.	Well Locked	Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Housing and Pad in Good Shape	Well Properly Labeled	Comments
AD-15	✓	✓	✓	✓	✓	✓	
AD-11	✓	✓	✓	✓	✓	✓	
AD-14	✓	✓	✓	✓	✓	✓	
AD-17	✓	✓	✓	✓	✓	✓	

Instructions: Complete form and submit to AEP Environmental Services with Field Data. Place check mark for items that are satisfactory. Unsatisfactory items should be left blank with a note in the comments section on what needs to be remedied.

CCR Groundwater Monitoring Well Inspection Form

Facility: AEP WELSH PP

Sampling Period: FEBRUARY 23, 2021

Sampling Contractor: EAGLE

Signature: [signature]

Well No.	Well Locked	Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Housing and Pad in Good Shape	Well Properly Labeled	Comments
AD-01	✓	✓	✓	✓	✓	✓	
AD-08	✓	✓	✓	✓	✓	✓	
AD-09	✓	✓	✓	✓	✓	✓	
AD-13	✓	✓	✓	✓	✓	✓	
AD-05	✓	✓	✓	✓	✓	✓	

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 WELSH PP
Sample by	Kerry McDonald

Depth to water, feet (TOC)	15.89
Measured Total Depth, feet (TOC)	28.71

Sample Location ID	AD-01
Depth to water date	02/23/21

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)		
0925	16.30	176	6.40	757	10.7	5.38	277	17.73		
0930	16.30	176	6.47	744	10.8	2.77	296	18.24		
0935	16.30	176	6.50	740	6.8	1.78	298	18.69		
0940	16.30	176	6.52	737	6.2	1.55	298	18.73		
0945	16.31	176	6.55	736	5.9	1.52	298	18.77		

Total volume purged	
Sample appearance	CLEAR
Sample time	0947
Sample date	02/23/21

Facility Name	AFP WELSH PP
Sample by	KENNY McDONNELL

Depth to water, feet (TOC)	12.84
Measured Total Depth, feet (TOC)	32.88

Sample Location ID	AD-05
Depth to water date	02/23/21

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)		
1251	13.59	110	6.03	319	567	4.34	292	21.38		
1256	14.52	112	6.02	314	476	2.87	295	21.47		
				WON'T HOLD WATER LEVEL						

Total volume purged	
Sample appearance	TURBID
Sample time	1330
Sample date	02/23/21

Facility Name	Welsh
Sample by	Matt Hamilton

Depth to water, feet (TOC)	13.72
Measured Total Depth, feet (TOC)	22.10

Sample Location ID	AD-11
Depth to water date	2-23-21

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	13.84	200	5.84	344	11.8	7.00	193	21.48		
1030	13.84	200	6.23	363	3.1	6.12	200	20.34		
1035	13.84	200	6.27	387	2.5	5.63	215	20.31		

Total volume purged	
Sample appearance	clear
Sample time	1037
Sample date	2-23-21

Facility Name	AEP MCCSH DP
Sample by	Kenny McDonald

Depth to water, feet (TOC)	13.65
Measured Total Depth, feet (TOC)	21.27

Sample Location ID	AO-13
Depth to water date	02/23/21

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)		
1200	13.74	210	5.89	458	10.1	5.23	325	22.61		
1205	13.77	212	5.92	464	0.0	2.83	329	21.96		
1210	13.82	214	5.96	458	0.0	2.35	326	21.49		
1215	13.86	212	5.89	454	0.0	2.26	328	21.41		

Total volume purged	
Sample appearance	clear
Sample time	1217
Sample date	02/23/21

Facility Name	Welsh
Sample by	Matt Hamilton

Depth to water, feet (TOC)	11.70
Measured Total Depth, feet (TOC)	21.27

Sample Location ID	AD-14
Depth to water date	2-23-24

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1101	11.42	180	5.68	483	25.3	5.72	220	22.11		
1106	11.48	150	5.32	334	1.4	4.06	256	20.06		
1111	11.49	180	5.34	309	1.3	3.45	258	19.42		

Total volume purged	
Sample appearance	clear
Sample time	1113
Sample date	2-23-24

Duplicate

Facility Name	Welsh
Sample by	Matt Hamilton

Depth to water, feet (TOC)	22.38
Measured Total Depth, feet (TOC)	41.47

Sample Location ID	AD-17
Depth to water date	2-23-21

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)		
1154	22.98	120	5.53	1,760	14.4	2.51	42	22.71		
1209	23.65	120	5.38	1,760	23.1	1.35	51	22.30		
				Will not						
				hold water level						

Total volume purged	
Sample appearance	clear
Sample time	1241
Sample date	2-23-21

CCR Groundwater Monitoring Well Inspection Form

Facility: Welsh

Sampling Period: 6-1-21

Sampling Contractor: Eagle Env.

Signature:

Well No.	Well Locked	Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Housing and Pad in Good Shape	Well Properly Labeled	Comments
AP-15	✓	✓	✓	✓	✓	✓	
AP-11	✓	✓	✓		✓	✓	high vegitation
AP-14	✓	✓	✓		✓	✓	high vegitation
AP-3	✓	✓	✓	✓	✓	✓	gap in lid, allows wasp to nest
AP-16R	✓	✓	✓		✓	✓	overgrown
AP-17	✓	✓	✓	✓	✓	✓	
AP-2	✓	✓	✓		✓	✓	overgrown 11.45
AP-7	✓	✓	✓	✓	✓	✓	16.92
AP-10	✓	✓	✓		✓	✓	overgrown 14.14
AP-18	✓	✓	✓	✓	✓	✓	4.58
AP-22	✓	✓	✓		✓	✓	1.13 Severely overgrown
AP-23	✓	✓	✓		✓	✓	1.00 ~~Severely~~ severely overgrown

Hard to find

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: 06/01-02/21

Sampling Contractor: EAGLE ENVIRONMENTAL

Signature:

Well No.	Well Locked	Lock Functioning	Well Locked After Sampling	Access to Well Maintained	Well Housing and Pad in Good Shape	Well Properly Labeled	Comments	
AD-13	✓	✓	✓	✓	✓	✓		
AD-09	✓	✓	✓	✓	✓	✓		
AD-08	✓	✓	✓	✓	✓	✓		
AD-05	✓	✓	✓	✓	✓	✓		
AD-01	✓	✓	✓	✓	✓	✓		
AD-04C	✓	✓	✓	✓	✓	✓		
AD-04B	✓	✓	✓	✓	✓		NO LABEL	5.91
AD-04	✓	✓	✓	✓	✓	✓		15.03
AD-04A	✓	✓	✓	✓	✓		NO LABEL	15.04
AD-12	✓	✓	✓	[illegible]		✓	PAD COVERED IN SOIL + OVERGROWN	18.21
AD-06	✓	✓	✓	[illegible]		✓	PAD OVERGROWN	10.37

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 WELSHPP
Sample by	Kenny McDonald

Sample Location ID	AD-01

Depth to water, feet (TOC)	11.75
Measured Total Depth, feet (TOC)	28.71

Depth to water date	06/02/21

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	11.91	160	6.16	662	0.0	5.16	154	20.80		
0959	11.94	160	6.29	683	0.0	1.70	94	20.97		
1004	11.95	160	6.24	686	0.0	1.67	90	21.02		
1009	11.99	160	6.20	680	0.0	1.61	87	21.16		
1014	12.06	160	6.17	678	0.0	1.57	82	21.21		

Total volume purged	
Sample appearance	Clear
Sample time	1016
Sample date	06/02/21

DUPLICATE - BACKGROUND

1200

Facility Name	AFP WELSH PP
Sample by	KENNA McDONALD

Sample Location ID	AD-05

Depth to water, feet (TOC)	13.85
Measured Total Depth, feet (TOC)	32.88

Depth to water date	06/02/21

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)		
0821	15.02	110	5.77	326	223	4.65	315	21.27		
0826	15.97	110	5.83	322	93.0	3.99	322	21.00		
				WON'T HOLD WATER LEVEL						
	TOOK AFTER SAMPLING		5.79	325	77.0	4.85	155	21.39		

Total volume purged	
Sample appearance	TURBID
Sample time	~~0900~~ 0906
Sample date	06/02/21

Facility Name	Walsh
Sample by	Matt Hamilton

Sample Location ID	AD-11

Depth to water, feet (TOC)	13.48
Measured Total Depth, feet (TOC)	22.10

Depth to water date	6-1-21

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
1052	13.61	200	5.52	1,240	38.4	3.45	256	23.90		
1057	13.62	"	5.63	1,270	18.5	1.27	265	21.65		
1102	13.62	"	5.66	1,250	7.1	1.21	256	21.24		
1107	13.63	"	5.67	1,240	7.0	1.18	251	21.09		

Total volume purged	
Sample appearance	clear
Sample time	1109
Sample date	6-1-21

Facility Name	AFP WELLSHPD
Sample by	Kenny McDonald

Sample Location ID	AD-13

Depth to water, feet (TOC)	12.31
Measured Total Depth, feet (TOC)	21.27

Depth to water date	06/01/21

Purge Stabilization Data

Time	Water Depth (from TOC)	Flow Rate (mL/min)	pH (S.U.)	Spec Cond (µS/cm)	Turbidity (N.T.U)	D.O. (mg/L)	ORP (mV)	Temperature (°C)		
0903	12.53	160	5.31	562	0.0	3.91	293	22.15		
0908	12.57	160	5.71	497	0.0	3.07	271	22.07		
0913	12.63	160	5.87	463	0.0	3.08	265	21.90		
0918	12.70	160	5.98	437	0.0	3.16	261	21.64		
0923	12.74	160	6.00	433	0.0	3.22	259	21.68		
0928	12.80	160	6.07	430	0.0	3.22	257	21.87		

Total volume purged	
Sample appearance	CLEAN
Sample time	0930
Sample date	06/01/21

DUPLICATE LANDFILL
1200

Facility Name	Welsh
Sample by	Matt Hamilton

Sample Location ID	AD-14

Depth to water, feet (TOC)	9.55
Measured Total Depth, feet (TOC)	21.27

Depth to water date	6-1-21

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)		
1127	9.93	180	5.84	422	37.4	3.52	230	22.67		
1132	9.96	"	5.87	419	5.6	2.18	227	21.57		
1137	9.98	"	5.88	419	5.5	2.07	226	21.32		

Total volume purged	
Sample appearance	clear
Sample time	1139
Sample date	6-1-21

Facility Name	Welsh
Sample by	Matt Hamilton

Depth to water, feet (TOC)	22.17
Measured Total Depth, feet (TOC)	41.47

Sample Location ID	AD-17
Depth to water date	6-2-21

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)		
1124	22.75	120	5.75	2,160	15.2	1.98	270	22.44		
1127	23.31	120	5.68	2,180	12.2	1.57	241	20.96		
					Will not					
					Hold Water Level					

Total volume purged	
Sample appearance	clear
Sample time	1212
Sample date	6-2-21

Form REP-703
Rev. 1, 11/2013

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
T: 614-836-4221, Audinet 210-4221
F: 614-836-4168, Audinet 210-4168
http://aepenv/labs

Water Analysis

Location: Welsh PS ***Report Date: 10/24/2020***

AD-1

Sample Number: 202981-001 **Date Collected: 10/14/2020 12:04** **Date Received: 10/16/2020**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Alkalinity, as CaCO3	< 5	mg/L	U	20	5	MGK	10/16/2020 11:49	SM 2320B-2011
Chloride, Cl	2.16	mg/L		0.04	0.01	CRJ	10/20/2020 19:30	EPA 300.1-1997, Rev. 1.0
Fluoride, F	0.25	mg/L		0.06	0.01	CRJ	10/20/2020 19:30	EPA 300.1-1997, Rev. 1.0
Residue, Filterable, TDS	183	mg/L		50	20	HRF	10/19/2020	SM 2540C-2011
Sulfate, SO4	66.9	mg/L		0.4	0.06	CRJ	10/20/2020 19:30	EPA 300.1-1997, Rev. 1.0

AD-5

Sample Number: 202981-002 **Date Collected: 10/14/2020 10:42** **Date Received: 10/16/2020**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	18.8	mg/L		0.04	0.01	CRJ	10/20/2020 19:04	EPA 300.1-1997, Rev. 1.0
Fluoride, F	0.18	mg/L		0.06	0.01	CRJ	10/20/2020 19:04	EPA 300.1-1997, Rev. 1.0
Residue, Filterable, TDS	338	mg/L		100	40	HRF	10/19/2020	SM 2540C-2011
Sulfate, SO4	148	mg/L		2	0.3	CRJ	10/21/2020 09:18	EPA 300.1-1997, Rev. 1.0

AD-17

Sample Number: 202981-003 **Date Collected: 10/14/2020 11:50** **Date Received: 10/16/2020**

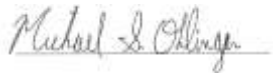
Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	35.7	mg/L		0.1	0.03	CRJ	10/20/2020 18:14	EPA 300.1-1997, Rev. 1.0
Fluoride, F	0.17	mg/L		0.2	0.04	CRJ	10/20/2020 18:14	EPA 300.1-1997, Rev. 1.0
Residue, Filterable, TDS	1720	mg/L		100	40	HRF	10/19/2020	SM 2540C-2011
Sulfate, SO4	1060	mg/L		10	2	CRJ	10/20/2020 17:48	EPA 300.1-1997, Rev. 1.0

Duplicate Background

Sample Number: 202981-004 **Date Collected: 10/14/2020 11:50** **Date Received: 10/16/2020**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	35.7	mg/L		0.1	0.03	CRJ	10/20/2020 16:58	EPA 300.1-1997, Rev. 1.0
Fluoride, F	0.19	mg/L		0.2	0.04	CRJ	10/20/2020 16:58	EPA 300.1-1997, Rev. 1.0
Residue, Filterable, TDS	1730	mg/L		100	40	HRF	10/19/2020	SM 2540C-2011
Sulfate, SO4	1060	mg/L		10	2	CRJ	10/20/2020 16:32	EPA 300.1-1997, Rev. 1.0

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.



Michael Ohlinger, Chemist

Email msohlinger@aep.com *Tel.*

Fax 614-836-4168 *Audinet 8-210-*

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: Jill Parker-Witt
Contact Phone: (318) 673-3816
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 202981

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, Fe, K, Mo, Mg, Na, Pb Se, TL	1 L bottle, Cool, 0-6°C TDS, F, Cl, SO_4	1 L bottle, Cool, 0-6°C Alkalinity, 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	10/14/2020	1204	G	GW	1				X					Routine (28 days)
AD-5	10/14/2020	1042	G	GW	1			X						
AD-17	10/14/2020	1150	G	GW	1			X						
DUPLICATE	10/14/2020	1150	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	10-15-20 1230		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Date/Time: 10-16-20 10am

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:** 4

Opened By SM, MK **Number of Glass Containers:** _____

Date/Time 10-16-20 9am **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? (Y) / N or N/A **Initial:** MK on ice / no ice

(IR Gun Ser# #2 (192635988), *Expir.* 11/12/2021) - 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:** MK 10-16-20

- 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# 20298 Initial & Date & Time : _____

Logged by SM Comments: _____

Reviewed by MGH _____

_____

_____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Form REP-703
Rev. 2, 05/2016

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
T: 614-836-4221, Audinet 210-4221
F: 614-836-4168, Audinet 210-4168
http://aepenv/labs

Water Analysis

Location: Welsh PS ***Report Date: 11/11/2020***

AD-1

Sample Number: 202988-001 **Date Collected: 10/14/2020 12:04** **Date Received: 10/19/2020**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.1	ug/L	U	0.5	0.1	GES	10/21/2020 16:15	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.3	ug/L	J	0.5	0.2	GES	10/21/2020 16:15	EPA 200.8-1994, Rev. 5.4
Barium, Ba	84.7	ug/L		1	0.2	GES	10/21/2020 16:15	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.984	ug/L		0.5	0.1	GES	10/21/2020 16:15	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	< 0.05	ug/L	U	0.2	0.05	GES	10/21/2020 16:15	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.9	ug/L	J	1	0.2	GES	10/21/2020 16:15	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	2.12	ug/L		0.2	0.1	GES	10/21/2020 16:15	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.3	ug/L	J	1	0.2	GES	10/21/2020 16:15	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	0.003	ug/L	J	0.005	0.002	JAB	10/20/2020	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 2	ug/L	U	10	2	GES	10/21/2020 16:15	EPA 200.8-1994, Rev. 5.4
Selenium, Se	5.3	ug/L		1	0.2	GES	10/21/2020 16:15	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.5	ug/L	U	2	0.5	GES	10/21/2020 16:15	EPA 200.8-1994, Rev. 5.4
Boron, B	0.670	mg/L		0.2	0.1	GES	10/21/2020 16:15	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	3.88	mg/L		0.3	0.1	DAM	10/22/2020 15:05	EPA 200.7-1994, Rev. 4.4
Iron, Fe	0.264	mg/L		0.1	0.02	DAM	10/22/2020 15:05	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.00932	mg/L		0.001	0.0002	GES	10/21/2020 16:15	EPA 200.8-1994, Rev. 5.4
Magnesium, Mg	2.15	mg/L		0.1	0.02	DAM	10/22/2020 15:05	EPA 200.7-1994, Rev. 4.4
Potassium, K	0.9	mg/L	J	1	0.2	DAM	10/22/2020 15:05	EPA 200.7-1994, Rev. 4.4
Sodium, Na	27.4	mg/L		0.5	0.1	DAM	10/22/2020 15:05	EPA 200.7-1994, Rev. 4.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	0.887	pCi/L	0.19	0.62	ttp	11/5/2020	SW-846 9320-2014,Rev. 1.0
Radium-226	0.665	pCi/L	0.14	0.15	ttp	11/10/2020	SW-846 9315-1986,Rev. 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.

AD-5

Sample Number: 202988-002 **Date Collected:** 10/14/2020 10:42 **Date Received:** 10/19/2020

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.02	ug/L	U	0.1	0.02	GES	10/21/2020 16:20	EPA 200.8-1994, Rev. 5.4
Arsenic, As	6.28	ug/L		0.1	0.03	GES	10/21/2020 16:20	EPA 200.8-1994, Rev. 5.4
Barium, Ba	71.7	ug/L		0.2	0.05	GES	10/21/2020 16:20	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.09	ug/L	J	0.1	0.02	GES	10/21/2020 16:20	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	< 0.01	ug/L	U	0.05	0.01	GES	10/21/2020 16:20	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.09	ug/L	J	0.2	0.04	GES	10/21/2020 16:20	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	14.9	ug/L		0.05	0.02	GES	10/21/2020 16:20	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.05	ug/L	J	0.2	0.05	GES	10/21/2020 16:20	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	< 0.002	ug/L	U	0.005	0.002	JAB	10/20/2020	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	10/21/2020 16:20	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.1	ug/L	J	0.2	0.03	GES	10/21/2020 16:20	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	10/21/2020 16:20	EPA 200.8-1994, Rev. 5.4
Boron, B	0.04	mg/L	J	0.05	0.02	GES	10/21/2020 16:20	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	36.6	mg/L		0.3	0.1	DAM	10/22/2020 14:13	EPA 200.7-1994, Rev. 4.4
Iron, Fe	37.4	mg/L		0.1	0.02	DAM	10/22/2020 14:13	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.134	mg/L		0.0002	0.00005	GES	10/21/2020 16:20	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	1.1	pCi/L	0.23	0.75	ttp	11/5/2020	SW-846 9320-2014,Rev. 1.0
Radium-226	1.6	pCi/L	0.21	0.16	ttp	11/10/2020	SW-846 9315-1986,Rev. 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.

AD-17

Sample Number: 202988-003 **Date Collected: 10/14/2020 11:50** **Date Received: 10/19/2020**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.02	ug/L	U	0.1	0.02	GES	10/21/2020 16:25	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.84	ug/L		0.1	0.03	GES	10/21/2020 16:25	EPA 200.8-1994, Rev. 5.4
Barium, Ba	10.9	ug/L		0.2	0.05	GES	10/21/2020 16:25	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.04	ug/L	J	0.1	0.02	GES	10/21/2020 16:25	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.01	ug/L	J	0.05	0.01	GES	10/21/2020 16:25	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.327	ug/L		0.2	0.04	GES	10/21/2020 16:25	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	45.4	ug/L		0.05	0.02	GES	10/21/2020 16:25	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.2	ug/L	J	0.2	0.05	GES	10/21/2020 16:25	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	< 0.002	ug/L	U	0.005	0.002	JAB	10/20/2020	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	10/21/2020 16:25	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.06	ug/L	J	0.2	0.03	GES	10/21/2020 16:25	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	10/21/2020 16:25	EPA 200.8-1994, Rev. 5.4
Boron, B	0.100	mg/L		0.05	0.02	GES	10/21/2020 16:25	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	185	mg/L		0.3	0.1	DAM	10/22/2020 15:09	EPA 200.7-1994, Rev. 4.4
Iron, Fe	198	mg/L		0.1	0.02	DAM	10/22/2020 15:09	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.274	mg/L		0.0002	0.00005	GES	10/21/2020 16:25	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	1.34	pCi/L	0.19	0.58	ttp	11/5/2020	SW-846 9320-2014,Rev. 1.0
Radium-226	0.829	pCi/L	0.16	0.17	ttp	11/10/2020	SW-846 9315-1986,Rev. 0

The RPD between the sample and duplicate result exceeds 25%.

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.

Duplicate Background

Sample Number: 202988-004 **Date Collected:** 10/14/2020 11:50 **Date Received:** 10/19/2020

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.02	ug/L	U	0.1	0.02	GES	10/21/2020 16:30	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.82	ug/L		0.1	0.03	GES	10/21/2020 16:30	EPA 200.8-1994, Rev. 5.4
Barium, Ba	10.9	ug/L		0.2	0.05	GES	10/21/2020 16:30	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.05	ug/L	J	0.1	0.02	GES	10/21/2020 16:30	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.01	ug/L	J	0.05	0.01	GES	10/21/2020 16:30	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.270	ug/L		0.2	0.04	GES	10/21/2020 16:30	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	44.9	ug/L		0.05	0.02	GES	10/21/2020 16:30	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.1	ug/L	J	0.2	0.05	GES	10/21/2020 16:30	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	< 0.002	ug/L	U	0.005	0.002	JAB	10/20/2020	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	10/21/2020 16:30	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.1	ug/L	J	0.2	0.03	GES	10/21/2020 16:30	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	10/21/2020 16:30	EPA 200.8-1994, Rev. 5.4
Boron, B	0.100	mg/L		0.05	0.02	GES	10/21/2020 16:30	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	184	mg/L		0.3	0.1	DAM	10/22/2020 15:14	EPA 200.7-1994, Rev. 4.4
Iron, Fe	197	mg/L		0.1	0.02	DAM	10/22/2020 15:14	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.277	mg/L		0.0002	0.00005	GES	10/21/2020 16:30	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

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.

Equipment Blank Background

Sample Number: 202988-005 **Date Collected:** 10/14/2020 12:47 **Date Received:** 10/19/2020

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.02	ug/L	U	0.1	0.02	GES	10/21/2020 16:35	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.10	ug/L		0.1	0.03	GES	10/21/2020 16:35	EPA 200.8-1994, Rev. 5.4
Barium, Ba	1.33	ug/L		0.2	0.05	GES	10/21/2020 16:35	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	< 0.02	ug/L	U	0.1	0.02	GES	10/21/2020 16:35	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	< 0.01	ug/L	U	0.05	0.01	GES	10/21/2020 16:35	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.08	ug/L	J	0.2	0.04	GES	10/21/2020 16:35	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.078	ug/L		0.05	0.02	GES	10/21/2020 16:35	EPA 200.8-1994, Rev. 5.4
Lead, Pb	< 0.05	ug/L	U	0.2	0.05	GES	10/21/2020 16:35	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	< 0.002	ug/L	U	0.005	0.002	JAB	10/20/2020	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	10/21/2020 16:35	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.03	ug/L	J	0.2	0.03	GES	10/21/2020 16:35	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	10/21/2020 16:35	EPA 200.8-1994, Rev. 5.4
Boron, B	0.03	mg/L	J	0.05	0.02	GES	10/21/2020 16:35	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	0.394	mg/L		0.3	0.1	DAM	10/22/2020 15:18	EPA 200.7-1994, Rev. 4.4
Iron, Fe	0.05	mg/L	J	0.1	0.02	DAM	10/22/2020 15:18	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.000572	mg/L		0.0002	0.00005	GES	10/21/2020 16:35	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

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.

Michael Ohlinger, Chemist
Email msohlinger@aep.com Tel.
Fax 614-836-4168 Audinet 8-210-

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: Jill Parker-Witt
Contact Phone: (318) 673-3816
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days): Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 202988

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	250 mL bottle, pH<2, HNO_3	1 L bottle, Cool, 0-6°C	Three (six every 10th*) 1 L bottles, pH<2, HNO_3	40 mL Glass vial or 125 mL PTFE lined bottle, HCL**, pH<2			Sample Specific Notes:
							B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Fe, K, Mo, Mg, Na, Pb Se, TL	B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Fe, Pb, Mo, Se, TL	Alkalinity, TDS, F, Cl, SO_4	Ra-226, Ra-228	Hg			
AD-1	10/14/2020	1204	G	GW	5		X			X	X			Routine (28 days)
AD-5	10/14/2020	1042	G	GW	5			X		X	X			
AD-17	10/14/2020	1150	G	GW	8			X		X	X			
DUPLICATE	10/14/2020	1150	G	GW	2			X			X			
EQUIPMENT BLANK	10/14/2020	1247	G	GW	2			X			X			
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	1	4				

* *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:
Matt Hamilton	Eqsk	10-15-20 1230		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: Michael Ohlinger	Date/Time: 10/19/2020

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:** 13 16

Opened By MSD **Number of Glass Containers:** _____

Date/Time 10/19/20 1:20 pm **Number of Mercury Containers:** 4

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial**: _____ on ice / no ice

(IR Gun Ser# #2 (192635988) *Expir.* 11/12/2021) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround _____ If **RUSH**, who was notified? _____

pH (15 min) Cr^{+6} (pres) (24 hr) NO_2 or NO_3 (48 hr) *ortho*-PO_4 (48 hr) Hg-diss (pres) (48 hr)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? Y (N) Comments No date / time of collection

Were correct containers used? (Y) / N Comments _____

Was pH checked & Color Coding done? (Y) / N or N/A **Initial & Date**: SH 10/19/2020

- 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# 202988 Initial & Date & Time : _____

Comments: _____

Logged by MSD _____

Reviewed by SM _____

_____

S/N Lot # pH-paper X000RWDG21

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.

Form REP-703
Rev. 1, 11/2013

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
T: 614-836-4221, Audinet 210-4221
F: 614-836-4168, Audinet 210-4168
http://aepenv/labs

Water Analysis

Location: Welsh PS ***Report Date: 10/24/2020***

AD-11

Sample Number: 202982-001 **Date Collected: 10/12/2020 11:21** **Date Received: 10/16/2020**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	8.16	mg/L		0.04	0.01	CRJ	10/21/2020 03:57	EPA 300.1-1997, Rev. 1.0
Fluoride, F	0.63	mg/L		0.06	0.01	CRJ	10/21/2020 03:57	EPA 300.1-1997, Rev. 1.0
Residue, Filterable, TDS	764	mg/L		100	40	HRF	10/19/2020	SM 2540C-2011
Sulfate, SO4	604	mg/L		5	0.8	CRJ	10/20/2020 22:02	EPA 300.1-1997, Rev. 1.0

AD-13

Sample Number: 202982-002 **Date Collected: 10/12/2020 11:49** **Date Received: 10/16/2020**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	18.1	mg/L		0.04	0.01	CRJ	10/21/2020 04:22	EPA 300.1-1997, Rev. 1.0
Fluoride, F	0.33	mg/L		0.06	0.01	CRJ	10/21/2020 04:22	EPA 300.1-1997, Rev. 1.0
Residue, Filterable, TDS	522	mg/L		100	40	HRF	10/19/2020	SM 2540C-2011
Sulfate, SO4	278	mg/L		2	0.3	CRJ	10/20/2020 22:53	EPA 300.1-1997, Rev. 1.0

AD-14

Sample Number: 202982-003 **Date Collected: 10/12/2020 12:16** **Date Received: 10/16/2020**

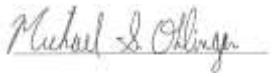
Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	8.59	mg/L		0.04	0.01	CRJ	10/21/2020 05:13	EPA 300.1-1997, Rev. 1.0
Fluoride, F	0.24	mg/L		0.06	0.01	CRJ	10/21/2020 05:13	EPA 300.1-1997, Rev. 1.0
Residue, Filterable, TDS	469	mg/L		50	20	HRF	10/19/2020	SM 2540C-2011
Sulfate, SO4	246	mg/L		2	0.3	CRJ	10/20/2020 23:18	EPA 300.1-1997, Rev. 1.0

Duplicate Landfill

Sample Number: 202982-004 **Date Collected: 10/12/2020 11:21** **Date Received: 10/16/2020**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	8.17	mg/L		0.04	0.01	CRJ	10/21/2020 05:38	EPA 300.1-1997, Rev. 1.0
Fluoride, F	0.62	mg/L		0.06	0.01	CRJ	10/21/2020 05:38	EPA 300.1-1997, Rev. 1.0
Residue, Filterable, TDS	780	mg/L		100	40	HRF	10/19/2020	SM 2540C-2011
Sulfate, SO4	605	mg/L		5	0.8	CRJ	10/20/2020 22:27	EPA 300.1-1997, Rev. 1.0

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.



Michael Ohlinger, Chemist

Email msohlinger@aep.com *Tel.*

Fax 614-836-4168 *Audinet 8-210-*

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 Landfill
Contact Name: Jill Parker-Witt
Contact Phone: (318) 673-3816
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days) Routine (28 days)

Site Contact: | Date:

For Lab Use Only: COC/Order #: 202482

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, Fe, 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-11	10/12/2020	1121	G	GW	1				X					Routine (28 days)
AD-13	10/12/2020	1149	G	GW	1				X					
AD-14	10/12/2020	1216	G	GW	1				X					
DUPLICATE	10/12/2020	1121	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:
Matt Hamilton	Eagle	10-15-20 1226		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time:
			S. Ha	10-16-20 1049

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:** _____

Opened By SM, MK **Number of Glass Containers:** _____

Date/Time 10-16-20 9am **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? Y / N or N/A **Initial:** MK on ice / no ice

(IR Gun Ser# #2 (192635988) *Expir.* 11/12/2021) - 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** MK 10-16-20

- 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# 202982 Initial & Date & Time: _____

Comments: _____

Logged by SM _____

_____

Reviewed by MMc _____

_____

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.

Form REP-703
Rev. 2, 05/2016

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
T: 614-836-4221, Audinet 210-4221
F: 614-836-4168, Audinet 210-4168
http://aepenv/labs

Water Analysis

Location: Welsh PS ***Report Date: 11/11/2020***

AD-11

Sample Number: 202991-001 **Date Collected: 10/12/2020 11:21** **Date Received: 10/19/2020**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.02	ug/L	J	0.1	0.02	GES	10/21/2020 20:41	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.64	ug/L		0.1	0.03	GES	10/21/2020 20:41	EPA 200.8-1994, Rev. 5.4
Barium, Ba	14.1	ug/L		0.2	0.05	GES	10/21/2020 20:41	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	1.52	ug/L		0.5	0.1	JDB	10/26/2020 18:18	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.31	ug/L		0.05	0.01	GES	10/21/2020 20:41	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.306	ug/L		0.2	0.04	GES	10/21/2020 20:41	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	14.0	ug/L		0.05	0.02	GES	10/21/2020 20:41	EPA 200.8-1994, Rev. 5.4
Lead, Pb	1.25	ug/L		0.2	0.05	GES	10/21/2020 20:41	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	0.006	ug/L		0.005	0.002	JAB	10/20/2020	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	10/21/2020 20:41	EPA 200.8-1994, Rev. 5.4
Selenium, Se	1.8	ug/L		0.2	0.03	GES	10/21/2020 20:41	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.2	ug/L	J	0.5	0.1	GES	10/21/2020 20:41	EPA 200.8-1994, Rev. 5.4
Boron, B	1.69	mg/L		0.05	0.02	GES	10/21/2020 20:41	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	8.57	mg/L		0.3	0.1	DAM	10/22/2020 19:28	EPA 200.7-1994, Rev. 4.4
Iron, Fe	3.17	mg/L		0.1	0.02	DAM	10/22/2020 19:28	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.0246	mg/L		0.001	0.0002	JDB	10/26/2020 18:18	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	2.28	pCi/L	0.21	0.61	ttp	11/5/2020	SW-846 9320-2014,Rev. 1.0
Radium-226	0.371	pCi/L	0.10	0.16	ttp	11/10/2020	SW-846 9315-1986,Rev. 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.

AD-13

Sample Number: 202991-002 **Date Collected: 10/12/2020 11:49** **Date Received: 10/19/2020**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.02	ug/L	U	0.1	0.02	GES	10/21/2020 20:46	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.55	ug/L		0.1	0.03	GES	10/21/2020 20:46	EPA 200.8-1994, Rev. 5.4
Barium, Ba	18.5	ug/L		0.2	0.05	GES	10/21/2020 20:46	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.834	ug/L		0.5	0.1	JDB	10/26/2020 18:23	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.17	ug/L		0.05	0.01	GES	10/21/2020 20:46	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.410	ug/L		0.2	0.04	GES	10/21/2020 20:46	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	8.50	ug/L		0.05	0.02	GES	10/21/2020 20:46	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.324	ug/L		0.2	0.05	GES	10/21/2020 20:46	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	< 0.002	ug/L	U	0.005	0.002	JAB	10/20/2020	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	10/21/2020 20:46	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.5	ug/L		0.2	0.03	GES	10/21/2020 20:46	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.2	ug/L	J	0.5	0.1	GES	10/21/2020 20:46	EPA 200.8-1994, Rev. 5.4
Boron, B	1.52	mg/L		0.05	0.02	GES	10/21/2020 20:46	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	8.03	mg/L		0.3	0.1	DAM	10/22/2020 18:44	EPA 200.7-1994, Rev. 4.4
Iron, Fe	4.02	mg/L		0.1	0.02	DAM	10/22/2020 18:44	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.0480	mg/L		0.001	0.0002	JDB	10/26/2020 18:23	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	1.08	pCi/L	0.17	0.54	ttp	11/5/2020	SW-846 9320-2014,Rev. 1.0
Radium-226	0.466	pCi/L	0.13	0.25	ttp	11/10/2020	SW-846 9315-1986,Rev. 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.

AD-14

Sample Number: 202991-003 **Date Collected: 10/12/2020 12:16** **Date Received: 10/19/2020**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.02	ug/L	U	0.1	0.02	GES	10/21/2020 20:51	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.44	ug/L		0.1	0.03	GES	10/21/2020 20:51	EPA 200.8-1994, Rev. 5.4
Barium, Ba	22.9	ug/L		0.2	0.05	GES	10/21/2020 20:51	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	1.46	ug/L		0.5	0.1	JDB	10/26/2020 18:28	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	3.21	ug/L		0.05	0.01	GES	10/21/2020 20:51	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.357	ug/L		0.2	0.04	GES	10/21/2020 20:51	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	26.0	ug/L		0.05	0.02	GES	10/21/2020 20:51	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.307	ug/L		0.2	0.05	GES	10/21/2020 20:51	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	0.391	ug/L		0.05	0.02	JAB	10/31/2020	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	10/21/2020 20:51	EPA 200.8-1994, Rev. 5.4
Selenium, Se	2.0	ug/L		0.2	0.03	GES	10/21/2020 20:51	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.3	ug/L	J	0.5	0.1	GES	10/21/2020 20:51	EPA 200.8-1994, Rev. 5.4
Boron, B	1.14	mg/L		0.05	0.02	GES	10/21/2020 20:51	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	9.63	mg/L		0.3	0.1	DAM	10/22/2020 19:32	EPA 200.7-1994, Rev. 4.4
Iron, Fe	0.08	mg/L	J	0.1	0.02	DAM	10/22/2020 19:32	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.0195	mg/L		0.001	0.0002	JDB	10/26/2020 18:28	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	3.69	pCi/L	0.21	0.57	ttp	11/5/2020	SW-846 9320-2014,Rev. 1.0
Radium-226	0.569	pCi/L	0.13	0.16	ttp	11/10/2020	SW-846 9315-1986,Rev. 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.

Duplicate Landfill

Sample Number: 202991-004 **Date Collected:** 10/12/2020 11:21 **Date Received:** 10/19/2020

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.02	ug/L	U	0.1	0.02	GES	10/21/2020 20:57	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.67	ug/L		0.1	0.03	GES	10/21/2020 20:57	EPA 200.8-1994, Rev. 5.4
Barium, Ba	14.5	ug/L		0.2	0.05	GES	10/21/2020 20:57	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	1.55	ug/L		0.5	0.1	JDB	10/26/2020 18:33	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.32	ug/L		0.05	0.01	GES	10/21/2020 20:57	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.320	ug/L		0.2	0.04	GES	10/21/2020 20:57	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	14.5	ug/L		0.05	0.02	GES	10/21/2020 20:57	EPA 200.8-1994, Rev. 5.4
Lead, Pb	1.30	ug/L		0.2	0.05	GES	10/21/2020 20:57	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	0.006	ug/L		0.005	0.002	JAB	10/20/2020	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	10/21/2020 20:57	EPA 200.8-1994, Rev. 5.4
Selenium, Se	1.9	ug/L		0.2	0.03	GES	10/21/2020 20:57	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.2	ug/L	J	0.5	0.1	GES	10/21/2020 20:57	EPA 200.8-1994, Rev. 5.4
Boron, B	1.75	mg/L		0.05	0.02	GES	10/21/2020 20:57	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	8.59	mg/L		0.3	0.1	DAM	10/22/2020 19:36	EPA 200.7-1994, Rev. 4.4
Iron, Fe	3.15	mg/L		0.1	0.02	DAM	10/22/2020 19:36	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.0245	mg/L		0.001	0.0002	JDB	10/26/2020 18:33	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

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.

Equipment Blank Landfill

Sample Number: 202991-005 **Date Collected:** 10/12/2020 11:55 **Date Received:** 10/19/2020

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.02	ug/L	U	0.1	0.02	GES	10/21/2020 21:02	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.1	ug/L	J	0.1	0.03	GES	10/21/2020 21:02	EPA 200.8-1994, Rev. 5.4
Barium, Ba	1.24	ug/L		0.2	0.05	GES	10/21/2020 21:02	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	< 0.02	ug/L	U	0.1	0.02	GES	10/21/2020 21:02	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	< 0.01	ug/L	U	0.05	0.01	GES	10/21/2020 21:02	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.08	ug/L	J	0.2	0.04	GES	10/21/2020 21:02	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.077	ug/L		0.05	0.02	GES	10/21/2020 21:02	EPA 200.8-1994, Rev. 5.4
Lead, Pb	< 0.05	ug/L	U	0.2	0.05	GES	10/21/2020 21:02	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	< 0.002	ug/L	U	0.005	0.002	JAB	10/20/2020	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	10/21/2020 21:02	EPA 200.8-1994, Rev. 5.4
Selenium, Se	< 0.03	ug/L	U	0.2	0.03	GES	10/21/2020 21:02	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	10/21/2020 21:02	EPA 200.8-1994, Rev. 5.4
Boron, B	0.03	mg/L	J	0.05	0.02	GES	10/21/2020 21:02	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	0.365	mg/L		0.3	0.1	DAM	10/22/2020 19:40	EPA 200.7-1994, Rev. 4.4
Iron, Fe	< 0.02	mg/L	U	0.1	0.02	DAM	10/22/2020 19:40	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.000529	mg/L		0.0002	0.00005	GES	10/21/2020 21:02	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

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.

Michael Ohlinger, Chemist
Email msohlinger@aep.com Tel.
Fax 614-836-4168 Audinet 8-210-

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 Landfill
Contact Name: Jill Parker-Witt
Contact Phone: (318) 673-3816
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (In Calendar Days): Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 202991

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, Fe, 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-11	10/12/2020	1121	G	GW	8		X			X	X			Routine (28 days)
AD-13	10/12/2020	1149	G	GW	5		X			X	X			
AD-14	10/12/2020	1216	G	GW	5		X			X	X			
DUPLICATE	10/12/2020	1121	G	GW	2		X				X			
EQUIPMENT BLANK	10/12/2020	1155	G	GW	2		X				X			
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	1	4				

** Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by: [signature]	Company: Eagle	Date/Time: 10-15-20 1230	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: 10-19-20 1:20

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:** ~~12~~ 17

Opened By 1150 **Number of Glass Containers:** _____

Date/Time 10/19/20 1200pm **Number of Mercury Containers:** 5

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial**: _____ on ice / no ice

(IR Gun Ser# #2 (192635988). *Expir.* 11/12/2021) - 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**: SH 10/19/20

- Was Add'l Preservative needed? (Y) / N If Yes: By whom & when: Hg lab (See Prep Book)

Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# GAB202991 Initial & Date & Time : _____

Comments: There were no dates or times on the bottles. JAB 10/19/2020

Logged by JAB

Reviewed by SM

S/N Lot # pH-paper X000RWDG21

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.

Form REP-703
Rev. 1, 11/2013

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
T: 614-836-4221, Audinet 210-4221
F: 614-836-4168, Audinet 210-4168
http://aepenv/labs

Water Analysis

Location: Welsh PS ***Report Date: 3/8/2021***

AD-1

Sample Number: 210423-001 **Date Collected: 02/23/2021 09:47** **Date Received: 2/25/2021**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Fluoride, F	0.31	mg/L		0.06	0.01	CRJ	03/02/2021 13:29	EPA 300.1-1997, Rev. 1.0

AD-5

Sample Number: 210423-002 **Date Collected: 02/23/2021 13:30** **Date Received: 2/25/2021**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Fluoride, F	0.23	mg/L		0.06	0.01	CRJ	03/02/2021 13:54	EPA 300.1-1997, Rev. 1.0

AD-17

Sample Number: 210423-003 **Date Collected: 02/23/2021 12:41** **Date Received: 2/25/2021**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Fluoride, F	0.17	mg/L		0.2	0.04	CRJ	03/02/2021 14:44	EPA 300.1-1997, Rev. 1.0

AD-8

Sample Number: 210423-004 **Date Collected: 02/23/2021 10:40** **Date Received: 2/25/2021**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Fluoride, F	0.69	mg/L		0.06	0.01	CRJ	03/02/2021 15:35	EPA 300.1-1997, Rev. 1.0

AD-9

Sample Number: 210423-005 **Date Collected: 02/23/2021 11:31** **Date Received: 2/25/2021**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Fluoride, F	0.21	mg/L		0.06	0.01	CRJ	03/02/2021 16:01	EPA 300.1-1997, Rev. 1.0

AD-11

Sample Number: 210423-006 **Date Collected: 02/23/2021 10:37** **Date Received: 2/25/2021**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Fluoride, F	0.52	mg/L		0.06	0.01	CRJ	03/02/2021 16:51	EPA 300.1-1997, Rev. 1.0

AD-13

Sample Number: 210423-007 **Date Collected:** 02/23/2021 12:17 **Date Received:** 2/25/2021

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Fluoride, F	0.27	mg/L		0.06	0.01	CRJ	03/02/2021 17:17	EPA 300.1-1997, Rev. 1.0

AD-14

Sample Number: 210423-008 **Date Collected:** 02/23/2021 11:13 **Date Received:** 2/25/2021

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Fluoride, F	0.20	mg/L		0.06	0.01	CRJ	03/02/2021 14:19	EPA 300.1-1997, Rev. 1.0

AD-15

Sample Number: 210423-009 **Date Collected:** 02/23/2021 09:59 **Date Received:** 2/25/2021

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Fluoride, F	0.08	mg/L		0.06	0.01	CRJ	03/02/2021 18:08	EPA 300.1-1997, Rev. 1.0

Duplicate

Sample Number: 210423-010 **Date Collected:** 02/23/2021 09:31 **Date Received:** 2/25/2021

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Fluoride, F	0.20	mg/L		0.06	0.01	CRJ	03/02/2021 18:33	EPA 300.1-1997, Rev. 1.0

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Michael Ohlinger, Chemist
Email msohlinger@aep.com Tel.
Fax 614-836-4168 Audinet 8-210-

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: Welsh Power Plant
Contact Name: Jill Parker-Witt
Contact Phone: 318-673-3816
Sampler(s): Matt Hamilton/Kenny McDonald

Analysis Turnaround Time (In Calendar Days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 210423

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3: B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Mo, Se, Tl and Na, K, Mg, Sr	Field-filter 500 mL bottle, then pH<2, HNO_3: dissolved Fe and Mn	250mL bottle, Cool, 0-6°C: Fluoride	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	2/23/2021	947	G	GW	1				X					
AD-5	2/23/2021	1330	G	GW	1				X					
AD-17	2/23/2021	1241	G	GW	1				X					
AD-8	2/23/2021	1040	G	GW	1				X					
AD-9	2/23/2021	1131	G	GW	1				X					
AD-11	2/23/2021	1037	G	GW	1				X					
AD-13	2/23/2021	1217	G	GW	1				X					
AD-14	2/23/2021	1113	G	GW	1				X					
AD-15	2/23/2021	959	G	GW	1				X					
DUPLICATE	2/23/2021	931	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	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	2/24/21 1:35		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Date/Time: 2/25/21 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: 10

Opened By MSD — Number of Glass Containers: —

Date/Time 2/25/21 1:30PM — Number of Mercury Containers: _____

Were all temperatures within 0-6°C? Y / N or N/A Initial: _____ (on ice) / no ice

1(IR Gun Ser# 200700311, Expir. 11/06/22) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: _____ If RUSH, who was notified? _____

pH (15 min) | Cr^{+6} (pres) (24 hr) | NO_2 or NO_3 (48 hr) | *ortho*-PO_4 (48 hr) | Hg-diss (pres) (48 hr)

Was 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: MeK 2/25/21

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: _____

Initial & Date & Time : _____

Lab ID# 210423

Comments: _____

Logged by MSD

Reviewed by SM

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.

Form REP-703
Rev. 2, 05/2016

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
T: 614-836-4221, Audinet 210-4221
F: 614-836-4168, Audinet 210-4168
http://aepenv/labs

Water Analysis

Location: Welsh PS ***Report Date: 3/19/2021***

AD-1

Sample Number: 210452-001 **Date Collected: 02/23/2021 09:47** **Date Received: 3/1/2021**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.24	ug/L		0.1	0.02	GES	03/03/2021 09:34	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.74	ug/L		0.1	0.03	GES	03/03/2021 09:34	EPA 200.8-1994, Rev. 5.4
Barium, Ba	338	ug/L		0.2	0.05	GES	03/03/2021 09:34	EPA 200.8-1994, Rev. 5.4
•The MS is outside the acceptable limit of 75-125%.•The MSD is outside the acceptable limit of 75-125%.								
Beryllium, Be	0.136	ug/L		0.1	0.02	GES	03/03/2021 09:34	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.03	ug/L	J	0.05	0.01	GES	03/03/2021 09:34	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.338	ug/L		0.2	0.04	GES	03/03/2021 09:34	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.477	ug/L		0.05	0.02	GES	03/03/2021 09:34	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.852	ug/L		0.2	0.05	GES	03/03/2021 09:34	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	< 0.002	ug/L	U	0.005	0.002	JAB	03/05/2021	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	1	ug/L	J	2	0.4	GES	03/03/2021 09:34	EPA 200.8-1994, Rev. 5.4
Selenium, Se	2.5	ug/L		0.2	0.03	GES	03/03/2021 09:34	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	03/03/2021 09:34	EPA 200.8-1994, Rev. 5.4
Boron, B	0.617	mg/L		0.05	0.02	GES	03/03/2021 09:34	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	113	mg/L		0.3	0.1	DAM	03/03/2021 13:02	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.00155	mg/L		0.0002	0.00005	GES	03/03/2021 09:34	EPA 200.8-1994, Rev. 5.4
Magnesium, Mg	19.3	mg/L		0.1	0.02	DAM	03/03/2021 13:02	EPA 200.7-1994, Rev. 4.4
Potassium, K	1.44	mg/L		1	0.2	DAM	03/03/2021 13:02	EPA 200.7-1994, Rev. 4.4
Sodium, Na	26.3	mg/L		0.5	0.1	DAM	03/03/2021 13:02	EPA 200.7-1994, Rev. 4.4
Strontium, Sr	1.86	mg/L		0.01	0.002	DAM	03/03/2021 13:02	EPA 200.7-1994, Rev. 4.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	1.46	pCi/L	0.18	0.53	ttp	3/10/2021	SW-846 9320-2014,Rev. 1.0
Radium-226	0.277	pCi/L	0.072	0.096	ttp	3/15/2021	SW-846 9315-1986,Rev. 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.

AD-5

Sample Number: 210452-002 **Date Collected: 02/23/2021 13:30** **Date Received: 3/1/2021**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.02	ug/L	U	0.1	0.02	GES	03/03/2021 09:39	EPA 200.8-1994, Rev. 5.4
Arsenic, As	2.06	ug/L		0.1	0.03	GES	03/03/2021 09:39	EPA 200.8-1994, Rev. 5.4
Barium, Ba	68.3	ug/L		0.2	0.05	GES	03/03/2021 09:39	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.03	ug/L	J	0.1	0.02	GES	03/03/2021 09:39	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	< 0.01	ug/L	U	0.05	0.01	GES	03/03/2021 09:39	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.1	ug/L	J	0.2	0.04	GES	03/03/2021 09:39	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	6.31	ug/L		0.05	0.02	GES	03/03/2021 09:39	EPA 200.8-1994, Rev. 5.4
Lead, Pb	< 0.05	ug/L	U	0.2	0.05	GES	03/03/2021 09:39	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	< 0.002	ug/L	U	0.005	0.002	JAB	03/05/2021	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	03/03/2021 09:39	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.03	ug/L	J	0.2	0.03	GES	03/03/2021 09:39	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	03/03/2021 09:39	EPA 200.8-1994, Rev. 5.4
Boron, B	0.03	mg/L	J	0.05	0.02	GES	03/03/2021 09:39	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	30.9	mg/L		0.3	0.1	DAM	03/03/2021 12:36	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.0705	mg/L		0.0002	0.00005	GES	03/03/2021 09:39	EPA 200.8-1994, Rev. 5.4
Magnesium, Mg	5.55	mg/L		0.1	0.02	DAM	03/03/2021 12:36	EPA 200.7-1994, Rev. 4.4
Potassium, K	1.76	mg/L		1	0.2	DAM	03/03/2021 12:36	EPA 200.7-1994, Rev. 4.4
Sodium, Na	18.4	mg/L		0.5	0.1	DAM	03/03/2021 12:36	EPA 200.7-1994, Rev. 4.4
Strontium, Sr	0.242	mg/L		0.01	0.002	DAM	03/03/2021 12:36	EPA 200.7-1994, Rev. 4.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	0.87	pCi/L	0.19	0.61	ttp	3/10/2021	SW-846 9320-2014,Rev. 1.0
Radium-226	0.527	pCi/L	0.10	0.12	ttp	3/15/2021	SW-846 9315-1986,Rev. 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.

AD-17

Sample Number: 210452-003 **Date Collected: 02/23/2021 12:41** **Date Received: 3/1/2021**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.02	ug/L	U	0.1	0.02	GES	03/03/2021 09:44	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.61	ug/L		0.1	0.03	GES	03/03/2021 09:44	EPA 200.8-1994, Rev. 5.4
Barium, Ba	10.6	ug/L		0.2	0.05	GES	03/03/2021 09:44	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.03	ug/L	J	0.1	0.02	GES	03/03/2021 09:44	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.03	ug/L	J	0.05	0.01	GES	03/03/2021 09:44	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.1	ug/L	J	0.2	0.04	GES	03/03/2021 09:44	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	41.1	ug/L		0.05	0.02	GES	03/03/2021 09:44	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.08	ug/L	J	0.2	0.05	GES	03/03/2021 09:44	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	< 0.002	ug/L	U	0.005	0.002	JAB	03/05/2021	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	03/03/2021 09:44	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.04	ug/L	J	0.2	0.03	GES	03/03/2021 09:44	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	03/03/2021 09:44	EPA 200.8-1994, Rev. 5.4
Boron, B	0.098	mg/L		0.05	0.02	GES	03/03/2021 09:44	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	168	mg/L		0.3	0.1	DAM	03/03/2021 13:06	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.249	mg/L		0.0002	0.00005	GES	03/03/2021 09:44	EPA 200.8-1994, Rev. 5.4
Magnesium, Mg	48.9	mg/L		0.1	0.02	DAM	03/03/2021 13:06	EPA 200.7-1994, Rev. 4.4
Potassium, K	8.08	mg/L		1	0.2	DAM	03/03/2021 13:06	EPA 200.7-1994, Rev. 4.4
Sodium, Na	28.5	mg/L		0.5	0.1	DAM	03/03/2021 13:06	EPA 200.7-1994, Rev. 4.4
Strontium, Sr	1.39	mg/L		0.01	0.002	DAM	03/03/2021 13:06	EPA 200.7-1994, Rev. 4.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	0.879	pCi/L	0.15	0.48	ttp	3/10/2021	SW-846 9320-2014,Rev. 1.0
Radium-226	0.554	pCi/L	0.10	0.11	ttp	3/15/2021	SW-846 9315-1986,Rev. 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.

AD-8

Sample Number: 210452-004 **Date Collected: 02/23/2021 10:40** **Date Received: 3/1/2021**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.02	ug/L	U	0.1	0.02	GES	03/03/2021 09:49	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.31	ug/L		0.1	0.03	GES	03/03/2021 09:49	EPA 200.8-1994, Rev. 5.4
Barium, Ba	24.2	ug/L		0.2	0.05	GES	03/03/2021 09:49	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	< 0.1	ug/L	U	0.5	0.1	GES	03/03/2021 10:25	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.03	ug/L	J	0.05	0.01	GES	03/03/2021 09:49	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.1	ug/L	J	0.2	0.04	GES	03/03/2021 09:49	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.899	ug/L		0.05	0.02	GES	03/03/2021 09:49	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.06	ug/L	J	0.2	0.05	GES	03/03/2021 09:49	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	< 0.002	ug/L	U	0.005	0.002	JAB	03/05/2021	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	03/03/2021 09:49	EPA 200.8-1994, Rev. 5.4
Selenium, Se	< 0.03	ug/L	U	0.2	0.03	GES	03/03/2021 09:49	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	03/03/2021 09:49	EPA 200.8-1994, Rev. 5.4
Boron, B	1.18	mg/L		0.05	0.02	GES	03/03/2021 09:49	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	14.8	mg/L		0.3	0.1	DAM	03/03/2021 13:10	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.104	mg/L		0.001	0.0002	GES	03/03/2021 10:25	EPA 200.8-1994, Rev. 5.4
Magnesium, Mg	8.25	mg/L		0.1	0.02	DAM	03/03/2021 13:10	EPA 200.7-1994, Rev. 4.4
Potassium, K	1.40	mg/L		1	0.2	DAM	03/03/2021 13:10	EPA 200.7-1994, Rev. 4.4
Sodium, Na	59.0	mg/L		0.5	0.1	DAM	03/03/2021 13:10	EPA 200.7-1994, Rev. 4.4
Strontium, Sr	0.121	mg/L		0.01	0.002	DAM	03/03/2021 13:10	EPA 200.7-1994, Rev. 4.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	0.374	pCi/L	0.18	0.61	ttp	3/10/2021	SW-846 9320-2014,Rev. 1.0
Radium-226	0.17	pCi/L	0.071	0.18	ttp	3/15/2021	SW-846 9315-1986,Rev. 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.

AD-9

Sample Number: 210452-005 **Date Collected: 02/23/2021 11:31** **Date Received: 3/1/2021**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.02	ug/L	U	0.1	0.02	GES	03/03/2021 09:54	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.27	ug/L		0.1	0.03	GES	03/03/2021 09:54	EPA 200.8-1994, Rev. 5.4
Barium, Ba	54.9	ug/L		0.2	0.05	GES	03/03/2021 09:54	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	1.51	ug/L		0.5	0.1	GES	03/03/2021 10:30	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.33	ug/L		0.05	0.01	GES	03/03/2021 09:54	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.373	ug/L		0.2	0.04	GES	03/03/2021 09:54	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	21.7	ug/L		0.05	0.02	GES	03/03/2021 09:54	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.1	ug/L	J	0.2	0.05	GES	03/03/2021 09:54	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	0.003	ug/L	J	0.005	0.002	JAB	03/05/2021	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	03/03/2021 09:54	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.4	ug/L		0.2	0.03	GES	03/03/2021 09:54	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.2	ug/L	J	0.5	0.1	GES	03/03/2021 09:54	EPA 200.8-1994, Rev. 5.4
Boron, B	0.219	mg/L		0.05	0.02	GES	03/03/2021 09:54	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	11.6	mg/L		0.3	0.1	DAM	03/03/2021 13:14	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.189	mg/L		0.001	0.0002	GES	03/03/2021 10:30	EPA 200.8-1994, Rev. 5.4
Magnesium, Mg	5.79	mg/L		0.1	0.02	DAM	03/03/2021 13:14	EPA 200.7-1994, Rev. 4.4
Potassium, K	3.02	mg/L		1	0.2	DAM	03/03/2021 13:14	EPA 200.7-1994, Rev. 4.4
Sodium, Na	42.5	mg/L		0.5	0.1	DAM	03/03/2021 13:14	EPA 200.7-1994, Rev. 4.4
Strontium, Sr	0.165	mg/L		0.01	0.002	DAM	03/03/2021 13:14	EPA 200.7-1994, Rev. 4.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	1.18	pCi/L	0.20	0.64	ttp	3/10/2021	SW-846 9320-2014,Rev. 1.0
Radium-226	0.377	pCi/L	0.089	0.12	ttp	3/15/2021	SW-846 9315-1986,Rev. 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.

AD-11

Sample Number: 210452-006 **Date Collected: 02/23/2021 10:37** **Date Received: 3/1/2021**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.04	ug/L	J	0.1	0.02	GES	03/03/2021 09:59	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.47	ug/L		0.1	0.03	GES	03/03/2021 09:59	EPA 200.8-1994, Rev. 5.4
Barium, Ba	38.2	ug/L		0.2	0.05	GES	03/03/2021 09:59	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.515	ug/L		0.1	0.02	GES	03/03/2021 09:59	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.18	ug/L		0.05	0.01	GES	03/03/2021 09:59	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.276	ug/L		0.2	0.04	GES	03/03/2021 09:59	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	8.63	ug/L		0.05	0.02	GES	03/03/2021 09:59	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.435	ug/L		0.2	0.05	GES	03/03/2021 09:59	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	0.011	ug/L		0.005	0.002	JAB	03/05/2021	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	03/03/2021 09:59	EPA 200.8-1994, Rev. 5.4
Selenium, Se	1.0	ug/L		0.2	0.03	GES	03/03/2021 09:59	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.1	ug/L	J	0.5	0.1	GES	03/03/2021 09:59	EPA 200.8-1994, Rev. 5.4
Boron, B	1.15	mg/L		0.05	0.02	GES	03/03/2021 09:59	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	23.3	mg/L		0.3	0.1	DAM	03/03/2021 13:18	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.0102	mg/L		0.0002	0.00005	GES	03/03/2021 09:59	EPA 200.8-1994, Rev. 5.4
Magnesium, Mg	8.41	mg/L		0.1	0.02	DAM	03/03/2021 13:18	EPA 200.7-1994, Rev. 4.4
Potassium, K	2.82	mg/L		1	0.2	DAM	03/03/2021 13:18	EPA 200.7-1994, Rev. 4.4
Sodium, Na	126	mg/L		0.5	0.1	DAM	03/03/2021 13:18	EPA 200.7-1994, Rev. 4.4
Strontium, Sr	0.267	mg/L		0.01	0.002	DAM	03/03/2021 13:18	EPA 200.7-1994, Rev. 4.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	0.971	pCi/L	0.15	0.46	ttp	3/10/2021	SW-846 9320-2014,Rev. 1.0
Radium-226	0.327	pCi/L	0.081	0.11	ttp	3/15/2021	SW-846 9315-1986,Rev. 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.

AD-13

Sample Number: 210452-007 **Date Collected: 02/23/2021 12:17** **Date Received: 3/1/2021**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.06	ug/L	J	0.1	0.02	GES	03/03/2021 10:04	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.67	ug/L		0.1	0.03	GES	03/03/2021 10:04	EPA 200.8-1994, Rev. 5.4
Barium, Ba	115	ug/L		0.2	0.05	GES	03/03/2021 10:04	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.04	ug/L	J	0.1	0.02	GES	03/03/2021 10:04	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.03	ug/L	J	0.05	0.01	GES	03/03/2021 10:04	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.243	ug/L		0.2	0.04	GES	03/03/2021 10:04	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.717	ug/L		0.05	0.02	GES	03/03/2021 10:04	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.1	ug/L	J	0.2	0.05	GES	03/03/2021 10:04	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	0.002	ug/L	J	0.005	0.002	JAB	03/05/2021	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	2.34	ug/L		2	0.4	GES	03/03/2021 10:04	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.5	ug/L		0.2	0.03	GES	03/03/2021 10:04	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	03/03/2021 10:04	EPA 200.8-1994, Rev. 5.4
Boron, B	0.581	mg/L		0.05	0.02	GES	03/03/2021 10:04	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	46.4	mg/L		0.3	0.1	DAM	03/03/2021 13:22	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.00302	mg/L		0.0002	0.00005	GES	03/03/2021 10:04	EPA 200.8-1994, Rev. 5.4
Magnesium, Mg	10.6	mg/L		0.1	0.02	DAM	03/03/2021 13:22	EPA 200.7-1994, Rev. 4.4
Potassium, K	2.24	mg/L		1	0.2	DAM	03/03/2021 13:22	EPA 200.7-1994, Rev. 4.4
Sodium, Na	32.2	mg/L		0.5	0.1	DAM	03/03/2021 13:22	EPA 200.7-1994, Rev. 4.4
Strontium, Sr	0.416	mg/L		0.01	0.002	DAM	03/03/2021 13:22	EPA 200.7-1994, Rev. 4.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	1.42	pCi/L	0.15	0.44	ttp	3/10/2021	SW-846 9320-2014,Rev. 1.0
Radium-226	0.844	pCi/L	0.13	0.12	ttp	3/15/2021	SW-846 9315-1986,Rev. 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.

AD-14

Sample Number: 210452-008 **Date Collected: 02/23/2021 11:13** **Date Received: 3/1/2021**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.03	ug/L	J	0.1	0.02	GES	03/03/2021 10:09	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.31	ug/L		0.1	0.03	GES	03/03/2021 10:09	EPA 200.8-1994, Rev. 5.4
Barium, Ba	36.5	ug/L		0.2	0.05	GES	03/03/2021 10:09	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.4	ug/L	J	0.5	0.1	GES	03/03/2021 11:41	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.36	ug/L		0.05	0.01	GES	03/03/2021 10:09	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.2	ug/L	J	0.2	0.04	GES	03/03/2021 10:09	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	4.18	ug/L		0.05	0.02	GES	03/03/2021 10:09	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.1	ug/L	J	0.2	0.05	GES	03/03/2021 10:09	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	< 0.02	ug/L	U	0.05	0.02	JAB	03/05/2021	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	03/03/2021 10:09	EPA 200.8-1994, Rev. 5.4
Selenium, Se	1.3	ug/L		0.2	0.03	GES	03/03/2021 10:09	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	03/03/2021 10:09	EPA 200.8-1994, Rev. 5.4
Boron, B	1.09	mg/L		0.05	0.02	GES	03/03/2021 10:09	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	13.1	mg/L		0.3	0.1	DAM	03/03/2021 13:26	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.00900	mg/L		0.001	0.0002	GES	03/03/2021 11:41	EPA 200.8-1994, Rev. 5.4
Magnesium, Mg	6.10	mg/L		0.1	0.02	DAM	03/03/2021 13:26	EPA 200.7-1994, Rev. 4.4
Potassium, K	0.8	mg/L	J	1	0.2	DAM	03/03/2021 13:26	EPA 200.7-1994, Rev. 4.4
Sodium, Na	34.3	mg/L		0.5	0.1	DAM	03/03/2021 13:26	EPA 200.7-1994, Rev. 4.4
Strontium, Sr	0.218	mg/L		0.01	0.002	DAM	03/03/2021 13:26	EPA 200.7-1994, Rev. 4.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	0.601	pCi/L	0.19	0.63	ttp	3/10/2021	SW-846 9320-2014,Rev. 1.0
Radium-226	0.431	pCi/L	0.092	0.099	ttp	3/15/2021	SW-846 9315-1986,Rev. 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.

AD-15

Sample Number: 210452-009 **Date Collected: 02/23/2021 09:59** **Date Received: 3/1/2021**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.02	ug/L	U	0.1	0.02	GES	03/03/2021 10:15	EPA 200.8-1994, Rev. 5.4
Arsenic, As	1.39	ug/L		0.1	0.03	GES	03/03/2021 10:15	EPA 200.8-1994, Rev. 5.4
Barium, Ba	72.4	ug/L		0.2	0.05	GES	03/03/2021 10:15	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.190	ug/L		0.1	0.02	GES	03/03/2021 10:15	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.02	ug/L	J	0.05	0.01	GES	03/03/2021 10:15	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.1	ug/L	J	0.2	0.04	GES	03/03/2021 10:15	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	2.61	ug/L		0.05	0.02	GES	03/03/2021 10:15	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.08	ug/L	J	0.2	0.05	GES	03/03/2021 10:15	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	< 0.002	ug/L	U	0.005	0.002	JAB	03/05/2021	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	03/03/2021 10:15	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.2	ug/L		0.2	0.03	GES	03/03/2021 10:15	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	03/03/2021 10:15	EPA 200.8-1994, Rev. 5.4
Boron, B	0.03	mg/L	J	0.05	0.02	GES	03/03/2021 10:15	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	2.30	mg/L		0.3	0.1	DAM	03/03/2021 13:30	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.00167	mg/L		0.0002	0.00005	GES	03/03/2021 10:15	EPA 200.8-1994, Rev. 5.4
Magnesium, Mg	2.77	mg/L		0.1	0.02	DAM	03/03/2021 13:30	EPA 200.7-1994, Rev. 4.4
Potassium, K	0.5	mg/L	J	1	0.2	DAM	03/03/2021 13:30	EPA 200.7-1994, Rev. 4.4
Sodium, Na	10.5	mg/L		0.5	0.1	DAM	03/03/2021 13:30	EPA 200.7-1994, Rev. 4.4
Strontium, Sr	0.0322	mg/L		0.01	0.002	DAM	03/03/2021 13:30	EPA 200.7-1994, Rev. 4.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	0.899	pCi/L	0.19	0.60	ttp	3/10/2021	SW-846 9320-2014,Rev. 1.0
Radium-226	0.122	pCi/L	0.38	0.088	ttp	3/15/2021	SW-846 9315-1986,Rev. 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.

Duplicate

Sample Number: 210452-010 **Date Collected:** 02/23/2021 09:31 **Date Received:** 3/1/2021

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.03	ug/L	J	0.1	0.02	GES	03/03/2021 11:46	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.29	ug/L		0.1	0.03	GES	03/03/2021 11:46	EPA 200.8-1994, Rev. 5.4
Barium, Ba	37.6	ug/L		0.2	0.05	GES	03/03/2021 11:46	EPA 200.8-1994, Rev. 5.4
•The MS is outside the acceptable limit of 75-125%.•The MSD is outside the acceptable limit of 75-125%.								
Beryllium, Be	0.354	ug/L		0.1	0.02	GES	03/03/2021 11:46	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.36	ug/L		0.05	0.01	GES	03/03/2021 11:46	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.2	ug/L	J	0.2	0.04	GES	03/03/2021 11:46	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	4.25	ug/L		0.05	0.02	GES	03/03/2021 11:46	EPA 200.8-1994, Rev. 5.4
•The MS is outside the acceptable limit of 75-125%.•The MSD is outside the acceptable limit of 75-125%.								
Lead, Pb	0.1	ug/L	J	0.2	0.05	GES	03/03/2021 11:46	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	0.003	ug/L	J	0.005	0.002	JAB	03/05/2021	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	03/03/2021 11:46	EPA 200.8-1994, Rev. 5.4
Selenium, Se	1.4	ug/L		0.2	0.03	GES	03/03/2021 11:46	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	03/03/2021 11:46	EPA 200.8-1994, Rev. 5.4
Boron, B	1.10	mg/L		0.05	0.02	GES	03/03/2021 11:46	EPA 200.8-1994, Rev. 5.4
•The MS is outside the acceptable limit of 75-125%.•The MSD is outside the acceptable limit of 75-125%.								
Calcium, Ca	13.1	mg/L		0.3	0.1	DAM	03/03/2021 13:34	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.00765	mg/L		0.0002	0.00005	GES	03/03/2021 11:46	EPA 200.8-1994, Rev. 5.4
•The MS is outside the acceptable limit of 75-125%.•The MSD is outside the acceptable limit of 75-125%.								
Magnesium, Mg	6.09	mg/L		0.1	0.02	DAM	03/03/2021 13:34	EPA 200.7-1994, Rev. 4.4
Potassium, K	0.8	mg/L	J	1	0.2	DAM	03/03/2021 13:34	EPA 200.7-1994, Rev. 4.4
Sodium, Na	34.6	mg/L		0.5	0.1	DAM	03/03/2021 13:34	EPA 200.7-1994, Rev. 4.4
Strontium, Sr	0.220	mg/L		0.01	0.002	DAM	03/03/2021 13:34	EPA 200.7-1994, Rev. 4.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

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.

Equipment Blank Background

Sample Number: 210452-011 **Date Collected:** 02/23/2021 11:55 **Date Received:** 3/1/2021

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.02	ug/L	U	0.1	0.02	GES	03/03/2021 10:20	EPA 200.8-1994, Rev. 5.4
Arsenic, As	< 0.03	ug/L	U	0.1	0.03	GES	03/03/2021 10:20	EPA 200.8-1994, Rev. 5.4
Barium, Ba	0.09	ug/L	J	0.2	0.05	GES	03/03/2021 10:20	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	< 0.02	ug/L	U	0.1	0.02	GES	03/03/2021 10:20	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	< 0.01	ug/L	U	0.05	0.01	GES	03/03/2021 10:20	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	< 0.04	ug/L	U	0.2	0.04	GES	03/03/2021 10:20	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	< 0.02	ug/L	U	0.05	0.02	GES	03/03/2021 10:20	EPA 200.8-1994, Rev. 5.4
Lead, Pb	< 0.05	ug/L	U	0.2	0.05	GES	03/03/2021 10:20	EPA 200.8-1994, Rev. 5.4
Mercury, Hg	< 0.002	ug/L	U	0.005	0.002	JAB	03/05/2021	EPA 245.7-2005, Rev. 2.0
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	03/03/2021 10:20	EPA 200.8-1994, Rev. 5.4
Selenium, Se	< 0.03	ug/L	U	0.2	0.03	GES	03/03/2021 10:20	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	03/03/2021 10:20	EPA 200.8-1994, Rev. 5.4
Boron, B	< 0.02	mg/L	U	0.05	0.02	GES	03/03/2021 10:20	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	< 0.1	mg/L	U	0.3	0.1	DAM	03/03/2021 14:16	EPA 200.7-1994, Rev. 4.4
Lithium, Li	< 0.00005	mg/L	U	0.0002	0.00005	GES	03/03/2021 10:20	EPA 200.8-1994, Rev. 5.4
Magnesium, Mg	< 0.02	mg/L	U	0.1	0.02	DAM	03/03/2021 14:16	EPA 200.7-1994, Rev. 4.4
Potassium, K	< 0.2	mg/L	U	1	0.2	DAM	03/03/2021 14:16	EPA 200.7-1994, Rev. 4.4
Sodium, Na	< 0.1	mg/L	U	0.5	0.1	DAM	03/03/2021 14:16	EPA 200.7-1994, Rev. 4.4
Strontium, Sr	< 0.002	mg/L	U	0.01	0.002	DAM	03/03/2021 14:16	EPA 200.7-1994, Rev. 4.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

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.

Michael Ohlinger, Chemist
Email msohlinger@aep.com *Tel.*
Fax 614-836-4168 *Audinet 8-210-*

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: Welsh Power Plant
Contact Name: Jill Parker-Witt
Contact Phone: 318-673-3816
Sampler(s): Matt Hamilton/Kenny McDonald

Analysis Turnaround Time (in Calendar Days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 210452

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3 B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Mo, Se, Tl and Na, K, Mg, Sr	Field-filter 500 mL bottle, then pH<2, HNO_3 dissolved Fe and Mn	250mL bottle, Cool, 0-6°C Fluoride	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	2/23/2021	947	G	GW	5		X			X	X			
AD-5	2/23/2021	1330	G	GW	5		X			X	X			
AD-17	2/23/2021	1241	G	GW	5		X			X	X			
AD-8	2/23/2021	1040	G	GW	5		X			X	X			
AD-9	2/23/2021	1131	G	GW	5		X			X	X			
AD-11	2/23/2021	1037	G	GW	5		X			X	X			
AD-13	2/23/2021	1217	G	GW	5		X			X	X			
AD-14	2/23/2021	1113	G	GW	8		X			X	X			
AD-15	2/23/2021	959	G	GW	5		X			X	X			
DUPLICATE	2/23/2021	931	G	GW	2		X				X			
EQUIPMENT BLANK	2/23/2021	1155	G	GW	2		X				X			
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	1	4				

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by: [signature]	Company: Eagle	Date/Time: 2/24/21 1030	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: 3-1-21 12:30

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: 4

Opened By SM — Number of Glass Containers: _____

Date/Time 3-1-21 12:30 — Number of Mercury Containers: 11

Were all temperatures within 0-6°C? Y / N or N/A Initial: _____ on ice / no ice

1(IR Gun Ser# 200700311, Expir. 11/06/22) - If No, specify each deviation: _____

Was container in good condition? Y / N Comments _____

Was Chain of Custody received? Y / N Comments _____

Requested turnaround: Rolie 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: SM 3-1-21

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# 210452 Initial & Date & Time : _____

Logged by SM Comments: _____

Reviewed by 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.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215112 **Customer: Welsh Power Station** **Date Reported: 07/02/2021**

Customer Sample ID: Customer Description:
Lab Number: 215112-001 Sampling Point: AD-1
Date Collected: 06/02/2021 Date Received: 06/04/2021
Preparation:

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	2.26	mg/L	2	0.04	0.01		CRJ	06/08/2021	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.30	mg/L	2	0.06	0.01		CRJ	06/08/2021	EPA 300.1 -1997, Rev. 1.0
Sulfate	61.4	mg/L	2	0.40	0.06		CRJ	06/08/2021	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	400	mg/L	1	50	20		SDW	06/07/2021	SM 2540C-2011

Customer Sample ID: Customer Description:
Lab Number: 215112-002 Sampling Point: AD-5
Date Collected: 06/02/2021 Date Received: 06/04/2021
Preparation:

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	19.6	mg/L	2	0.04	0.01		CRJ	06/07/2021	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.21	mg/L	2	0.06	0.01		CRJ	06/07/2021	EPA 300.1 -1997, Rev. 1.0
Sulfate	53.8	mg/L	2	0.40	0.06		CRJ	06/07/2021	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		SDW	06/07/2021	SM 2540C-2011

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 215112 **Customer: Welsh Power Station** **Date Reported: 07/02/2021**

Customer Sample ID: Customer Description:
Lab Number: 215112-003 Sampling Point: AD-17
Date Collected: 06/02/2021 Date Received: 06/04/2021
Preparation:

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	44.9	mg/L	5	0.10	0.03		CRJ	06/07/2021	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.31	mg/L	5	0.15	0.04		CRJ	06/07/2021	EPA 300.1 -1997, Rev. 1.0
Sulfate	1210	mg/L	50	10	2		CRJ	06/07/2021	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	1890	mg/L	2	100	40		SDW	06/07/2021	SM 2540C-2011

Customer Sample ID: Duplicate Background Customer Description:
Lab Number: 215112-004 Sampling Point:
Date Collected: 06/02/2021 Date Received: 06/04/2021
Preparation:

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	2.26	mg/L	2	0.04	0.01		CRJ	06/08/2021	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.30	mg/L	2	0.06	0.01		CRJ	06/08/2021	EPA 300.1 -1997, Rev. 1.0
Sulfate	60.2	mg/L	2	0.40	0.06		CRJ	06/08/2021	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	430	mg/L	2	100	40		SDW	06/07/2021	SM 2540C-2011

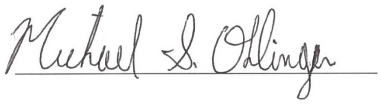
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215112 **Customer: Welsh Power Station** **Date Reported: 07/02/2021**

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

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215112 **Customer: Welsh Power Station** **Date Reported: 07/02/2021**

Data Qualifer Legend

B1	Analyte detected in method blank (MB) at or above the method criteria.
B2	Analyte detected in initial calibration blank (ICB) at or above the method criteria.
B3	Analyte detected in continuing calibration blank (CCB) at or above the method criteria.
B4	The interference check standard (ICS) exceeded the method criteria on this parameter.
H1	Sample was received past holding time.
H2	Sample analysis performed past holding time.
J1	Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
J2	Concentration estimated. Analyte exceeded calibration range.
L1	The associated laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) recovery was outside acceptance limits.
M1	The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.
M2	Analyzed by method of standard additions (MSA).
O1	The reporting limit for oil and grease is directly affected by the collected sample volume.
O2	Client did not provide additional bottles; thefore, the MS and duplicate are missing in this batch.
O3	Client did not provide additional bottles; therefore, the duplicate is missing in this batch.
O4	Sample was transferred to a different bottle due to excess fine particulate. The particulate was rinsed with hexane, and the hexane layer was transferred to the corresponding bottle. The hexane rinse was completed three times.
P1	The precision between duplicate results was above acceptance limits.
P2	The precision on the laboratory control sample duplicate (LCSD) was above acceptance limits.
P3	The precision on the matrix spike duplicate (MSD) was above acceptance limits.
P4	The field duplicate was used as a sample duplicate.
P5	The precision on the inorganic efficiency check (IEC) exceeded the method criteria.
Q1	Sample received in inappropriate sample container.
Q2	Sample was received damaged. The sample was recoverable.
Q3	Sample container was received damaged. Unable to recover the sample.
Q4	Sample was received outside of thermal preservation range.
Q5	Sample was received with improper chemical preservation.
Q6	Insufficient sample was received by the laboratory to perform the requested analysis.
Q7	Insufficient sample was received to meet method QC requirements.
Q8	Sample was received with head space.
Q9	Due to instrument malfunction, sample was invalidated.
Q10	Analysis was performed by a contracted laboratory. See attached report.
Q11	Sample contains free fiquid.
Q12	Sample does not contain free fiquid.
Q13	Sample did not ignite.
Q14	This analyte and method are not included on the primary Laboratory Scope of TNI Accreditation.
R1	Surrogate recovery was outside acceptance limits.
R2	Carrier recovery was outside acceptance limits.
R3	Internal standard recovery was outside acceptance limits.
R4	The recovery of the reduction efficency checks (REC) for nitrate or nitrite exceeded the method criteria.
R5	The back calculation recovery of one or more calibartion points exceeded the method criteria.
S1	Residue weight is above or below the method criteria and needs to be re-analyzed at a different dilution.

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215112 **Customer: Welsh Power Station** **Date Reported: 07/02/2021**

S2	Residue weight is above the method criteria but was already analyzed with the highest dilution factor.
S3	Residue wieght is below the method criteria but was already analyzed with 1000mL.
S4	Sample and duplicate results vary due to large amounts of solids present.
S5	Filtration time exceeds ten minutes.
S6	Insufficient sample was received to meet the minimum volume of the method. Residue wieght is below the method criteria and was analyzed with less than 1000mL.
S7	Sample did not achieve constant weight.
S8	Sample with low residue was selected for duplicate analysis.
S9	Based on history, the sample residue was only measured twice and did not achieve constant weight.
U1	Not detected at or above method detection limit (MDL).
V1	The associated initial calibration verification (ICV) recovery was outside acceptance limits.
V2	The associated continuing calibration verification (CCV) 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: Jill Parker-Witt
Contact Phone: (318) 673-3816
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days) Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 215112

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	6/2/2021	1016	G	GW	1				X					
AD-5	6/2/2021	900	G	GW	1				X					
AD-17	6/2/2021	1212	G	GW	1				X					
DUPLICATE - BACKGROUND	6/2/2021	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	06/03/21 1400		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Date/Time: 6-4-21 12p

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 SM **Number of Glass Containers:** _____

Date/Time 6-4-21 12pm **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? (Y) / N or N/A **Initial:** SM on ice / no ice

1(IR Gun Ser# 200700311, *Expir.* 06-11-22) - 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:** JWB 6-4-21

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# 215112 Initial & Date & Time : _____

Comments: _____

Logged by SM _____

_____

Reviewed by MSD _____

_____

_____

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.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215117 **Customer: Welsh Power Station** **Date Reported: 07/06/2021**

Customer Sample ID:	Customer Description:
Lab Number: 215117-001	Sampling Point: AD-1
Date Collected: 06/02/2021 10:16	Date Received: 06/08/2021 07:24
Preparation:	

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.18	µg/L	1	0.10	0.02		GES	06/10/21 15:06	EPA 200.8-1994, Rev. 5.4
Arsenic	0.66	µg/L	1	0.10	0.03		GES	06/10/21 15:06	EPA 200.8-1994, Rev. 5.4
Barium	349	µg/L	1	0.20	0.05		GES	06/10/21 15:06	EPA 200.8-1994, Rev. 5.4
Beryllium	0.088	µg/L	1	0.050	0.007		GES	06/10/21 15:06	EPA 200.8-1994, Rev. 5.4
Boron	0.786	mg/L	1	0.050	0.009		GES	06/10/21 15:06	EPA 200.8-1994, Rev. 5.4
Cadmium	0.01	µg/L	1	0.020	0.004	J1	GES	06/10/21 15:06	EPA 200.8-1994, Rev. 5.4
Calcium	97.1	mg/L	1	0.3	0.1		DAM	06/21/21 20:33	EPA 200.7-1994, Rev. 4.4
Chromium	0.32	µg/L	1	0.20	0.04		GES	06/10/21 15:06	EPA 200.8-1994, Rev. 5.4
Cobalt	0.474	µg/L	1	0.020	0.003		GES	06/10/21 15:06	EPA 200.8-1994, Rev. 5.4
Lead	0.09	µg/L	1	0.20	0.05	J1	GES	06/10/21 15:06	EPA 200.8-1994, Rev. 5.4
Lithium	0.00052	mg/L	1	0.00020	0.00005		GES	06/10/21 15:06	EPA 200.8-1994, Rev. 5.4
Mercury	2	ng/L	1	5	2	J1	JAB	06/18/21 00:00	EPA 245.7 -2005, Rev. 2.0
Molybdenum	4.8	µg/L	1	0.5	0.1		GES	06/10/21 15:06	EPA 200.8-1994, Rev. 5.4
Selenium	1.26	µg/L	1	0.50	0.09		GES	06/10/21 15:06	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	06/10/21 15:06	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	0.08	0.11		TTP	06/28/21 10:21	SW-846 9315-1986, Rev. 0
Carrier Recovery	89.9	%						
Radium-228	1.79	pCi/L	0.22	0.69		TTP	06/24/21 17:03	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	67.6	%						

* 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: 215117 **Customer: Welsh Power Station** **Date Reported: 07/06/2021**

Customer Sample ID:	Customer Description:
Lab Number: 215117-002	Sampling Point: AD-5
Date Collected: 06/02/2021 09:00	Date Received: 06/08/2021 07:24
Preparation:	

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	06/10/21 15:11	EPA 200.8-1994, Rev. 5.4
Arsenic	1.72	µg/L	1	0.10	0.03		GES	06/10/21 15:11	EPA 200.8-1994, Rev. 5.4
Barium	49.3	µg/L	1	0.20	0.05		GES	06/10/21 15:11	EPA 200.8-1994, Rev. 5.4
Beryllium	0.018	µg/L	1	0.050	0.007	M1, J1	GES	06/10/21 15:11	EPA 200.8-1994, Rev. 5.4
Boron	0.027	mg/L	1	0.050	0.009	J1	GES	06/10/21 15:11	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	06/10/21 15:11	EPA 200.8-1994, Rev. 5.4
Calcium	24.4	mg/L	1	0.3	0.1		DAM	06/21/21 20:53	EPA 200.7-1994, Rev. 4.4
Chromium	0.26	µg/L	1	0.20	0.04		GES	06/10/21 15:11	EPA 200.8-1994, Rev. 5.4
Cobalt	10.5	µg/L	1	0.020	0.003		GES	06/10/21 15:11	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	06/10/21 15:11	EPA 200.8-1994, Rev. 5.4
Lithium	0.0764	mg/L	1	0.00020	0.00005	M1	GES	06/10/21 15:11	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	06/18/21 00:00	EPA 245.7 -2005, Rev. 2.0
Molybdenum	0.1	µg/L	1	0.5	0.1	J1	GES	06/10/21 15:11	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	06/10/21 15:11	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	06/10/21 15:11	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.64	pCi/L	0.12	0.11		TTP	06/28/21 12:15	SW-846 9315-1986, Rev. 0
Carrier Recovery	80.8	%						
Radium-228	1.83	pCi/L	0.21	0.64		TTP	06/24/21 17:03	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	66.3	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215117 **Customer: Welsh Power Station** **Date Reported: 07/06/2021**

Customer Sample ID:	Customer Description:
Lab Number: 215117-003	Sampling Point: AD-17
Date Collected: 06/02/2021 12:12	Date Received: 06/08/2021 07:24
Preparation:	

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	06/10/21 15:27	EPA 200.8-1994, Rev. 5.4
Arsenic	0.84	µg/L	1	0.10	0.03		GES	06/10/21 15:27	EPA 200.8-1994, Rev. 5.4
Barium	10.9	µg/L	1	0.20	0.05		GES	06/10/21 15:27	EPA 200.8-1994, Rev. 5.4
Beryllium	0.066	µg/L	1	0.050	0.007		GES	06/10/21 15:27	EPA 200.8-1994, Rev. 5.4
Boron	0.124	mg/L	1	0.050	0.009		GES	06/10/21 15:27	EPA 200.8-1994, Rev. 5.4
Cadmium	0.026	µg/L	1	0.020	0.004		GES	06/10/21 15:27	EPA 200.8-1994, Rev. 5.4
Calcium	233	mg/L	1	0.3	0.1		DAM	06/21/21 20:57	EPA 200.7-1994, Rev. 4.4
Chromium	0.38	µg/L	1	0.20	0.04		GES	06/10/21 15:27	EPA 200.8-1994, Rev. 5.4
Cobalt	72.9	µg/L	1	0.020	0.003		GES	06/10/21 15:27	EPA 200.8-1994, Rev. 5.4
Lead	0.09	µg/L	1	0.20	0.05	J1	GES	06/10/21 15:27	EPA 200.8-1994, Rev. 5.4
Lithium	0.311	mg/L	1	0.00020	0.00005		GES	06/10/21 15:27	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	06/18/21 00:00	EPA 245.7 -2005, Rev. 2.0
Molybdenum	0.2	µg/L	1	0.5	0.1	J1	GES	06/10/21 15:27	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	06/10/21 15:27	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	06/10/21 15:27	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.98	pCi/L	0.14	0.11		TTP	06/28/21 12:15	SW-846 9315-1986, Rev. 0
Carrier Recovery	101	%						
Radium-228	1.42	pCi/L	0.17	0.52		TTP	06/24/21 17:03	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	73.1	%						

* 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: 215117 **Customer: Welsh Power Station** **Date Reported: 07/06/2021**

Customer Sample ID: Duplicate Background
Customer Description:
Lab Number: 215117-004
Sampling Point:
Date Collected: 06/02/2021 12:00
Date Received: 06/08/2021 07:24
Preparation:

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.19	µg/L	1	0.10	0.02		GES	06/10/21 15:32	EPA 200.8-1994, Rev. 5.4
Arsenic	0.65	µg/L	1	0.10	0.03		GES	06/10/21 15:32	EPA 200.8-1994, Rev. 5.4
Barium	356	µg/L	1	0.20	0.05		GES	06/10/21 15:32	EPA 200.8-1994, Rev. 5.4
Beryllium	0.086	µg/L	1	0.050	0.007		GES	06/10/21 15:32	EPA 200.8-1994, Rev. 5.4
Boron	0.786	mg/L	1	0.050	0.009		GES	06/10/21 15:32	EPA 200.8-1994, Rev. 5.4
Cadmium	0.011	µg/L	1	0.020	0.004	J1	GES	06/10/21 15:32	EPA 200.8-1994, Rev. 5.4
Calcium	98.7	mg/L	1	0.3	0.1		DAM	06/21/21 21:01	EPA 200.7-1994, Rev. 4.4
Chromium	0.34	µg/L	1	0.20	0.04		GES	06/10/21 15:32	EPA 200.8-1994, Rev. 5.4
Cobalt	0.486	µg/L	1	0.020	0.003		GES	06/10/21 15:32	EPA 200.8-1994, Rev. 5.4
Lead	0.10	µg/L	1	0.20	0.05	J1	GES	06/10/21 15:32	EPA 200.8-1994, Rev. 5.4
Lithium	0.00059	mg/L	1	0.00020	0.00005		GES	06/10/21 15:32	EPA 200.8-1994, Rev. 5.4
Mercury	2	ng/L	1	5	2	J1	JAB	06/18/21 00:00	EPA 245.7 -2005, Rev. 2.0
Molybdenum	5.0	µg/L	1	0.5	0.1		GES	06/10/21 15:32	EPA 200.8-1994, Rev. 5.4
Selenium	1.29	µg/L	1	0.50	0.09		GES	06/10/21 15:32	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	06/10/21 15:32	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215117 **Customer: Welsh Power Station** **Date Reported: 07/06/2021**

Customer Sample ID: Equipment Blank- Background
Customer Description:
Lab Number: 215117-005
Sampling Point:
Date Collected: 06/02/2021 09:50
Date Received: 06/08/2021 07:24
Preparation:

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	06/10/21 15:37	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	06/10/21 15:37	EPA 200.8-1994, Rev. 5.4
Barium	0.10	µg/L	1	0.20	0.05	J1	GES	06/10/21 15:37	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	06/10/21 15:37	EPA 200.8-1994, Rev. 5.4
Boron	<0.009	mg/L	1	0.050	0.009	U1	GES	06/10/21 15:37	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	06/10/21 15:37	EPA 200.8-1994, Rev. 5.4
Calcium	<0.1	mg/L	1	0.3	0.1	U1	DAM	06/21/21 21:05	EPA 200.7-1994, Rev. 4.4
Chromium	0.23	µg/L	1	0.20	0.04		GES	06/10/21 15:37	EPA 200.8-1994, Rev. 5.4
Cobalt	0.037	µg/L	1	0.020	0.003		GES	06/10/21 15:37	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	06/10/21 15:37	EPA 200.8-1994, Rev. 5.4
Lithium	0.00008	mg/L	1	0.00020	0.00005	J1	GES	06/10/21 15:37	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	06/18/21 00:00	EPA 245.7 -2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	06/10/21 15:37	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	06/10/21 15:37	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	06/10/21 15:37	EPA 200.8-1994, Rev. 5.4

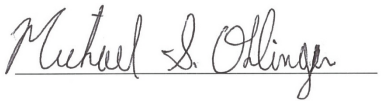
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215117 **Customer: Welsh Power Station** **Date Reported: 07/06/2021**

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

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215117 **Customer: Welsh Power Station** **Date Reported: 07/06/2021**

Data Qualifer Legend

B1	Analyte detected in method blank (MB) at or above the method criteria.
B2	Analyte detected in initial calibration blank (ICB) at or above the method criteria.
B3	Analyte detected in continuing calibration blank (CCB) at or above the method criteria.
B4	The interference check standard (ICS) exceeded the method criteria on this parameter.
H1	Sample was received past holding time.
H2	Sample analysis performed past holding time.
J1	Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
J2	Concentration estimated. Analyte exceeded calibration range.
L1	The associated laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) recovery was outside acceptance limits.
M1	The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.
M2	Analyzed by method of standard additions (MSA).
O1	The reporting limit for oil and grease is directly affected by the collected sample volume.
O2	Client did not provide additional bottles; thefore, the MS and duplicate are missing in this batch.
O3	Client did not provide additional bottles; therefore, the duplicate is missing in this batch.
O4	Sample was transferred to a different bottle due to excess fine particulate. The particulate was rinsed with hexane, and the hexane layer was transferred to the corresponding bottle. The hexane rinse was completed three times.
P1	The precision between duplicate results was above acceptance limits.
P2	The precision on the laboratory control sample duplicate (LCSD) was above acceptance limits.
P3	The precision on the matrix spike duplicate (MSD) was above acceptance limits.
P4	The field duplicate was used as a sample duplicate.
P5	The precision on the inorganic efficiency check (IEC) exceeded the method criteria.
Q1	Sample received in inappropriate sample container.
Q2	Sample was received damaged. The sample was recoverable.
Q3	Sample container was received damaged. Unable to recover the sample.
Q4	Sample was received outside of thermal preservation range.
Q5	Sample was received with improper chemical preservation.
Q6	Insufficient sample was received by the laboratory to perform the requested analysis.
Q7	Insufficient sample was received to meet method QC requirements.
Q8	Sample was received with head space.
Q9	Due to instrument malfunction, sample was invalidated.
Q10	Analysis was performed by a contracted laboratory. See attached report.
Q11	Sample contains free fiquid.
Q12	Sample does not contain free fiquid.
Q13	Sample did not ignite.
Q14	This analyte and method are not included on the primary Laboratory Scope of TNI Accreditation.
R1	Surrogate recovery was outside acceptance limits.
R2	Carrier recovery was outside acceptance limits.
R3	Internal standard recovery was outside acceptance limits.
R4	The recovery of the reduction efficency checks (REC) for nitrate or nitrite exceeded the method criteria.
R5	The back calculation recovery of one or more calibartion points exceeded the method criteria.
S1	Residue weight is above or below the method criteria and needs to be re-analyzed at a different dilution.

S2	Residue weight is above the method criteria but was already analyzed with the highest dilution factor.
S3	Residue wieght is below the method criteria but was already analyzed with 1000mL.
S4	Sample and duplicate results vary due to large amounts of solids present.
S5	Filtration time exceeds ten minutes.
S6	Insufficient sample was received to meet the minimum volume of the method. Residue wieght is below the method criteria and was analyzed with less than 1000mL.
S7	Sample did not achieve constant weight.
S8	Sample with low residue was selected for duplicate analysis.
S9	Based on history, the sample residue was only measured twice and did not achieve constant weight.
U1	Not detected at or above method detection limit (MDL).
V1	The associated initial calibration verification (ICV) recovery was outside acceptance limits.
V2	The associated continuing calibration verification (CCV) 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: Jill Parker-Witt
Contact Phone: (318) 673-3816
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days): Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 215117

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3	Field-filter 500 mL bottle, then pH<2, HNO_3	1 L bottle, Cool, 0-6°C	Three (six every 10th*) 1 L bottles, pH<2, HNO_3	125 mL PTFE lined bottle, HCL**, pH<2			Sample Specific Notes:
							B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Mo, Se, Tl	dissolved Fe and Mn	TDS, F, Cl, SO_4	Ra-226, Ra-228	Hg			
AD-1	6/2/2021	1016	G	GW	8		X			X	X			Routine (28 days)
AD-5	6/2/2021	900	G	GW	5		X			X	X			
AD-17	6/2/2021	1212	G	GW	5		X			X	X			
DUPLICATE - BACKGROUND	6/2/2021	1200	G	GW	2		X				X			
EQUIPMENT BLANK - BACKGROUND	6/2/2021	950	G	GW	2		X				X			
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	1	4				

** Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by: Kenny	Company: EAGLE	Date/Time: 06/03/21 1400	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: C. Kemble	Date/Time: 6-7-21 1pm

Postal Order

Partial

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
Cooler Box Bag Envelope	PONY UPS FedEX USPS
	Other _____

Plant/Customer Walsh **Number of Plastic Containers:** 11

Opened By SM **Number of Glass Containers:** _____

Date/Time 6-7-21 1pm **Number of Mercury Containers:** 5

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial:** SM on ice / (no ice)

1(IR Gun Ser# 200700311, *Expir.* 06-11-22) - If No, specify each deviation: _____

Was container in good condition? (Y) N Comments _____

Was Chain of Custody received? (Y) N Comments _____

Requested turnaround: Rush 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 6-8-21

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: MG Lab (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# 215117

Comments: Not all Samples arrived waiting for extra coolers from fedex.

Logged by SM

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.

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
Cooler Box Bag Envelope	PONY UPS FedEX USPS
Missing Samples	Other

Plant/Customer Welsh **Number of Plastic Containers:** 6

Opened By SM **Number of Glass Containers:**

Date/Time 6-9-21 1:35 **Number of Mercury Containers:**

Were all temperatures within 0-6°C? Y / N or N/A **Initial:** SM on ice / no ice

1(IR Gun Ser# 200700311, *Expir.* 06-11-22) - 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:** SM 6-9-21

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:

Initial & Date & Time :

Lab ID# 215117

Comments: remaining Samples arrived today added to Original Order

Logged by SM

Reviewed by MLO

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.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215113 **Customer: Welsh Power Station** **Date Reported: 07/02/2021**

Customer Sample ID: Customer Description:
Lab Number: 215113-001 Sampling Point: AD-11
Date Collected: 06/01/2021 Date Received: 06/04/2021
Preparation:

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	6.52	mg/L	2	0.04	0.01		CRJ	06/08/2021	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.62	mg/L	2	0.06	0.01		CRJ	06/08/2021	EPA 300.1 -1997, Rev. 1.0
Sulfate	485	mg/L	25	5.0	0.8		CRJ	06/08/2021	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	790	mg/L	1	50	20		SDW	06/07/2021	SM 2540C-2011

Customer Sample ID: Customer Description:
Lab Number: 215113-002 Sampling Point: AD-13
Date Collected: 06/01/2021 Date Received: 06/04/2021
Preparation:

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	3.70	mg/L	2	0.04	0.01		CRJ	06/08/2021	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.43	mg/L	2	0.06	0.01		CRJ	06/08/2021	EPA 300.1 -1997, Rev. 1.0
Sulfate	94.6	mg/L	2	0.40	0.06		CRJ	06/08/2021	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		SDW	06/07/2021	SM 2540C-2011

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 215113 **Customer: Welsh Power Station** **Date Reported: 07/02/2021**

Customer Sample ID: Customer Description:
Lab Number: 215113-003 Sampling Point: AD-14
Date Collected: 06/01/2021 Date Received: 06/04/2021
Preparation:

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	1.10	mg/L	2	0.04	0.01		CRJ	06/08/2021	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.20	mg/L	2	0.06	0.01		CRJ	06/08/2021	EPA 300.1 -1997, Rev. 1.0
Sulfate	91.8	mg/L	2	0.40	0.06		CRJ	06/08/2021	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		SDW	06/07/2021	SM 2540C-2011

Customer Sample ID: Duplicate - Landfill Customer Description:
Lab Number: 215113-004 Sampling Point:
Date Collected: 06/01/2021 Date Received: 06/04/2021
Preparation:

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	3.44	mg/L	2	0.04	0.01		CRJ	06/08/2021	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.42	mg/L	2	0.06	0.01		CRJ	06/08/2021	EPA 300.1 -1997, Rev. 1.0
Sulfate	90.8	mg/L	2	0.40	0.06		CRJ	06/08/2021	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	270	mg/L	2	100	40		SDW	06/07/2021	SM 2540C-2011

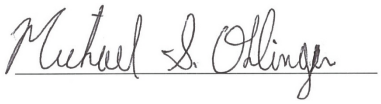
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215113 **Customer: Welsh Power Station** **Date Reported: 07/02/2021**

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

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215113 **Customer: Welsh Power Station** **Date Reported: 07/02/2021**

Data Qualifer Legend

B1	Analyte detected in method blank (MB) at or above the method criteria.
B2	Analyte detected in initial calibration blank (ICB) at or above the method criteria.
B3	Analyte detected in continuing calibration blank (CCB) at or above the method criteria.
B4	The interference check standard (ICS) exceeded the method criteria on this parameter.
H1	Sample was received past holding time.
H2	Sample analysis performed past holding time.
J1	Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
J2	Concentration estimated. Analyte exceeded calibration range.
L1	The associated laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) recovery was outside acceptance limits.
M1	The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.
M2	Analyzed by method of standard additions (MSA).
O1	The reporting limit for oil and grease is directly affected by the collected sample volume.
O2	Client did not provide additional bottles; thefore, the MS and duplicate are missing in this batch.
O3	Client did not provide additional bottles; therefore, the duplicate is missing in this batch.
O4	Sample was transferred to a different bottle due to excess fine particulate. The particulate was rinsed with hexane, and the hexane layer was transferred to the corresponding bottle. The hexane rinse was completed three times.
P1	The precision between duplicate results was above acceptance limits.
P2	The precision on the laboratory control sample duplicate (LCSD) was above acceptance limits.
P3	The precision on the matrix spike duplicate (MSD) was above acceptance limits.
P4	The field duplicate was used as a sample duplicate.
P5	The precision on the inorganic efficiency check (IEC) exceeded the method criteria.
Q1	Sample received in inappropriate sample container.
Q2	Sample was received damaged. The sample was recoverable.
Q3	Sample container was received damaged. Unable to recover the sample.
Q4	Sample was received outside of thermal preservation range.
Q5	Sample was received with improper chemical preservation.
Q6	Insufficient sample was received by the laboratory to perform the requested analysis.
Q7	Insufficient sample was received to meet method QC requirements.
Q8	Sample was received with head space.
Q9	Due to instrument malfunction, sample was invalidated.
Q10	Analysis was performed by a contracted laboratory. See attached report.
Q11	Sample contains free fiquid.
Q12	Sample does not contain free fiquid.
Q13	Sample did not ignite.
Q14	This analyte and method are not included on the primary Laboratory Scope of TNI Accreditation.
R1	Surrogate recovery was outside acceptance limits.
R2	Carrier recovery was outside acceptance limits.
R3	Internal standard recovery was outside acceptance limits.
R4	The recovery of the reduction efficency checks (REC) for nitrate or nitrite exceeded the method criteria.
R5	The back calculation recovery of one or more calibartion points exceeded the method criteria.
S1	Residue weight is above or below the method criteria and needs to be re-analyzed at a different dilution.

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Job ID: 215113 **Customer: Welsh Power Station** **Date Reported: 07/02/2021**

S2	Residue weight is above the method criteria but was already analyzed with the highest dilution factor.
S3	Residue wieght is below the method criteria but was already analyzed with 1000mL.
S4	Sample and duplicate results vary due to large amounts of solids present.
S5	Filtration time exceeds ten minutes.
S6	Insufficient sample was received to meet the minimum volume of the method. Residue wieght is below the method criteria and was analyzed with less than 1000mL.
S7	Sample did not achieve constant weight.
S8	Sample with low residue was selected for duplicate analysis.
S9	Based on history, the sample residue was only measured twice and did not achieve constant weight.
U1	Not detected at or above method detection limit (MDL).
V1	The associated initial calibration verification (ICV) recovery was outside acceptance limits.
V2	The associated continuing calibration verification (CCV) 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 Landfill
Contact Name: Jill Parker-Witt
Contact Phone: (318) 673-3816
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days): Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 215713

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-11	6/1/2021	1109	G	GW	1				X					
AD-13	6/1/2021	930	G	GW	1				X					
AD-14	6/1/2021	1131	G	GW	1				X					
DUPLICATE - LANDFILL	6/1/2021	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: FAGLE	Date/Time: 06/03/21 1400	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time: 6-4-21 12p

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:** 4

Opened By 6-4-21 12p **Number of Glass Containers:** _____

Date/Time SM, JWB **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? (Y) N or N/A **Initial:** SM (on ice) no ice

1(IR Gun Ser# 200700311, *Expir.* 06-11-22) - 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:** JWB 6-4-21

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: _____

Initial & Date & Time : _____

Lab ID# 215113

Comments: _____

Logged by MSD _____

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.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215118 **Customer: Welsh Power Station** **Date Reported: 07/06/2021**

Customer Sample ID: Customer Description:
Lab Number: 215118-001 Sampling Point: AD-11
Date Collected: 06/01/2021 11:09 Date Received: 06/08/2021 07:44
Preparation:

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.03	µg/L	1	0.10	0.02	J1	GES	06/10/2021 15:42	EPA 200.8-1994, Rev. 5.4
Arsenic	0.50	µg/L	1	0.10	0.03		GES	06/10/2021 15:42	EPA 200.8-1994, Rev. 5.4
Barium	36.3	µg/L	1	0.20	0.05		GES	06/10/2021 15:42	EPA 200.8-1994, Rev. 5.4
Beryllium	0.896	µg/L	1	0.050	0.007		GES	06/10/2021 15:42	EPA 200.8-1994, Rev. 5.4
Boron	1.64	mg/L	1	0.050	0.009		GES	06/10/2021 15:42	EPA 200.8-1994, Rev. 5.4
Cadmium	0.325	µg/L	1	0.020	0.004		GES	06/10/2021 15:42	EPA 200.8-1994, Rev. 5.4
Calcium	22.0	mg/L	1	0.3	0.1		DAM	06/21/2021 21:54	EPA 200.7-1994, Rev. 4.4
Chromium	0.39	µg/L	1	0.20	0.04		GES	06/10/2021 15:42	EPA 200.8-1994, Rev. 5.4
Cobalt	13.8	µg/L	1	0.020	0.003		GES	06/10/2021 15:42	EPA 200.8-1994, Rev. 5.4
Lead	0.69	µg/L	1	0.20	0.05		GES	06/10/2021 15:42	EPA 200.8-1994, Rev. 5.4
Lithium	0.0145	mg/L	1	0.00020	0.00005		GES	06/10/2021 15:42	EPA 200.8-1994, Rev. 5.4
Mercury	7	ng/L	1	5	2		JAB	06/18/2021 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	0.2	µg/L	1	0.5	0.1	J1	GES	06/10/2021 15:42	EPA 200.8-1994, Rev. 5.4
Selenium	1.31	µg/L	1	0.50	0.09		GES	06/10/2021 15:42	EPA 200.8-1994, Rev. 5.4
Thallium	0.14	µg/L	1	0.20	0.04	J1	GES	06/10/2021 15:42	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.92	pCi/L	0.13	0.12		TTP	06/28/2021 12:15	SW-846 9315-1986, Rev. 0
Carrier Recovery	97.1	%						
Radium-228	5.01	pCi/L	0.26	0.72		TTP	06/24/2021 17:03	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	67.8	%						

* 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: 215118 **Customer: Welsh Power Station** **Date Reported: 07/06/2021**

Customer Sample ID:
Customer Description:
Lab Number: 215118-002
Sampling Point: AD-13
Date Collected: 06/01/2021 09:30
Date Received: 06/08/2021 07:44
Preparation:

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.09	µg/L	1	0.10	0.02	J1	GES	06/10/2021 15:47	EPA 200.8-1994, Rev. 5.4
Arsenic	0.73	µg/L	1	0.10	0.03		GES	06/10/2021 15:47	EPA 200.8-1994, Rev. 5.4
Barium	116	µg/L	1	0.20	0.05		GES	06/10/2021 15:47	EPA 200.8-1994, Rev. 5.4
Beryllium	0.103	µg/L	1	0.050	0.007		GES	06/10/2021 15:47	EPA 200.8-1994, Rev. 5.4
Boron	0.831	mg/L	1	0.050	0.009		GES	06/10/2021 15:47	EPA 200.8-1994, Rev. 5.4
Cadmium	0.032	µg/L	1	0.020	0.004		GES	06/10/2021 15:47	EPA 200.8-1994, Rev. 5.4
Calcium	41.3	mg/L	1	0.3	0.1		DAM	06/21/2021 21:09	EPA 200.7-1994, Rev. 4.4
Chromium	0.41	µg/L	1	0.20	0.04		GES	06/10/2021 15:47	EPA 200.8-1994, Rev. 5.4
Cobalt	0.971	µg/L	1	0.020	0.003		GES	06/10/2021 15:47	EPA 200.8-1994, Rev. 5.4
Lead	0.06	µg/L	1	0.20	0.05	J1	GES	06/10/2021 15:47	EPA 200.8-1994, Rev. 5.4
Lithium	0.00211	mg/L	1	0.00020	0.00005		GES	06/10/2021 15:47	EPA 200.8-1994, Rev. 5.4
Mercury	3	ng/L	1	5	2	J1	JAB	06/18/2021 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	2.6	µg/L	1	0.5	0.1		GES	06/10/2021 15:47	EPA 200.8-1994, Rev. 5.4
Selenium	1.04	µg/L	1	0.50	0.09		GES	06/10/2021 15:47	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	06/10/2021 15:47	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	1	pCi/L	0.14	0.13		TTP	06/28/2021 12:15	SW-846 9315-1986, Rev. 0
Carrier Recovery	90.2	%						
Radium-228	1.27	pCi/L	0.20	0.61		TTP	06/25/2021 12:25	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	76.2	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215118 **Customer: Welsh Power Station** **Date Reported: 07/06/2021**

Customer Sample ID:
Customer Description:
Lab Number: 215118-003
Sampling Point: AD-14
Date Collected: 06/01/2021 11:31
Date Received: 06/08/2021 07:44
Preparation:

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.06	µg/L	1	0.10	0.02	J1	GES	06/10/2021 16:02	EPA 200.8-1994, Rev. 5.4
Arsenic	0.35	µg/L	1	0.10	0.03		GES	06/10/2021 16:02	EPA 200.8-1994, Rev. 5.4
Barium	48.6	µg/L	1	0.20	0.05		GES	06/10/2021 16:02	EPA 200.8-1994, Rev. 5.4
Beryllium	0.253	µg/L	1	0.050	0.007		GES	06/10/2021 16:02	EPA 200.8-1994, Rev. 5.4
Boron	1.33	mg/L	1	0.050	0.009		GES	06/10/2021 16:02	EPA 200.8-1994, Rev. 5.4
Cadmium	0.318	µg/L	1	0.020	0.004		GES	06/10/2021 16:02	EPA 200.8-1994, Rev. 5.4
Calcium	29.5	mg/L	1	0.3	0.1		DAM	06/21/2021 21:13	EPA 200.7-1994, Rev. 4.4
Chromium	0.41	µg/L	1	0.20	0.04		GES	06/10/2021 16:02	EPA 200.8-1994, Rev. 5.4
Cobalt	3.60	µg/L	1	0.020	0.003		GES	06/10/2021 16:02	EPA 200.8-1994, Rev. 5.4
Lead	0.11	µg/L	1	0.20	0.05	J1	GES	06/10/2021 16:02	EPA 200.8-1994, Rev. 5.4
Lithium	0.00676	mg/L	1	0.00020	0.00005		GES	06/10/2021 16:02	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	06/18/2021 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	0.6	µg/L	1	0.5	0.1		GES	06/10/2021 16:02	EPA 200.8-1994, Rev. 5.4
Selenium	2.61	µg/L	1	0.50	0.09		GES	06/10/2021 16:02	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.04	J1	GES	06/10/2021 16:02	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.74	pCi/L	0.13	0.11		TTP	06/28/2021 12:15	SW-846 9315-1986, Rev. 0
Carrier Recovery	84.1	%						
Radium-228	0.87	pCi/L	0.17	0.55		TTP	06/25/2021 12:25	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	75.7	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215118 **Customer: Welsh Power Station** **Date Reported: 07/06/2021**

Customer Sample ID: Duplicate Landfill
Customer Description:
Lab Number: 215118-004
Sampling Point:
Date Collected: 06/01/2021 12:00
Date Received: 06/08/2021 07:44
Preparation:

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.1	µg/L	1	0.10	0.02		GES	06/10/2021 17:09	EPA 200.8-1994, Rev. 5.4
Arsenic	0.81	µg/L	1	0.10	0.03		GES	06/10/2021 17:09	EPA 200.8-1994, Rev. 5.4
Barium	118	µg/L	1	0.20	0.05		GES	06/10/2021 17:09	EPA 200.8-1994, Rev. 5.4
Beryllium	0.107	µg/L	1	0.050	0.007		GES	06/10/2021 17:09	EPA 200.8-1994, Rev. 5.4
Boron	0.863	mg/L	1	0.050	0.009		GES	06/10/2021 17:09	EPA 200.8-1994, Rev. 5.4
Cadmium	0.032	µg/L	1	0.020	0.004		GES	06/10/2021 17:09	EPA 200.8-1994, Rev. 5.4
Calcium	41.2	mg/L	1	0.3	0.1		DAM	06/21/2021 21:17	EPA 200.7-1994, Rev. 4.4
Chromium	0.39	µg/L	1	0.20	0.04		GES	06/10/2021 17:09	EPA 200.8-1994, Rev. 5.4
Cobalt	0.980	µg/L	1	0.020	0.003		GES	06/10/2021 17:09	EPA 200.8-1994, Rev. 5.4
Lead	0.08	µg/L	1	0.20	0.05	J1	GES	06/10/2021 17:09	EPA 200.8-1994, Rev. 5.4
Lithium	0.00210	mg/L	1	0.00020	0.00005		GES	06/10/2021 17:09	EPA 200.8-1994, Rev. 5.4
Mercury	3	ng/L	1	5	2	J1	JAB	06/18/2021 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	2.7	µg/L	1	0.5	0.1		GES	06/10/2021 17:09	EPA 200.8-1994, Rev. 5.4
Selenium	0.83	µg/L	1	0.50	0.09		GES	06/10/2021 17:09	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	06/10/2021 17:09	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215118 **Customer: Welsh Power Station** **Date Reported: 07/06/2021**

Customer Sample ID: Equipment Blank- Landfill
Customer Description:
Lab Number: 215118-005
Sampling Point:
Date Collected: 06/01/2021 09:00
Date Received: 06/08/2021 07:44
Preparation:

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	06/10/2021 17:14	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	06/10/2021 17:14	EPA 200.8-1994, Rev. 5.4
Barium	0.19	µg/L	1	0.20	0.05	J1	GES	06/10/2021 17:14	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	06/10/2021 17:14	EPA 200.8-1994, Rev. 5.4
Boron	<0.009	mg/L	1	0.050	0.009	U1	GES	06/10/2021 17:14	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	06/10/2021 17:14	EPA 200.8-1994, Rev. 5.4
Calcium	<0.1	mg/L	1	0.3	0.1	U1	DAM	06/21/2021 21:21	EPA 200.7-1994, Rev. 4.4
Chromium	0.29	µg/L	1	0.20	0.04		GES	06/10/2021 17:14	EPA 200.8-1994, Rev. 5.4
Cobalt	0.037	µg/L	1	0.020	0.003		GES	06/10/2021 17:14	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	06/10/2021 17:14	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00005	mg/L	1	0.00020	0.00005	U1	GES	06/10/2021 17:14	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	06/18/2021 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	06/10/2021 17:14	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	06/10/2021 17:14	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	06/10/2021 17:14	EPA 200.8-1994, Rev. 5.4

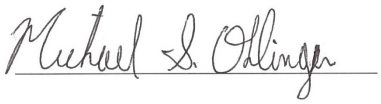
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215118 **Customer: Welsh Power Station** **Date Reported: 07/06/2021**

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

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 215118 **Customer: Welsh Power Station** **Date Reported: 07/06/2021**

Data Qualifer Legend

B1	Analyte detected in method blank (MB) at or above the method criteria.
B2	Analyte detected in initial calibration blank (ICB) at or above the method criteria.
B3	Analyte detected in continuing calibration blank (CCB) at or above the method criteria.
B4	The interference check standard (ICS) exceeded the method criteria on this parameter.
H1	Sample was received past holding time.
H2	Sample analysis performed past holding time.
J1	Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
J2	Concentration estimated. Analyte exceeded calibration range.
L1	The associated laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) recovery was outside acceptance limits.
M1	The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.
M2	Analyzed by method of standard additions (MSA).
O1	The reporting limit for oil and grease is directly affected by the collected sample volume.
O2	Client did not provide additional bottles; thefore, the MS and duplicate are missing in this batch.
O3	Client did not provide additional bottles; therefore, the duplicate is missing in this batch.
O4	Sample was transferred to a different bottle due to excess fine particulate. The particulate was rinsed with hexane, and the hexane layer was transferred to the corresponding bottle. The hexane rinse was completed three times.
P1	The precision between duplicate results was above acceptance limits.
P2	The precision on the laboratory control sample duplicate (LCSD) was above acceptance limits.
P3	The precision on the matrix spike duplicate (MSD) was above acceptance limits.
P4	The field duplicate was used as a sample duplicate.
P5	The precision on the inorganic efficiency check (IEC) exceeded the method criteria.
Q1	Sample received in inappropriate sample container.
Q2	Sample was received damaged. The sample was recoverable.
Q3	Sample container was received damaged. Unable to recover the sample.
Q4	Sample was received outside of thermal preservation range.
Q5	Sample was received with improper chemical preservation.
Q6	Insufficient sample was received by the laboratory to perform the requested analysis.
Q7	Insufficient sample was received to meet method QC requirements.
Q8	Sample was received with head space.
Q9	Due to instrument malfunction, sample was invalidated.
Q10	Analysis was performed by a contracted laboratory. See attached report.
Q11	Sample contains free fiquid.
Q12	Sample does not contain free fiquid.
Q13	Sample did not ignite.
Q14	This analyte and method are not included on the primary Laboratory Scope of TNI Accreditation.
R1	Surrogate recovery was outside acceptance limits.
R2	Carrier recovery was outside acceptance limits.
R3	Internal standard recovery was outside acceptance limits.
R4	The recovery of the reduction efficency checks (REC) for nitrate or nitrite exceeded the method criteria.
R5	The back calculation recovery of one or more calibartion points exceeded the method criteria.
S1	Residue weight is above or below the method criteria and needs to be re-analyzed at a different dilution.

S2	Residue weight is above the method criteria but was already analyzed with the highest dilution factor.
S3	Residue wieght is below the method criteria but was already analyzed with 1000mL.
S4	Sample and duplicate results vary due to large amounts of solids present.
S5	Filtration time exceeds ten minutes.
S6	Insufficient sample was received to meet the minimum volume of the method. Residue wieght is below the method criteria and was analyzed with less than 1000mL.
S7	Sample did not achieve constant weight.
S8	Sample with low residue was selected for duplicate analysis.
S9	Based on history, the sample residue was only measured twice and did not achieve constant weight.
U1	Not detected at or above method detection limit (MDL).
V1	The associated initial calibration verification (ICV) recovery was outside acceptance limits.
V2	The associated continuing calibration verification (CCV) 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 Landfill
Contact Name: Jill Parker-Witt
Contact Phone: (318) 673-3816
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days): Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 215118

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-11	6/1/2021	1109	G	GW	5		X			X	X			
AD-13	6/1/2021	930	G	GW	8		X			X	X			
AD-14	6/1/2021	1131	G	GW	5		X			X	X			
DUPLICATE - LANDFILL	6/1/2021	1200	G	GW	2		X				X			
EQUIPMENT BLANK - LANDFILL	6/1/2021	900	G	GW	2		X				X			
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	F4	1	4				

** 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:
Kyle	EAGLE	06/03/21 1400		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time:
			S. Heule	6-7-21 1pm

portal order

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:** 11

Opened By 6-7-21 **Number of Glass Containers:** _____

Date/Time SM 1pm **Number of Mercury Containers:** 5

Were all temperatures within 0-6°C? Y / N or N/A **Initial:** SM on ice / no ice

1(IR Gun Ser# 200700311, *Expir.* 06-11-22) - If No, specify each deviation: _____

Was container in good condition? Y / N Comments _____

Was Chain of Custody received? Y / N Comments _____

Requested turnaround: Rush **If RUSH**, who was notified? _____

pH (15 min)	Cr^{+6} (pres) (24 hr)	NO_2 or NO_3 (48 hr)	*ortho*-PO_4 (48 hr)	Hg-diss (pres) (48 hr)

Was COC filled out properly? Y / N Comments _____

Were samples labeled properly? Y / N Comments _____

Were correct containers used? Y / N Comments _____

Was pH checked & Color Coding done? Y / N or N/A **Initial & Date:** MGH 6-8-21

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: HgLab (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# 215118

Comments: Purchase Order waiting on Order - cooler for Fedex

Logged by SM

Reviewed by MSD

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.

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:** 6

Opened By SM **Number of Glass Containers:** _____

Date/Time 6-9-21 1:35 **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial:** SM on ice / no ice

1(IR Gun Ser# 200700311, *Expir.* 06-11-22) - If No, specify each deviation: _____

Was container in good condition? (Y) / N **Comments** _____

Was Chain of Custody received? (Y) / N **Comments** _____

Requested turnaround: Rush **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:** SM 6-9-21

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# 215118 Initial & Date & Time : _____

Logged by SM Comments: remaining samples arrived today added to original bottles

Reviewed by 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.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 216023 **Customer: Welsh Power Station** **Date Reported: 11/05/2021**

Customer Sample ID: AD-11 **Customer Description:**
Lab Number: 216023-001 **Preparation:**
Date Collected: 10/19/2021 10:36 **Date Received: 10/22/2021 10:50**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	9.73	mg/L	2	0.04	0.02		CRJ	10/27/2021 20:50	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.66	mg/L	2	0.06	0.02		CRJ	10/27/2021 20:50	EPA 300.1 -1997, Rev. 1.0
Sulfate	488	mg/L	25	5.0	0.8		CRJ	10/27/2021 19:33	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	800	mg/L	1	50	20		SDW	10/25/2021 10:53	SM 2540C-2011

Customer Sample ID: AD-13 **Customer Description:**
Lab Number: 216023-002 **Preparation:**
Date Collected: 10/19/2021 09:14 **Date Received: 10/22/2021 10:50**

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	10/28/2021 00:13	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.19	mg/L	2	0.06	0.02		CRJ	10/28/2021 00:13	EPA 300.1 -1997, Rev. 1.0
Sulfate	201	mg/L	10	2.0	0.3		CRJ	10/27/2021 23:48	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	400	mg/L	1	50	20		SDW	10/25/2021 10:53	SM 2540C-2011

Customer Sample ID: AD-14 **Customer Description:**
Lab Number: 216023-003 **Preparation:**
Date Collected: 10/19/2021 09:51 **Date Received: 10/22/2021 10:50**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	8.22	mg/L	2	0.04	0.02		CRJ	10/28/2021 03:36	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.23	mg/L	2	0.06	0.02		CRJ	10/28/2021 03:36	EPA 300.1 -1997, Rev. 1.0
Sulfate	223	mg/L	10	2.0	0.3		CRJ	10/28/2021 01:55	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	430	mg/L	1	50	20		SDW	10/25/2021 10:58	SM 2540C-2011

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 216023 **Customer: Welsh Power Station** **Date Reported: 11/05/2021**

Customer Sample ID: Duplicate - Landfill
Lab Number: 216023-004
Date Collected: 10/19/2021 10:36

Customer Description:
Preparation:
Date Received: 10/22/2021 10:50

Ion Chromatography

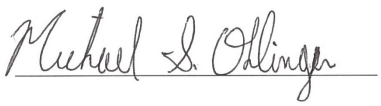
Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	9.80	mg/L	2	0.04	0.02		CRJ	10/28/2021 00:38	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.66	mg/L	2	0.06	0.02		CRJ	10/28/2021 00:38	EPA 300.1 -1997, Rev. 1.0
Sulfate	493	mg/L	25	5.0	0.8		CRJ	10/28/2021 01:29	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
TDS, Filterable Residue	800	mg/L	1	50	20		SDW	10/25/2021 10:58	SM 2540C-2011

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 Landfill
Contact Name: Jill Parker-Witt
Contact Phone: (318) 673-3816
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 216023

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-11	10/19/2021	1036	G	GW	1				X					
AD-13	10/19/2021	914	G	GW	1				X					
AD-14	10/19/2021	951	G	GW	1				X					
DUPLICATE - LANDFILL	10/19/2021	1036	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	F4	1	4				

** Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company: Eagle	Date/Time: 10-21-21 1200	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time: 10/22/21 10:50AM

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 MGK/MSO **Number of Glass Containers:** _____

Date/Time 10/22/21 10:50 AM **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? (Y) / N or N/A **Initial:** MSO on ice / no ice

1(IR Gun Ser# 200700311, *Expir.* 06-11-22) - 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 10/22/21

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# 216023 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.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 216057 **Customer: Welsh Power Station** **Date Reported: 11/18/2021**

Customer Sample ID: AD-11 Customer Description:
Lab Number: 216057-001 Preparation:
Date Collected: 10/19/2021 10:36 Date Received: 10/26/2021 12:00

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.02	µg/L	1	0.10	0.02	J1	GES	10/28/2021 14:55	EPA 200.8-1994, Rev. 5.4
Arsenic	0.64	µg/L	1	0.10	0.03		GES	10/28/2021 14:55	EPA 200.8-1994, Rev. 5.4
Barium	12.3	µg/L	1	0.20	0.05		GES	10/28/2021 14:55	EPA 200.8-1994, Rev. 5.4
Beryllium	1.31	µg/L	1	0.050	0.007		GES	10/28/2021 14:55	EPA 200.8-1994, Rev. 5.4
Boron	1.95	mg/L	1	0.050	0.009		GES	10/28/2021 14:55	EPA 200.8-1994, Rev. 5.4
Cadmium	0.320	µg/L	1	0.020	0.004		GES	10/28/2021 14:55	EPA 200.8-1994, Rev. 5.4
Calcium	8.1	mg/L	1	0.3	0.1		DAM	10/28/2021 12:02	EPA 200.7-1994, Rev. 4.4
Chromium	0.62	µg/L	1	0.20	0.04		GES	10/28/2021 14:55	EPA 200.8-1994, Rev. 5.4
Cobalt	15.2	µg/L	1	0.020	0.003		GES	10/28/2021 14:55	EPA 200.8-1994, Rev. 5.4
Lead	1.37	µg/L	1	0.20	0.05		GES	10/28/2021 14:55	EPA 200.8-1994, Rev. 5.4
Lithium	0.0211	mg/L	1	0.00020	0.00005		GES	10/28/2021 14:55	EPA 200.8-1994, Rev. 5.4
Mercury	7	ng/L	1	5	2		JAB	11/02/2021 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/28/2021 14:55	EPA 200.8-1994, Rev. 5.4
Selenium	2.12	µg/L	1	0.50	0.09		GES	10/28/2021 14:55	EPA 200.8-1994, Rev. 5.4
Thallium	0.18	µg/L	1	0.20	0.04	J1	GES	10/28/2021 14:55	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.84	pCi/L	0.13	0.15		ST	11/15/2021 10:18	SW-846 9315-1986, Rev. 0
Carrier Recovery	95.3	%						
Radium-228	1.31	pCi/L	0.26	0.84		TTP	11/01/2021 15:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	64.9	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 216057 **Customer: Welsh Power Station** **Date Reported: 11/18/2021**

Customer Sample ID: AD-13
Lab Number: 216057-002
Date Collected: 10/19/2021 09:14

Customer Description:
Preparation:
Date Received: 10/26/2021 12:00

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	10/28/2021 14:14	EPA 200.8-1994, Rev. 5.4
Arsenic	0.34	µg/L	1	0.10	0.03		GES	10/28/2021 14:14	EPA 200.8-1994, Rev. 5.4
Barium	14.6	µg/L	1	0.20	0.05		GES	10/28/2021 14:14	EPA 200.8-1994, Rev. 5.4
Beryllium	0.505	µg/L	1	0.050	0.007		GES	10/28/2021 14:14	EPA 200.8-1994, Rev. 5.4
Boron	1.36	mg/L	1	0.050	0.009		GES	10/28/2021 14:14	EPA 200.8-1994, Rev. 5.4
Cadmium	0.146	µg/L	1	0.020	0.004		GES	10/28/2021 14:14	EPA 200.8-1994, Rev. 5.4
Calcium	5.5	mg/L	1	0.3	0.1		DAM	10/28/2021 12:06	EPA 200.7-1994, Rev. 4.4
Chromium	0.34	µg/L	1	0.20	0.04		GES	10/28/2021 14:14	EPA 200.8-1994, Rev. 5.4
Cobalt	6.75	µg/L	1	0.020	0.003		GES	10/28/2021 14:14	EPA 200.8-1994, Rev. 5.4
Lead	0.36	µg/L	1	0.20	0.05		GES	10/28/2021 14:14	EPA 200.8-1994, Rev. 5.4
Lithium	0.0330	mg/L	1	0.00020	0.00005		GES	10/28/2021 14:14	EPA 200.8-1994, Rev. 5.4
Mercury	2	ng/L	1	5	2	J1	JAB	11/02/2021 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/28/2021 14:14	EPA 200.8-1994, Rev. 5.4
Selenium	0.37	µg/L	1	0.50	0.09	J1	GES	10/28/2021 14:14	EPA 200.8-1994, Rev. 5.4
Thallium	0.19	µg/L	1	0.20	0.04	J1	GES	10/28/2021 14:14	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.34	pCi/L	0.08	0.11		ST	11/15/2021 10:18	SW-846 9315-1986, Rev. 0
Carrier Recovery	89.7	%						
Radium-228	0.88	pCi/L	0.16	0.50		TTP	11/01/2021 15:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	77.5	%						

* 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: 216057 **Customer: Welsh Power Station** **Date Reported: 11/18/2021**

Customer Sample ID: AD-14
Lab Number: 216057-003
Date Collected: 10/19/2021 09:51

Customer Description:
Preparation:
Date Received: 10/26/2021 12:00

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	10/28/2021 14:19	EPA 200.8-1994, Rev. 5.4
Arsenic	0.41	µg/L	1	0.10	0.03		GES	10/28/2021 14:19	EPA 200.8-1994, Rev. 5.4
Barium	23.8	µg/L	1	0.20	0.05		GES	10/28/2021 14:19	EPA 200.8-1994, Rev. 5.4
Beryllium	1.24	µg/L	1	0.050	0.007		GES	10/28/2021 14:19	EPA 200.8-1994, Rev. 5.4
Boron	1.05	mg/L	1	0.050	0.009		GES	10/28/2021 14:19	EPA 200.8-1994, Rev. 5.4
Cadmium	2.72	µg/L	1	0.020	0.004		GES	10/28/2021 14:19	EPA 200.8-1994, Rev. 5.4
Calcium	8.2	mg/L	1	0.3	0.1		DAM	10/28/2021 12:09	EPA 200.7-1994, Rev. 4.4
Chromium	0.58	µg/L	1	0.20	0.04		GES	10/28/2021 14:19	EPA 200.8-1994, Rev. 5.4
Cobalt	23.4	µg/L	1	0.020	0.003		GES	10/28/2021 14:19	EPA 200.8-1994, Rev. 5.4
Lead	0.35	µg/L	1	0.20	0.05		GES	10/28/2021 14:19	EPA 200.8-1994, Rev. 5.4
Lithium	0.0151	mg/L	1	0.00020	0.00005		GES	10/28/2021 14:19	EPA 200.8-1994, Rev. 5.4
Mercury	308	ng/L	1	5	2		JAB	11/02/2021 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/28/2021 14:19	EPA 200.8-1994, Rev. 5.4
Selenium	2.34	µg/L	1	0.50	0.09		GES	10/28/2021 14:19	EPA 200.8-1994, Rev. 5.4
Thallium	0.28	µg/L	1	0.20	0.04		GES	10/28/2021 14:19	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.96	pCi/L	0.14	0.09		ST	11/08/2021 11:14	SW-846 9315-1986, Rev. 0
Carrier Recovery	98.0	%						
Radium-228	1.46	pCi/L	0.21	0.64		TTP	11/01/2021 15:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	72.0	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 216057 **Customer: Welsh Power Station** **Date Reported: 11/18/2021**

Customer Sample ID: DUPLICATE - LANDFILL
Customer Description:
Lab Number: 216057-004
Preparation:
Date Collected: 10/19/2021 10:36
Date Received: 10/26/2021 12:00

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.02	µg/L	1	0.10	0.02	J1	GES	10/28/2021 14:25	EPA 200.8-1994, Rev. 5.4
Arsenic	0.66	µg/L	1	0.10	0.03		GES	10/28/2021 14:25	EPA 200.8-1994, Rev. 5.4
Barium	12.8	µg/L	1	0.20	0.05		GES	10/28/2021 14:25	EPA 200.8-1994, Rev. 5.4
Beryllium	1.34	µg/L	1	0.050	0.007		GES	10/28/2021 14:25	EPA 200.8-1994, Rev. 5.4
Boron	2.06	mg/L	1	0.050	0.009		GES	10/28/2021 14:25	EPA 200.8-1994, Rev. 5.4
Cadmium	0.333	µg/L	1	0.020	0.004		GES	10/28/2021 14:25	EPA 200.8-1994, Rev. 5.4
Calcium	8.1	mg/L	1	0.3	0.1		DAM	10/28/2021 12:13	EPA 200.7-1994, Rev. 4.4
Chromium	0.51	µg/L	1	0.20	0.04		GES	10/28/2021 14:25	EPA 200.8-1994, Rev. 5.4
Cobalt	16.1	µg/L	1	0.020	0.003		GES	10/28/2021 14:25	EPA 200.8-1994, Rev. 5.4
Lead	1.43	µg/L	1	0.20	0.05		GES	10/28/2021 14:25	EPA 200.8-1994, Rev. 5.4
Lithium	0.0214	mg/L	1	0.00020	0.00005		GES	10/28/2021 14:25	EPA 200.8-1994, Rev. 5.4
Mercury	7	ng/L	1	5	2		JAB	11/02/2021 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/28/2021 14:25	EPA 200.8-1994, Rev. 5.4
Selenium	2.09	µg/L	1	0.50	0.09		GES	10/28/2021 14:25	EPA 200.8-1994, Rev. 5.4
Thallium	0.19	µg/L	1	0.20	0.04	J1	GES	10/28/2021 14:25	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 216057 **Customer: Welsh Power Station** **Date Reported: 11/18/2021**

Customer Sample ID: EQUIPMENT BLANK - LANDFILL
Customer Description:
Lab Number: 216057-005
Preparation:
Date Collected: 10/19/2021 11:02
Date Received: 10/26/2021 12:00

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	10/28/2021 14:30	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	10/28/2021 14:30	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	GES	10/28/2021 14:30	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	10/28/2021 14:30	EPA 200.8-1994, Rev. 5.4
Boron	<0.009	mg/L	1	0.050	0.009	U1	GES	10/28/2021 14:30	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	10/28/2021 14:30	EPA 200.8-1994, Rev. 5.4
Calcium	<0.1	mg/L	1	0.3	0.1	U1	DAM	10/28/2021 11:46	EPA 200.7-1994, Rev. 4.4
Chromium	0.19	µg/L	1	0.20	0.04	J1	GES	10/28/2021 14:30	EPA 200.8-1994, Rev. 5.4
Cobalt	0.014	µg/L	1	0.020	0.003	J1	GES	10/28/2021 14:30	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	10/28/2021 14:30	EPA 200.8-1994, Rev. 5.4
Lithium	<0.00005	mg/L	1	0.00020	0.00005	U1	GES	10/28/2021 14:30	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	JAB	11/02/2021 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/28/2021 14:30	EPA 200.8-1994, Rev. 5.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	10/28/2021 14:30	EPA 200.8-1994, Rev. 5.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	10/28/2021 14:30	EPA 200.8-1994, Rev. 5.4

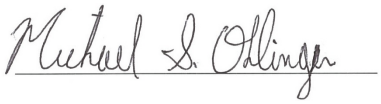
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 216057 **Customer: Welsh Power Station** **Date Reported: 11/18/2021**

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 Landfill
Contact Name: Jill Parker-Witt
Contact Phone: (318) 673-3816
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 216057

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-11	10/19/2021	1036	G	GW	8		X			X	X			
AD-13	10/19/2021	914	G	GW	5		X			X	X			
AD-14	10/19/2021	951	G	GW	5		X			X	X			
DUPLICATE - LANDFILL	10/19/2021	1036	G	GW	2		X				X			
EQUIPMENT BLANK - LANDFILL	10/19/2021	1102	G	GW	2		X				X			
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							**4**	**F4**	**1**	**4**	**2**			

** 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	10-21-21 1200		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Date/Time: 10/26/21 12:00pm

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

Opened By Misha **Number of Glass Containers:** _____

Date/Time 10/26/2021 12:00Pm **Number of Mercury Containers:** 5

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial:** MG/C on ice / (no ice)

1(IR Gun Ser# 200700311, *Expir.* 06-11-22) - 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:** MG/C 10/26/2021

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# 216057 Initial & Date & Time : _____

Comments: _____

Logged by MSD _____

_____

Reviewed by MG/C _____

_____

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.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 216027 **Customer: Welsh Power Station** **Date Reported: 11/18/2021**

Customer Sample ID: AD-1
Customer Description:
Lab Number: 216027-001
Preparation:
Date Collected: 10/20/2021 10:34
Date Received: 10/22/2021 10:50

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	2.21	mg/L	2	0.04	0.02		CRJ	10/29/2021 14:10	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.22	mg/L	2	0.06	0.02		CRJ	10/29/2021 14:10	EPA 300.1 -1997, Rev. 1.0
Sulfate	72.4	mg/L	2	0.40	0.06		CRJ	10/29/2021 14:10	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	12	mg/L	1	20	5	J1	MGK	11/05/2021 15:55	SM 2320B-2011
TDS, Filterable Residue	190	mg/L	1	50	20		SDW	10/25/2021 11:28	SM 2540C-2011

Customer Sample ID: AD-5
Customer Description:
Lab Number: 216027-002
Preparation:
Date Collected: 10/20/2021 09:15
Date Received: 10/22/2021 10:50

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	17.4	mg/L	2	0.04	0.02		CRJ	10/29/2021 16:44	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.17	mg/L	2	0.06	0.02		CRJ	10/29/2021 16:44	EPA 300.1 -1997, Rev. 1.0
Sulfate	155	mg/L	10	2.0	0.3		CRJ	10/29/2021 13:45	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	51	mg/L	1	20	5		MGK	11/05/2021 15:55	SM 2320B-2011
TDS, Filterable Residue	370	mg/L	1	50	20		SDW	10/25/2021 11:28	SM 2540C-2011

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 216027 **Customer: Welsh Power Station** **Date Reported: 11/18/2021**

Customer Sample ID: AD-17
Lab Number: 216027-003
Date Collected: 10/20/2021 12:02
Customer Description:
Preparation:
Date Received: 10/22/2021 10:50

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	37.3	mg/L	5	0.10	0.05		CRJ	10/29/2021 17:35	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.16	mg/L	5	0.15	0.05		CRJ	10/29/2021 17:35	EPA 300.1 -1997, Rev. 1.0
Sulfate	1040	mg/L	50	10	2		CRJ	10/29/2021 20:08	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	<5	mg/L	1	20	5	U1	MGK	11/05/2021 15:55	SM 2320B-2011
TDS, Filterable Residue	1710	mg/L	1	50	20		SDW	10/25/2021 11:33	SM 2540C-2011

Customer Sample ID: Duplicate - Background
Lab Number: 216027-004
Date Collected: 10/20/2021 12:00
Customer Description:
Preparation:
Date Received: 10/22/2021 10:50

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Chloride	2.18	mg/L	5	0.10	0.05		CRJ	10/29/2021 17:10	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.22	mg/L	5	0.15	0.05		CRJ	10/29/2021 17:10	EPA 300.1 -1997, Rev. 1.0
Sulfate	68.9	mg/L	5	1.0	0.2		CRJ	10/29/2021 17:10	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	14	mg/L	1	20	5	J1	MGK	11/05/2021 15:55	SM 2320B-2011
TDS, Filterable Residue	200	mg/L	1	50	20		SDW	10/25/2021 11:40	SM 2540C-2011

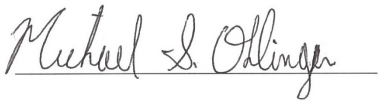
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 216027 **Customer: Welsh Power Station** **Date Reported: 11/18/2021**

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: Jill Parker-Witt
Contact Phone: (318) 673-3816
Sampler(s): Matt Hamilton Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
Routine (28 days)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 216027

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	10/20/2021	1034	G	GW	1				X					
AD-5	10/20/2021	915	G	GW	1				X					
AD-17	10/20/2021	1202	G	GW	1				X					
DUPLICATE - BACKGROUND	10/20/2021	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: Eagle	Date/Time: 10-21-21 12pm	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: Michael Ohly	Date/Time: 10/22/21 10:50AM

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 MGK/MSO **Number of Glass Containers:** _____

Date/Time 10/22/21 10:50 AM **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? (Y) / N or N/A **Initial:** MSO on ice / no ice

1(IR Gun Ser# 200700311, *Expir.* 06-11-22) - 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 10/22/21

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# 216027 Initial & Date & Time : _____

Logged by MSO Comments: _____

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.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 216055 **Customer: Welsh Power Station** **Date Reported: 11/16/2021**

Customer Sample ID: AD-1
Lab Number: 216055-001
Date Collected: 10/20/2021 10:34

Customer Description:
Preparation:
Date Received: 10/26/2021 13:00

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.04	µg/L	1	0.10	0.02	J1	GES	10/28/2021 11:17	EPA 200.8-1994, Rev. 5.4
Arsenic	0.20	µg/L	1	0.10	0.03		GES	10/28/2021 11:17	EPA 200.8-1994, Rev. 5.4
Barium	86.1	µg/L	1	0.20	0.05		GES	10/28/2021 11:17	EPA 200.8-1994, Rev. 5.4
Beryllium	0.932	µg/L	1	0.050	0.007		GES	10/28/2021 11:17	EPA 200.8-1994, Rev. 5.4
Boron	0.732	mg/L	1	0.050	0.009		GES	10/28/2021 11:17	EPA 200.8-1994, Rev. 5.4
Cadmium	0.026	µg/L	1	0.020	0.004		GES	10/28/2021 11:17	EPA 200.8-1994, Rev. 5.4
Calcium	4.8	mg/L	1	0.3	0.1		DAM	10/28/2021 10:17	EPA 200.7-1994, Rev. 4.4
Chromium	0.33	µg/L	1	0.20	0.04		GES	10/28/2021 11:17	EPA 200.8-1994, Rev. 5.4
Cobalt	2.44	µg/L	1	0.020	0.003		GES	10/28/2021 11:17	EPA 200.8-1994, Rev. 5.4
Lead	0.23	µg/L	1	0.20	0.05		GES	10/28/2021 11:17	EPA 200.8-1994, Rev. 5.4
Lithium	0.00756	mg/L	1	0.00020	0.00005		GES	10/28/2021 11:17	EPA 200.8-1994, Rev. 5.4
Magnesium	2.69	mg/L	1	0.10	0.02		DAM	10/28/2021 10:17	EPA 200.7-1994, Rev. 4.4
Mercury	3	ng/L	1	5	2	J1	JAB	11/15/2021 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/28/2021 11:17	EPA 200.8-1994, Rev. 5.4
Potassium	1	mg/L	1	1.0	0.2		DAM	10/28/2021 10:17	EPA 200.7-1994, Rev. 4.4
Selenium	7.39	µg/L	1	0.50	0.09		GES	10/28/2021 11:17	EPA 200.8-1994, Rev. 5.4
Sodium	32.7	mg/L	1	0.5	0.2		DAM	10/28/2021 10:17	EPA 200.7-1994, Rev. 4.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	10/28/2021 11:17	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.55	pCi/L	0.11	0.13	P1	ST	11/15/2021 10:18	SW-846 9315-1986, Rev. 0
Carrier Recovery	85.2	%						
Radium-228	0.44	pCi/L	0.14	0.47		TTP	11/01/2021 15:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	78.8	%						

* 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: 216055 **Customer: Welsh Power Station** **Date Reported: 11/16/2021**

Customer Sample ID: AD-5
Lab Number: 216055-002
Date Collected: 10/20/2021 09:15

Customer Description:
Preparation:
Date Received: 10/26/2021 13:00

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	10/28/2021 11:22	EPA 200.8-1994, Rev. 5.4
Arsenic	1.44	µg/L	1	0.10	0.03		GES	10/28/2021 11:22	EPA 200.8-1994, Rev. 5.4
Barium	53.2	µg/L	1	0.20	0.05		GES	10/28/2021 11:22	EPA 200.8-1994, Rev. 5.4
Beryllium	0.018	µg/L	1	0.050	0.007	J1	GES	10/28/2021 11:22	EPA 200.8-1994, Rev. 5.4
Boron	0.038	mg/L	1	0.050	0.009	J1	GES	10/28/2021 11:22	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	10/28/2021 11:22	EPA 200.8-1994, Rev. 5.4
Calcium	38.4	mg/L	1	0.3	0.1		DAM	10/28/2021 10:46	EPA 200.7-1994, Rev. 4.4
Chromium	0.23	µg/L	1	0.20	0.04		GES	10/28/2021 11:22	EPA 200.8-1994, Rev. 5.4
Cobalt	6.85	µg/L	1	0.020	0.003		GES	10/28/2021 11:22	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	10/28/2021 11:22	EPA 200.8-1994, Rev. 5.4
Lithium	0.133	mg/L	1	0.00020	0.00005	M1	GES	10/28/2021 11:22	EPA 200.8-1994, Rev. 5.4
Magnesium	13.3	mg/L	1	0.10	0.02		DAM	10/28/2021 10:46	EPA 200.7-1994, Rev. 4.4
Mercury	<2	ng/L	1	5	2	U1	JAB	11/15/2021 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/28/2021 11:22	EPA 200.8-1994, Rev. 5.4
Potassium	3.2	mg/L	1	1.0	0.2		DAM	10/28/2021 10:46	EPA 200.7-1994, Rev. 4.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	10/28/2021 11:22	EPA 200.8-1994, Rev. 5.4
Sodium	33.2	mg/L	1	0.5	0.2		DAM	10/28/2021 10:46	EPA 200.7-1994, Rev. 4.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	10/28/2021 11:22	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.74	pCi/L	0.12	0.12		ST	11/15/2021 10:18	SW-846 9315-1986, Rev. 0
Carrier Recovery	89.5	%						
Radium-228	1.94	pCi/L	0.22	0.68		TTP	11/01/2021 15:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	73.4	%						

* 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: 216055 **Customer: Welsh Power Station** **Date Reported: 11/16/2021**

Customer Sample ID: AD-17
Lab Number: 216055-003
Date Collected: 10/20/2021 12:02

Customer Description:
Preparation:
Date Received: 10/26/2021 13:00

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	10/28/2021 11:38	EPA 200.8-1994, Rev. 5.4
Arsenic	0.57	µg/L	1	0.10	0.03		GES	10/28/2021 11:38	EPA 200.8-1994, Rev. 5.4
Barium	10.2	µg/L	1	0.20	0.05		GES	10/28/2021 11:38	EPA 200.8-1994, Rev. 5.4
Beryllium	0.035	µg/L	1	0.050	0.007	J1	GES	10/28/2021 11:38	EPA 200.8-1994, Rev. 5.4
Boron	0.104	mg/L	1	0.050	0.009		GES	10/28/2021 11:38	EPA 200.8-1994, Rev. 5.4
Cadmium	0.019	µg/L	1	0.020	0.004	J1	GES	10/28/2021 11:38	EPA 200.8-1994, Rev. 5.4
Calcium	164	mg/L	1	0.3	0.1		DAM	10/28/2021 10:50	EPA 200.7-1994, Rev. 4.4
Chromium	0.38	µg/L	1	0.20	0.04		GES	10/28/2021 11:38	EPA 200.8-1994, Rev. 5.4
Cobalt	42.9	µg/L	1	0.020	0.003		GES	10/28/2021 11:38	EPA 200.8-1994, Rev. 5.4
Lead	0.07	µg/L	1	0.20	0.05	J1	GES	10/28/2021 11:38	EPA 200.8-1994, Rev. 5.4
Lithium	0.250	mg/L	1	0.00020	0.00005		GES	10/28/2021 11:38	EPA 200.8-1994, Rev. 5.4
Magnesium	47.4	mg/L	1	0.10	0.02		DAM	10/28/2021 10:50	EPA 200.7-1994, Rev. 4.4
Mercury	<2	ng/L	1	5	2	U1	JAB	11/15/2021 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/28/2021 11:38	EPA 200.8-1994, Rev. 5.4
Potassium	7.7	mg/L	1	1.0	0.2		DAM	10/28/2021 10:50	EPA 200.7-1994, Rev. 4.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	10/28/2021 11:38	EPA 200.8-1994, Rev. 5.4
Sodium	29.1	mg/L	1	0.5	0.2		DAM	10/28/2021 10:50	EPA 200.7-1994, Rev. 4.4
Thallium	0.05	µg/L	1	0.20	0.04	J1	GES	10/28/2021 11:38	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.59	pCi/L	0.10	0.09		ST	11/15/2021 10:18	SW-846 9315-1986, Rev. 0
Carrier Recovery	96.6	%						
Radium-228	1.14	pCi/L	0.19	0.57		TTP	11/01/2021 15:34	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	67.1	%						

* 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: 216055 **Customer: Welsh Power Station** **Date Reported: 11/16/2021**

Customer Sample ID: Duplicate - Background
Customer Description:
Lab Number: 216055-004
Preparation:
Date Collected: 10/20/2021 12:00
Date Received: 10/26/2021 13:00

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.04	µg/L	1	0.10	0.02	J1	GES	10/28/2021 11:43	EPA 200.8-1994, Rev. 5.4
Arsenic	0.20	µg/L	1	0.10	0.03		GES	10/28/2021 11:43	EPA 200.8-1994, Rev. 5.4
Barium	87.9	µg/L	1	0.20	0.05		GES	10/28/2021 11:43	EPA 200.8-1994, Rev. 5.4
Beryllium	0.935	µg/L	1	0.050	0.007		GES	10/28/2021 11:43	EPA 200.8-1994, Rev. 5.4
Boron	0.725	mg/L	1	0.050	0.009		GES	10/28/2021 11:43	EPA 200.8-1994, Rev. 5.4
Cadmium	0.032	µg/L	1	0.020	0.004		GES	10/28/2021 11:43	EPA 200.8-1994, Rev. 5.4
Calcium	4.9	mg/L	1	0.3	0.1		DAM	10/28/2021 10:54	EPA 200.7-1994, Rev. 4.4
Chromium	0.29	µg/L	1	0.20	0.04		GES	10/28/2021 11:43	EPA 200.8-1994, Rev. 5.4
Cobalt	2.55	µg/L	1	0.020	0.003		GES	10/28/2021 11:43	EPA 200.8-1994, Rev. 5.4
Lead	0.24	µg/L	1	0.20	0.05		GES	10/28/2021 11:43	EPA 200.8-1994, Rev. 5.4
Lithium	0.00759	mg/L	1	0.00020	0.00005		GES	10/28/2021 11:43	EPA 200.8-1994, Rev. 5.4
Magnesium	2.72	mg/L	1	0.10	0.02		DAM	10/28/2021 10:54	EPA 200.7-1994, Rev. 4.4
Mercury	2	ng/L	1	5	2	J1	JAB	11/15/2021 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/28/2021 11:43	EPA 200.8-1994, Rev. 5.4
Potassium	0.9	mg/L	1	1.0	0.2	J1	DAM	10/28/2021 10:54	EPA 200.7-1994, Rev. 4.4
Selenium	7.99	µg/L	1	0.50	0.09		GES	10/28/2021 11:43	EPA 200.8-1994, Rev. 5.4
Sodium	33.0	mg/L	1	0.5	0.2		DAM	10/28/2021 10:54	EPA 200.7-1994, Rev. 4.4
Thallium	0.05	µg/L	1	0.20	0.04	J1	GES	10/28/2021 11:43	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: 216055 **Customer: Welsh Power Station** **Date Reported: 11/16/2021**

Customer Sample ID: Equipment Blank - Background
Customer Description:
Lab Number: 216055-005
Preparation:
Date Collected: 10/20/2021 10:42
Date Received: 10/26/2021 13:00

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	<0.02	µg/L	1	0.10	0.02	U1	GES	10/28/2021 11:48	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.03	µg/L	1	0.10	0.03	U1	GES	10/28/2021 11:48	EPA 200.8-1994, Rev. 5.4
Barium	<0.05	µg/L	1	0.20	0.05	U1	GES	10/28/2021 11:48	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.007	µg/L	1	0.050	0.007	U1	GES	10/28/2021 11:48	EPA 200.8-1994, Rev. 5.4
Boron	<0.009	mg/L	1	0.050	0.009	U1	GES	10/28/2021 11:48	EPA 200.8-1994, Rev. 5.4
Cadmium	<0.004	µg/L	1	0.020	0.004	U1	GES	10/28/2021 11:48	EPA 200.8-1994, Rev. 5.4
Calcium	<0.1	mg/L	1	0.3	0.1	U1	DAM	10/28/2021 10:58	EPA 200.7-1994, Rev. 4.4
Chromium	0.23	µg/L	1	0.20	0.04		GES	10/28/2021 11:48	EPA 200.8-1994, Rev. 5.4
Cobalt	0.013	µg/L	1	0.020	0.003	J1	GES	10/28/2021 11:48	EPA 200.8-1994, Rev. 5.4
Lead	<0.05	µg/L	1	0.20	0.05	U1	GES	10/28/2021 11:48	EPA 200.8-1994, Rev. 5.4
Lithium	0.00009	mg/L	1	0.00020	0.00005	J1	GES	10/28/2021 11:48	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.02	mg/L	1	0.10	0.02	U1	DAM	10/28/2021 10:58	EPA 200.7-1994, Rev. 4.4
Mercury	<2	ng/L	1	5	2	U1	JAB	11/15/2021 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	<0.1	µg/L	1	0.5	0.1	U1	GES	10/28/2021 11:48	EPA 200.8-1994, Rev. 5.4
Potassium	<0.2	mg/L	1	1.0	0.2	U1	DAM	10/28/2021 10:58	EPA 200.7-1994, Rev. 4.4
Selenium	<0.09	µg/L	1	0.50	0.09	U1	GES	10/28/2021 11:48	EPA 200.8-1994, Rev. 5.4
Sodium	<0.2	mg/L	1	0.5	0.2	U1	DAM	10/28/2021 10:58	EPA 200.7-1994, Rev. 4.4
Thallium	<0.04	µg/L	1	0.20	0.04	U1	GES	10/28/2021 11:48	EPA 200.8-1994, Rev. 5.4

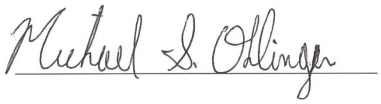
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 216055 **Customer: Welsh Power Station** **Date Reported: 11/16/2021**

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

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Michael Ohlinger (614-836-4184)

Program: Coal Combustion Residuals (CCR)

Site Contact: | Date: | For Lab Use Only: COC/Order #: 216055

Project Name: Welsh Background
Contact Name: Jill Parker-Witt
Contact Phone: (318) 673-3816
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, 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	10/20/2021	1034	G	GW	8		X			X	X			Routine (28 days)
AD-5	10/20/2021	915	G	GW	5		X			X	X			
AD-17	10/20/2021	1202	G	GW	5		X			X	X			
DUPLICATE - BACKGROUND	10/20/2021	1200	G	GW	2		X				X			
EQUIPMENT BLANK - BACKGROUND	10/20/2021	1042	G	GW	2		X				X			
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ________; F= filter in field							4	F4	1	4	2			

* *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:
Relinquished by: [signature]	Company: Eagle	Date/Time: 10-21-21 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: 10/26/21

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

Opened By Melissa **Number of Glass Containers:** _____

Date/Time 10/26/2021 12:00pm **Number of Mercury Containers:** 5

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial:** MGK on ice / (no ice)

1(IR Gun Ser# 200700311, *Expir.* 06-11-22) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: _____ If **RUSH**, who was notified? _____

pH (15 min)	Cr^{+6} (pres) (24 hr)	NO_2 or NO_3 (48 hr)	*ortho*-PO_4 (48 hr)	Hg-diss (pres) (48 hr)

Was 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 10/26/2021

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: Hg Lab (See Prep Book)

Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# 216055 Initial & Date & Time : _____

Comments: _____

Logged by MSG _____

_____

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.