

2018 – 2019 ANNUAL GROUNDWATER MONITORING
AND CORRECTIVE ACTION REPORT
AREA 2 POND, AREA 3 POND, AND AREA 4 POND
LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS

by Haley & Aldrich, Inc.
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**2018 – 2019 Annual Groundwater Monitoring
and Corrective Action Report**

This Annual Groundwater Monitoring and Corrective Action Report documents the groundwater monitoring system results for the Lawrence Energy Center (LEC) inactive Area 2 Pond, Area 3 Pond, and Area 4 Pond (Ash Ponds) consistent with applicable sections of §§ 257.90 through 257.98, and describes activities conducted in 2018 and 2019 prior to July 2019 and documents compliance with the U.S. Environmental Protection Agency Coal Combustion Residual Rule. I certify that the 2018 – 2019 Annual Groundwater Monitoring and Corrective Action Report for the LEC Ash Ponds is, to the best of my knowledge, accurate and complete.

Signed: 
Professional Geologist

Print Name: Mark Nicholls
Kansas License No.: Professional Geologist No. 881
Title: Technical Expert 2
Company: Haley & Aldrich, Inc.



Mark
Nicholls

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1. Introduction

This 2019 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) addresses the inactive Area 2 Pond, Area 3 Pond, and Area 4 Pond (Ash Ponds) at the Lawrence Energy Center (LEC), operated by Westar Energy, Inc. (Westar). This Annual Report was developed in accordance with the U.S. Environmental Protection Agency (USEPA) Coal Combustion Residual (CCR) Rule, specifically Code of Federal Regulations Title 40 (40 CFR), subsections 257.90(e) and 257.100(e), effective 19 October 2015 (Rule) including subsequent revisions. Westar prepared and placed in the facility's operating record a notification of intent to initiate closure of the Ash Ponds by 17 December 2015. Due to the USEPA Extension of Compliance Deadlines for Certain Inactive Surface Impoundments, Response to Partial Vacatur effective 4 October 2016, in accordance with the requirement under § 257.100(e)(1), the alternative reporting timeframes specified in § 257.100(e)(2) through (6) are applicable for the Ash Ponds.

This Annual Report documents the groundwater monitoring system results for the Ash Ponds which are consistent with applicable sections of §§ 257.90 through 257.98 and describes activities conducted prior to July 2019, and documents compliance with the Rule. The specific requirements listed in § 257.90(e)(1) through (5) of the Rule are provided in Section 2 of this Annual Report and are in bold italic font, followed by a short narrative describing how each Rule requirement has been met.

2. 40 CFR § 257.90 Applicability

2.1 40 CFR § 257.90(a)

Except as provided for in §257.100 for inactive CCR surface impoundments, all CCR landfills, CCR surface impoundments, and lateral expansions of CCR units are subject to the groundwater monitoring and corrective action requirements under § 257.90 through § 257.98, except as provided in paragraph (g) of this section.

Westar has installed and certified a groundwater monitoring system at the LEC Ash Ponds. The Ash Ponds are monitored by a multi-unit groundwater monitoring system subject to the groundwater monitoring and corrective action requirements described under 40 CFR §§ 257.90 through 257.98. This document addresses the requirement for the Owner/Operator to prepare an Annual Report per § 257.90(e).

2.2 40 CFR § 257.90(e) – SUMMARY

Annual groundwater monitoring and corrective action report. For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by § 257.105(h)(1).

40 CFR § 257.100(e)(5)(ii)

No later than August 1, 2019, prepare the initial groundwater monitoring and corrective action report as set forth in 257.90(e.)

This Annual Report is the initial report for the LEC Ash Ponds, as required by the Rule. The groundwater monitoring system was established and certified prior to 17 April 2019, as required by § 257.100(e)(5)(i). Prior to 17 April 2019, Westar installed a groundwater monitoring system at the Ash Ponds consistent with § 257.91. Groundwater sampling and analysis was conducted in accordance with requirements described in § 257.93, and the status of the groundwater monitoring program described in § 257.94 is provided in this report. This Annual Report documents the activities completed prior to July 2019.

2.2.1 Status of the Groundwater Monitoring Program

The Ash Ponds are currently in the detection monitoring program.

2.2.2 Key Actions Completed

Detection monitoring was conducted at the Ash Ponds in 2018 and 2019 prior to July 2019.

2.2.3 Problems Encountered

No noteworthy problems (i.e., problems could include damaged wells, issues with sample collection or lack of sampling, or problems with analytical analysis) were encountered at the Ash Ponds in 2018 and 2019 prior to July 2019.

2.2.4 Actions to Resolve Problems

No problems were encountered at the Ash Ponds in 2018 and 2019 prior to July 2019, therefore, no actions to resolve the problems were required.

2.2.5 Project Key Activities for Upcoming Year

Key activities planned for July 2019 through June 2020 include the 2019 – 2020 Annual Groundwater Monitoring and Corrective Action Report, statistical analysis of detection monitoring analytical data collected in March 2019, and semi-annual detection monitoring.

2.3 40 CFR § 257.90(e) – INFORMATION

At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

2.3.1 40 CFR § 257.90(e)(1) – CCR Unit and Monitoring Well Network

A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

As required by § 257.90(e)(1), a map showing the locations of the CCR unit and associated upgradient and downgradient monitoring wells for the Ash Ponds is included in this report as Figure 1.

2.3.2 40 CFR § 257.90(e)(2) – Monitoring System Changes

Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

The design and construction of the monitoring well system for the Ash Ponds at LEC are described in the CCR Groundwater Monitoring Network Description Report dated 17 April 2019. This report was placed in the facility's operating record by 17 April 2019, as required by § 257.105(h)(2). No new monitoring wells were installed or decommissioned since the groundwater monitoring system was certified.

2.3.3 40 CFR § 257.90(e)(3) – Summary of Sampling Events

In addition to all the monitoring data obtained under § 257.90 through § 257.98, a summary including the number of groundwater samples that were collected for analysis for each

background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

A total of eight independent detection monitoring samples from each background (upgradient) and downgradient monitoring well were collected during 2018 and 2019 prior to 17 April 2019. A summary table including the sample names, dates of sample collection, and monitoring data obtained for the groundwater monitoring program for the Ash Ponds is presented in Table I of this report. The groundwater monitoring sampling and laboratory analyses conducted in 2018 and 2019 prior to July 2019 were completed under a detection monitoring program.

2.3.4 40 CFR § 257.90(e)(4) – Monitoring Transition Narrative

A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and

Detection monitoring was conducted in accordance with § 257.94(b), and no transition between monitoring programs occurred for the Ash Ponds in calendar year 2018 or prior to July 2019.

2.3.5 40 CFR § 257.90(e)(5) – Other Requirements

Other information required to be included in the annual report as specified in § 257.90 through § 257.98.

This initial Annual Report documents activities conducted to comply with §§ 257.90 through 257.94 of the Rule. It is understood that there are supplemental references in §§ 257.90 through 257.98 to information that must be placed in the Annual Report; however, none of the activities referenced as required in the Annual Report are relevant to the groundwater monitoring program for activities completed in the reporting period.

TABLE

TABLE I
SUMMARY OF ANALYTICAL RESULTS
 WESTAR LAWRENCE ENERGY CENTER
 AREA 2 POND, AREA 3 POND AND AREA 4 POND
 LAWRENCE, KANSAS

Location	Measure Point Elevation (TOC)	Sample Name	Sample Date	Event	Depth to Water (btoc)	Groundwater Elevation (ft AMSL)	Field Parameters				Detection Monitoring - USEPA Appendix III Constituents (mg/L)						Assessment Monitoring - USEPA Appendix IV Constituents (mg/L)											
							Temperature (Deg C)	Conductivity (µS/cm)	Turbidity (NTU)	pH (su)	Boron, Total	Calcium, Total	Chloride	Fluoride	pH	Sulfate	TDS	Antimony, Total	Arsenic, Total	Barium, Total	Beryllium, Total	Cadmium, Total	Chromium, Total	Cobalt, Total	Fluoride	Lead, Total	Lithium, Total	
Up Gradient	MW-37	833.29	MW-37-030718	3/7/2018	Round 1	10.04	823.25	12.94	936	0.59	7.21	2.2	134	27.2	0.37	7.3	335	735	<0.0010	0.0047	0.045	<0.0010	<0.00050	<0.0050	<0.0010	0.37	<0.010	0.013
			MW-37-050918	5/9/2018	Round 2	11.10	822.19	15.75	1017	2.71	7.39	2.2	138	31.1	0.36	7.2	355	776	<0.0010	0.0077	0.055	<0.0010	<0.00050	<0.0050	<0.0010	0.36	<0.010	0.014
			MW-37-070218	7/2/2018	Round 3	12.32	820.97	16.93	924	1.83	7.09	2.2	136	29.0	0.36	7.7	293	753	<0.0010	0.0056	0.048	<0.0010	<0.00050	<0.0050	<0.0010	0.36	<0.010	0.015
			MW-37-081418	8/14/2018	Round 4	14.38	818.91	16.62	934	0.56	7.16	2.1	135	29.4	0.41	7.2	294	759	<0.0010	0.0045	0.046	<0.0010	<0.00050	<0.0050	<0.0010	0.41	<0.010	0.011
			MW-37-100318	10/3/2018	Round 5	14.54	818.75	17.70	965	0.27	7.05	2.2	140	29.7	0.32	7.4	371	751	<0.0010	0.0053	0.050	<0.0010	<0.00050	<0.0050	<0.0010	0.32	<0.010	0.017
			MW-37-111918	11/19/2018	Round 6	11.39	821.90	13.63	926	0.80	6.83	2.0	143	29.7	0.44	7.2	275	3120	<0.0010	0.0054	0.051	<0.0010	<0.00050	<0.0050	<0.0010	0.44	<0.010	0.010
			MW-37-011119	1/11/2019	Round 7	8.51	824.78	12.69	929	18.2	6.95	2.1	140	28.8	0.28	7.4	283	722	<0.0010	0.0089	0.058	<0.0010	<0.00050	<0.0050	<0.0010	0.28	<0.010	0.018
			MW-37-031819	3/18/2019	Round 8	7.33	825.96	13.28	1022	10.79	6.96	1.9	138	33.5	0.38	7.2	297	734	<0.0010	0.0074	0.054	<0.0010	<0.00050	<0.0050	<0.0010	0.38	<0.010	0.018
Down Gradient	MW-38	832.626	MW-38-030718	3/7/2018	Round 1	16.11	816.52	14.00	2824	2.14	7.45	6.2	319	220	5.0	7.6	1390	2230	<0.0010	0.015	0.038	<0.0010	<0.00050	<0.0050	<0.0010	5.0	<0.010	0.079
			MW-38-050918	5/9/2018	Round 2	15.98	816.65	16.84	3080	0.46	7.75	6.0	312	237	5.0	7.5	1470	2520	<0.0010	0.014	0.037	<0.0010	<0.00050	<0.0050	<0.0010	5.0	<0.010	0.083
			MW-38-070218	7/2/2018	Round 3	16.43	816.20	17.88	2790	1.36	7.44	5.8	300	254	5.1	7.7	1560	2480	<0.0010	0.013	0.034	<0.0010	<0.00050	<0.00050	<0.0010	5.1	<0.010	0.077
			MW-38-081418	8/14/2018	Round 4	16.84	815.79	17.49	2770	1.41	7.51	5.7	312	206	5.5	7.5	1300	2250	<0.0010	0.013	0.034	<0.0010	<0.00050	<0.0050	<0.0010	5.5	<0.010	0.072
			MW-38-100318	10/3/2018	Round 5	16.69	815.94	18.50	2830	0.4	7.42	5.6	309	250	5.3	7.6	1370	461	<0.0010	0.014	0.032	<0.0010	<0.00050	<0.0050	<0.0010	5.3	<0.010	0.076
			MW-38-111918	11/19/2018	Round 6	14.56	818.07	14.38	2830	1.08	7.23	4.9	320	206	4.8	7.5	1220	1400	<0.0010	0.014	0.032	<0.0010	<0.00050	<0.0050	<0.0010	4.8	<0.010	0.071
			MW-38-011119	1/11/2019	Round 7	14.14	818.49	13.56	2800	0.72	7.41	5.4	322	202	4.7	7.6	1210	2600	<0.0010	0.014	0.032	<0.0010	<0.00050	<0.0050	<0.0010	4.7	<0.010	0.076
			MW-38-031919	3/19/2019	Round 8	14.29	818.34	13.70	2940	0.85	7.13	5.2	302	199	4.7	7.5	1350	2140	<0.0010	0.015	0.031	<0.0010	<0.00050	<0.0050	<0.0010	4.7	<0.010	0.076
	MW-39	830.615	MW-39-030818	3/8/2018	Round 1	15.60	815.02	12.22	3640	0.44	7.15	5.5	478	357	2.7	7.3	1920	3090	<0.0010	0.012	0.031	<0.0010	<0.00050	<0.0050	<0.0010	2.7	<0.010	0.038
			MW-39-050918	5/9/2018	Round 2	14.97	815.65	18.41	4030	0.27	7.34	5.4	490	375	2.9	7.3	1870	3400	<0.0010	0.013	0.033	<0.0010	<0.00050	<0.0050	0.0011	2.9	<0.010	0.050
			MW-39-070218	7/2/2018	Round 3	15.4	815.22	18.88	3850	0.03	7.03	5.3	478	487	3.3	7.5	2110	3390	<0.0010	0.013	0.032	<0.0010	<0.00050	<0.0050	0.0014	3.3	<0.010	0.049
			MW-39-081418	8/14/2018	Round 4	15.69	814.93	18.82	3880	0.02	7.15	5.5	511	403	3.0	7.1	1750	3550	<0.0010	0.013	0.032	<0.0010	<0.00050	<0.0050	0.0016	3.0	<0.010	0.047
			MW-39-100318	10/3/2018	Round 5	15.41	815.21	19.04	4030	0.15	7.06	5.4	493	535	3.2	7.2	1940	3550	<0.0010	0.013	0.033	<0.0010	<0.00050	<0.0050	0.0014	3.2	<0.010	0.049
			MW-39-111918	11/19/2018	Round 6	12.74	817.88	15.46	4010	0.54	6.95	4.3	486	443	3.5	7.4	1880	3640	<0.0010	0.014	0.032	<0.0010	<0.00050	<0.0050	<0.0010	3.5	<0.010	0.062
			MW-39-011119	1/11/2019	Round 7	12.21	818.41	14.01	3820	0.28	7.10	4.8	510	373	2.9	7.2	1730	3770	<0.0010	0.010	0.030	<0.0010	<0.00050	<0.0050	0.0013	2.9	<0.010	0.043
			MW-39-031919	3/19/2019	Round 8	12.65	817.97	15.09	4155	0.53	6.92	4.6	490	399	1.9	7.3	1810	3480	<0.0010	0.011	0.030	<0.0010	<0.00050	<0.00050	0.0012	1.9	<0.010	0.045
	MW-40	831.358	MW-40-030818	3/8/2018	Round 1	16.17	815.19	13.17	3767	0.79	7.11	7.4	526	410	1.6	7.0	1930	3180	<0.0010	0.013	0.037	<0.0010	<0.00050	<0.0050	<0.0010	1.6	<0.010	0.046
			MW-40-050918	5/9/2018	Round 2	15.60	815.76	18.47	3980	0.21	7.45	7.2	527	412	1.9	7.0	1890	3300	<0.0010	0.014	0.039	<0.0010	<0.00050	<0.0050	<0.0010	1.9	<0.010	0.056
			MW-40-070218	7/2/2018	Round 3	16.01	815.35	20.00	3600	0.39	7.21	7.0	487	429	2.1	7.0	2160	3190	<0.0010	0.014	0.036	<0.0010	<0.00050	<0.0050	<0.0010	2.1	<0.010	0.052
			MW-40-081418	8/14/2018	Round 4	16.25	815.11	20.03	3550	0.10	7.36	6.9	506	331	1.9	7.0	1770	3310	<0.0010	0.014	0.035	<0.0010	<0.00050	<0.0050	<0.0010	1.9	<0.010	0.048
			MW-40-100318	10/3/2018	Round 5	16.01	815.35	20.63	3610	1.2	7.2	6.7	512	356	2.0	7.0	1830	3230	<0.0010	0.014	0.036	<0.0010	<0.00050	<0.0050	<0.0010	2.0	<0.010	0.053
			MW-40-111918	11/19/2018	Round 6	13.43	817.93	15.34	3580	0.82	7.00	6.1	536	351	1.7	7.0	1780	3100	<0.0010	0.027	0.035	<0.0010	<0.00050	<0.0050	<0.0010	1.7	<0.010	0.047
			MW-40-011119	1/11/2019	Round 7	12.72	818.64	13.79	3440	0.75	7.14	6.4	504	306	1.5	7.0	1610	3100	<0.0010	0.014	0.034	<0.0010	<0.00050	<0.0050	<0.0010	1.5	<0.010	0.045
			MW-40-031919	3/19/2019	Round 8	13.25	818.11	16.01	3678	0.68	6.85	5.8	468	329	1.2	7.2	1730	3060	<0.0010	0.015	0.100	<0.0010	<0.00050	<0.0050	<0.0010	1.2	<0.010	0.049
MW-K	842.600	MW-K-050918	5/10/2018	Round 1	26.35	816.25	17.43	4230	5.74	7.10	3.6	504	481	3.4	7.2	1570	3580	<0.0010	0.075	0.052	<0.0010	<0.00050	<0.0050	0.0028	3.4	<0.010	0.051	
		MW-K-070218	7/2/2018	Round 2	26.77	815.83	19.05	4100	2.58	7.04	3.1	473	593	3.5	7.7	2020	3350	<0.0010	0.070	0.042	<0.0010	<0.00050	<0.0050	0.0015	3.5	<0.010	0.067	
		MW-K-081418	8/14/2018	Round 3	27.18	815.42	18.69	4070	5.43	7.17	2.9	482	516	0.76	7.3	1650	3740	<0.0010	0.073	0.041	<0.0010	<0.00050	<0.0050	0.0016	0.76	<0.010	0.063	
		MW-K-100318	10/3/2018	Round 4	27.00	815.60	19.12	4370	1.68	7.06	2.9	513	708	3.5	7.1	1940	4000	<0.0010	0.072	0.045	<0.0010	<0.00050	<0.0050	0.0014	3.5	<0.010	0.07	
		MW-K-111918	11/19/2018	Round 5	24.68	817.92	14.96	4570	1.64	6.91	2.2	554	638	3.2	7.2	1960	3840	<0.0010	0.069	0.044	<0.0010	<0.00050	<0.0050	0.0011	3.2	<0.010	0.066	
		MW-K-121218	12/12/2018	Round 6	23.21	819.39	14.80	4340	1.19	7.01	2.6	541	587	3.1	7.2	1920	4010	<0.0010	0.069	0.042	<0.0010	<0.00050	<0.0050	0.0015	3.1	<0.010	0.076	
		MW-K-011119	1/11/2019	Round 7	24.32	818.28	13.77	4640	1.55	7.23	2.1	533	653	3.0	7.4	2000	4090	<0.0010										

TABLE I
SUMMARY OF ANALYTICAL RESULTS
 WESTAR LAWRENCE ENERGY CENTER
 AREA 2 POND, AREA 3 POND AND AREA 4 POND
 LAWRENCE, KANSAS

Location	Measure Point Elevation (TOC)	Sample Name	Sample Date	Event	Depth to Water (btoc)	Groundwater Elevation (ft AMSL)	Assessment Monitoring - USEPA Appendix IV Constituents (mg/L)				Assessment Monitoring - USEPA Appendix IV Constituents (pCi/L)	
							Mercury, Total	Molybdenum, Total	Selenium, Total	Thallium, Total	Radium-226 & 228 Combined	
Up Gradient	MW-37	833.29	MW-37-030718	3/7/2018	Round 1	10.04	823.25	<0.00020	0.13	<0.0010	<0.0010	0.641
			MW-37-050918	5/9/2018	Round 2	11.10	822.19	<0.00020	0.14	<0.0010	<0.0010	0.794
			MW-37-070218	7/2/2018	Round 3	12.32	820.97	<0.00020	0.14	<0.0010	<0.0010	1.12
			MW-37-081418	8/14/2018	Round 4	14.38	818.91	<0.00020	0.13	<0.0010	<0.0010	1.45
			MW-37-100318	10/3/2018	Round 5	14.54	818.75	<0.00020	0.13	<0.0010	<0.0010	0.561
			MW-37-111918	11/19/2018	Round 6	11.39	821.90	<0.00020	0.13	<0.0010	<0.0010	0.449
			MW-37-011119	1/11/2019	Round 7	8.51	824.78	<0.00020	0.14	<0.0010	<0.0010	1.10
			MW-37-031819	3/18/2019	Round 8	7.33	825.96	<0.00020	0.13	<0.0010	<0.0010	1.15
Down Gradient	MW-38	832.626	MW-38-030718	3/7/2018	Round 1	16.11	816.52	<0.00020	0.10	<0.0010	<0.0010	1.56
			MW-38-050918	5/9/2018	Round 2	15.98	816.65	<0.00020	0.093	<0.0010	<0.0010	0.862
			MW-38-070218	7/2/2018	Round 3	16.43	816.20	<0.00020	0.099	<0.0010	<0.0010	1.88
			MW-38-081418	8/14/2018	Round 4	16.84	815.79	<0.00020	0.087	<0.0010	<0.0010	0.377
			MW-38-100318	10/3/2018	Round 5	16.69	815.94	<0.00020	0.089	<0.0010	<0.0010	0.136
			MW-38-111918	11/19/2018	Round 6	14.56	818.07	<0.00020	0.087	<0.0010	<0.0010	0.951
			MW-38-011119	1/11/2019	Round 7	14.14	818.49	<0.00020	0.088	<0.0010	<0.0010	0.862
			MW-38-031919	3/19/2019	Round 8	14.29	818.34	<0.00020	0.094	<0.0050	<0.0010	1.78
	MW-39	830.615	MW-39-030818	3/8/2018	Round 1	15.60	815.02	<0.00020	0.11	<0.0010	<0.0010	0.966
			MW-39-050918	5/9/2018	Round 2	14.97	815.65	<0.00020	0.11	<0.0010	<0.0010	0.795
			MW-39-070218	7/2/2018	Round 3	15.4	815.22	<0.00020	0.11	<0.0010	<0.0010	1.47
			MW-39-081418	8/14/2018	Round 4	15.69	814.93	<0.00020	0.093	<0.0010	<0.0010	1.05
			MW-39-100318	10/3/2018	Round 5	15.41	815.21	<0.00020	0.089	<0.0010	<0.0010	0.582
			MW-39-111918	11/19/2018	Round 6	12.74	817.88	<0.00020	0.14	<0.0010	<0.0010	1.23
			MW-39-011119	1/11/2019	Round 7	12.21	818.41	<0.00020	0.11	<0.0010	<0.0010	0.782
			MW-39-031919	3/19/2019	Round 8	12.65	817.97	<0.00020	0.15	<0.0050	<0.0010	1.62
	MW-40	831.358	MW-40-030818	3/8/2018	Round 1	16.17	815.19	<0.00020	0.140	<0.0010	<0.0010	1.00
			MW-40-050918	5/9/2018	Round 2	15.60	815.76	<0.00020	0.15	<0.0010	<0.0010	0.277
			MW-40-070218	7/2/2018	Round 3	16.01	815.35	<0.00020	0.19	<0.0010	<0.0010	0.633
			MW-40-081418	8/14/2018	Round 4	16.25	815.11	<0.00020	0.16	<0.0010	<0.0010	0.900
			MW-40-100318	10/3/2018	Round 5	16.01	815.35	<0.00020	0.16	<0.0010	<0.0010	0.184
			MW-40-111918	11/19/2018	Round 6	13.43	817.93	<0.00020	0.062	<0.0010	<0.0010	0.810
			MW-40-011119	1/11/2019	Round 7	12.72	818.64	<0.00020	0.15	<0.0010	<0.0010	0.481
			MW-40-031919	3/19/2019	Round 8	13.25	818.11	<0.00020	0.15	<0.0050	<0.0010	1.26
	MW-K	842.600	MW-K-050918	5/10/2018	Round 1	26.35	816.25	<0.00020	0.040	<0.0010	<0.0010	0.866
			MW-K-070218	7/2/2018	Round 2	26.77	815.83	<0.00020	0.032	<0.0010	<0.0010	1.60
			MW-K-081418	8/14/2018	Round 3	27.18	815.42	<0.00020	0.027	<0.0010	<0.0010	2.73
			MW-K-100318	10/3/2018	Round 4	27.00	815.60	<0.00020	0.027	<0.0010	<0.0010	0.253
			MW-K-111918	11/19/2018	Round 5	24.68	817.92	<0.00020	0.018	<0.0010	<0.0010	0.864
			MW-K-121218	12/12/2018	Round 6	23.21	819.39	<0.00020	0.022	<0.0010	<0.0010	1.16
			MW-K-011119	1/11/2019	Round 7	24.32	818.28	<0.00020	0.014	<0.0010	<0.0010	0.800
			MW-K-031919	3/19/2019	Round 8	24.55	818.05	<0.00020	0.014	<0.0010	<0.0010	0.951
	MW-L	843.050	MW-L-050918	5/10/2018	Round 1	27.24	804.12	<0.00020	0.038	<0.0010	<0.0010	1.01
			MW-L-070218	7/2/2018	Round 2	27.63	815.42	<0.00020	0.043	<0.0010	<0.0010	1.23
			MW-L-081418	8/14/2018	Round 3	27.96	815.09	<0.00020	0.039	<0.0010	<0.0010	1.01
			MW-L-100318	10/3/2018	Round 4	27.73	815.32	<0.00020	0.038	<0.0010	<0.0010	0.597
			MW-L-111918	11/19/2018	Round 5	25.17	817.88	<0.00020	0.041	<0.0010	<0.0010	2.08
			MW-L-121218	12/12/2018	Round 6	23.64	819.41	<0.00020	0.047	<0.0010	<0.0010	1.16
			MW-L-011119	1/11/2019	Round 7	24.68	818.37	<0.00020	0.047	<0.0010	<0.0010	1.26
			MW-L-031919	3/19/2019	Round 8	25.08	817.97	<0.00020	0.051	<0.0050	<0.0010	0.483






ABBREVIATIONS AND NOTES:
Bold value: Detection above laboratory reporting limit
 µS/cm: microSiemen per centimeter
 CCR: Coal Combustion Residuals
 J = estimated value
 J- = estimate value, with low bias
 MCL: Maximum Contaminant Level
 mg/L: milligram per liter
 NA: Not Applicable
 NTU: Nephelometric Turbidity Units
 pCi/L: picoCurie per liter
 su: standard units
 USEPA: United States Environmental Protection Agency

FIGURE

GIS FILE PATH: G:\Projects\Westar\Lawrence Energy Center (LEC)\GIS\MXDs\2019_03\Pond Complex Well Locations_072419.mxd — USER: rabrown — LAST SAVED: 7/24/2019 1:44:40 PM



LEGEND

-  MONITORING WELL
-  AREA 2 POND (INACTIVE)
-  AREA 3 POND (INACTIVE)
-  AREA 4 POND (INACTIVE)
-  ASH PONDS BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX.



WESTAR ENERGY
LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS

**LAWRENCE ENERGY CENTER
ASH PONDS
MONITORING WELL MAP**

JULY 2019

FIGURE 1



November 2, 2022
Project No. 0204993-000

TO: Evergy Kansas Central, Inc.
Jared Morrison – Director, Water and Waste Programs

FROM: Haley & Aldrich, Inc.
Steven F. Putrich, P.E., Principal Consultant – Engineering Principal
Mark Nicholls, P.G., Senior Associate – Senior Hydrogeologist

SUBJECT: 2018–2019 Annual Groundwater Monitoring and Corrective Action Report Addendum
Evergy Kansas Central, Inc.
Area 2 Pond, Area 3 Pond, and Area 4 Pond (inactive)
Lawrence Energy Center – Lawrence, Kansas

The Evergy Kansas Central, Inc. (Evergy) Area 2 Pond (inactive), Area 3 Pond (inactive), and Area 4 Pond (inactive; collectively, inactive Ash Ponds) at the Lawrence Energy Center is subject to the groundwater monitoring and corrective action requirements described under Code of Federal Regulations Title 40 (40 CFR) §257.90 through §257.98 (Rule). An Annual Groundwater Monitoring and Corrective Action (GWMCA) Report documenting the activities completed through June 2019 for the inactive Ash Ponds was completed and placed in the facility’s operating record on July 31, 2019, as required by the Rule. The Annual GWMCA Report contained the specific information listed in 40 CFR §257.90(e).

This report addendum has been prepared to supplement the operating record in recognition of comments received by Evergy from the U.S. Environmental Protection Agency (USEPA) on January 11, 2022. In addition to the information listed in 40 CFR §257.90(e), the USEPA indicated in their comments that the GWMCA Report should contain:

- Results of laboratory analysis of groundwater or other environmental media samples for the presence of constituents of Appendices III and IV to 40 CFR Part 257 (or of other constituents, such as those supporting characterization of site conditions that may ultimately affect a remedy);
- Required statistical analyses performed on those (laboratory analysis) results;
- Measured groundwater elevations; and
- Calculated groundwater flow rate and direction.

While this information is not specifically referred to in 40 CFR §257.90(e) for inclusion in the GWMCA Report, it has been routinely collected and maintained in Evergy’s files and is being provided in the attachments to this addendum. The applicable laboratory analysis reports for baseline sampling events in 2018 and 2019 are included in Attachment 1. Since no statistical analyses were completed from July 2018 through June 2019, there were no analyses to report in this addendum. For each of the of 2018 and 2019 baseline sampling events, the measured groundwater elevations, with calculated groundwater flow rates and directions, have been included in Attachment 2.

The Attachments to this addendum are described below:

- Attachment 1 – Laboratory Analytical Reports: Includes laboratory data packages with supporting information such as case narrative, sample and method summary, analytical results, quality control, and chain-of-custody documentation. The laboratory data packages for the baseline sampling events completed in March, May, July, August, October, November, and December 2018, and January and March 2019 are provided.
- Attachment 2 – Groundwater Potentiometric Maps: Includes the measured groundwater elevations at each well and the generalized groundwater flow direction and calculated flow rate. Maps for the sampling events completed in March, May, July, August, October, and November 2018, and January and March 2019 are provided.

ATTACHMENT 1
Laboratory Analytical Reports

ATTACHMENT 1-1
March 2018 Sampling Event
Laboratory Analytical Report

April 02, 2018

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC LF CCR
Pace Project No.: 60265489

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on March 08, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
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CERTIFICATIONS

Project: LEC LF CCR

Pace Project No.: 60265489

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 17-016-0

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC LF CCR

Pace Project No.: 60265489

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60265489001	MW-37-030718	Water	03/07/18 15:02	03/08/18 15:50
60265489002	MW-38-030718	Water	03/07/18 16:10	03/08/18 15:50
60265489003	MW-39-030818	Water	03/08/18 08:23	03/08/18 15:50
60265489004	MW-40-030818	Water	03/08/18 09:42	03/08/18 15:50
60265489005	DUP-03	Water	03/07/18 06:00	03/08/18 15:50

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC LF CCR

Pace Project No.: 60265489

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60265489001	MW-37-030718	EPA 200.7	TDS	7	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	TDS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	OL	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
		60265489002	MW-38-030718	EPA 200.7	TDS
EPA 200.8	SMW			7	PASI-K
EPA 245.1	TDS			1	PASI-K
EPA 903.1	KAC			1	PASI-PA
EPA 904.0	JLW			1	PASI-PA
Total Radium Calculation	CMC			1	PASI-PA
SM 2540C	OL			1	PASI-K
SM 4500-H+B	MJK			1	PASI-K
EPA 300.0	AGO			3	PASI-K
60265489003	MW-39-030818			EPA 200.7	TDS
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	TDS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	OL	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
		60265489004	MW-40-030818	EPA 200.7	TDS
EPA 200.8	SMW			7	PASI-K
EPA 245.1	TDS			1	PASI-K
EPA 903.1	KAC			1	PASI-PA
EPA 904.0	JLW			1	PASI-PA
Total Radium Calculation	CMC			1	PASI-PA
SM 2540C	OL			1	PASI-K
SM 4500-H+B	MJK			1	PASI-K
EPA 300.0	AGO			3	PASI-K
60265489005	DUP-03			EPA 200.7	TDS

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SAMPLE ANALYTE COUNT

Project: LEC LF CCR

Pace Project No.: 60265489

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	TDS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	OL	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC LF CCR

Pace Project No.: 60265489

Sample: MW-37-030718		Lab ID: 60265489001	Collected: 03/07/18 15:02	Received: 03/08/18 15:50	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.045	mg/L	0.0050	1	03/15/18 15:25	03/20/18 17:23	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/20/18 17:23	7440-41-7	
Boron, Total Recoverable	2.2	mg/L	0.10	1	03/15/18 15:25	03/20/18 17:23	7440-42-8	
Calcium, Total Recoverable	134	mg/L	0.20	1	03/15/18 15:25	03/20/18 17:23	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	03/15/18 15:25	03/20/18 17:23	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	03/15/18 15:25	03/20/18 17:23	7439-92-1	
Lithium	0.013	mg/L	0.010	1	03/15/18 15:25	03/20/18 17:23	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:18	7440-36-0	
Arsenic, Total Recoverable	0.0047	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:18	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	03/15/18 15:25	03/29/18 18:18	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:18	7440-48-4	
Molybdenum, Total Recoverable	0.13	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:18	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:18	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/30/18 16:02	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	03/13/18 10:51	03/13/18 15:29	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	735	mg/L	5.0	1		03/14/18 11:40		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.3	Std. Units	0.10	1		03/15/18 11:03		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	27.2	mg/L	5.0	5		03/29/18 19:42	16887-00-6	
Fluoride	0.37	mg/L	0.20	1		03/27/18 17:48	16984-48-8	
Sulfate	335	mg/L	50.0	50		03/29/18 19:57	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC LF CCR

Pace Project No.: 60265489

Sample: MW-38-030718		Lab ID: 60265489002		Collected: 03/07/18 16:10		Received: 03/08/18 15:50		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.038	mg/L	0.0050	1	03/15/18 15:25	03/20/18 17:25	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/20/18 17:25	7440-41-7		
Boron, Total Recoverable	6.2	mg/L	0.10	1	03/15/18 15:25	03/20/18 17:25	7440-42-8		
Calcium, Total Recoverable	319	mg/L	0.20	1	03/15/18 15:25	03/20/18 17:25	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	03/15/18 15:25	03/20/18 17:25	7440-47-3		
Lead, Total Recoverable	<0.010	mg/L	0.010	1	03/15/18 15:25	03/20/18 17:25	7439-92-1		
Lithium	0.079	mg/L	0.010	1	03/15/18 15:25	03/20/18 17:25	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:22	7440-36-0		
Arsenic, Total Recoverable	0.015	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:22	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	03/15/18 15:25	03/29/18 18:22	7440-43-9		
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:22	7440-48-4		
Molybdenum, Total Recoverable	0.10	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:22	7439-98-7		
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:22	7782-49-2		
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/30/18 16:05	7440-28-0		
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	03/13/18 10:51	03/13/18 15:31	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	2230	mg/L	5.0	1		03/14/18 11:40			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.6	Std. Units	0.10	1		03/15/18 11:04		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	220	mg/L	20.0	20		03/28/18 16:39	16887-00-6		
Fluoride	5.0	mg/L	0.20	1		03/27/18 18:01	16984-48-8		
Sulfate	1390	mg/L	200	200		03/28/18 16:54	14808-79-8		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC LF CCR

Pace Project No.: 60265489

Sample: MW-39-030818		Lab ID: 60265489003		Collected: 03/08/18 08:23		Received: 03/08/18 15:50		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.031	mg/L	0.0050	1	03/15/18 15:25	03/20/18 17:27	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/20/18 17:27	7440-41-7		
Boron, Total Recoverable	5.5	mg/L	0.10	1	03/15/18 15:25	03/20/18 17:27	7440-42-8		
Calcium, Total Recoverable	478	mg/L	0.20	1	03/15/18 15:25	03/20/18 17:27	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	03/15/18 15:25	03/20/18 17:27	7440-47-3		
Lead, Total Recoverable	<0.010	mg/L	0.010	1	03/15/18 15:25	03/20/18 17:27	7439-92-1		
Lithium	0.038	mg/L	0.010	1	03/15/18 15:25	03/20/18 17:27	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:27	7440-36-0		
Arsenic, Total Recoverable	0.012	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:27	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	03/15/18 15:25	03/29/18 18:27	7440-43-9		
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:27	7440-48-4		
Molybdenum, Total Recoverable	0.11	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:27	7439-98-7		
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:27	7782-49-2		
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/30/18 16:07	7440-28-0		
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	03/13/18 10:51	03/13/18 15:33	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	3090	mg/L	5.0	1		03/14/18 12:10			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.3	Std. Units	0.10	1		03/15/18 11:10		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	357	mg/L	50.0	50		03/28/18 17:09	16887-00-6		
Fluoride	2.7	mg/L	0.20	1		03/27/18 18:56	16984-48-8		
Sulfate	1920	mg/L	500	500		03/28/18 17:25	14808-79-8		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC LF CCR

Pace Project No.: 60265489

Sample: MW-40-030818	Lab ID: 60265489004	Collected: 03/08/18 09:42	Received: 03/08/18 15:50	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.037	mg/L	0.0050	1	03/15/18 15:25	03/20/18 17:30	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/20/18 17:30	7440-41-7	
Boron, Total Recoverable	7.4	mg/L	0.10	1	03/15/18 15:25	03/20/18 17:30	7440-42-8	
Calcium, Total Recoverable	526	mg/L	0.20	1	03/15/18 15:25	03/20/18 17:30	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	03/15/18 15:25	03/20/18 17:30	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	03/15/18 15:25	03/20/18 17:30	7439-92-1	
Lithium	0.046	mg/L	0.010	1	03/15/18 15:25	03/20/18 17:30	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:31	7440-36-0	
Arsenic, Total Recoverable	0.013	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:31	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	03/15/18 15:25	03/29/18 18:31	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:31	7440-48-4	
Molybdenum, Total Recoverable	0.14	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:31	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:31	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/30/18 16:09	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	03/13/18 10:51	03/13/18 15:40	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3180	mg/L	5.0	1		03/14/18 12:10		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.0	Std. Units	0.10	1		03/15/18 11:13		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	410	mg/L	50.0	50		03/28/18 17:40	16887-00-6	
Fluoride	1.6	mg/L	0.20	1		03/27/18 19:10	16984-48-8	
Sulfate	1930	mg/L	500	500		03/28/18 17:56	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC LF CCR

Pace Project No.: 60265489

Sample: DUP-03		Lab ID: 60265489005	Collected: 03/07/18 06:00	Received: 03/08/18 15:50	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.038	mg/L	0.0050	1	03/15/18 15:25	03/20/18 17:33	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/20/18 17:33	7440-41-7	
Boron, Total Recoverable	6.2	mg/L	0.10	1	03/15/18 15:25	03/20/18 17:33	7440-42-8	
Calcium, Total Recoverable	315	mg/L	0.20	1	03/15/18 15:25	03/20/18 17:33	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	03/15/18 15:25	03/20/18 17:33	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	03/15/18 15:25	03/20/18 17:33	7439-92-1	
Lithium	0.078	mg/L	0.010	1	03/15/18 15:25	03/20/18 17:33	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:35	7440-36-0	
Arsenic, Total Recoverable	0.015	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:35	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	03/15/18 15:25	03/29/18 18:35	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:35	7440-48-4	
Molybdenum, Total Recoverable	0.099	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:35	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/29/18 18:35	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/15/18 15:25	03/30/18 16:12	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	03/13/18 10:51	03/13/18 15:42	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	2400	mg/L	5.0	1		03/14/18 12:02		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.5	Std. Units	0.10	1		03/14/18 10:20		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	249	mg/L	50.0	50		03/28/18 18:11	16887-00-6	
Fluoride	5.1	mg/L	0.20	1		03/27/18 19:23	16984-48-8	
Sulfate	1320	mg/L	200	200		03/29/18 20:13	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC LF CCR

Pace Project No.: 60265489

QC Batch: 517375 Analysis Method: EPA 245.1
 QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
 Associated Lab Samples: 60265489001, 60265489002, 60265489003, 60265489004, 60265489005

METHOD BLANK: 2117497 Matrix: Water
 Associated Lab Samples: 60265489001, 60265489002, 60265489003, 60265489004, 60265489005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	03/13/18 14:36	

LABORATORY CONTROL SAMPLE: 2117498

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0050	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2117499 2117500

Parameter	Units	60265281001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	ND	.005	.005	0.0049	0.0048	98	97	70-130	1	20	

MATRIX SPIKE SAMPLE: 2117501

Parameter	Units	60265283003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	.005	0.0049	98	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC LF CCR
Pace Project No.: 60265489

QC Batch: 517746 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60265489001, 60265489002, 60265489003, 60265489004, 60265489005

METHOD BLANK: 2119089 Matrix: Water
Associated Lab Samples: 60265489001, 60265489002, 60265489003, 60265489004, 60265489005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	03/20/18 17:12	
Beryllium	mg/L	<0.0010	0.0010	03/20/18 17:12	
Boron	mg/L	<0.10	0.10	03/20/18 17:12	
Calcium	mg/L	<0.20	0.20	03/20/18 17:12	
Chromium	mg/L	<0.0050	0.0050	03/20/18 17:12	
Lead	mg/L	<0.010	0.010	03/20/18 17:12	
Lithium	mg/L	<0.010	0.010	03/20/18 17:12	

LABORATORY CONTROL SAMPLE: 2119090

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.0	105	85-115	
Beryllium	mg/L	1	0.98	98	85-115	
Boron	mg/L	1	1.0	105	85-115	
Calcium	mg/L	10	10.2	102	85-115	
Chromium	mg/L	1	1.0	100	85-115	
Lead	mg/L	1	1.0	102	85-115	
Lithium	mg/L	1	1.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2119091 2119092

Parameter	Units	60265830001		2119091		2119092		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Barium	mg/L	55.2 ug/L		1	1	1.1	1.0	101	99	70-130	2	20	
Beryllium	mg/L	ND		1	1	0.97	0.96	97	96	70-130	1	20	
Boron	mg/L	712 ug/L		1	1	1.8	1.7	105	101	70-130	3	20	
Calcium	mg/L	148000 ug/L		10	10	160	157	120	88	70-130	2	20	
Chromium	mg/L	0.057		1	1	1.0	1.0	99	97	70-130	2	20	
Lead	mg/L	ND		1	1	0.92	0.91	92	91	70-130	1	20	
Lithium	mg/L	617 ug/L		1	1	1.6	1.6	98	95	70-130	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC LF CCR
Pace Project No.: 60265489

QC Batch: 517745 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60265489001, 60265489002, 60265489003, 60265489004, 60265489005

METHOD BLANK: 2119080 Matrix: Water
Associated Lab Samples: 60265489001, 60265489002, 60265489003, 60265489004, 60265489005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	03/16/18 17:02	
Arsenic	mg/L	<0.0010	0.0010	03/16/18 17:02	
Cadmium	mg/L	<0.00050	0.00050	03/16/18 17:02	
Cobalt	mg/L	<0.0010	0.0010	03/16/18 17:02	
Molybdenum	mg/L	<0.0010	0.0010	03/16/18 17:02	
Selenium	mg/L	<0.0010	0.0010	03/16/18 17:02	
Thallium	mg/L	<0.0010	0.0010	03/19/18 12:36	

LABORATORY CONTROL SAMPLE: 2119081

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.039	98	85-115	
Arsenic	mg/L	.04	0.041	102	85-115	
Cadmium	mg/L	.04	0.039	99	85-115	
Cobalt	mg/L	.04	0.040	99	85-115	
Molybdenum	mg/L	.04	0.040	100	85-115	
Selenium	mg/L	.04	0.040	100	85-115	
Thallium	mg/L	.04	0.040	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2119082 2119083

Parameter	Units	60265865001		2119082		2119083		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Antimony	mg/L	1.4 ug/L	.04	.04	0.040	0.040	97	96	70-130	2	20		
Arsenic	mg/L	0.78J ug/L	.04	.04	0.041	0.041	101	101	70-130	0	20		
Cadmium	mg/L	6.4 ug/L	.04	.04	0.044	0.044	95	93	70-130	2	20		
Cobalt	mg/L	1.2 ug/L	.04	.04	0.039	0.039	95	95	70-130	0	20		
Molybdenum	mg/L	20.9 ug/L	.04	.04	0.062	0.062	103	102	70-130	1	20		
Selenium	mg/L	5.9 ug/L	.04	.04	0.045	0.044	97	95	70-130	1	20		
Thallium	mg/L	20.7 ug/L	.04	.04	0.061	0.061	101	101	70-130	0	20		

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QUALITY CONTROL DATA

Project: LEC LF CCR

Pace Project No.: 60265489

QC Batch: 517481

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60265489001, 60265489002, 60265489005

METHOD BLANK: 2117939

Matrix: Water

Associated Lab Samples: 60265489001, 60265489002, 60265489005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	03/14/18 11:35	

LABORATORY CONTROL SAMPLE: 2117940

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	983	98	80-120	

SAMPLE DUPLICATE: 2117941

Parameter	Units	60265443006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	701	715	2	10	

SAMPLE DUPLICATE: 2117942

Parameter	Units	60265443007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	718	697	3	10	

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QUALITY CONTROL DATA

Project: LEC LF CCR

Pace Project No.: 60265489

QC Batch: 517482

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60265489003, 60265489004

METHOD BLANK: 2117943

Matrix: Water

Associated Lab Samples: 60265489003, 60265489004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	03/14/18 12:08	

LABORATORY CONTROL SAMPLE: 2117944

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	966	97	80-120	

SAMPLE DUPLICATE: 2117945

Parameter	Units	60265641004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	493	476	4	10	

SAMPLE DUPLICATE: 2117946

Parameter	Units	60265552005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	998	1010	2	10	

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QUALITY CONTROL DATA

Project: LEC LF CCR

Pace Project No.: 60265489

QC Batch: 517519 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60265489005

SAMPLE DUPLICATE: 2118089

Parameter	Units	60265274003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.7	7.8	1	5	H6

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QUALITY CONTROL DATA

Project: LEC LF CCR

Pace Project No.: 60265489

QC Batch: 517657 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60265489001, 60265489002, 60265489003, 60265489004

SAMPLE DUPLICATE: 2118756

Parameter	Units	60265364002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.8	7.8	0	5	H6

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QUALITY CONTROL DATA

Project: LEC LF CCR

Pace Project No.: 60265489

QC Batch: 519299 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60265489001, 60265489002, 60265489003, 60265489004, 60265489005

METHOD BLANK: 2125739 Matrix: Water
 Associated Lab Samples: 60265489001, 60265489002, 60265489003, 60265489004, 60265489005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.20	0.20	03/27/18 10:10	

LABORATORY CONTROL SAMPLE: 2125740

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.5	99	90-110	

MATRIX SPIKE SAMPLE: 2125741

Parameter	Units	60266009003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	ND	25	23.5	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2125742 2125743

Parameter	Units	60266434001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	69.2	500	500	453	322	77	51	80-120	34	15	M1,R1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC LF CCR

Pace Project No.: 60265489

QC Batch: 519504

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60265489001, 60265489005

METHOD BLANK: 2126361

Matrix: Water

Associated Lab Samples: 60265489001, 60265489005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	03/29/18 10:06	
Sulfate	mg/L	<1.0	1.0	03/29/18 10:06	

LABORATORY CONTROL SAMPLE: 2126362

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	90-110	
Sulfate	mg/L	5	4.8	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2126363 2126364

Parameter	Units	60265944003 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Chloride	mg/L	6.4	5	5	11.0	11.6	91	104	80-120	6	15	
Sulfate	mg/L	ND	5	5	5.0	5.3	97	102	80-120	5	15	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC LF CCR

Pace Project No.: 60265489

QC Batch: 519505 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60265489002, 60265489003, 60265489004, 60265489005

METHOD BLANK: 2126366 Matrix: Water
 Associated Lab Samples: 60265489002, 60265489003, 60265489004, 60265489005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	03/29/18 00:21	
Sulfate	mg/L	<1.0	1.0	03/29/18 00:21	

LABORATORY CONTROL SAMPLE: 2126367

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	90-110	
Sulfate	mg/L	5	4.8	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2126368 2126369

Parameter	Units	60266041001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1100	500	500	1740	1720	128	123	80-120	2	15	M1

MATRIX SPIKE SAMPLE: 2126370

Parameter	Units	60266135001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	1.5	5	6.5	101	80-120	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC LF CCR

Pace Project No.: 60265489

Sample: MW-37-030718 **Lab ID: 60265489001** Collected: 03/07/18 15:02 Received: 03/08/18 15:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.287 ± 0.564 (1.01) C:NA T:77%	pCi/L	03/26/18 18:42	13982-63-3	
Radium-228	EPA 904.0	0.354 ± 0.494 (1.06) C:80% T:76%	pCi/L	03/22/18 15:01	15262-20-1	
Total Radium	Total Radium Calculation	0.641 ± 1.06 (2.07)	pCi/L	03/28/18 14:19	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC LF CCR

Pace Project No.: 60265489

Sample: MW-38-030718 **Lab ID: 60265489002** Collected: 03/07/18 16:10 Received: 03/08/18 15:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.606 ± 0.580 (0.883) C:NA T:87%	pCi/L	03/26/18 18:42	13982-63-3	
Radium-228	EPA 904.0	0.954 ± 0.464 (0.803) C:73% T:81%	pCi/L	03/22/18 14:31	15262-20-1	
Total Radium	Total Radium Calculation	1.56 ± 1.04 (1.69)	pCi/L	03/28/18 14:19	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC LF CCR

Pace Project No.: 60265489

Sample: MW-39-030818 **Lab ID: 60265489003** Collected: 03/08/18 08:23 Received: 03/08/18 15:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.429 ± 0.552 (0.919) C:NA T:89%	pCi/L	03/26/18 18:42	13982-63-3	
Radium-228	EPA 904.0	0.537 ± 0.386 (0.752) C:74% T:83%	pCi/L	03/22/18 14:32	15262-20-1	
Total Radium	Total Radium Calculation	0.966 ± 0.938 (1.67)	pCi/L	03/28/18 14:19	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC LF CCR

Pace Project No.: 60265489

Sample: MW-40-030818 **Lab ID: 60265489004** Collected: 03/08/18 09:42 Received: 03/08/18 15:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.146 ± 0.453 (0.878) C:NA T:89%	pCi/L	03/26/18 18:42	13982-63-3	
Radium-228	EPA 904.0	0.858 ± 0.423 (0.725) C:81% T:74%	pCi/L	03/22/18 14:32	15262-20-1	
Total Radium	Total Radium Calculation	1.00 ± 0.876 (1.60)	pCi/L	03/28/18 14:19	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC LF CCR

Pace Project No.: 60265489

Sample: DUP-03 **Lab ID: 60265489005** Collected: 03/07/18 06:00 Received: 03/08/18 15:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.279 ± 0.475 (0.838) C:NA T:84%	pCi/L	03/26/18 18:42	13982-63-3	
Radium-228	EPA 904.0	0.829 ± 0.508 (0.968) C:80% T:72%	pCi/L	03/22/18 14:32	15262-20-1	
Total Radium	Total Radium Calculation	1.11 ± 0.983 (1.81)	pCi/L	03/28/18 14:19	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC LF CCR

Pace Project No.: 60265489

QC Batch: 291244

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60265489001, 60265489002, 60265489003, 60265489004, 60265489005

METHOD BLANK: 1425561

Matrix: Water

Associated Lab Samples: 60265489001, 60265489002, 60265489003, 60265489004, 60265489005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.503 ± 0.356 (0.692) C:81% T:88%	pCi/L	03/22/18 15:01	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC LF CCR

Pace Project No.: 60265489

QC Batch: 291237

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60265489001, 60265489002, 60265489003, 60265489004, 60265489005

METHOD BLANK: 1425550

Matrix: Water

Associated Lab Samples: 60265489001, 60265489002, 60265489003, 60265489004, 60265489005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.263 ± 0.301 (0.178) C:NA T:81%	pCi/L	03/26/18 18:28	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: LEC LF CCR

Pace Project No.: 60265489

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

PASI-PA Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

R1 RPD value was outside control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC LF CCR

Pace Project No.: 60265489

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60265489001	MW-37-030718	EPA 200.7	517746	EPA 200.7	517788
60265489002	MW-38-030718	EPA 200.7	517746	EPA 200.7	517788
60265489003	MW-39-030818	EPA 200.7	517746	EPA 200.7	517788
60265489004	MW-40-030818	EPA 200.7	517746	EPA 200.7	517788
60265489005	DUP-03	EPA 200.7	517746	EPA 200.7	517788
60265489001	MW-37-030718	EPA 200.8	517745	EPA 200.8	517783
60265489002	MW-38-030718	EPA 200.8	517745	EPA 200.8	517783
60265489003	MW-39-030818	EPA 200.8	517745	EPA 200.8	517783
60265489004	MW-40-030818	EPA 200.8	517745	EPA 200.8	517783
60265489005	DUP-03	EPA 200.8	517745	EPA 200.8	517783
60265489001	MW-37-030718	EPA 245.1	517375	EPA 245.1	517399
60265489002	MW-38-030718	EPA 245.1	517375	EPA 245.1	517399
60265489003	MW-39-030818	EPA 245.1	517375	EPA 245.1	517399
60265489004	MW-40-030818	EPA 245.1	517375	EPA 245.1	517399
60265489005	DUP-03	EPA 245.1	517375	EPA 245.1	517399
60265489001	MW-37-030718	EPA 903.1	291237		
60265489002	MW-38-030718	EPA 903.1	291237		
60265489003	MW-39-030818	EPA 903.1	291237		
60265489004	MW-40-030818	EPA 903.1	291237		
60265489005	DUP-03	EPA 903.1	291237		
60265489001	MW-37-030718	EPA 904.0	291244		
60265489002	MW-38-030718	EPA 904.0	291244		
60265489003	MW-39-030818	EPA 904.0	291244		
60265489004	MW-40-030818	EPA 904.0	291244		
60265489005	DUP-03	EPA 904.0	291244		
60265489001	MW-37-030718	Total Radium Calculation	292809		
60265489002	MW-38-030718	Total Radium Calculation	292809		
60265489003	MW-39-030818	Total Radium Calculation	292809		
60265489004	MW-40-030818	Total Radium Calculation	292809		
60265489005	DUP-03	Total Radium Calculation	292809		
60265489001	MW-37-030718	SM 2540C	517481		
60265489002	MW-38-030718	SM 2540C	517481		
60265489003	MW-39-030818	SM 2540C	517482		
60265489004	MW-40-030818	SM 2540C	517482		
60265489005	DUP-03	SM 2540C	517481		
60265489001	MW-37-030718	SM 4500-H+B	517657		
60265489002	MW-38-030718	SM 4500-H+B	517657		
60265489003	MW-39-030818	SM 4500-H+B	517657		
60265489004	MW-40-030818	SM 4500-H+B	517657		
60265489005	DUP-03	SM 4500-H+B	517519		
60265489001	MW-37-030718	EPA 300.0	519299		
60265489001	MW-37-030718	EPA 300.0	519504		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC LF CCR

Pace Project No.: 60265489

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60265489002	MW-38-030718	EPA 300.0	519299		
60265489002	MW-38-030718	EPA 300.0	519505		
60265489003	MW-39-030818	EPA 300.0	519299		
60265489003	MW-39-030818	EPA 300.0	519505		
60265489004	MW-40-030818	EPA 300.0	519299		
60265489004	MW-40-030818	EPA 300.0	519505		
60265489005	DUP-03	EPA 300.0	519299		
60265489005	DUP-03	EPA 300.0	519504		
60265489005	DUP-03	EPA 300.0	519505		

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Sample Condition Upon Receipt

WO#: 60265489
Barcode
60265489

Client Name: Westar

Courier: FedEx [] UPS [] VIA [] Clay [] PEX [] ECI [] Pace [x] Xroads [] Client [] Other []

Tracking #: Pace Shipping Label Used? Yes [] No [x]

Custody Seal on Cooler/Box Present: Yes [] No [x] Seals intact: Yes [] No [x]

Packing Material: Bubble Wrap [] Bubble Bags [] Foam [] None [x] Other []

Thermometer Used: T-266 / T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 2.9 Corr. Factor CF +0.2 CF -0.1 Corrected 3.1

Date and initials of person examining contents:

3/18/18

Temperature should be above freezing to 6°C

Table with 2 columns: Question/Requirement and Yes/No/N/A checkboxes. Rows include Chain of Custody, Samples arrived, Short Hold Time, Rush Turn Around Time, Sufficient volume, Containers used, Containers intact, Unpreserved soils, Filtered volume, Sample labels, Matrix (WT), pH preservation, Cyanide water, Lead acetate strip, Potassium iodide test, Trip Blank, Headspace, and USDA Regulated Area.

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: Amw

Date: 3/19/18

Pittsburgh Lab Sample Condition Upon Receipt

30246063

Face Analytical

Client Name: Pace Kansas

Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 4171 8390 3525

Label	<u>DS</u>
LIMS Login	<u>34</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used NA Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>10D1071</u>	<u>DS 3-13-18</u>
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
-Includes date/time/ID Matrix: <u>WT</u>					
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Hex Cr Aqueous Compliance/NPDES sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>phcd</u>	
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed <u>DS</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Rad Aqueous Samples Screened > 0.5 mrem/hr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>DS</u>	Date: <u>3-13-18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

ATTACHMENT 1-2
May 2018 Sampling Event
Laboratory Analytical Report

June 15, 2018

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC ISI CCR
Pace Project No.: 60270161

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on May 10, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC ISI CCR

Pace Project No.: 60270161

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
WY STR Certification #: 2456.01
Arkansas Certification #: 17-016-0
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

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SAMPLE SUMMARY

Project: LEC ISI CCR

Pace Project No.: 60270161

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60270161001	MW-37-050918	Water	05/09/18 11:32	05/10/18 17:00
60270161002	MW-38-050918	Water	05/09/18 12:47	05/10/18 17:00
60270161003	MW-39-050918	Water	05/09/18 13:57	05/10/18 17:00
60270161004	MW-40-050918	Water	05/09/18 15:49	05/10/18 17:00
60270161005	MW-K-051018	Water	05/10/18 11:17	05/10/18 17:00
60270161006	MW-L-051018	Water	05/10/18 14:47	05/10/18 17:00
60270161007	DUP-050918	Water	05/09/18 08:00	05/10/18 17:00

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60270161

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60270161001	MW-37-050918	EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	TDS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	LDB	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
60270161002	MW-38-050918	EPA 300.0	OL, WNM	3	PASI-K
		EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	TDS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	LDB	1	PASI-K
60270161003	MW-39-050918	SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	OL, WNM	3	PASI-K
		EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	TDS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60270161004	MW-40-050918	SM 2540C	LDB	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	OL, WNM	3	PASI-K
		EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	TDS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60270161005	MW-K-051018	Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	LDB	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
		EPA 200.7	TDS	7	PASI-K

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60270161

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60270161006	MW-L-051018	EPA 200.8	JGP	7	PASI-K
		EPA 245.1	TDS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	LDB	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
		EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	TDS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	LDB	1	PASI-K
SM 4500-H+B	MJK	1	PASI-K		
60270161007	DUP-050918	EPA 300.0	WNM	3	PASI-K
		EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	TDS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	LDB	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	WNM	3	PASI-K

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60270161

Sample: MW-37-050918	Lab ID: 60270161001	Collected: 05/09/18 11:32	Received: 05/10/18 17:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.055	mg/L	0.0050	1	05/11/18 14:00	05/14/18 20:43	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/11/18 14:00	05/14/18 20:43	7440-41-7	
Boron, Total Recoverable	2.2	mg/L	0.10	1	05/11/18 14:00	05/14/18 20:43	7440-42-8	
Calcium, Total Recoverable	138	mg/L	0.20	1	05/11/18 14:00	05/14/18 20:43	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	05/11/18 14:00	05/14/18 20:43	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	05/11/18 14:00	05/14/18 20:43	7439-92-1	
Lithium	0.014	mg/L	0.010	1	05/11/18 14:00	05/14/18 20:43	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:02	7440-36-0	
Arsenic, Total Recoverable	0.0077	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:02	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	05/23/18 09:25	06/14/18 18:02	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:02	7440-48-4	
Molybdenum, Total Recoverable	0.14	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:02	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:02	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:02	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	05/31/18 15:45	06/01/18 11:19	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	776	mg/L	5.0	1		05/15/18 18:18		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2	Std. Units	0.10	1		05/14/18 11:34		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	31.1	mg/L	2.0	2		06/02/18 13:44	16887-00-6	
Fluoride	0.36	mg/L	0.20	1		05/30/18 19:52	16984-48-8	
Sulfate	355	mg/L	50.0	50		06/02/18 13:03	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60270161

Sample: MW-38-050918		Lab ID: 60270161002	Collected: 05/09/18 12:47	Received: 05/10/18 17:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.037	mg/L	0.0050	1	05/11/18 14:00	05/14/18 20:45	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/11/18 14:00	05/14/18 20:45	7440-41-7	
Boron, Total Recoverable	6.0	mg/L	0.10	1	05/11/18 14:00	05/14/18 20:45	7440-42-8	
Calcium, Total Recoverable	312	mg/L	0.20	1	05/11/18 14:00	05/14/18 20:45	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	05/11/18 14:00	05/14/18 20:45	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	05/11/18 14:00	05/14/18 20:45	7439-92-1	
Lithium	0.083	mg/L	0.010	1	05/11/18 14:00	05/14/18 20:45	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:05	7440-36-0	
Arsenic, Total Recoverable	0.014	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:05	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	05/23/18 09:25	06/14/18 18:05	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:05	7440-48-4	
Molybdenum, Total Recoverable	0.093	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:05	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:05	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:05	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	05/31/18 15:45	06/01/18 11:26	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	2520	mg/L	5.0	1		05/15/18 18:18		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.5	Std. Units	0.10	1		05/14/18 11:35		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	237	mg/L	20.0	20		06/02/18 13:58	16887-00-6	
Fluoride	5.0	mg/L	0.20	1		05/30/18 20:06	16984-48-8	
Sulfate	1470	mg/L	200	200		06/02/18 14:12	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60270161

Sample: MW-39-050918		Lab ID: 60270161003		Collected: 05/09/18 13:57		Received: 05/10/18 17:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.033	mg/L	0.0050	1	05/11/18 14:00	05/14/18 20:52	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/11/18 14:00	05/14/18 20:52	7440-41-7		
Boron, Total Recoverable	5.4	mg/L	0.10	1	05/11/18 14:00	05/14/18 20:52	7440-42-8		
Calcium, Total Recoverable	490	mg/L	0.20	1	05/11/18 14:00	05/14/18 20:52	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	05/11/18 14:00	05/14/18 20:52	7440-47-3		
Lead, Total Recoverable	<0.010	mg/L	0.010	1	05/11/18 14:00	05/14/18 20:52	7439-92-1		
Lithium	0.050	mg/L	0.010	1	05/11/18 14:00	05/14/18 20:52	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:08	7440-36-0		
Arsenic, Total Recoverable	0.013	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:08	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	05/23/18 09:25	06/14/18 18:08	7440-43-9		
Cobalt, Total Recoverable	0.0011	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:08	7440-48-4		
Molybdenum, Total Recoverable	0.11	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:08	7439-98-7		
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:08	7782-49-2		
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:08	7440-28-0		
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	05/31/18 15:45	06/01/18 11:28	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	3400	mg/L	5.0	1		05/15/18 18:18			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.3	Std. Units	0.10	1		05/14/18 11:36		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	375	mg/L	100	100		06/02/18 09:31	16887-00-6		
Fluoride	2.9	mg/L	0.20	1		05/31/18 12:13	16984-48-8	M1, R1	
Sulfate	1870	mg/L	100	100		06/02/18 09:31	14808-79-8		

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60270161

Sample: MW-40-050918		Lab ID: 60270161004	Collected: 05/09/18 15:49	Received: 05/10/18 17:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.039	mg/L	0.0050	1	05/11/18 14:00	05/14/18 20:54	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/11/18 14:00	05/14/18 20:54	7440-41-7	
Boron, Total Recoverable	7.2	mg/L	0.10	1	05/11/18 14:00	05/14/18 20:54	7440-42-8	
Calcium, Total Recoverable	527	mg/L	0.20	1	05/11/18 14:00	05/14/18 20:54	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	05/11/18 14:00	05/14/18 20:54	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	05/11/18 14:00	05/14/18 20:54	7439-92-1	
Lithium	0.056	mg/L	0.010	1	05/11/18 14:00	05/14/18 20:54	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:11	7440-36-0	
Arsenic, Total Recoverable	0.014	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:11	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	05/23/18 09:25	06/14/18 18:11	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:11	7440-48-4	
Molybdenum, Total Recoverable	0.15	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:11	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:11	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:11	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	05/31/18 15:45	06/01/18 11:30	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3300	mg/L	5.0	1		05/15/18 18:18		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.0	Std. Units	0.10	1		05/14/18 11:38		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	412	mg/L	50.0	50		06/01/18 22:46	16887-00-6	
Fluoride	1.9	mg/L	0.20	1		06/01/18 22:31	16984-48-8	
Sulfate	1890	mg/L	100	100		06/01/18 23:01	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60270161

Sample: MW-K-051018		Lab ID: 60270161005	Collected: 05/10/18 11:17	Received: 05/10/18 17:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.052	mg/L	0.0050	1	05/11/18 14:00	05/14/18 20:57	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/11/18 14:00	05/14/18 20:57	7440-41-7	
Boron, Total Recoverable	3.6	mg/L	0.10	1	05/11/18 14:00	05/14/18 20:57	7440-42-8	
Calcium, Total Recoverable	504	mg/L	0.20	1	05/11/18 14:00	05/14/18 20:57	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	05/11/18 14:00	05/14/18 20:57	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	05/11/18 14:00	05/14/18 20:57	7439-92-1	
Lithium	0.051	mg/L	0.010	1	05/11/18 14:00	05/14/18 20:57	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:13	7440-36-0	
Arsenic, Total Recoverable	0.075	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:13	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	05/23/18 09:25	06/14/18 18:13	7440-43-9	
Cobalt, Total Recoverable	0.0028	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:13	7440-48-4	
Molybdenum, Total Recoverable	0.040	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:13	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:13	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:13	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	05/31/18 15:45	06/01/18 11:32	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3580	mg/L	5.0	1		05/16/18 16:00		D6
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2	Std. Units	0.10	1		05/14/18 11:39		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	481	mg/L	50.0	50		06/01/18 23:16	16887-00-6	
Fluoride	3.4	mg/L	0.20	1		05/31/18 14:12	16984-48-8	
Sulfate	1570	mg/L	200	200		06/01/18 23:31	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60270161

Sample: MW-L-051018		Lab ID: 60270161006	Collected: 05/10/18 14:47	Received: 05/10/18 17:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.094	mg/L	0.0050	1	05/11/18 14:00	05/14/18 21:00	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/11/18 14:00	05/14/18 21:00	7440-41-7	
Boron, Total Recoverable	2.6	mg/L	0.10	1	05/11/18 14:00	05/14/18 21:00	7440-42-8	
Calcium, Total Recoverable	508	mg/L	0.20	1	05/11/18 14:00	05/14/18 21:00	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	05/11/18 14:00	05/14/18 21:00	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	05/11/18 14:00	05/14/18 21:00	7439-92-1	
Lithium	0.044	mg/L	0.010	1	05/11/18 14:00	05/14/18 21:00	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:16	7440-36-0	
Arsenic, Total Recoverable	0.021	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:16	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	05/23/18 09:25	06/14/18 18:16	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:16	7440-48-4	
Molybdenum, Total Recoverable	0.038	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:16	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:16	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:16	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	05/31/18 15:45	06/01/18 11:34	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3880	mg/L	5.0	1		05/16/18 16:00		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.1	Std. Units	0.10	1		05/14/18 11:40		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	486	mg/L	50.0	50		06/01/18 23:46	16887-00-6	
Fluoride	2.2	mg/L	0.20	1		05/31/18 14:27	16984-48-8	
Sulfate	1730	mg/L	200	200		06/02/18 00:30	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60270161

Sample: DUP-050918		Lab ID: 60270161007	Collected: 05/09/18 08:00	Received: 05/10/18 17:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.032	mg/L	0.0050	1	05/11/18 14:00	05/14/18 21:02	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/11/18 14:00	05/14/18 21:02	7440-41-7	
Boron, Total Recoverable	5.3	mg/L	0.10	1	05/11/18 14:00	05/14/18 21:02	7440-42-8	
Calcium, Total Recoverable	482	mg/L	0.20	1	05/11/18 14:00	05/14/18 21:02	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	05/11/18 14:00	05/14/18 21:02	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	05/11/18 14:00	05/14/18 21:02	7439-92-1	
Lithium	0.048	mg/L	0.010	1	05/11/18 14:00	05/14/18 21:02	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:19	7440-36-0	
Arsenic, Total Recoverable	0.013	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:19	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	05/23/18 09:25	06/14/18 18:19	7440-43-9	
Cobalt, Total Recoverable	0.0011	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:19	7440-48-4	
Molybdenum, Total Recoverable	0.10	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:19	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:19	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:19	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	05/31/18 15:45	06/01/18 11:37	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3360	mg/L	5.0	1		05/15/18 18:18		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2	Std. Units	0.10	1		05/14/18 11:42		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	385	mg/L	50.0	50		06/02/18 00:45	16887-00-6	
Fluoride	3.5	mg/L	0.20	1		05/31/18 14:42	16984-48-8	
Sulfate	1940	mg/L	200	200		06/02/18 01:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60270161

QC Batch: 528138 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60270161001, 60270161002, 60270161003, 60270161004, 60270161005, 60270161006, 60270161007

METHOD BLANK: 2163340 Matrix: Water
Associated Lab Samples: 60270161001, 60270161002, 60270161003, 60270161004, 60270161005, 60270161006, 60270161007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	06/01/18 11:15	

LABORATORY CONTROL SAMPLE: 2163341

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0050	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2163342 2163343

Parameter	Units	60270871001		60270871002		60270871003		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Mercury	mg/L	ND	.005	.005	0.0048	0.0048	96	95	70-130	0	20

MATRIX SPIKE SAMPLE: 2163344

Parameter	Units	60270968001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.00031	.005	0.0051	96	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60270161

QC Batch: 525434 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60270161001, 60270161002, 60270161003, 60270161004, 60270161005, 60270161006, 60270161007

METHOD BLANK: 2151562 Matrix: Water
Associated Lab Samples: 60270161001, 60270161002, 60270161003, 60270161004, 60270161005, 60270161006, 60270161007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	05/14/18 20:09	
Beryllium	mg/L	<0.0010	0.0010	05/14/18 20:09	
Boron	mg/L	<0.10	0.10	05/14/18 20:09	
Calcium	mg/L	<0.20	0.20	05/14/18 20:09	
Chromium	mg/L	<0.0050	0.0050	05/14/18 20:09	
Lead	mg/L	<0.010	0.010	05/14/18 20:09	
Lithium	mg/L	<0.010	0.010	05/14/18 20:09	

LABORATORY CONTROL SAMPLE: 2151563

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.0	101	85-115	
Beryllium	mg/L	1	1.0	100	85-115	
Boron	mg/L	1	0.96	96	85-115	
Calcium	mg/L	10	9.7	97	85-115	
Chromium	mg/L	1	0.98	98	85-115	
Lead	mg/L	1	1.0	102	85-115	
Lithium	mg/L	1	1.0	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2151564 2151565

Parameter	Units	60270146001		2151565		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Barium	mg/L	110 ug/L	1	1	1.2	1.1	108	101	70-130	6	20
Beryllium	mg/L	ND	1	1	1.0	0.99	104	99	70-130	5	20
Boron	mg/L	ND	1	1	<2.0	<2.0	97	94	70-130		20
Calcium	mg/L	11400000 ug/L	10	10	12000	11500	5000	260	70-130	4	20 M1
Chromium	mg/L	ND	1	1	1.0	0.99	104	99	70-130	5	20
Lead	mg/L	ND	1	1	0.96	0.91	96	91	70-130	6	20
Lithium	mg/L	210 ug/L	1	1	1.4	1.3	117	113	70-130	3	20

MATRIX SPIKE SAMPLE: 2151566

Parameter	Units	60270113020 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	180 ug/L	1	1.2	106	70-130	
Beryllium	mg/L	0.29J ug/L	1	1.0	102	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60270161

MATRIX SPIKE SAMPLE:		2151566					
Parameter	Units	60270113020 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	mg/L	87.3J ug/L	1	1.1	100	70-130	
Calcium	mg/L	75700 ug/L	10	86.5	108	70-130	
Chromium	mg/L	5.4 ug/L	1	1.0	99	70-130	
Lead	mg/L	5.1J ug/L	1	1.0	99	70-130	
Lithium	mg/L	41.2 ug/L	1	1.1	106	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60270161

QC Batch:	526944	Analysis Method:	EPA 200.8
QC Batch Method:	EPA 200.8	Analysis Description:	200.8 MET
Associated Lab Samples:	60270161001, 60270161002, 60270161003, 60270161004, 60270161005, 60270161006, 60270161007		

METHOD BLANK: 2158358 Matrix: Water
Associated Lab Samples: 60270161001, 60270161002, 60270161003, 60270161004, 60270161005, 60270161006, 60270161007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	05/24/18 20:23	
Arsenic	mg/L	<0.0010	0.0010	05/24/18 20:23	
Cadmium	mg/L	<0.00050	0.00050	05/24/18 20:23	
Cobalt	mg/L	<0.0010	0.0010	05/24/18 20:23	
Molybdenum	mg/L	<0.0010	0.0010	05/24/18 20:23	
Selenium	mg/L	<0.0010	0.0010	05/24/18 20:23	
Thallium	mg/L	<0.0010	0.0010	05/24/18 20:23	

LABORATORY CONTROL SAMPLE: 2158359

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.043	106	85-115	
Arsenic	mg/L	.04	0.042	104	85-115	
Cadmium	mg/L	.04	0.039	99	85-115	
Cobalt	mg/L	.04	0.038	95	85-115	
Molybdenum	mg/L	.04	0.039	98	85-115	
Selenium	mg/L	.04	0.039	98	85-115	
Thallium	mg/L	.04	0.036	90	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2158360 2158361

Parameter	Units	60270477001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony	mg/L	ND	.04	.04	0.043	0.043	106	107	70-130	1	20		
Arsenic	mg/L	1.7 ug/L	.04	.04	0.043	0.042	102	100	70-130	2	20		
Cadmium	mg/L	ND	.04	.04	0.037	0.038	93	94	70-130	1	20		
Cobalt	mg/L	1.1 ug/L	.04	.04	0.037	0.037	90	89	70-130	1	20		
Molybdenum	mg/L	5.3 ug/L	.04	.04	0.047	0.047	105	104	70-130	1	20		
Selenium	mg/L	2.0 ug/L	.04	.04	0.037	0.038	89	89	70-130	1	20		
Thallium	mg/L	ND	.04	.04	0.038	0.038	96	96	70-130	0	20		

MATRIX SPIKE SAMPLE: 2158362

Parameter	Units	60270478001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	ND	.04	0.043	106	70-130	
Arsenic	mg/L	1.2 ug/L	.04	0.041	99	70-130	
Cadmium	mg/L	ND	.04	0.037	92	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60270161

MATRIX SPIKE SAMPLE:		2158362					
Parameter	Units	60270478001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cobalt	mg/L	ND	.04	0.036	88	70-130	
Molybdenum	mg/L	3.5 ug/L	.04	0.045	103	70-130	
Selenium	mg/L	2.0 ug/L	.04	0.036	86	70-130	
Thallium	mg/L	ND	.04	0.038	94	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60270161

QC Batch: 525897

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60270161001, 60270161002, 60270161003, 60270161004, 60270161007

METHOD BLANK: 2153395

Matrix: Water

Associated Lab Samples: 60270161001, 60270161002, 60270161003, 60270161004, 60270161007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	05/15/18 18:18	

LABORATORY CONTROL SAMPLE: 2153396

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	996	100	80-120	

SAMPLE DUPLICATE: 2153397

Parameter	Units	60269871001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1580	1580	0	10	

SAMPLE DUPLICATE: 2153398

Parameter	Units	60270161004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3300	3360	2	10	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60270161

QC Batch: 526099

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60270161005, 60270161006

METHOD BLANK: 2154245

Matrix: Water

Associated Lab Samples: 60270161005, 60270161006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	14.0	5.0	05/16/18 16:00	

LABORATORY CONTROL SAMPLE: 2154246

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1050	105	80-120	

SAMPLE DUPLICATE: 2154247

Parameter	Units	60270179030 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	298	293	2	10	

SAMPLE DUPLICATE: 2154248

Parameter	Units	60270161005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3580	4010	11	10 D6	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60270161

QC Batch: 525655 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60270161001, 60270161002, 60270161003, 60270161004, 60270161005, 60270161006, 60270161007

SAMPLE DUPLICATE: 2152791

Parameter	Units	60270135002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.7	8.8	0	5	H6

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60270161

QC Batch: 527766

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60270161001, 60270161002

METHOD BLANK: 2162192

Matrix: Water

Associated Lab Samples: 60270161001, 60270161002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.20	0.20	05/30/18 11:37	

LABORATORY CONTROL SAMPLE: 2162193

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.5	101	90-110	

MATRIX SPIKE SAMPLE: 2162196

Parameter	Units	60271006002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	4.4	2.5	7.1	107	90-110	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60270161

QC Batch: 527873

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60270161003, 60270161005, 60270161006, 60270161007

METHOD BLANK: 2162538

Matrix: Water

Associated Lab Samples: 60270161003, 60270161005, 60270161006, 60270161007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.20	0.20	05/31/18 10:25	

LABORATORY CONTROL SAMPLE: 2162539

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.5	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2162540 2162541

Parameter	Units	60270161003		2162540		2162541		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Fluoride	mg/L	2.9	2.5	2.5	3.2	5.9	12	120	90-110	59	15 M1,R1

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60270161

QC Batch: 528342

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60270161004, 60270161005, 60270161006, 60270161007

METHOD BLANK: 2164198

Matrix: Water

Associated Lab Samples: 60270161003, 60270161004, 60270161005, 60270161006, 60270161007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	06/01/18 20:02	
Fluoride	mg/L	<0.20	0.20	06/01/18 20:02	
Sulfate	mg/L	<1.0	1.0	06/01/18 20:02	

LABORATORY CONTROL SAMPLE: 2164199

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Fluoride	mg/L	2.5	2.5	100	90-110	
Sulfate	mg/L	5	4.9	99	90-110	

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60270161

QC Batch: 528367 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60270161001, 60270161002

METHOD BLANK: 2164516 Matrix: Water
Associated Lab Samples: 60270161001, 60270161002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	06/02/18 08:37	
Sulfate	mg/L	<1.0	1.0	06/02/18 08:37	

LABORATORY CONTROL SAMPLE: 2164517

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	99	90-110	
Sulfate	mg/L	5	5.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2164518 2164519

Parameter	Units	60270755003		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Sulfate	mg/L	18200	25000	25000	44000	45600	103	110	90-110	4	15		

MATRIX SPIKE SAMPLE: 2164520

Parameter	Units	60271006002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	803	500	1330	105	90-110	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60270161

QC Batch: 528370	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60270161003	

METHOD BLANK: 2164571 Matrix: Water
Associated Lab Samples: 60270161003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	06/02/18 08:40	
Sulfate	mg/L	<1.0	1.0	06/02/18 08:40	

LABORATORY CONTROL SAMPLE: 2164572

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2164573 2164574

Parameter	Units	60270161003		2164574		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chloride	mg/L	375	500	500	849	95	98	90-110	2	15	
Sulfate	mg/L	1870	500	500	2360	98	98	90-110	0	15 E	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60270161

Sample: MW-37-050918 **Lab ID: 60270161001** Collected: 05/09/18 11:32 Received: 05/10/18 17:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.677 ± 0.473 (0.571) C:NA T:91%	pCi/L	06/04/18 12:11	13982-63-3	
Radium-228	EPA 904.0	0.117 ± 0.406 (0.908) C:82% T:86%	pCi/L	06/01/18 14:33	15262-20-1	
Total Radium	Total Radium Calculation	0.794 ± 0.879 (1.48)	pCi/L	06/05/18 13:26	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60270161

Sample: MW-38-050918 **Lab ID: 60270161002** Collected: 05/09/18 12:47 Received: 05/10/18 17:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.125 ± 0.286 (0.461) C:NA T:98%	pCi/L	06/04/18 12:27	13982-63-3	
Radium-228	EPA 904.0	0.737 ± 0.415 (0.758) C:79% T:85%	pCi/L	06/01/18 14:33	15262-20-1	
Total Radium	Total Radium Calculation	0.862 ± 0.701 (1.22)	pCi/L	06/05/18 14:09	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60270161

Sample: MW-39-050918 **Lab ID: 60270161003** Collected: 05/09/18 13:57 Received: 05/10/18 17:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.123 ± 0.281 (0.452) C:NA T:92%	pCi/L	06/04/18 12:42	13982-63-3	
Radium-228	EPA 904.0	0.672 ± 0.377 (0.687) C:82% T:85%	pCi/L	06/01/18 14:33	15262-20-1	
Total Radium	Total Radium Calculation	0.795 ± 0.658 (1.14)	pCi/L	06/05/18 14:09	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60270161

Sample: MW-40-050918 **Lab ID: 60270161004** Collected: 05/09/18 15:49 Received: 05/10/18 17:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.217 ± 0.331 (0.532) C:NA T:84%	pCi/L	06/04/18 12:27	13982-63-3	
Radium-228	EPA 904.0	0.0603 ± 0.301 (0.685) C:83% T:90%	pCi/L	06/01/18 14:33	15262-20-1	
Total Radium	Total Radium Calculation	0.277 ± 0.632 (1.22)	pCi/L	06/05/18 14:09	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60270161

Sample: MW-K-051018 **Lab ID: 60270161005** Collected: 05/10/18 11:17 Received: 05/10/18 17:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0848 ± 0.387 (0.624) C:NA T:67%	pCi/L	06/04/18 12:27	13982-63-3	
Radium-228	EPA 904.0	0.781 ± 0.411 (0.734) C:78% T:83%	pCi/L	06/01/18 14:33	15262-20-1	
Total Radium	Total Radium Calculation	0.866 ± 0.798 (1.36)	pCi/L	06/05/18 14:09	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60270161

Sample: MW-L-051018 **Lab ID: 60270161006** Collected: 05/10/18 14:47 Received: 05/10/18 17:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0606 ± 0.277 (0.563) C:NA T:98%	pCi/L	06/04/18 12:27	13982-63-3	
Radium-228	EPA 904.0	0.951 ± 0.401 (0.644) C:82% T:88%	pCi/L	06/01/18 14:33	15262-20-1	
Total Radium	Total Radium Calculation	1.01 ± 0.678 (1.21)	pCi/L	06/05/18 14:09	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60270161

Sample: DUP-050918 **Lab ID: 60270161007** Collected: 05/09/18 08:00 Received: 05/10/18 17:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.235 ± 0.326 (0.544) C:NA T:95%	pCi/L	06/04/18 12:27	13982-63-3	
Radium-228	EPA 904.0	0.445 ± 0.394 (0.805) C:80% T:86%	pCi/L	06/01/18 14:34	15262-20-1	
Total Radium	Total Radium Calculation	0.680 ± 0.720 (1.35)	pCi/L	06/05/18 14:09	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60270161

QC Batch:	299174	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60270161001, 60270161002, 60270161003, 60270161004, 60270161005, 60270161006, 60270161007		

METHOD BLANK:	1464829	Matrix:	Water
Associated Lab Samples:	60270161001, 60270161002, 60270161003, 60270161004, 60270161005, 60270161006, 60270161007		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.117 ± 0.310 (0.693) C:81% T:81%	pCi/L	06/01/18 14:32	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60270161

QC Batch: 299195

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60270161001, 60270161002, 60270161003, 60270161004, 60270161005, 60270161006, 60270161007

METHOD BLANK: 1464852

Matrix: Water

Associated Lab Samples: 60270161001, 60270161002, 60270161003, 60270161004, 60270161005, 60270161006, 60270161007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.145 ± 0.349 (0.674) C:NA T:82%	pCi/L	06/04/18 12:11	

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QUALIFIERS

Project: LEC ISI CCR

Pace Project No.: 60270161

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

PASI-PA Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

D6 The precision between the sample and sample duplicate exceeded laboratory control limits.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

R1 RPD value was outside control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

Pace Project No.: 60270161

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60270161001	MW-37-050918	EPA 200.7	525434	EPA 200.7	525527
60270161002	MW-38-050918	EPA 200.7	525434	EPA 200.7	525527
60270161003	MW-39-050918	EPA 200.7	525434	EPA 200.7	525527
60270161004	MW-40-050918	EPA 200.7	525434	EPA 200.7	525527
60270161005	MW-K-051018	EPA 200.7	525434	EPA 200.7	525527
60270161006	MW-L-051018	EPA 200.7	525434	EPA 200.7	525527
60270161007	DUP-050918	EPA 200.7	525434	EPA 200.7	525527
60270161001	MW-37-050918	EPA 200.8	526944	EPA 200.8	526988
60270161002	MW-38-050918	EPA 200.8	526944	EPA 200.8	526988
60270161003	MW-39-050918	EPA 200.8	526944	EPA 200.8	526988
60270161004	MW-40-050918	EPA 200.8	526944	EPA 200.8	526988
60270161005	MW-K-051018	EPA 200.8	526944	EPA 200.8	526988
60270161006	MW-L-051018	EPA 200.8	526944	EPA 200.8	526988
60270161007	DUP-050918	EPA 200.8	526944	EPA 200.8	526988
60270161001	MW-37-050918	EPA 245.1	528138	EPA 245.1	528170
60270161002	MW-38-050918	EPA 245.1	528138	EPA 245.1	528170
60270161003	MW-39-050918	EPA 245.1	528138	EPA 245.1	528170
60270161004	MW-40-050918	EPA 245.1	528138	EPA 245.1	528170
60270161005	MW-K-051018	EPA 245.1	528138	EPA 245.1	528170
60270161006	MW-L-051018	EPA 245.1	528138	EPA 245.1	528170
60270161007	DUP-050918	EPA 245.1	528138	EPA 245.1	528170
60270161001	MW-37-050918	EPA 903.1	299195		
60270161002	MW-38-050918	EPA 903.1	299195		
60270161003	MW-39-050918	EPA 903.1	299195		
60270161004	MW-40-050918	EPA 903.1	299195		
60270161005	MW-K-051018	EPA 903.1	299195		
60270161006	MW-L-051018	EPA 903.1	299195		
60270161007	DUP-050918	EPA 903.1	299195		
60270161001	MW-37-050918	EPA 904.0	299174		
60270161002	MW-38-050918	EPA 904.0	299174		
60270161003	MW-39-050918	EPA 904.0	299174		
60270161004	MW-40-050918	EPA 904.0	299174		
60270161005	MW-K-051018	EPA 904.0	299174		
60270161006	MW-L-051018	EPA 904.0	299174		
60270161007	DUP-050918	EPA 904.0	299174		
60270161001	MW-37-050918	Total Radium Calculation	301029		
60270161002	MW-38-050918	Total Radium Calculation	301033		
60270161003	MW-39-050918	Total Radium Calculation	301033		
60270161004	MW-40-050918	Total Radium Calculation	301033		
60270161005	MW-K-051018	Total Radium Calculation	301033		
60270161006	MW-L-051018	Total Radium Calculation	301033		
60270161007	DUP-050918	Total Radium Calculation	301033		
60270161001	MW-37-050918	SM 2540C	525897		
60270161002	MW-38-050918	SM 2540C	525897		
60270161003	MW-39-050918	SM 2540C	525897		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

Pace Project No.: 60270161

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60270161004	MW-40-050918	SM 2540C	525897		
60270161005	MW-K-051018	SM 2540C	526099		
60270161006	MW-L-051018	SM 2540C	526099		
60270161007	DUP-050918	SM 2540C	525897		
60270161001	MW-37-050918	SM 4500-H+B	525655		
60270161002	MW-38-050918	SM 4500-H+B	525655		
60270161003	MW-39-050918	SM 4500-H+B	525655		
60270161004	MW-40-050918	SM 4500-H+B	525655		
60270161005	MW-K-051018	SM 4500-H+B	525655		
60270161006	MW-L-051018	SM 4500-H+B	525655		
60270161007	DUP-050918	SM 4500-H+B	525655		
60270161001	MW-37-050918	EPA 300.0	527766		
60270161001	MW-37-050918	EPA 300.0	528367		
60270161002	MW-38-050918	EPA 300.0	527766		
60270161002	MW-38-050918	EPA 300.0	528367		
60270161003	MW-39-050918	EPA 300.0	527873		
60270161003	MW-39-050918	EPA 300.0	528370		
60270161004	MW-40-050918	EPA 300.0	528342		
60270161005	MW-K-051018	EPA 300.0	527873		
60270161005	MW-K-051018	EPA 300.0	528342		
60270161006	MW-L-051018	EPA 300.0	527873		
60270161006	MW-L-051018	EPA 300.0	528342		
60270161007	DUP-050918	EPA 300.0	527873		
60270161007	DUP-050918	EPA 300.0	528342		

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Sample Condition Upon Receipt

WO#: 60270161



Client Name: Westar Energy

Courier: FedEx UPS VIA Clay PEX ECI Pace Xroads Client Other

Tracking #: _____ Pace Shipping Label Used? Yes No

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No *5/10/18*

Packing Material: Bubble Wrap Bubble Bags Foam None Other

Thermometer Used: T-298 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 0.6/1.0 Corr. Factor 1/1 Corrected 1.7/2.1

Date and initials of person examining contents:

5/10/18

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<i>Hmw</i>

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: *Hmw*

Date: 5/11/18

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:	REGULATORY AGENCY
Company: WESTAR ENERGY	Report To: Brandon Griffin	Attention:	<input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER
Address: 818 Kansas Ave Topeka, KS 66612	Copy To: Jared Morrison	Company Name:	<input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER
Email To: brandon.l.griffin@westarenergy.com	Purchase Order No.: 10LEC-0000012756	Pace Quote Reference:	Site Location
Phone: 785-575-8135 Fax:	Project Name: LEC ISI CCR	Pace Project Manager: Heather Wilson 913-563-1407	STATE: KS
Requested Due Date/TAT: 7 day	Project Number:	Pace Profile #: 9655, 1	

ITEM #	Section D Required Client Information	Valid Matrix Codes MATRIX CODE	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test ↓ Y/N	Requested Analysis Filtered (Y/N)								Residual Chlorine (Y/N)																						
			COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other		200.7 Total Metals*	200.8 Total Metals**	245.1 Total Hg	300: Cl, F, SO ₄	4500 H+B	2540C TDS	Radium-226 & 228																								
			DATE	TIME	DATE	TIME																																										
1	MW-37-050918	WT G			5/9	1132	4	1	3																																							
2	MW-38-050918	WT G			5/9	1247	4	1	3																																							
3	MW-39-050918	WT G			5/9	1357	4	1	3																																							
4	MW-40-050918	WT G			5/9	1549	4	1	3																																							
5																																																
6	MW-K-051018	WT G			5/10	1117	4	1	3																																							
7	MW-L-051018	WT G			5/10	1447	4	1	3																																							
8																																																
9																																																
10																																																
11																																																
12	DUP-050918	WT G			5/9	0800	4	1	3																																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
200.7 Total Metals*: B, Ca, Ba, Be, Cr, Pb, Li	<i>B. J. Westar</i>	5/10/18	1530	<i>[Signature]</i>	5/10	1700	1.7	Y	N	Y
200.8 Total Metals**: Sb, As, Cd, Co, Mo, Se, Ti							2.1	Y	N	Y

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	<i>Brandon Griffin</i>				
SIGNATURE of SAMPLER:	<i>[Signature]</i>				
DATE Signed (MM/DD/YY):		<i>05/10/18</i>			

Page 39 of 41

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: KS

Workorder: 60270161

Workorder Name: LEC ISI CCR

Owner Received Date: 5/10/2018 Results Requested By: 6/5/2018

Report To: Subcontract To: Requested Analysis

Heather Wilson
 Pace Analytical Kansas
 9608 Loiret Blvd.
 Lenexa, KS 66219
 Phone 1(913)563-1407

Pace Analytical Pittsburgh
 1638 Roseytown Road
 Suites 2,3, & 4
 Greensburg, PA 15601
 Phone (724)850-5600

WO#: 30253032



Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Radium-226 & Total Radium	Radium-228	LAB USE ONLY
						HNO3							
1	MW-37-050918	PS	5/9/2018 11:32	60270161001	Water	1					X	X	001
2	MW-38-050918	PS	5/9/2018 12:47	60270161002	Water	1					X	X	002
3	MW-39-050918	PS	5/9/2018 13:57	60270161003	Water	1					X	X	003
4	MW-40-050918	PS	5/9/2018 15:49	60270161004	Water	1					X	X	004
5	MW-K-051018	PS	5/10/2018 11:17	60270161005	Water	1					X	X	005
6	MW-L-051018	PS	5/10/2018 14:47	60270161006	Water	1					X	X	006
7	DUP-050918	PS	5/9/2018 08:00	60270161007	Water	1					X	X	007

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	[Signature]	5/9/18 12:00	[Signature]	5-15-18 1045	
2					
3					

Cooler Temperature on Receipt: °C Custody Seal: Y or N Received on Ice: Y or N Samples Intact: Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: Pace KS

Project # 30253032

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: _____

Label	<u>PSH</u>
LIMS Login	<u>PSH</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used NA Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>10122671</u>	<u>DS 5-15-18</u>
Chain of Custody Present:	/			1.	
Chain of Custody Filled Out:	/			2.	
Chain of Custody Relinquished:	/			3.	
Sampler Name & Signature on COC:	/			4.	
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	/			5.	
Samples Arrived within Hold Time:	/			6.	
Short Hold Time Analysis (<72hr remaining):	/			7.	
Rush Turn Around Time Requested:	/			8.	
Sufficient Volume:	/			9.	
Correct Containers Used: -Pace Containers Used:	/			10.	
Containers Intact:	/			11.	
Orthophosphate field filtered			/	12.	
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.	
Organic Samples checked for dechlorination:			/	14.	
Filtered volume received for Dissolved tests			/	15.	
All containers have been checked for preservation.	/			16.	
All containers needing preservation are found to be in compliance with EPA recommendation.	/				<u>pH 2</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed	Date/time of preservation
				<u>DS</u>	
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):			/	17.	
Trip Blank Present:			/	18.	
Trip Blank Custody Seals Present			/		
Rad Aqueous Samples Screened > 0.5 mrem/hr	/			Initial when completed:	Date:
				<u>DS</u>	<u>5-15-18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

ATTACHMENT 1-3
July 2018 Sampling Event
Laboratory Analytical Report

July 13, 2018

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC ISI CCR
Pace Project No.: 60274082

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on July 03, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Sara Carson for
Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC ISI CCR

Pace Project No.: 60274082

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Certification Number: 10090

WY STR Certification #: 2456.01

Arkansas Certification #: 17-016-0

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC ISI CCR

Pace Project No.: 60274082

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60274082001	MW-37-070218	Water	07/02/18 09:29	07/03/18 12:05
60274082002	MW-38-070218	Water	07/02/18 10:49	07/03/18 12:05
60274082003	MW-K-070218	Water	07/02/18 11:55	07/03/18 12:05
60274082004	MW-L-070218	Water	07/02/18 13:25	07/03/18 12:05
60274082005	MW-39-070218	Water	07/02/18 14:30	07/03/18 12:05
60274082006	MW-40-070218	Water	07/02/18 15:36	07/03/18 12:05
60274082007	DUP-070218	Water	07/02/18 06:00	07/03/18 12:05

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60274082

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60274082001	MW-37-070218	EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LMB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60274082002	MW-38-070218	EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LMB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60274082003	MW-K-070218	EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LMB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60274082004	MW-L-070218	EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LMB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60274082005	MW-39-070218	EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LMB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60274082006	MW-40-070218	EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LMB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60274082007	DUP-070218	EPA 200.7	TDS	7	PASI-K

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60274082

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LMB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60274082

Sample: MW-37-070218	Lab ID: 60274082001	Collected: 07/02/18 09:29	Received: 07/03/18 12:05	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.048	mg/L	0.0050	1	07/05/18 16:00	07/12/18 21:38	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 21:38	7440-41-7	
Boron, Total Recoverable	2.2	mg/L	0.10	1	07/05/18 16:00	07/12/18 21:38	7440-42-8	
Calcium, Total Recoverable	136	mg/L	0.20	1	07/05/18 16:00	07/12/18 21:38	7440-70-2	M1
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	07/05/18 16:00	07/12/18 21:38	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	07/05/18 16:00	07/12/18 21:38	7439-92-1	
Lithium	0.015	mg/L	0.010	1	07/05/18 16:00	07/12/18 21:38	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:29	7440-36-0	
Arsenic, Total Recoverable	0.0056	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:29	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	07/05/18 16:00	07/12/18 23:29	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:29	7440-48-4	
Molybdenum, Total Recoverable	0.14	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:29	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:29	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:29	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	07/11/18 16:00	07/12/18 09:33	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	753	mg/L	5.0	1		07/09/18 11:21		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.7	Std. Units	0.10	1		07/09/18 17:36		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	29.0	mg/L	2.0	2		07/11/18 21:37	16887-00-6	
Fluoride	0.36	mg/L	0.20	1		07/09/18 14:22	16984-48-8	
Sulfate	293	mg/L	20.0	20		07/11/18 21:52	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60274082

Sample: MW-38-070218		Lab ID: 60274082002	Collected: 07/02/18 10:49	Received: 07/03/18 12:05	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.034	mg/L	0.0050	1	07/05/18 16:00	07/12/18 21:44	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 21:44	7440-41-7	
Boron, Total Recoverable	5.8	mg/L	0.10	1	07/05/18 16:00	07/12/18 21:44	7440-42-8	
Calcium, Total Recoverable	300	mg/L	0.20	1	07/05/18 16:00	07/12/18 21:44	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	07/05/18 16:00	07/12/18 21:44	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	07/05/18 16:00	07/12/18 21:44	7439-92-1	
Lithium	0.077	mg/L	0.010	1	07/05/18 16:00	07/12/18 21:44	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:31	7440-36-0	
Arsenic, Total Recoverable	0.013	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:31	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	07/05/18 16:00	07/12/18 23:31	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:31	7440-48-4	
Molybdenum, Total Recoverable	0.099	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:31	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:31	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:31	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	07/11/18 16:00	07/12/18 09:35	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	2480	mg/L	5.0	1		07/09/18 11:21		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.7	Std. Units	0.10	1		07/09/18 17:37		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	254	mg/L	1.0	1		07/09/18 15:07	16887-00-6	
Fluoride	5.1	mg/L	0.20	1		07/09/18 15:07	16984-48-8	
Sulfate	1560	mg/L	1.0	1		07/09/18 15:07	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60274082

Sample: MW-K-070218	Lab ID: 60274082003	Collected: 07/02/18 11:55	Received: 07/03/18 12:05	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium, Total Recoverable	0.042	mg/L	0.0050	1	07/05/18 16:00	07/12/18 21:47	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 21:47	7440-41-7	
Boron, Total Recoverable	3.1	mg/L	0.10	1	07/05/18 16:00	07/12/18 21:47	7440-42-8	
Calcium, Total Recoverable	473	mg/L	0.20	1	07/05/18 16:00	07/12/18 21:47	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	07/05/18 16:00	07/12/18 21:47	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	07/05/18 16:00	07/12/18 21:47	7439-92-1	
Lithium	0.067	mg/L	0.010	1	07/05/18 16:00	07/12/18 21:47	7439-93-2	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:39	7440-36-0	
Arsenic, Total Recoverable	0.070	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:39	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	07/05/18 16:00	07/12/18 23:39	7440-43-9	
Cobalt, Total Recoverable	0.0015	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:39	7440-48-4	
Molybdenum, Total Recoverable	0.032	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:39	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:39	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:39	7440-28-0	
245.1 Mercury								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	<0.00020	mg/L	0.00020	1	07/11/18 16:00	07/12/18 09:37	7439-97-6	
2540C Total Dissolved Solids								
Analytical Method: SM 2540C								
Total Dissolved Solids	3350	mg/L	5.0	1		07/09/18 11:21		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	7.7	Std. Units	0.10	1		07/09/18 17:40		H6
300.0 IC Anions 28 Days								
Analytical Method: EPA 300.0								
Chloride	593	mg/L	1.0	1		07/09/18 15:22	16887-00-6	
Fluoride	3.5	mg/L	0.20	1		07/09/18 15:22	16984-48-8	
Sulfate	2020	mg/L	1.0	1		07/09/18 15:22	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60274082

Sample: MW-L-070218		Lab ID: 60274082004	Collected: 07/02/18 13:25	Received: 07/03/18 12:05	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.055	mg/L	0.0050	1	07/05/18 16:00	07/12/18 21:49	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 21:49	7440-41-7	
Boron, Total Recoverable	2.4	mg/L	0.10	1	07/05/18 16:00	07/12/18 21:49	7440-42-8	
Calcium, Total Recoverable	511	mg/L	0.20	1	07/05/18 16:00	07/12/18 21:49	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	07/05/18 16:00	07/12/18 21:49	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	07/05/18 16:00	07/12/18 21:49	7439-92-1	
Lithium	0.038	mg/L	0.010	1	07/05/18 16:00	07/12/18 21:49	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:47	7440-36-0	
Arsenic, Total Recoverable	0.022	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:47	7440-38-2	
Cadmium, Total Recoverable	<0.0050	mg/L	0.00050	1	07/05/18 16:00	07/12/18 23:47	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:47	7440-48-4	
Molybdenum, Total Recoverable	0.043	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:47	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:47	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:47	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	07/11/18 16:00	07/12/18 09:39	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3690	mg/L	5.0	1		07/09/18 11:21		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.3	Std. Units	0.10	1		07/09/18 17:45		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	648	mg/L	1.0	1		07/09/18 15:37	16887-00-6	
Fluoride	2.0	mg/L	0.20	1		07/09/18 15:37	16984-48-8	
Sulfate	2090	mg/L	1.0	1		07/09/18 15:37	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60274082

Sample: MW-39-070218	Lab ID: 60274082005	Collected: 07/02/18 14:30	Received: 07/03/18 12:05	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.032	mg/L	0.0050	1	07/05/18 16:00	07/12/18 21:51	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 21:51	7440-41-7	
Boron, Total Recoverable	5.3	mg/L	0.10	1	07/05/18 16:00	07/12/18 21:51	7440-42-8	
Calcium, Total Recoverable	478	mg/L	0.20	1	07/05/18 16:00	07/12/18 21:51	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	07/05/18 16:00	07/12/18 21:51	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	07/05/18 16:00	07/12/18 21:51	7439-92-1	
Lithium	0.049	mg/L	0.010	1	07/05/18 16:00	07/12/18 21:51	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:49	7440-36-0	
Arsenic, Total Recoverable	0.013	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:49	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	07/05/18 16:00	07/12/18 23:49	7440-43-9	
Cobalt, Total Recoverable	0.0014	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:49	7440-48-4	
Molybdenum, Total Recoverable	0.11	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:49	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:49	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:49	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	07/11/18 16:00	07/12/18 09:41	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3390	mg/L	5.0	1		07/09/18 11:21		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.5	Std. Units	0.10	1		07/09/18 17:48		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	487	mg/L	1.0	1		07/09/18 15:52	16887-00-6	
Fluoride	3.3	mg/L	0.20	1		07/09/18 15:52	16984-48-8	
Sulfate	2110	mg/L	1.0	1		07/09/18 15:52	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60274082

Sample: MW-40-070218	Lab ID: 60274082006	Collected: 07/02/18 15:36	Received: 07/03/18 12:05	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.036	mg/L	0.0050	1	07/05/18 16:00	07/12/18 21:58	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 21:58	7440-41-7	
Boron, Total Recoverable	7.0	mg/L	0.10	1	07/05/18 16:00	07/12/18 21:58	7440-42-8	
Calcium, Total Recoverable	487	mg/L	0.20	1	07/05/18 16:00	07/12/18 21:58	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	07/05/18 16:00	07/12/18 21:58	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	07/05/18 16:00	07/12/18 21:58	7439-92-1	
Lithium	0.052	mg/L	0.010	1	07/05/18 16:00	07/12/18 21:58	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:52	7440-36-0	
Arsenic, Total Recoverable	0.014	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:52	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	07/05/18 16:00	07/12/18 23:52	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:52	7440-48-4	
Molybdenum, Total Recoverable	0.19	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:52	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:52	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:52	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	07/11/18 16:00	07/12/18 09:48	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3190	mg/L	5.0	1		07/09/18 11:21		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.0	Std. Units	0.10	1		07/09/18 17:51		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	429	mg/L	1.0	1		07/09/18 16:07	16887-00-6	
Fluoride	2.1	mg/L	0.20	1		07/09/18 16:07	16984-48-8	
Sulfate	2160	mg/L	1.0	1		07/09/18 16:07	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60274082

Sample: DUP-070218		Lab ID: 60274082007	Collected: 07/02/18 06:00	Received: 07/03/18 12:05	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.043	mg/L	0.0050	1	07/05/18 16:00	07/12/18 22:00	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 22:00	7440-41-7	
Boron, Total Recoverable	3.1	mg/L	0.10	1	07/05/18 16:00	07/12/18 22:00	7440-42-8	
Calcium, Total Recoverable	462	mg/L	0.20	1	07/05/18 16:00	07/12/18 22:00	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	07/05/18 16:00	07/12/18 22:00	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	07/05/18 16:00	07/12/18 22:00	7439-92-1	
Lithium	0.069	mg/L	0.010	1	07/05/18 16:00	07/12/18 22:00	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:54	7440-36-0	
Arsenic, Total Recoverable	0.070	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:54	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	07/05/18 16:00	07/12/18 23:54	7440-43-9	
Cobalt, Total Recoverable	0.0011	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:54	7440-48-4	
Molybdenum, Total Recoverable	0.030	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:54	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:54	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	07/05/18 16:00	07/12/18 23:54	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	07/11/18 16:00	07/12/18 09:50	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3510	mg/L	5.0	1		07/09/18 11:21		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.5	Std. Units	0.10	1		07/09/18 17:31		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	479	mg/L	50.0	50		07/12/18 14:53	16887-00-6	
Fluoride	3.8	mg/L	0.20	1		07/09/18 16:22	16984-48-8	
Sulfate	1660	mg/L	200	200		07/12/18 15:07	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60274082

QC Batch: 533926 Analysis Method: EPA 245.1
 QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
 Associated Lab Samples: 60274082001, 60274082002, 60274082003, 60274082004, 60274082005, 60274082006, 60274082007

METHOD BLANK: 2186616 Matrix: Water
 Associated Lab Samples: 60274082001, 60274082002, 60274082003, 60274082004, 60274082005, 60274082006, 60274082007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	07/12/18 09:22	

LABORATORY CONTROL SAMPLE: 2186617

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0049	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2186618 2186619

Parameter	Units	60273744001		2186618		2186619		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Mercury	mg/L	ND	ND	.005	.005	0.0048	0.0050	93	98	70-130	4	20

MATRIX SPIKE SAMPLE: 2186622

Parameter	Units	60273637002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	.005	0.0049	98	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60274082

QC Batch:	533027	Analysis Method:	EPA 200.7
QC Batch Method:	EPA 200.7	Analysis Description:	200.7 Metals, Total
Associated Lab Samples:	60274082001, 60274082002, 60274082003, 60274082004, 60274082005, 60274082006, 60274082007		

METHOD BLANK: 2183110 Matrix: Water
Associated Lab Samples: 60274082001, 60274082002, 60274082003, 60274082004, 60274082005, 60274082006, 60274082007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	07/12/18 21:32	
Beryllium	mg/L	<0.0010	0.0010	07/12/18 21:32	
Boron	mg/L	<0.10	0.10	07/12/18 21:32	
Calcium	mg/L	<0.20	0.20	07/12/18 21:32	
Chromium	mg/L	<0.0050	0.0050	07/12/18 21:32	
Lead	mg/L	<0.010	0.010	07/12/18 21:32	
Lithium	mg/L	<0.010	0.010	07/12/18 21:32	

LABORATORY CONTROL SAMPLE: 2183111

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	0.99	99	85-115	
Beryllium	mg/L	1	0.99	99	85-115	
Boron	mg/L	1	0.98	98	85-115	
Calcium	mg/L	10	10	100	85-115	
Chromium	mg/L	1	1.0	101	85-115	
Lead	mg/L	1	1.0	102	85-115	
Lithium	mg/L	1	0.96	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2183112 2183113

Parameter	Units	60274082001		2183112		2183113		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Barium	mg/L	0.048	1	1	1	1.0	1.0	99	100	70-130	1	20	
Beryllium	mg/L	<0.0010	1	1	1	0.97	0.97	97	97	70-130	0	20	
Boron	mg/L	2.2	1	1	1	3.1	3.1	93	94	70-130	0	20	
Calcium	mg/L	136	10	10	10	142	143	60	65	70-130	0	20	M1
Chromium	mg/L	<0.0050	1	1	1	1.0	1.0	100	100	70-130	1	20	
Lead	mg/L	<0.010	1	1	1	0.98	0.98	98	98	70-130	0	20	
Lithium	mg/L	0.015	1	1	1	1.0	1.0	100	101	70-130	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2183199 2183200

Parameter	Units	60274099003		2183199		2183200		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Barium	mg/L	207 ug/L	1	1	1	1.2	1.2	101	101	70-130	0	20	
Beryllium	mg/L	<0.16 ug/L	1	1	1	0.95	0.95	95	95	70-130	0	20	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60274082

Parameter	Units	2183199		2183200		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		60274099003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Boron	mg/L	6790 ug/L	1	1	7.7	7.7	95	90	70-130	1	20	
Calcium	mg/L	152000 ug/L	10	10	161	161	90	93	70-130	0	20	
Chromium	mg/L	<1.1 ug/L	1	1	1.0	0.99	100	99	70-130	0	20	
Lead	mg/L	<3.0 ug/L	1	1	0.97	0.96	97	96	70-130	1	20	
Lithium	mg/L	21.6 ug/L	1	1	1.1	1.1	106	104	70-130	1	20	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60274082

QC Batch: 533028 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
 Associated Lab Samples: 60274082001, 60274082002, 60274082003, 60274082004, 60274082005, 60274082006, 60274082007

METHOD BLANK: 2183114 Matrix: Water
 Associated Lab Samples: 60274082001, 60274082002, 60274082003, 60274082004, 60274082005, 60274082006, 60274082007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	07/12/18 23:21	
Arsenic	mg/L	<0.0010	0.0010	07/12/18 23:21	
Cadmium	mg/L	<0.00050	0.00050	07/12/18 23:21	
Cobalt	mg/L	<0.0010	0.0010	07/12/18 23:21	
Molybdenum	mg/L	<0.0010	0.0010	07/12/18 23:21	
Selenium	mg/L	<0.0010	0.0010	07/12/18 23:21	
Thallium	mg/L	<0.0010	0.0010	07/12/18 23:21	

LABORATORY CONTROL SAMPLE: 2183115

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.040	99	85-115	
Arsenic	mg/L	.04	0.039	98	85-115	
Cadmium	mg/L	.04	0.040	99	85-115	
Cobalt	mg/L	.04	0.038	96	85-115	
Molybdenum	mg/L	.04	0.040	100	85-115	
Selenium	mg/L	.04	0.038	96	85-115	
Thallium	mg/L	.04	0.038	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2183116 2183117

Parameter	Units	60274082002		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony	mg/L	<0.0010	.04	.04	0.038	0.038	95	95	70-130	0	20		
Arsenic	mg/L	0.013	.04	.04	0.052	0.052	96	97	70-130	1	20		
Cadmium	mg/L	<0.00050	.04	.04	0.035	0.035	88	88	70-130	0	20		
Cobalt	mg/L	<0.0010	.04	.04	0.035	0.035	87	88	70-130	1	20		
Molybdenum	mg/L	0.099	.04	.04	0.15	0.15	115	119	70-130	1	20		
Selenium	mg/L	<0.0010	.04	.04	0.037	0.038	93	94	70-130	1	20		
Thallium	mg/L	<0.0010	.04	.04	0.034	0.034	85	85	70-130	0	20		

MATRIX SPIKE SAMPLE: 2183195

Parameter	Units	60274095001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	ND	.04	0.038	95	70-130	
Arsenic	mg/L	2.5 ug/L	.04	0.041	97	70-130	
Cadmium	mg/L	ND	.04	0.036	89	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60274082

MATRIX SPIKE SAMPLE:		2183195					
Parameter	Units	60274095001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cobalt	mg/L	1.2 ug/L	.04	0.038	92	70-130	
Molybdenum	mg/L	5.9 ug/L	.04	0.051	112	70-130	
Selenium	mg/L	1.2 ug/L	.04	0.038	91	70-130	
Thallium	mg/L	ND	.04	0.034	85	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60274082

QC Batch: 533427

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60274082001, 60274082002, 60274082003, 60274082004, 60274082005, 60274082006, 60274082007

METHOD BLANK: 2184817

Matrix: Water

Associated Lab Samples: 60274082001, 60274082002, 60274082003, 60274082004, 60274082005, 60274082006, 60274082007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	07/09/18 11:21	

LABORATORY CONTROL SAMPLE: 2184818

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1000	100	80-120	

SAMPLE DUPLICATE: 2184819

Parameter	Units	60274099003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	894	893	0	10	

SAMPLE DUPLICATE: 2184820

Parameter	Units	60274126003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	414	410	1	10	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60274082

QC Batch: 533489 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60274082001, 60274082002, 60274082003, 60274082004, 60274082005, 60274082006, 60274082007

SAMPLE DUPLICATE: 2184986

Parameter	Units	60274082007 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.5	7.5	1	5	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60274082

QC Batch: 533372 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60274082001, 60274082002, 60274082003, 60274082004, 60274082005, 60274082006, 60274082007

METHOD BLANK: 2184696 Matrix: Water
Associated Lab Samples: 60274082001, 60274082002, 60274082003, 60274082004, 60274082005, 60274082006, 60274082007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	07/09/18 09:45	
Fluoride	mg/L	<0.20	0.20	07/09/18 09:45	
Sulfate	mg/L	<1.0	1.0	07/09/18 09:45	

LABORATORY CONTROL SAMPLE: 2184697

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	97	90-110	
Fluoride	mg/L	2.5	2.6	102	90-110	
Sulfate	mg/L	5	5.4	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2184698 2184699

Parameter	Units	7590403001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Chloride	mg/L	459	250	250	729	738	108	112	90-110	1	15	M1
Sulfate	mg/L	656	250	250	920	934	105	111	90-110	2	15	M1

MATRIX SPIKE SAMPLE: 2184700

Parameter	Units	60274082007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	3.8	2.5	6.5	109	90-110	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60274082

QC Batch: 533855	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60274082001	

METHOD BLANK: 2186198 Matrix: Water
Associated Lab Samples: 60274082001, 60274082002, 60274082003, 60274082004, 60274082005, 60274082006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	07/11/18 15:36	
Sulfate	mg/L	<1.0	1.0	07/11/18 15:36	

LABORATORY CONTROL SAMPLE: 2186199

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2186200 2186201

Parameter	Units	60273535001		60273535004		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Chloride	mg/L	513	2500	2500	2900	2840	95	93	90-110	2	15		
Sulfate	mg/L	4860	2500	2500	7600	7420	109	102	90-110	2	15		

MATRIX SPIKE SAMPLE: 2186202

Parameter	Units	60273535004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	516	2500	2830	93	90-110	
Sulfate	mg/L	4880	2500	7320	98	90-110	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60274082

QC Batch: 534094	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60274082007	

METHOD BLANK: 2187512 Matrix: Water
Associated Lab Samples: 60274082007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	07/12/18 13:27	
Sulfate	mg/L	<1.0	1.0	07/12/18 13:27	

LABORATORY CONTROL SAMPLE: 2187513

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Sulfate	mg/L	5	4.9	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2187514 2187515

Parameter	Units	2078019001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	2.8	5	5	8.0	8.1	104	106	90-110	1	15	H1

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QUALIFIERS

Project: LEC ISI CCR

Pace Project No.: 60274082

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

H1 Analysis conducted outside the EPA method holding time.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

Pace Project No.: 60274082

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60274082001	MW-37-070218	EPA 200.7	533027	EPA 200.7	533115
60274082002	MW-38-070218	EPA 200.7	533027	EPA 200.7	533115
60274082003	MW-K-070218	EPA 200.7	533027	EPA 200.7	533115
60274082004	MW-L-070218	EPA 200.7	533027	EPA 200.7	533115
60274082005	MW-39-070218	EPA 200.7	533027	EPA 200.7	533115
60274082006	MW-40-070218	EPA 200.7	533027	EPA 200.7	533115
60274082007	DUP-070218	EPA 200.7	533027	EPA 200.7	533115
60274082001	MW-37-070218	EPA 200.8	533028	EPA 200.8	533119
60274082002	MW-38-070218	EPA 200.8	533028	EPA 200.8	533119
60274082003	MW-K-070218	EPA 200.8	533028	EPA 200.8	533119
60274082004	MW-L-070218	EPA 200.8	533028	EPA 200.8	533119
60274082005	MW-39-070218	EPA 200.8	533028	EPA 200.8	533119
60274082006	MW-40-070218	EPA 200.8	533028	EPA 200.8	533119
60274082007	DUP-070218	EPA 200.8	533028	EPA 200.8	533119
60274082001	MW-37-070218	EPA 245.1	533926	EPA 245.1	533979
60274082002	MW-38-070218	EPA 245.1	533926	EPA 245.1	533979
60274082003	MW-K-070218	EPA 245.1	533926	EPA 245.1	533979
60274082004	MW-L-070218	EPA 245.1	533926	EPA 245.1	533979
60274082005	MW-39-070218	EPA 245.1	533926	EPA 245.1	533979
60274082006	MW-40-070218	EPA 245.1	533926	EPA 245.1	533979
60274082007	DUP-070218	EPA 245.1	533926	EPA 245.1	533979
60274082001	MW-37-070218	SM 2540C	533427		
60274082002	MW-38-070218	SM 2540C	533427		
60274082003	MW-K-070218	SM 2540C	533427		
60274082004	MW-L-070218	SM 2540C	533427		
60274082005	MW-39-070218	SM 2540C	533427		
60274082006	MW-40-070218	SM 2540C	533427		
60274082007	DUP-070218	SM 2540C	533427		
60274082001	MW-37-070218	SM 4500-H+B	533489		
60274082002	MW-38-070218	SM 4500-H+B	533489		
60274082003	MW-K-070218	SM 4500-H+B	533489		
60274082004	MW-L-070218	SM 4500-H+B	533489		
60274082005	MW-39-070218	SM 4500-H+B	533489		
60274082006	MW-40-070218	SM 4500-H+B	533489		
60274082007	DUP-070218	SM 4500-H+B	533489		
60274082001	MW-37-070218	EPA 300.0	533372		
60274082001	MW-37-070218	EPA 300.0	533855		
60274082002	MW-38-070218	EPA 300.0	533372		
60274082003	MW-K-070218	EPA 300.0	533372		
60274082004	MW-L-070218	EPA 300.0	533372		
60274082005	MW-39-070218	EPA 300.0	533372		
60274082006	MW-40-070218	EPA 300.0	533372		
60274082007	DUP-070218	EPA 300.0	533372		
60274082007	DUP-070218	EPA 300.0	534094		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60274082



60274082

Client Name: Westar Energy

Courier: FedEx UPS VIA Clay PEX ECI Pace Xroads Client Other

Tracking #: _____ Pace Shipping Label Used? Yes No

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No

Packing Material: Bubble Wrap Bubble Bags Foam None Other Ziploc

Thermometer Used: T300 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read -0.2 Corr. Factor +1.2 Corrected 1.0

Temperature should be above freezing to 6°C -0.1 +1.2 1.1

Date and initials of person examining contents: 7/5/18 KE

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WI</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: MJW for HMW

Date: 7/5/18

July 25, 2018

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC ISI CCR
Pace Project No.: 60274208

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on July 05, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC ISI CCR

Pace Project No.: 60274208

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC ISI CCR

Pace Project No.: 60274208

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60274208001	MW-37-070218	Water	07/02/18 09:29	07/05/18 09:40
60274208002	MW-38-070218	Water	07/02/18 10:49	07/05/18 09:40
60274208003	MW-K-070218	Water	07/02/18 11:55	07/05/18 09:40
60274208004	MW-L-070218	Water	07/02/18 13:25	07/05/18 09:40
60274208005	MW-39-070218	Water	07/02/18 14:30	07/05/18 09:40
60274208006	MW-40-070218	Water	07/02/18 15:36	07/05/18 09:40
60274208007	DUP-070218	Water	07/02/18 06:00	07/05/18 09:40

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60274208

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60274208001	MW-37-070218	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60274208002	MW-38-070218	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60274208003	MW-K-070218	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60274208004	MW-L-070218	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60274208005	MW-39-070218	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60274208006	MW-40-070218	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60274208007	DUP-070218	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60274208

Sample: MW-37-070218 **Lab ID: 60274208001** Collected: 07/02/18 09:29 Received: 07/05/18 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	-0.064 ± 0.376 (0.838) C:NA T:87%	pCi/L	07/19/18 11:48	13982-63-3	
Radium-228	EPA 904.0	1.12 ± 0.535 (0.953) C:72% T:94%	pCi/L	07/24/18 11:40	15262-20-1	
Total Radium	Total Radium Calculation	1.12 ± 0.911 (1.79)	pCi/L	07/25/18 13:01	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60274208

Sample: MW-38-070218 **Lab ID: 60274208002** Collected: 07/02/18 10:49 Received: 07/05/18 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.281 ± 0.477 (0.842) C:NA T:81%	pCi/L	07/19/18 11:48	13982-63-3	
Radium-228	EPA 904.0	1.60 ± 0.671 (1.14) C:76% T:78%	pCi/L	07/24/18 11:47	15262-20-1	
Total Radium	Total Radium Calculation	1.88 ± 1.15 (1.98)	pCi/L	07/25/18 13:01	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60274208

Sample: MW-K-070218 **Lab ID: 60274208003** Collected: 07/02/18 11:55 Received: 07/05/18 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.000 ± 0.277 (0.621) C:NA T:90%	pCi/L	07/19/18 12:03	13982-63-3	
Radium-228	EPA 904.0	1.60 ± 0.621 (0.992) C:73% T:83%	pCi/L	07/24/18 11:47	15262-20-1	
Total Radium	Total Radium Calculation	1.60 ± 0.898 (1.61)	pCi/L	07/25/18 13:01	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60274208

Sample: MW-L-070218 **Lab ID: 60274208004** Collected: 07/02/18 13:25 Received: 07/05/18 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.000 ± 0.375 (0.794) C:NA T:87%	pCi/L	07/19/18 12:03	13982-63-3	
Radium-228	EPA 904.0	1.23 ± 0.542 (0.925) C:74% T:88%	pCi/L	07/24/18 11:47	15262-20-1	
Total Radium	Total Radium Calculation	1.23 ± 0.917 (1.72)	pCi/L	07/25/18 13:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60274208

Sample: MW-39-070218 **Lab ID: 60274208005** Collected: 07/02/18 14:30 Received: 07/05/18 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.441 ± 0.481 (0.757) C:NA T:85%	pCi/L	07/19/18 12:03	13982-63-3	
Radium-228	EPA 904.0	1.03 ± 0.560 (1.05) C:72% T:90%	pCi/L	07/24/18 11:47	15262-20-1	
Total Radium	Total Radium Calculation	1.47 ± 1.04 (1.81)	pCi/L	07/25/18 13:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60274208

Sample: MW-40-070218 **Lab ID: 60274208006** Collected: 07/02/18 15:36 Received: 07/05/18 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.000 ± 0.350 (0.759) C:NA T:85%	pCi/L	07/19/18 12:03	13982-63-3	
Radium-228	EPA 904.0	0.633 ± 0.468 (0.933) C:76% T:91%	pCi/L	07/24/18 11:47	15262-20-1	
Total Radium	Total Radium Calculation	0.633 ± 0.818 (1.69)	pCi/L	07/25/18 13:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60274208

Sample: DUP-070218 **Lab ID: 60274208007** Collected: 07/02/18 06:00 Received: 07/05/18 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.367 ± 0.418 (0.659) C:NA T:90%	pCi/L	07/19/18 12:03	13982-63-3	
Radium-228	EPA 904.0	0.702 ± 0.537 (1.08) C:76% T:87%	pCi/L	07/24/18 11:47	15262-20-1	
Total Radium	Total Radium Calculation	1.07 ± 0.955 (1.74)	pCi/L	07/25/18 13:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60274208

QC Batch: 305169

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60274208001, 60274208002, 60274208003, 60274208004, 60274208005, 60274208006, 60274208007

METHOD BLANK: 1492664

Matrix: Water

Associated Lab Samples: 60274208001, 60274208002, 60274208003, 60274208004, 60274208005, 60274208006, 60274208007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.266 ± 0.359 (0.768) C:75% T:83%	pCi/L	07/24/18 11:39	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60274208

QC Batch: 305164

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60274208001, 60274208002, 60274208003, 60274208004, 60274208005, 60274208006, 60274208007

METHOD BLANK: 1492659

Matrix: Water

Associated Lab Samples: 60274208001, 60274208002, 60274208003, 60274208004, 60274208005, 60274208006, 60274208007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.345 ± 0.360 (0.508) C:NA T:79%	pCi/L	07/19/18 11:00	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: LEC ISI CCR

Pace Project No.: 60274208

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

Pace Project No.: 60274208

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60274208001	MW-37-070218	EPA 903.1	305164		
60274208002	MW-38-070218	EPA 903.1	305164		
60274208003	MW-K-070218	EPA 903.1	305164		
60274208004	MW-L-070218	EPA 903.1	305164		
60274208005	MW-39-070218	EPA 903.1	305164		
60274208006	MW-40-070218	EPA 903.1	305164		
60274208007	DUP-070218	EPA 903.1	305164		
60274208001	MW-37-070218	EPA 904.0	305169		
60274208002	MW-38-070218	EPA 904.0	305169		
60274208003	MW-K-070218	EPA 904.0	305169		
60274208004	MW-L-070218	EPA 904.0	305169		
60274208005	MW-39-070218	EPA 904.0	305169		
60274208006	MW-40-070218	EPA 904.0	305169		
60274208007	DUP-070218	EPA 904.0	305169		
60274208001	MW-37-070218	Total Radium Calculation	306983		
60274208002	MW-38-070218	Total Radium Calculation	306983		
60274208003	MW-K-070218	Total Radium Calculation	306983		
60274208004	MW-L-070218	Total Radium Calculation	306983		
60274208005	MW-39-070218	Total Radium Calculation	306983		
60274208006	MW-40-070218	Total Radium Calculation	306983		
60274208007	DUP-070218	Total Radium Calculation	306983		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: KS

Workorder: 60274208

Workorder Name: LEC ISI CCR

Owner Received Date: 7/5/2018

Results Requested By: 7/16/2018

Report To	Subcontract To	Requested Analysis
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Heather Wilson
 Pace Analytical Kansas
 9608 Loiret Blvd.
 Lenexa, KS 66219
 Phone 1(913)563-1407

Pace Analytical Pittsburgh
 1638 Roseytown Road
 Suites 2,3, & 4
 Greensburg, PA 15601
 Phone (724)850-5600

RADIUM-226
RADIUM-228 + TOTAL RADIUM

WO#: 30258421



30258421

Preserved Containers

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers						RADIUM-226	RADIUM-228 + TOTAL RADIUM	LAB USE ONLY
						HNO3								
1	MW-37-070218	PS	7/2/2018 09:29	60274208001	Water	2						X	X	001
2	MW-38-070218	PS	7/2/2018 10:49	60274208002	Water	2						X	X	002
3	MW-K-070218	PS	7/2/2018 11:55	60274208003	Water	2						X	X	003
4	MW-L-070218	PS	7/2/2018 13:25	60274208004	Water	2						X	X	004
5	MW-39-070218	PS	7/2/2018 14:30	60274208005	Water	2						X	X	005
6	MW-40-070218	PS	7/2/2018 15:36	60274208006	Water	2						X	X	006
7	DUP-070218	PS	7/2/2018 06:00	60274208007	Water	2						X	X	007

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1				7/5/18 940	
2					
3					

Cooler Temperature on Receipt 9.4 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Page 16 of 21



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A

Required Client Information:
 Company: **WESTAR ENERGY**
 Address: **818 Kansas Ave**
Topeka, KS 66612
 Email To: **brandon.l.griffin@westarenergy.com**
 Phone: **785-575-8135** Fax:
 Requested Due Date/TAT: **15 day**

Section B

Required Project Information:
 Report To: **Brandon Griffin**
 Copy To: **Jared Morrison**
 Purchase Order No.: **10LEC-0000012756**
 Project Name: **LEC ISI CCR**
 Project Number:

Section C

Invoice Information:
 Attention:
 Company Name:
 Address:
 Pace Quote Reference:
 Pace Project Manager: **Heather Wilson 913-563-1407**
 Pace Profile #: **9655, 1**

REGULATORY AGENCY
 NPDES GROUND WATER DRINKING WATER
 UST RCRA OTHER
 Site Location: **KS**
 STATE:

ITEM #	Section D Required Client Information SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE	Valid Matrix Codes		MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test ↓ Y/N	Requested Analysis Filtered (Y/N)				Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.						
		MATRIX	CODE			COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other		Radium-226	Radium-228	Total Radium	3			0	2	5	8	4	2
		DRINKING WATER	DW			DATE	TIME	DATE	TIME																							
1	MW-37-070218	WT	G					7/2	0929	2																						
2	MW-38-070218	WT	G					7/2	1049	2																						
3	MW-K-070218	WT	G					7/2	1155	2																						
4	MW-L-070218	WT	G					7/2	1325	2																						
5	MW-39-070218	WT	G					7/2	1430	2																						
6	MW-40-070218	WT	G					7/2	1536	2																						
7																																
8																																
9																																
10																																
11	DUP-070218	WT	G					7/2	0600	2																						
12																																

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	<i>B/27/Westar</i>	7/2/18	1700	<i>Jennifer Palko PALE</i>	7/6/18	0940	9.4	Y	Y	Y

SAMPLER NAME AND SIGNATURE
 PRINT Name of SAMPLER: **Brandon Griffin**
 SIGNATURE of SAMPLER: *B/27*
 DATE Signed (MM/DD/YY): **07/02/18**

Temp in °C: _____
 Received on ice (Y/N): _____
 Custody Sealed Cooler (Y/N): _____
 Samples Intact (Y/N): _____

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Westar Energy

Project # 30258421

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 4368 72769564

Label	<u>BPH</u>
LIMS Login	<u>BPH</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used 9 Type of Ice: Wet Blue Nonmelted

Cooler Temperature Observed Temp 9.4 °C Correction Factor: 0 °C Final Temp: 9.4 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>7/5/18 JVB</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>PHU2</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>JVB</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rad Aqueous Samples Screened > 0.5 mrem/hr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JVB</u> Date: <u>7/5/18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: KS

Workorder: 60274208

Workorder Name: LEC ISI CCR

Owner Received Date: 7/5/2018

Results Requested By: 7/16/2018

Report To	Subcontract To	Requested Analysis	
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Heather Wilson
Pace Analytical Kansas
9608 Loiret Blvd.
Lenexa, KS 66219
Phone 1(913)563-1407

Pace Analytical Pittsburgh
1638 Roseytown Road
Suites 2,3, & 4
Greensburg, PA 15601
Phone (724)850-5600

WO#: 30258421



30258421

Preserved Containers

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					RADIUM-226	RADIUM-228 + TOTAL RADIUM	LAB USE ONLY
						HNO3							
1	MW-37-070218	PS	7/2/2018 09:29	60274208001	Water	2					X	X	001
2	MW-38-070218	PS	7/2/2018 10:49	60274208002	Water	2					X	X	002
3	MW-K-070218	PS	7/2/2018 11:55	60274208003	Water	2					X	X	003
4	MW-L-070218	PS	7/2/2018 13:25	60274208004	Water	2					X	X	004
5	MW-39-070218	PS	7/2/2018 14:30	60274208005	Water	2					X	X	005
6	MW-40-070218	PS	7/2/2018 15:36	60274208006	Water	2					X	X	006
7	DUP-070218	PS	7/2/2018 06:00	60274208007	Water	2					X	X	007

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1			<i>[Signature]</i>	7/5/18 9:40	
2					
3					

Cooler Temperature on Receipt 9.4 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A

Required Client Information:

Company: **WESTAR ENERGY**

Address: **818 Kansas Ave
Topeka, KS 66612**

Email To: **brandon.l.griffin@westarenergy.com**

Phone: **785-575-8135** Fax: _____

Requested Due Date/TAT: **15 day**

Section B

Required Project Information:

Report To: **Brandon Griffin**

Copy To: **Jared Morrison**

Purchase Order No.: **10LEC-0000012756**

Project Name: **LEC ISI CCR**

Project Number: _____

Section C

Invoice Information:

Attention: _____

Company Name: _____

Address: _____

Pace Quote Reference: _____

Pace Project Manager: **Heather Wilson 913-563-1407**

Pace Profile #: **9655, 1**

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER

UST RCRA OTHER _____

Site Location: _____

STATE: **KS**

ITEM #	Section D Required Client Information	Valid Matrix Codes MATRIX CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Analysis Test ↓ Y/N	Requested Analysis Filtered (Y/N)				Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.							
					COMPOSITE START				COMPOSITE END/GRAB		Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH		Na ₂ S ₂ O ₃	Methanol	Other	Radium-226			Radium-228	Total Radium					
					DATE	TIME			DATE	TIME																			
1	MW-37-070218		WT	G			7/2	0929	2		2																		
2	MW-38-070218		WT	G			7/2	1049	2		2																		
3	MW-K-070218		WT	G			7/2	1155	2		2																		
4	MW-L-070218		WT	G			7/2	1325	2		2																		
5	MW-39-070218		WT	G			7/2	1430	2		2																		
6	MW-40-070218		WT	G			7/2	1536	2		2																		
7																													
8																													
9																													
10																													
11	DUP-070218		WT	G			7/2	0600	2		2																		
12																													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	<i>B/G/W</i> / Westar	7/2/18	1700	<i>Jennifer Palko</i> PACE	7/6/18	0940	9.4	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: *Brandon Griffin*

SIGNATURE of SAMPLER: *B/G*

DATE Signed (MM/DD/YY): *07/02/18*

Temp in °C: _____

Received on ice (Y/N): _____

Custody Sealed Cooler (Y/N): _____

Samples Intact (Y/N): _____

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Westar Energy

Project # 30258421

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 4368 72769564

Label	<u>BPH</u>
LIMS Login	<u>BPH</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used 9 Type of Ice: Wet Blue Nonmelted

Cooler Temperature Observed Temp 9.4 °C Correction Factor: 0 °C Final Temp: 9.4 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>7/5/18 JVB</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>PHU2</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>JVB</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rad Aqueous Samples Screened > 0.5 mrem/hr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>JVB</u> Date: <u>7/5/18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

ATTACHMENT 1-4
August 2018 Sampling Event
Laboratory Analytical Report

August 27, 2018

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC ISI CCR
Pace Project No.: 60277882

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on August 16, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC ISI CCR

Pace Project No.: 60277882

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Certification Number: 10090

WY STR Certification #: 2456.01

Arkansas Certification #: 17-016-0

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC ISI CCR

Pace Project No.: 60277882

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60277882001	MW-37-081418	Water	08/14/18 08:10	08/16/18 16:00
60277882002	MW-38-081418	Water	08/14/18 09:19	08/16/18 16:00
60277882003	MW-K-081418	Water	08/14/18 11:09	08/16/18 16:00
60277882004	MW-L-081418	Water	08/14/18 12:12	08/16/18 16:00
60277882005	MW-39-081418	Water	08/14/18 13:27	08/16/18 16:00
60277882006	MW-40-081418	Water	08/14/18 14:30	08/16/18 16:00
60277882007	DUP-081418	Water	08/14/18 06:00	08/16/18 16:00

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60277882

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60277882001	MW-37-081418	EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	EMR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60277882002	MW-38-081418	EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	EMR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60277882003	MW-K-081418	EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	EMR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL, WNM	3	PASI-K
60277882004	MW-L-081418	EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	EMR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60277882005	MW-39-081418	EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	EMR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60277882006	MW-40-081418	EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	EMR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60277882007	DUP-081418	EPA 200.7	TDS	7	PASI-K

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60277882

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	EMR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60277882

Sample: MW-37-081418		Lab ID: 60277882001	Collected: 08/14/18 08:10	Received: 08/16/18 16:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.046	mg/L	0.0050	1	08/20/18 09:10	08/24/18 16:44	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 16:44	7440-41-7	
Boron, Total Recoverable	2.1	mg/L	0.10	1	08/20/18 09:10	08/24/18 16:44	7440-42-8	
Calcium, Total Recoverable	135	mg/L	0.20	1	08/20/18 09:10	08/24/18 16:44	7440-70-2	M1
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	08/20/18 09:10	08/24/18 16:44	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	08/20/18 09:10	08/24/18 16:44	7439-92-1	
Lithium	0.011	mg/L	0.010	1	08/20/18 09:10	08/24/18 16:44	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:07	7440-36-0	
Arsenic, Total Recoverable	0.0045	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:07	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	08/20/18 09:10	08/24/18 12:07	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:07	7440-48-4	
Molybdenum, Total Recoverable	0.13	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:07	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:07	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:07	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	08/22/18 11:50	08/22/18 16:20	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	759	mg/L	5.0	1		08/20/18 14:54		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2	Std. Units	0.10	1		08/18/18 10:48		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	29.4	mg/L	2.0	2		08/26/18 10:30	16887-00-6	
Fluoride	0.41	mg/L	0.20	1		08/25/18 17:32	16984-48-8	
Sulfate	294	mg/L	50.0	50		08/26/18 10:44	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60277882

Sample: MW-38-081418		Lab ID: 60277882002	Collected: 08/14/18 09:19	Received: 08/16/18 16:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.034	mg/L	0.0050	1	08/20/18 09:10	08/24/18 16:50	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 16:50	7440-41-7	
Boron, Total Recoverable	5.7	mg/L	0.10	1	08/20/18 09:10	08/24/18 16:50	7440-42-8	
Calcium, Total Recoverable	312	mg/L	0.20	1	08/20/18 09:10	08/24/18 16:50	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	08/20/18 09:10	08/24/18 16:50	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	08/20/18 09:10	08/24/18 16:50	7439-92-1	
Lithium	0.072	mg/L	0.010	1	08/20/18 09:10	08/24/18 16:50	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:11	7440-36-0	
Arsenic, Total Recoverable	0.013	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:11	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	08/20/18 09:10	08/24/18 12:11	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:11	7440-48-4	
Molybdenum, Total Recoverable	0.087	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:11	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:11	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:11	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	08/22/18 11:50	08/22/18 16:22	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	2250	mg/L	5.0	1		08/20/18 14:54		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.5	Std. Units	0.10	1		08/18/18 10:53		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	206	mg/L	20.0	20		08/26/18 10:58	16887-00-6	
Fluoride	5.5	mg/L	0.20	1		08/25/18 17:46	16984-48-8	
Sulfate	1300	mg/L	100	100		08/26/18 11:13	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60277882

Sample: MW-K-081418	Lab ID: 60277882003	Collected: 08/14/18 11:09		Received: 08/16/18 16:00		Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.041	mg/L	0.0050	1	08/20/18 09:10	08/24/18 16:52	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 16:52	7440-41-7	
Boron, Total Recoverable	2.9	mg/L	0.10	1	08/20/18 09:10	08/24/18 16:52	7440-42-8	
Calcium, Total Recoverable	482	mg/L	0.20	1	08/20/18 09:10	08/24/18 16:52	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	08/20/18 09:10	08/24/18 16:52	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	08/20/18 09:10	08/24/18 16:52	7439-92-1	
Lithium	0.063	mg/L	0.010	1	08/20/18 09:10	08/24/18 16:52	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:14	7440-36-0	
Arsenic, Total Recoverable	0.073	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:14	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	08/20/18 09:10	08/24/18 12:14	7440-43-9	
Cobalt, Total Recoverable	0.0016	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:14	7440-48-4	
Molybdenum, Total Recoverable	0.027	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:14	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:14	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:14	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	08/22/18 11:50	08/22/18 16:24	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3740	mg/L	5.0	1		08/20/18 14:54		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.3	Std. Units	0.10	1		08/18/18 11:04		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	516	mg/L	100	100		08/27/18 14:33	16887-00-6	
Fluoride	0.76	mg/L	0.20	1		08/25/18 18:01	16984-48-8	
Sulfate	1650	mg/L	100	100		08/27/18 14:33	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60277882

Sample: MW-L-081418	Lab ID: 60277882004	Collected: 08/14/18 12:12	Received: 08/16/18 16:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium, Total Recoverable	0.047	mg/L	0.0050	1	08/20/18 09:10	08/24/18 16:55	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 16:55	7440-41-7	
Boron, Total Recoverable	1.7	mg/L	0.10	1	08/20/18 09:10	08/24/18 16:55	7440-42-8	
Calcium, Total Recoverable	546	mg/L	0.20	1	08/20/18 09:10	08/24/18 16:55	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	08/20/18 09:10	08/24/18 16:55	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	08/20/18 09:10	08/24/18 16:55	7439-92-1	
Lithium	0.045	mg/L	0.010	1	08/20/18 09:10	08/24/18 16:55	7439-93-2	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:22	7440-36-0	
Arsenic, Total Recoverable	0.020	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:22	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	08/20/18 09:10	08/24/18 12:22	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:22	7440-48-4	
Molybdenum, Total Recoverable	0.039	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:22	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:22	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:22	7440-28-0	
245.1 Mercury								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	<0.00020	mg/L	0.00020	1	08/22/18 11:50	08/22/18 16:26	7439-97-6	
2540C Total Dissolved Solids								
Analytical Method: SM 2540C								
Total Dissolved Solids	4090	mg/L	5.0	1		08/21/18 12:08		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	7.0	Std. Units	0.10	1		08/18/18 11:07		H6
300.0 IC Anions 28 Days								
Analytical Method: EPA 300.0								
Chloride	625	mg/L	50.0	50		08/26/18 12:09	16887-00-6	
Fluoride	1.9	mg/L	0.20	1		08/25/18 18:15	16984-48-8	
Sulfate	1910	mg/L	200	200		08/26/18 12:24	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60277882

Sample: MW-39-081418		Lab ID: 60277882005	Collected: 08/14/18 13:27	Received: 08/16/18 16:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.032	mg/L	0.0050	1	08/20/18 09:10	08/24/18 17:01	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 17:01	7440-41-7	
Boron, Total Recoverable	5.5	mg/L	0.10	1	08/20/18 09:10	08/24/18 17:01	7440-42-8	
Calcium, Total Recoverable	511	mg/L	0.20	1	08/20/18 09:10	08/24/18 17:01	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	08/20/18 09:10	08/24/18 17:01	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	08/20/18 09:10	08/24/18 17:01	7439-92-1	
Lithium	0.047	mg/L	0.010	1	08/20/18 09:10	08/24/18 17:01	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:26	7440-36-0	
Arsenic, Total Recoverable	0.013	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:26	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	08/20/18 09:10	08/24/18 12:26	7440-43-9	
Cobalt, Total Recoverable	0.0016	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:26	7440-48-4	
Molybdenum, Total Recoverable	0.093	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:26	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:26	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:26	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	08/22/18 11:50	08/22/18 16:28	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3550	mg/L	5.0	1		08/21/18 12:08		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.1	Std. Units	0.10	1		08/18/18 11:32		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	403	mg/L	50.0	50		08/26/18 12:38	16887-00-6	
Fluoride	3.0	mg/L	0.20	1		08/25/18 18:29	16984-48-8	
Sulfate	1750	mg/L	200	200		08/26/18 12:52	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60277882

Sample: MW-40-081418	Lab ID: 60277882006	Collected: 08/14/18 14:30	Received: 08/16/18 16:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.035	mg/L	0.0050	1	08/20/18 09:10	08/24/18 17:04	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 17:04	7440-41-7	
Boron, Total Recoverable	6.9	mg/L	0.10	1	08/20/18 09:10	08/24/18 17:04	7440-42-8	
Calcium, Total Recoverable	506	mg/L	0.20	1	08/20/18 09:10	08/24/18 17:04	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	08/20/18 09:10	08/24/18 17:04	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	08/20/18 09:10	08/24/18 17:04	7439-92-1	
Lithium	0.048	mg/L	0.010	1	08/20/18 09:10	08/24/18 17:04	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:30	7440-36-0	
Arsenic, Total Recoverable	0.014	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:30	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	08/20/18 09:10	08/24/18 12:30	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:30	7440-48-4	
Molybdenum, Total Recoverable	0.16	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:30	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:30	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:30	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	08/22/18 11:50	08/22/18 16:31	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3310	mg/L	5.0	1		08/21/18 12:08		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.0	Std. Units	0.10	1		08/18/18 11:43		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	331	mg/L	50.0	50		08/26/18 13:06	16887-00-6	
Fluoride	1.9	mg/L	0.20	1		08/25/18 18:43	16984-48-8	
Sulfate	1770	mg/L	200	200		08/26/18 13:20	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60277882

Sample: DUP-081418		Lab ID: 60277882007	Collected: 08/14/18 06:00	Received: 08/16/18 16:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.032	mg/L	0.0050	1	08/20/18 09:10	08/24/18 17:06	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 17:06	7440-41-7	
Boron, Total Recoverable	5.8	mg/L	0.10	1	08/20/18 09:10	08/24/18 17:06	7440-42-8	
Calcium, Total Recoverable	320	mg/L	0.20	1	08/20/18 09:10	08/24/18 17:06	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	08/20/18 09:10	08/24/18 17:06	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	08/20/18 09:10	08/24/18 17:06	7439-92-1	
Lithium	0.075	mg/L	0.010	1	08/20/18 09:10	08/24/18 17:06	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:34	7440-36-0	
Arsenic, Total Recoverable	0.014	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:34	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	08/20/18 09:10	08/24/18 12:34	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:34	7440-48-4	
Molybdenum, Total Recoverable	0.089	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:34	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:34	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:34	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	08/22/18 11:50	08/22/18 16:33	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	2410	mg/L	5.0	1		08/21/18 12:08		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.5	Std. Units	0.10	1		08/18/18 10:45		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	194	mg/L	20.0	20		08/26/18 13:35	16887-00-6	
Fluoride	5.5	mg/L	0.20	1		08/25/18 18:58	16984-48-8	
Sulfate	1310	mg/L	200	200		08/26/18 13:49	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60277882

QC Batch: 540772 Analysis Method: EPA 245.1
 QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
 Associated Lab Samples: 60277882001, 60277882002, 60277882003, 60277882004, 60277882005, 60277882006, 60277882007

METHOD BLANK: 2215570 Matrix: Water
 Associated Lab Samples: 60277882001, 60277882002, 60277882003, 60277882004, 60277882005, 60277882006, 60277882007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	08/22/18 15:53	

LABORATORY CONTROL SAMPLE: 2215571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0050	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2215572 2215573

Parameter	Units	60277898001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	ND	.005	.005	0.0045	0.0045	91	90	70-130	1	20	

MATRIX SPIKE SAMPLE: 2215574

Parameter	Units	60277950001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	.005	0.0045	89	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60277882

QC Batch:	540234	Analysis Method:	EPA 200.7
QC Batch Method:	EPA 200.7	Analysis Description:	200.7 Metals, Total
Associated Lab Samples:	60277882001, 60277882002, 60277882003, 60277882004, 60277882005, 60277882006, 60277882007		

METHOD BLANK: 2213785 Matrix: Water
Associated Lab Samples: 60277882001, 60277882002, 60277882003, 60277882004, 60277882005, 60277882006, 60277882007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	08/24/18 16:37	
Beryllium	mg/L	<0.0010	0.0010	08/24/18 16:37	
Boron	mg/L	<0.10	0.10	08/24/18 16:37	
Calcium	mg/L	<0.20	0.20	08/24/18 16:37	
Chromium	mg/L	<0.0050	0.0050	08/24/18 16:37	
Lead	mg/L	<0.010	0.010	08/24/18 16:37	
Lithium	mg/L	<0.010	0.010	08/24/18 16:37	

LABORATORY CONTROL SAMPLE: 2213786

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.0	100	85-115	
Beryllium	mg/L	1	1.0	101	85-115	
Boron	mg/L	1	1.0	100	85-115	
Calcium	mg/L	10	10.3	103	85-115	
Chromium	mg/L	1	1.0	100	85-115	
Lead	mg/L	1	0.99	99	85-115	
Lithium	mg/L	1	1.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2213787 2213788

Parameter	Units	60277882001		2213788		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.						
Barium	mg/L	0.046	1	1.0	1.0	100	100	70-130	0	20	
Beryllium	mg/L	<0.0010	1	1.0	1.0	100	100	70-130	0	20	
Boron	mg/L	2.1	1	3.2	3.1	111	105	70-130	2	20	
Calcium	mg/L	135	10	149	147	135	115	70-130	1	20 M1	
Chromium	mg/L	<0.0050	1	0.97	0.98	97	98	70-130	0	20	
Lead	mg/L	<0.010	1	0.98	0.98	98	98	70-130	0	20	
Lithium	mg/L	0.011	1	1.0	1.0	99	99	70-130	0	20	

MATRIX SPIKE SAMPLE: 2213789

Parameter	Units	60277958005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	0.019	1	1.0	101	70-130	
Beryllium	mg/L	<0.0010	1	0.98	98	70-130	
Boron	mg/L	0.28	1	1.3	100	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60277882

MATRIX SPIKE SAMPLE:		2213789					
Parameter	Units	60277958005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Calcium	mg/L	268	10	261	-65	70-130	M1
Chromium	mg/L	<0.0050	1	0.96	96	70-130	
Lead	mg/L	<0.010	1	0.95	95	70-130	
Lithium	mg/L	0.019	1	1.0	101	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60277882

QC Batch: 540242 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60277882001, 60277882002, 60277882003, 60277882004, 60277882005, 60277882006, 60277882007

METHOD BLANK: 2213821 Matrix: Water
Associated Lab Samples: 60277882001, 60277882002, 60277882003, 60277882004, 60277882005, 60277882006, 60277882007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	08/24/18 11:59	
Arsenic	mg/L	<0.0010	0.0010	08/24/18 11:59	
Cadmium	mg/L	<0.00050	0.00050	08/24/18 11:59	
Cobalt	mg/L	<0.0010	0.0010	08/24/18 11:59	
Molybdenum	mg/L	<0.0010	0.0010	08/24/18 11:59	
Selenium	mg/L	<0.0010	0.0010	08/24/18 11:59	
Thallium	mg/L	<0.0010	0.0010	08/24/18 11:59	

LABORATORY CONTROL SAMPLE: 2213822

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.040	99	85-115	
Arsenic	mg/L	.04	0.040	100	85-115	
Cadmium	mg/L	.04	0.040	99	85-115	
Cobalt	mg/L	.04	0.039	99	85-115	
Molybdenum	mg/L	.04	0.040	100	85-115	
Selenium	mg/L	.04	0.040	100	85-115	
Thallium	mg/L	.04	0.038	94	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2213823 2213824

Parameter	Units	60277598001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony	mg/L	ND	.04	.04	0.039	0.039	96	96	70-130	0	20		
Arsenic	mg/L	1.2 ug/L	.04	.04	0.039	0.039	94	95	70-130	2	20		
Cadmium	mg/L	ND	.04	.04	0.036	0.036	90	90	70-130	0	20		
Cobalt	mg/L	ND	.04	.04	0.039	0.039	96	97	70-130	1	20		
Molybdenum	mg/L	3.9 ug/L	.04	.04	0.045	0.046	104	105	70-130	1	20		
Selenium	mg/L	2.0 ug/L	.04	.04	0.036	0.037	86	88	70-130	2	20		
Thallium	mg/L	ND	.04	.04	0.035	0.035	87	87	70-130	0	20		

MATRIX SPIKE SAMPLE: 2213825

Parameter	Units	60277599001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	ND	.04	0.038	95	70-130	
Arsenic	mg/L	2.2 ug/L	.04	0.040	93	70-130	
Cadmium	mg/L	ND	.04	0.036	90	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60277882

MATRIX SPIKE SAMPLE:		2213825					
Parameter	Units	60277599001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cobalt	mg/L	ND	.04	0.039	95	70-130	
Molybdenum	mg/L	4.6 ug/L	.04	0.045	101	70-130	
Selenium	mg/L	1.4 ug/L	.04	0.037	88	70-130	
Thallium	mg/L	ND	.04	0.035	87	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60277882

QC Batch: 540367 Analysis Method: SM 2540C

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60277882001, 60277882002, 60277882003

METHOD BLANK: 2214119 Matrix: Water

Associated Lab Samples: 60277882001, 60277882002, 60277882003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	08/20/18 14:54	

LABORATORY CONTROL SAMPLE: 2214120

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1000	100	80-120	

SAMPLE DUPLICATE: 2214121

Parameter	Units	60277422001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1020	1010	1	10	

SAMPLE DUPLICATE: 2214122

Parameter	Units	60277601012 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	9.3	9.3	0	10	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60277882

QC Batch: 540573

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60277882004, 60277882005, 60277882006, 60277882007

METHOD BLANK: 2214824

Matrix: Water

Associated Lab Samples: 60277882004, 60277882005, 60277882006, 60277882007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	08/21/18 12:08	

LABORATORY CONTROL SAMPLE: 2214825

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1000	100	80-120	

SAMPLE DUPLICATE: 2214826

Parameter	Units	60277882004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	4090	4120	1	10	

SAMPLE DUPLICATE: 2214827

Parameter	Units	60277958004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1680	1700	1	10	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60277882

QC Batch: 540137 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60277882001, 60277882002, 60277882003, 60277882004, 60277882007

SAMPLE DUPLICATE: 2213138

Parameter	Units	60277439003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.8	7.8	0	5	H6

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60277882

QC Batch: 540138 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60277882005, 60277882006

SAMPLE DUPLICATE: 2213139

Parameter	Units	60277549003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.0	7.0	0	5	H6

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60277882

QC Batch:	541421	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60277882001, 60277882002, 60277882003, 60277882004, 60277882005, 60277882006, 60277882007		

METHOD BLANK: 2218728 Matrix: Water
Associated Lab Samples: 60277882001, 60277882002, 60277882003, 60277882004, 60277882005, 60277882006, 60277882007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.20	0.20	08/25/18 14:41	

LABORATORY CONTROL SAMPLE: 2218729

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.6	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2218730 2218731

Parameter	Units	60277531001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	8.0	50	50	59.6	59.0	103	102	90-110	1	15	

MATRIX SPIKE SAMPLE: 2218732

Parameter	Units	60277542001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	ND	125	132	102	90-110	

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60277882

QC Batch: 541460 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60277882001, 60277882002, 60277882004, 60277882005, 60277882006, 60277882007

METHOD BLANK: 2219133 Matrix: Water
Associated Lab Samples: 60277882001, 60277882002, 60277882004, 60277882005, 60277882006, 60277882007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	08/26/18 06:42	
Sulfate	mg/L	<1.0	1.0	08/26/18 06:42	

LABORATORY CONTROL SAMPLE: 2219134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.5	91	90-110	
Sulfate	mg/L	5	4.8	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2219135 2219136

Parameter	Units	60277531001		2219136		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Sulfate	mg/L	2220	1000	1000	3170	3210	95	99	90-110	1	15	

MATRIX SPIKE SAMPLE: 2219137

Parameter	Units	60277542001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	1020	500	1500	96	90-110	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60277882

QC Batch: 541494

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60277882003

METHOD BLANK: 2219205

Matrix: Water

Associated Lab Samples: 60277882003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	08/27/18 07:50	
Sulfate	mg/L	<1.0	1.0	08/27/18 07:50	

LABORATORY CONTROL SAMPLE: 2219206

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	95	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2219207 2219208

Parameter	Units	60277433001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	0.39J	5	5	5.9	5.9	110	110	90-110	0	15	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: LEC ISI CCR

Pace Project No.: 60277882

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

Pace Project No.: 60277882

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60277882001	MW-37-081418	EPA 200.7	540234	EPA 200.7	540346
60277882002	MW-38-081418	EPA 200.7	540234	EPA 200.7	540346
60277882003	MW-K-081418	EPA 200.7	540234	EPA 200.7	540346
60277882004	MW-L-081418	EPA 200.7	540234	EPA 200.7	540346
60277882005	MW-39-081418	EPA 200.7	540234	EPA 200.7	540346
60277882006	MW-40-081418	EPA 200.7	540234	EPA 200.7	540346
60277882007	DUP-081418	EPA 200.7	540234	EPA 200.7	540346
60277882001	MW-37-081418	EPA 200.8	540242	EPA 200.8	540344
60277882002	MW-38-081418	EPA 200.8	540242	EPA 200.8	540344
60277882003	MW-K-081418	EPA 200.8	540242	EPA 200.8	540344
60277882004	MW-L-081418	EPA 200.8	540242	EPA 200.8	540344
60277882005	MW-39-081418	EPA 200.8	540242	EPA 200.8	540344
60277882006	MW-40-081418	EPA 200.8	540242	EPA 200.8	540344
60277882007	DUP-081418	EPA 200.8	540242	EPA 200.8	540344
60277882001	MW-37-081418	EPA 245.1	540772	EPA 245.1	540885
60277882002	MW-38-081418	EPA 245.1	540772	EPA 245.1	540885
60277882003	MW-K-081418	EPA 245.1	540772	EPA 245.1	540885
60277882004	MW-L-081418	EPA 245.1	540772	EPA 245.1	540885
60277882005	MW-39-081418	EPA 245.1	540772	EPA 245.1	540885
60277882006	MW-40-081418	EPA 245.1	540772	EPA 245.1	540885
60277882007	DUP-081418	EPA 245.1	540772	EPA 245.1	540885
60277882001	MW-37-081418	SM 2540C	540367		
60277882002	MW-38-081418	SM 2540C	540367		
60277882003	MW-K-081418	SM 2540C	540367		
60277882004	MW-L-081418	SM 2540C	540573		
60277882005	MW-39-081418	SM 2540C	540573		
60277882006	MW-40-081418	SM 2540C	540573		
60277882007	DUP-081418	SM 2540C	540573		
60277882001	MW-37-081418	SM 4500-H+B	540137		
60277882002	MW-38-081418	SM 4500-H+B	540137		
60277882003	MW-K-081418	SM 4500-H+B	540137		
60277882004	MW-L-081418	SM 4500-H+B	540137		
60277882005	MW-39-081418	SM 4500-H+B	540138		
60277882006	MW-40-081418	SM 4500-H+B	540138		
60277882007	DUP-081418	SM 4500-H+B	540137		
60277882001	MW-37-081418	EPA 300.0	541421		
60277882001	MW-37-081418	EPA 300.0	541460		
60277882002	MW-38-081418	EPA 300.0	541421		
60277882002	MW-38-081418	EPA 300.0	541460		
60277882003	MW-K-081418	EPA 300.0	541421		
60277882003	MW-K-081418	EPA 300.0	541494		
60277882004	MW-L-081418	EPA 300.0	541421		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

Pace Project No.: 60277882

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60277882004	MW-L-081418	EPA 300.0	541460		
60277882005	MW-39-081418	EPA 300.0	541421		
60277882005	MW-39-081418	EPA 300.0	541460		
60277882006	MW-40-081418	EPA 300.0	541421		
60277882006	MW-40-081418	EPA 300.0	541460		
60277882007	DUP-081418	EPA 300.0	541421		
60277882007	DUP-081418	EPA 300.0	541460		

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Sample Condition Upon Receipt

WO#: 60277882



Client Name: Westar Energy

Courier: FedEx UPS VIA Clay PEX ECI Pace Xroads Client Other

Tracking #: _____ Pace Shipping Label Used? Yes No

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No

Packing Material: Bubble Wrap Bubble Bags Foam None Other

Thermometer Used: T-298 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 0.6 Corr. Factor +1.1 Corrected 1.7

Date and initials of person examining contents:

PMB/16/18

Temperature should be above freezing to 6°C

Chain of Custody present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>PH</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

HW

Client Notification/ Resolution: Copy COC to Client? Y N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review:

Date: _____

REVIEWED
By hwilson at 9:39 pm, 8/17/18

August 31, 2018

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC ISI CCR
Pace Project No.: 60277976

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on August 17, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC ISI CCR

Pace Project No.: 60277976

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: LEC ISI CCR

Pace Project No.: 60277976

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60277976001	MW-37-081418	Water	08/14/18 08:10	08/17/18 10:30
60277976002	MW-38-081418	Water	08/14/18 09:19	08/17/18 10:30
60277976003	MW-K-081418	Water	08/14/18 11:09	08/17/18 10:30
60277976004	MW-L-081418	Water	08/14/18 12:12	08/17/18 10:30
60277976005	MW-39-081418	Water	08/14/18 13:27	08/17/18 10:30
60277976006	MW-40-081418	Water	08/14/18 14:30	08/17/18 10:30
60277976007	DUP-081418	Water	08/14/18 06:00	08/17/18 10:30

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60277976

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60277976001	MW-37-081418	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60277976002	MW-38-081418	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60277976003	MW-K-081418	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60277976004	MW-L-081418	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60277976005	MW-39-081418	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60277976006	MW-40-081418	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60277976007	DUP-081418	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60277976

Sample: MW-37-081418 **Lab ID: 60277976001** Collected: 08/14/18 08:10 Received: 08/17/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.358 ± 0.373 (0.504) C:NA T:80%	pCi/L	08/30/18 11:37	13982-63-3	
Radium-228	EPA 904.0	1.09 ± 0.479 (0.787) C:71% T:90%	pCi/L	08/28/18 16:40	15262-20-1	
Total Radium	Total Radium Calculation	1.45 ± 0.852 (1.29)	pCi/L	08/30/18 16:24	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60277976

Sample: MW-38-081418 **Lab ID: 60277976002** Collected: 08/14/18 09:19 Received: 08/17/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	-0.030 ± 0.283 (0.478) C:NA T:92%	pCi/L	08/30/18 11:37	13982-63-3	
Radium-228	EPA 904.0	0.377 ± 0.468 (0.996) C:70% T:86%	pCi/L	08/28/18 16:40	15262-20-1	
Total Radium	Total Radium Calculation	0.377 ± 0.751 (1.47)	pCi/L	08/30/18 16:24	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60277976

Sample: MW-K-081418 **Lab ID: 60277976003** Collected: 08/14/18 11:09 Received: 08/17/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.538 ± 0.357 (0.422) C:NA T:94%	pCi/L	08/30/18 11:37	13982-63-3	
Radium-228	EPA 904.0	2.19 ± 0.701 (0.940) C:69% T:83%	pCi/L	08/28/18 16:40	15262-20-1	
Total Radium	Total Radium Calculation	2.73 ± 1.06 (1.36)	pCi/L	08/30/18 16:24	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60277976

Sample: MW-L-081418 **Lab ID: 60277976004** Collected: 08/14/18 12:12 Received: 08/17/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.305 ± 0.347 (0.478) C:NA T:100%	pCi/L	08/30/18 11:37	13982-63-3	
Radium-228	EPA 904.0	0.702 ± 0.459 (0.881) C:71% T:88%	pCi/L	08/28/18 16:40	15262-20-1	
Total Radium	Total Radium Calculation	1.01 ± 0.806 (1.36)	pCi/L	08/30/18 16:24	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60277976

Sample: MW-39-081418 **Lab ID: 60277976005** Collected: 08/14/18 13:27 Received: 08/17/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.227 ± 0.417 (0.610) C:NA T:79%	pCi/L	08/30/18 11:37	13982-63-3	
Radium-228	EPA 904.0	0.824 ± 0.467 (0.862) C:73% T:88%	pCi/L	08/28/18 16:40	15262-20-1	
Total Radium	Total Radium Calculation	1.05 ± 0.884 (1.47)	pCi/L	08/30/18 16:24	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60277976

Sample: MW-40-081418 **Lab ID: 60277976006** Collected: 08/14/18 14:30 Received: 08/17/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0268 ± 0.292 (0.466) C:NA T:94%	pCi/L	08/30/18 11:37	13982-63-3	
Radium-228	EPA 904.0	0.873 ± 0.514 (0.962) C:72% T:86%	pCi/L	08/28/18 16:40	15262-20-1	
Total Radium	Total Radium Calculation	0.900 ± 0.806 (1.43)	pCi/L	08/30/18 16:24	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60277976

Sample: DUP-081418 **Lab ID: 60277976007** Collected: 08/14/18 06:00 Received: 08/17/18 10:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.206 ± 0.351 (0.512) C:NA T:92%	pCi/L	08/30/18 11:37	13982-63-3	
Radium-228	EPA 904.0	0.770 ± 0.478 (0.902) C:73% T:82%	pCi/L	08/28/18 16:40	15262-20-1	
Total Radium	Total Radium Calculation	0.976 ± 0.829 (1.41)	pCi/L	08/31/18 11:00	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60277976

QC Batch: 310328

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60277976001, 60277976002, 60277976003, 60277976004, 60277976005, 60277976006, 60277976007

METHOD BLANK: 1516039

Matrix: Water

Associated Lab Samples: 60277976001, 60277976002, 60277976003, 60277976004, 60277976005, 60277976006, 60277976007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.165 ± 0.230 (0.331) C:NA T:93%	pCi/L	08/30/18 11:00	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60277976

QC Batch: 310334

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60277976001, 60277976002, 60277976003, 60277976004, 60277976005, 60277976006, 60277976007

METHOD BLANK: 1516052

Matrix: Water

Associated Lab Samples: 60277976001, 60277976002, 60277976003, 60277976004, 60277976005, 60277976006, 60277976007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.546 ± 0.362 (0.684) C:71% T:90%	pCi/L	08/28/18 13:13	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: LEC ISI CCR

Pace Project No.: 60277976

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

Pace Project No.: 60277976

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60277976001	MW-37-081418	EPA 903.1	310328		
60277976002	MW-38-081418	EPA 903.1	310328		
60277976003	MW-K-081418	EPA 903.1	310328		
60277976004	MW-L-081418	EPA 903.1	310328		
60277976005	MW-39-081418	EPA 903.1	310328		
60277976006	MW-40-081418	EPA 903.1	310328		
60277976007	DUP-081418	EPA 903.1	310328		
60277976001	MW-37-081418	EPA 904.0	310334		
60277976002	MW-38-081418	EPA 904.0	310334		
60277976003	MW-K-081418	EPA 904.0	310334		
60277976004	MW-L-081418	EPA 904.0	310334		
60277976005	MW-39-081418	EPA 904.0	310334		
60277976006	MW-40-081418	EPA 904.0	310334		
60277976007	DUP-081418	EPA 904.0	310334		
60277976001	MW-37-081418	Total Radium Calculation	311529		
60277976002	MW-38-081418	Total Radium Calculation	311529		
60277976003	MW-K-081418	Total Radium Calculation	311529		
60277976004	MW-L-081418	Total Radium Calculation	311529		
60277976005	MW-39-081418	Total Radium Calculation	311529		
60277976006	MW-40-081418	Total Radium Calculation	311529		
60277976007	DUP-081418	Total Radium Calculation	311620		

REPORT OF LABORATORY ANALYSIS

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:		REGULATORY AGENCY <input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER _____ Site Location STATE: <u> </u> <u> </u>	
Company: WESTAR ENERGY		Report To: Brandon Griffin		Attention:			
Address: 818 Kansas Ave		Copy To: Jared Morrison		Company Name:			
Topeka, KS 66612				Address:			
Email To: brandon.j.griffin@westarenergy.com		Purchase Order No.: 10LEC-0000012756		Pace Quote Reference:			
Phone: 785-575-8135	Fax:	Project Name: LEC ISI CCR		Pace Project Manager: Heather Wilson 913-563-1407		Requested Analysis Filtered (Y/N) Residual Chlorine (Y/N)	
Requested Due Date/TAT: 15 day		Project Number:		Pace Profile #: 9655, 1			

ITEM #	Section D Required Client Information SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE	Valid Matrix Codes		MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test Y/N	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.					
		MATRIX	CODE			COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other					Radium-226	Radium-228	Total Radium		
		DRINKING WATER	DW			DATE	TIME	DATE	TIME																			
1	MW-37-081418	WT	G					8/14	0810		2																	
2	MW-38-081418	WT	G					8/14	0919		2																	
3	MW-K-081418	WT	G					8/14	1109		2																	
4	MW-L-081418	WT	G					8/14	1212		2																	
5	MW-39-081418	WT	G					8/14	1327		2																	
6	MW-40-081418	WT	G					8/14	1430		2																	
7																												
8																												
9																												
10																												
11																												
12																												

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	<i>[Signature]</i> Westar	8/16/18	0830	<i>[Signature]</i>	8/14/18	1030	2-8	Y	N	Y

SAMPLER NAME AND SIGNATURE				Temp in °C Received on Ice (Y/N) Custody Sealed Cooler (Y/N) Samples Intact (Y/N)
PRINT Name of SAMPLER: Brandon Griffin				
SIGNATURE of SAMPLER: <i>[Signature]</i>			DATE Signed (MM/DD/YY): 08/14/18	

Page 16 of 21

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Container Order #387682

Addresses

Order By :	Ship To :	Return To:
Company <u>WESTAR ENERGY</u>	Company <u>WESTAR ENERGY</u>	Company <u>Pace Analytical Pittsburgh</u>
Contact <u>Griffin, Brandon</u>	Contact <u>Griffin, Brandon</u>	Contact <u>Ferris, Carin</u>
Email <u>brandon.l.griffin@westarenergy.</u>	Email <u>brandon.l.griffin@westarenergy.</u>	Email <u>carin.ferris@pacelabs.com</u>
Address <u>818 S. Kansas Ave</u>	Address <u>818 S. Kansas Ave</u>	Address <u>1638 Roseytown Road</u>
Address 2 _____	Address 2 _____	Address 2 <u>Suites 2,3,4</u>
City <u>Topeka</u>	City <u>Topeka</u>	City <u>Greensburg</u>
State <u>KS</u> Zip <u>66612</u>	State <u>KS</u> Zip <u>66612</u>	State <u>PA</u> Zip <u>15601</u>
Phone <u>785-575-8135</u>	Phone <u>785-575-8135</u>	Phone <u>724-850-5615</u>

Info

Project Name <u>LEC ISI CCR- Radium</u>	Due Date <u>08/09/2018</u>	Profile <u>9655</u>	Quote _____
Project Manager <u>Wilson, Heather</u>	Return _____	Carrier <u>Most Economical</u>	Location _____

Trip Blanks

Include Trip Blanks

Bottle Labels

- Blank
 Pre-Printed No Sample IDs
 Pre-Printed With Sample IDs

Bottles

- Boxed Cases
 Individually Wrapped
 Grouped By Sample

Return Shipping Labels

- No Shipper Number
 With Shipper Number

COC Options

- Number of Blanks
 Pre-Printed

Misc

- Sampling Instructions
 Custody Seal
 Temp. Blanks
 Coolers
 Syringes
- Extra Bubble Wrap
 Short Hold/Rush Stickers
 DI Water
 USDA Regulated Soils

# of Samples	Matrix	Test	Container	Total	# of QC	Lot #	Notes
7	WT	Radium 226	1-1L Plastic w/ HNO3	7	0	061118-2AJN	
7	WT	Radium 228	1-1L Plastic w/ HNO3	7	0	061118-2AJN	

Hazard Shipping Placard In Place : NO

*Sample receiving hours are Monday through Friday 8:00 am to 6:00 pm and Saturday from 9:00 am to 12:00 pm unless special arrangements are made with your project manager.

*Pace Analytical reserves the right to return hazardous, toxic, or radioactive samples to you.

*Pace Analytical reserves the right to charge for unused bottles, as well as cost associated with sample storage and disposal.

*Payment term are net 30 days.

*Please include the proposal number on the chain of custody to insure proper billing.

Sample Notes

PP COC (1), PP labels w/o sample IDs
 prepaid Fedex return shipping label to Pace Pittsburgh

Ship Date : 08/08/2018

Prepared By: Garrett Hankins

Verified By:

Page 17 of 21

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: Westar Energy Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 87341256873612563359

Label _____
LIMS Login _____

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used 9 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 2.8 °C Correction Factor: 0.0 °C Final Temp: 2.8 °C

Temp should be above freezing to 6°C

Comments:				pH paper Lot# <u>10D3671</u>	Date and Initials of person examining contents: <u>ET 8-17-18</u>
	Yes	No	N/A		
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.	
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.	
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.	
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.	
-Includes date/time/ID Matrix: <u>WT</u>					
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.	
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.	
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.	
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.	
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.	
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.	
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.	
Hex Cr Aqueous Compliance/NPDES sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.	
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.	
Filtered volume received for Dissolved tests	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15.	
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.	<u>PHLZ</u>
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>ET</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.	
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.	
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Rad Aqueous Samples Screened > 0.5 mrem/hr	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Initial when completed: <u>ET</u>	Date: <u>8-17-18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: KS

Workorder: 60277976

Workorder Name: LEC ISI CCR

Owner Received Date: 8/17/2018 Results Requested By: 9/10/2018

Report To		Subcontract To					Requested Analysis													
Heather Wilson Pace Analytical Kansas 9608 Loiret Blvd. Lenexa, KS 66219 Phone 1(913)563-1407		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3, & 4 Greensburg, PA 15601 Phone (724)850-5600					<div style="text-align: center;"> <p>WO# : 30262769</p> <p>30262769</p> </div>													
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other	Preserved Containers										Radium-226 & Total Radium	Radium-228	LAB USE ONLY	
1	MW-37-081418	PS	8/14/2018 08:10	60277976001	Water	1												X	X	001
2	MW-38-081418	PS	8/14/2018 09:19	60277976002	Water	1												X	X	002
3	MW-K-081418	PS	8/14/2018 11:09	60277976003	Water	1												X	X	003
4	MW-L-081418	PS	8/14/2018 12:12	60277976004	Water	1												X	X	004
5	MW-39-081418	PS	8/14/2018 13:27	60277976005	Water	1												X	X	005
6	MW-40-081418	PS	8/14/2018 14:30	60277976006	Water	1												X	X	006
7	DUP-081418	PS	8/14/2018 06:00	60277976007	Water	1												X	X	007
Comments																				
Transfers	Released By	Date/Time	Received By	Date/Time																
1			<i>Haley</i>	8/17/18 10:20	BRH 8/20/18															
2																				
3																				
Cooler Temperature on Receipt 2.8 °C		Custody Seal Y or N		Received on Ice Y or N		Samples Intact Y or N														

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: / of /

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:		Page: / of /	
Company: WESTAR ENERGY		Report To: Brandon Griffin		Attention:		REGULATORY AGENCY	
Address: 818 Kansas Ave Topeka, KS 66612		Copy To: Jared Morrison		Company Name:			
Email To: brandon.l.griffin@westarenergy.com		Purchase Order No.: 10LEC-0000012756		Pace Quote Reference:		<input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER	
Phone: 785-575-8135 Fax:		Project Name: LEC ISI CCR		Pace Project Manager: Heather Wilson 913-563-1407		Site Location	
Requested Due Date/TAT: 15 day		Project Number:		Pace Profile #: 9655, 1		STATE: KS	

ITEM #	Section D Required Client Information SAMPLE ID (A-Z, 0-91.-) Sample IDs MUST BE UNIQUE	Valid Matrix Codes		MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Analysis Test ↓	Requested Analysis Filtered (Y/N)			Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.	
		MATRIX	CODE			COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol		Other	Radium-226	Radium-228			Total Radium
		DRINKING WATER	DW			DATE	TIME	DATE	TIME																
1	MW-37-081418	WT	G					8/14	0810		2														
2	MW-38-081418	WT	G					8/14	0919		2														
3	MW-K-081418	WT	G					8/14	1109		2														
4	MW-L-081418	WT	G					8/14	1212		2														
5	MW-39-081418	WT	G					8/14	1327		2														
6	MW-40-081418	WT	G					8/14	1430		2														
7																									
8																									
9																									
10																									
11																									
12																									

30262769

XXX

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	<i>[Signature]</i> Westar	8/16/18	0830	<i>[Signature]</i>	8-17-18	1030	2-8	Y	N	Y

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: Brandon Griffin					
SIGNATURE of SAMPLER: <i>[Signature]</i>					
DATE Signed (MM/DD/YY): 08/14/18					

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: Westar Energy

Project # 30262765

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 87341256873612563359

Label	<u>BAH</u>
LIMS Login	<u>BAH</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used 9 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 2.8 °C Correction Factor: 0.0 °C Final Temp: 2.8 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>ET 8-17-18</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. <u>10D3671</u>
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID Matrix: <u>WF</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>PH L2</u>
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>ET</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.
Trip Blank Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Rad Aqueous Samples Screened > 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>ET</u> Date: <u>8-17-18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

Sample 007 not written on C.O.C.
ID = DVP-081418 date + time = 8/14/18 0000

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

ATTACHMENT 1-5
October 2018 Sampling Event
Laboratory Analytical Report

October 22, 2018

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC ISI CCR
Pace Project No.: 60282726

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on October 04, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC ISI CCR

Pace Project No.: 60282726

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Certification Number: 10090

Arkansas Drinking Water

WY STR Certification #: 2456.01

Arkansas Certification #: 18-016-0

Arkansas Drinking Water

Illinois Certification #: 004455

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407-18-11

Utah Certification #: KS000212018-8

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC ISI CCR

Pace Project No.: 60282726

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60282726001	MW-37-100318	Water	10/03/18 09:42	10/04/18 16:35
60282726002	MW-38-100318	Water	10/03/18 11:04	10/04/18 16:35
60282726003	MW-K-100318	Water	10/03/18 12:10	10/04/18 16:35
60282726004	MW-L-100318	Water	10/03/18 13:29	10/04/18 16:35
60282726005	MW-39-100318	Water	10/03/18 14:54	10/04/18 16:35
60282726006	MW-40-100318	Water	10/03/18 15:43	10/04/18 16:35
60282726007	DUP-100318	Water	10/03/18 06:00	10/04/18 16:35

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60282726

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60282726001	MW-37-100318	EPA 200.7	CTR, EMR	7	PASI-K
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	EMR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60282726002	MW-38-100318	EPA 200.7	CTR	7	PASI-K
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	EMR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60282726003	MW-K-100318	EPA 200.7	CTR	7	PASI-K
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	EMR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60282726004	MW-L-100318	EPA 200.7	CTR, EMR	7	PASI-K
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	EMR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60282726005	MW-39-100318	EPA 200.7	CTR	7	PASI-K
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	EMR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60282726006	MW-40-100318	EPA 200.7	CTR	7	PASI-K
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	EMR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60282726007	DUP-100318	EPA 200.7	CTR	7	PASI-K

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60282726

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	EMR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60282726

Sample: MW-37-100318	Lab ID: 60282726001	Collected: 10/03/18 09:42	Received: 10/04/18 16:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.050	mg/L	0.0050	1	10/09/18 16:24	10/13/18 18:48	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/13/18 18:48	7440-41-7	
Boron, Total Recoverable	2.2	mg/L	0.10	1	10/09/18 16:24	10/13/18 18:48	7440-42-8	
Calcium, Total Recoverable	140	mg/L	0.20	1	10/09/18 16:24	10/13/18 18:48	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	10/09/18 16:24	10/13/18 18:48	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	10/09/18 16:24	10/13/18 18:48	7439-92-1	
Lithium	0.017	mg/L	0.010	1	10/09/18 16:24	10/16/18 11:11	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:12	7440-36-0	
Arsenic, Total Recoverable	0.0053	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:12	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	10/09/18 16:24	10/11/18 17:12	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:12	7440-48-4	
Molybdenum, Total Recoverable	0.13	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:12	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:22	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:12	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	10/11/18 12:55	10/11/18 17:00	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	751	mg/L	5.0	1		10/08/18 10:35		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.4	Std. Units	0.10	1		10/09/18 10:01		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	29.7	mg/L	2.0	2		10/15/18 18:46	16887-00-6	
Fluoride	0.32	mg/L	0.20	1		10/14/18 23:19	16984-48-8	
Sulfate	371	mg/L	50.0	50		10/15/18 05:57	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60282726

Sample: MW-38-100318		Lab ID: 60282726002	Collected: 10/03/18 11:04	Received: 10/04/18 16:35	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.032	mg/L	0.0050	1	10/09/18 16:24	10/15/18 17:19	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/13/18 18:50	7440-41-7	
Boron, Total Recoverable	5.6	mg/L	0.10	1	10/09/18 16:24	10/13/18 18:50	7440-42-8	
Calcium, Total Recoverable	309	mg/L	0.20	1	10/09/18 16:24	10/13/18 18:50	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	10/09/18 16:24	10/13/18 18:50	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	10/09/18 16:24	10/13/18 18:50	7439-92-1	
Lithium	0.076	mg/L	0.010	1	10/09/18 16:24	10/13/18 18:50	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:19	7440-36-0	
Arsenic, Total Recoverable	0.014	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:19	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	10/09/18 16:24	10/11/18 17:19	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:28	7440-48-4	
Molybdenum, Total Recoverable	0.089	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:19	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:28	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:19	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	10/11/18 12:55	10/11/18 17:02	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	461	mg/L	5.0	1		10/08/18 10:35		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.6	Std. Units	0.10	1		10/09/18 10:10		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	250	mg/L	50.0	50		10/15/18 06:11	16887-00-6	
Fluoride	5.3	mg/L	0.20	1		10/14/18 23:33	16984-48-8	
Sulfate	1370	mg/L	100	100		10/16/18 10:27	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60282726

Sample: MW-K-100318		Lab ID: 60282726003	Collected: 10/03/18 12:10	Received: 10/04/18 16:35	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.045	mg/L	0.0050	1	10/09/18 16:24	10/13/18 18:53	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/13/18 18:53	7440-41-7	
Boron, Total Recoverable	2.9	mg/L	0.10	1	10/09/18 16:24	10/13/18 18:53	7440-42-8	
Calcium, Total Recoverable	513	mg/L	0.20	1	10/09/18 16:24	10/13/18 18:53	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	10/09/18 16:24	10/13/18 18:53	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	10/09/18 16:24	10/13/18 18:53	7439-92-1	
Lithium	0.070	mg/L	0.010	1	10/09/18 16:24	10/13/18 18:53	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:21	7440-36-0	
Arsenic, Total Recoverable	0.072	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:21	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	10/09/18 16:24	10/11/18 17:21	7440-43-9	
Cobalt, Total Recoverable	0.0014	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:30	7440-48-4	
Molybdenum, Total Recoverable	0.027	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:21	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:30	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:21	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	10/11/18 12:55	10/11/18 17:06	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	4000	mg/L	5.0	1		10/08/18 10:35		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.1	Std. Units	0.10	1		10/09/18 10:15		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	708	mg/L	50.0	50		10/15/18 06:26	16887-00-6	
Fluoride	3.5	mg/L	0.20	1		10/14/18 23:47	16984-48-8	
Sulfate	1940	mg/L	200	200		10/16/18 10:41	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60282726

Sample: MW-L-100318	Lab ID: 60282726004	Collected: 10/03/18 13:29	Received: 10/04/18 16:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.059	mg/L	0.0050	1	10/09/18 16:24	10/13/18 18:55	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/13/18 18:55	7440-41-7	
Boron, Total Recoverable	1.8	mg/L	0.10	1	10/09/18 16:24	10/13/18 18:55	7440-42-8	
Calcium, Total Recoverable	561	mg/L	0.20	1	10/09/18 16:24	10/13/18 18:55	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	10/09/18 16:24	10/13/18 18:55	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	10/09/18 16:24	10/13/18 18:55	7439-92-1	
Lithium	0.050	mg/L	0.010	1	10/09/18 16:24	10/16/18 11:14	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:24	7440-36-0	
Arsenic, Total Recoverable	0.021	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:24	7440-38-2	
Cadmium, Total Recoverable	<0.0050	mg/L	0.00050	1	10/09/18 16:24	10/11/18 17:24	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:32	7440-48-4	
Molybdenum, Total Recoverable	0.038	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:24	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:32	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:24	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	10/11/18 12:55	10/11/18 17:08	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	4340	mg/L	5.0	1		10/08/18 10:35		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.1	Std. Units	0.10	1		10/09/18 10:17		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	877	mg/L	50.0	50		10/15/18 06:40	16887-00-6	
Fluoride	2.1	mg/L	0.20	1		10/15/18 00:02	16984-48-8	
Sulfate	2200	mg/L	200	200		10/16/18 11:20	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60282726

Sample: MW-39-100318		Lab ID: 60282726005		Collected: 10/03/18 14:54		Received: 10/04/18 16:35		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.033	mg/L	0.0050	1	10/09/18 16:24	10/15/18 17:21	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/13/18 18:58	7440-41-7		
Boron, Total Recoverable	5.4	mg/L	0.10	1	10/09/18 16:24	10/13/18 18:58	7440-42-8		
Calcium, Total Recoverable	493	mg/L	0.20	1	10/09/18 16:24	10/13/18 18:58	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	10/09/18 16:24	10/13/18 18:58	7440-47-3		
Lead, Total Recoverable	<0.010	mg/L	0.010	1	10/09/18 16:24	10/13/18 18:58	7439-92-1		
Lithium	0.049	mg/L	0.010	1	10/09/18 16:24	10/15/18 17:21	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:26	7440-36-0		
Arsenic, Total Recoverable	0.013	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:26	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	10/09/18 16:24	10/11/18 17:26	7440-43-9		
Cobalt, Total Recoverable	0.0014	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:34	7440-48-4		
Molybdenum, Total Recoverable	0.089	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:26	7439-98-7		
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:34	7782-49-2		
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:26	7440-28-0		
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	10/11/18 12:55	10/11/18 17:15	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	3550	mg/L	5.0	1		10/08/18 10:35			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.2	Std. Units	0.10	1		10/09/18 10:20		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	535	mg/L	50.0	50		10/15/18 06:54	16887-00-6		
Fluoride	3.2	mg/L	0.20	1		10/15/18 00:16	16984-48-8	M1	
Sulfate	1940	mg/L	200	200		10/16/18 11:34	14808-79-8		

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60282726

Sample: MW-40-100318		Lab ID: 60282726006	Collected: 10/03/18 15:43	Received: 10/04/18 16:35	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.036	mg/L	0.0050	1	10/09/18 16:24	10/15/18 17:23	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/13/18 19:00	7440-41-7	
Boron, Total Recoverable	6.7	mg/L	0.10	1	10/09/18 16:24	10/13/18 19:00	7440-42-8	
Calcium, Total Recoverable	512	mg/L	0.20	1	10/09/18 16:24	10/13/18 19:00	7440-70-2	M1
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	10/09/18 16:24	10/13/18 19:00	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	10/09/18 16:24	10/13/18 19:00	7439-92-1	
Lithium	0.053	mg/L	0.010	1	10/09/18 16:24	10/15/18 17:23	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:29	7440-36-0	
Arsenic, Total Recoverable	0.014	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:29	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	10/09/18 16:24	10/11/18 17:29	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:36	7440-48-4	
Molybdenum, Total Recoverable	0.16	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:29	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:36	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:29	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	10/11/18 12:55	10/11/18 17:17	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3230	mg/L	5.0	1		10/08/18 10:35		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.0	Std. Units	0.10	1		10/09/18 10:22		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	356	mg/L	20.0	20		10/15/18 09:39	16887-00-6	
Fluoride	2.0	mg/L	0.20	1		10/15/18 00:44	16984-48-8	
Sulfate	1830	mg/L	200	200		10/16/18 12:17	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60282726

Sample: DUP-100318		Lab ID: 60282726007	Collected: 10/03/18 06:00	Received: 10/04/18 16:35	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.060	mg/L	0.0050	1	10/09/18 16:24	10/13/18 19:09	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/13/18 19:09	7440-41-7	
Boron, Total Recoverable	1.8	mg/L	0.10	1	10/09/18 16:24	10/13/18 19:09	7440-42-8	
Calcium, Total Recoverable	556	mg/L	0.20	1	10/09/18 16:24	10/13/18 19:09	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	10/09/18 16:24	10/13/18 19:09	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	10/09/18 16:24	10/13/18 19:09	7439-92-1	
Lithium	0.046	mg/L	0.010	1	10/09/18 16:24	10/15/18 17:26	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:31	7440-36-0	
Arsenic, Total Recoverable	0.021	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:31	7440-38-2	
Cadmium, Total Recoverable	<0.0050	mg/L	0.00050	1	10/09/18 16:24	10/11/18 17:31	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:37	7440-48-4	
Molybdenum, Total Recoverable	0.038	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:31	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:37	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:31	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	10/11/18 12:55	10/11/18 17:19	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	4260	mg/L	5.0	1		10/08/18 10:35		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.0	Std. Units	0.10	1		10/08/18 10:50		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	725	mg/L	50.0	50		10/15/18 20:57	16887-00-6	M1
Fluoride	2.1	mg/L	0.20	1		10/15/18 00:59	16984-48-8	
Sulfate	2180	mg/L	200	200		10/16/18 12:31	14808-79-8	M1

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60282726

QC Batch: 549000 Analysis Method: EPA 245.1
 QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
 Associated Lab Samples: 60282726001, 60282726002, 60282726003, 60282726004, 60282726005, 60282726006, 60282726007

METHOD BLANK: 2251088 Matrix: Water
 Associated Lab Samples: 60282726001, 60282726002, 60282726003, 60282726004, 60282726005, 60282726006, 60282726007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	10/11/18 16:12	

LABORATORY CONTROL SAMPLE: 2251089

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0048	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2251090 2251091

Parameter	Units	60282442001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	ND	.005	.005	0.0047	0.0047	94	94	70-130	0	20	

MATRIX SPIKE SAMPLE: 2251092

Parameter	Units	60282725003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	<0.00020	.005	0.0046	92	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60282726

QC Batch: 548701 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60282726001, 60282726002, 60282726003, 60282726004, 60282726005, 60282726006, 60282726007

METHOD BLANK: 2249580 Matrix: Water
Associated Lab Samples: 60282726001, 60282726002, 60282726003, 60282726004, 60282726005, 60282726006, 60282726007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	10/16/18 11:09	
Beryllium	mg/L	<0.0010	0.0010	10/13/18 18:26	
Boron	mg/L	<0.10	0.10	10/13/18 18:26	
Calcium	mg/L	<0.20	0.20	10/13/18 18:26	
Chromium	mg/L	<0.0050	0.0050	10/13/18 18:26	
Lead	mg/L	<0.010	0.010	10/13/18 18:26	
Lithium	mg/L	<0.010	0.010	10/16/18 11:09	

LABORATORY CONTROL SAMPLE: 2249581

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	0.98	98	85-115	
Beryllium	mg/L	1	0.98	98	85-115	
Boron	mg/L	1	0.96	96	85-115	
Calcium	mg/L	10	9.9	99	85-115	
Chromium	mg/L	1	0.97	97	85-115	
Lead	mg/L	1	0.98	98	85-115	
Lithium	mg/L	1	0.96	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2249582 2249583

Parameter	Units	60282725001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Barium	mg/L	0.020	1	1	1.0	1.0	99	100	70-130	1	20		
Beryllium	mg/L	<0.0010	1	1	0.98	0.99	98	99	70-130	1	20		
Boron	mg/L	0.23	1	1	1.2	1.2	97	99	70-130	1	20		
Calcium	mg/L	104	10	10	112	114	83	104	70-130	2	20		
Chromium	mg/L	<0.0050	1	1	0.97	0.97	97	97	70-130	0	20		
Lead	mg/L	<0.010	1	1	0.95	0.96	95	96	70-130	1	20		
Lithium	mg/L	0.032	1	1	1.0	1.0	100	102	70-130	1	20		

MATRIX SPIKE SAMPLE: 2249584

Parameter	Units	60282726006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	0.036	1	1.0	99	70-130	
Beryllium	mg/L	<0.0010	1	0.97	97	70-130	
Boron	mg/L	6.7	1	7.7	106	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60282726

MATRIX SPIKE SAMPLE:		2249584					
Parameter	Units	60282726006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Calcium	mg/L	512	10	504	-79	70-130	M1
Chromium	mg/L	<0.0050	1	0.95	95	70-130	
Lead	mg/L	<0.010	1	0.91	91	70-130	
Lithium	mg/L	0.053	1	1.1	105	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60282726

QC Batch: 548702 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60282726001, 60282726002, 60282726003, 60282726004, 60282726005, 60282726006, 60282726007

METHOD BLANK: 2249585 Matrix: Water
Associated Lab Samples: 60282726001, 60282726002, 60282726003, 60282726004, 60282726005, 60282726006, 60282726007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	10/11/18 16:51	
Arsenic	mg/L	<0.0010	0.0010	10/11/18 16:51	
Cadmium	mg/L	<0.00050	0.00050	10/11/18 16:51	
Cobalt	mg/L	<0.0010	0.0010	10/11/18 16:51	
Molybdenum	mg/L	<0.0010	0.0010	10/11/18 16:51	
Selenium	mg/L	<0.0010	0.0010	10/15/18 16:05	
Thallium	mg/L	<0.0010	0.0010	10/11/18 16:51	

LABORATORY CONTROL SAMPLE: 2249586

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.039	98	85-115	
Arsenic	mg/L	.04	0.039	98	85-115	
Cadmium	mg/L	.04	0.039	97	85-115	
Cobalt	mg/L	.04	0.036	90	85-115	
Molybdenum	mg/L	.04	0.038	95	85-115	
Selenium	mg/L	.04	0.042	106	85-115	
Thallium	mg/L	.04	0.037	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2249587 2249588

Parameter	Units	60282725005		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony	mg/L	<0.0010	.04	.04	0.039	0.039	96	97	70-130	1	20		
Arsenic	mg/L	<0.0010	.04	.04	0.039	0.039	98	98	70-130	0	20		
Cadmium	mg/L	<0.00050	.04	.04	0.037	0.037	93	93	70-130	1	20		
Cobalt	mg/L	<0.0010	.04	.04	0.035	0.035	87	87	70-130	0	20		
Molybdenum	mg/L	0.0018	.04	.04	0.040	0.041	96	98	70-130	2	20		
Selenium	mg/L	<0.0010	.04	.04	0.040	0.041	101	102	70-130	1	20		
Thallium	mg/L	<0.0010	.04	.04	0.039	0.039	96	97	70-130	1	20		

MATRIX SPIKE SAMPLE: 2249589

Parameter	Units	60282726007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	<0.0010	.04	0.037	92	70-130	
Arsenic	mg/L	0.021	.04	0.058	94	70-130	
Cadmium	mg/L	<0.00050	.04	0.032	81	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60282726

MATRIX SPIKE SAMPLE:		2249589					
Parameter	Units	60282726007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cobalt	mg/L	<0.0010	.04	0.033	83	70-130	
Molybdenum	mg/L	0.038	.04	0.079	102	70-130	
Selenium	mg/L	<0.0010	.04	0.038	93	70-130	
Thallium	mg/L	<0.0010	.04	0.041	104	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60282726

QC Batch: 548230 Analysis Method: SM 2540C
 QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
 Associated Lab Samples: 60282726001, 60282726002, 60282726003, 60282726004, 60282726005, 60282726006, 60282726007

METHOD BLANK: 2247664 Matrix: Water
 Associated Lab Samples: 60282726001, 60282726002, 60282726003, 60282726004, 60282726005, 60282726006, 60282726007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	10/08/18 10:35	

LABORATORY CONTROL SAMPLE: 2247665

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	999	100	80-120	

SAMPLE DUPLICATE: 2247666

Parameter	Units	60282598003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	827	812	2	10	

SAMPLE DUPLICATE: 2247667

Parameter	Units	60282741001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1570	1560	1	10	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60282726

QC Batch: 548313

Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B

Analysis Description: 4500H+B pH

Associated Lab Samples: 60282726007

SAMPLE DUPLICATE: 2248308

Parameter	Units	60282204001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.4	7.4	0	5	H6

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60282726

QC Batch: 548542 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60282726001, 60282726002, 60282726003, 60282726004, 60282726005, 60282726006

SAMPLE DUPLICATE: 2249006

Parameter	Units	60282564001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.1	8.1	0	5	H6

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60282726

QC Batch:	549179	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60282726001, 60282726002, 60282726003, 60282726004, 60282726005, 60282726006, 60282726007		

METHOD BLANK: 2251780 Matrix: Water
Associated Lab Samples: 60282726001, 60282726002, 60282726003, 60282726004, 60282726005, 60282726006, 60282726007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	10/14/18 20:57	
Fluoride	mg/L	<0.20	0.20	10/14/18 20:57	
Sulfate	mg/L	<1.0	1.0	10/14/18 20:57	

LABORATORY CONTROL SAMPLE: 2251781

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	101	90-110	
Fluoride	mg/L	2.5	2.5	102	90-110	
Sulfate	mg/L	5	5.2	104	90-110	

MATRIX SPIKE SAMPLE: 2251784

Parameter	Units	60282726005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	3.2	2.5	6.2	120	90-110	M1

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60282726

QC Batch: 549550

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60282726006

METHOD BLANK: 2253640

Matrix: Water

Associated Lab Samples: 60282726006, 60282726007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	10/15/18 04:28	

LABORATORY CONTROL SAMPLE: 2253641

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.2	104	90-110	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60282726

QC Batch: 549582

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60282726001, 60282726007

METHOD BLANK: 2253757

Matrix: Water

Associated Lab Samples: 60282726001, 60282726007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	10/15/18 17:07	

LABORATORY CONTROL SAMPLE: 2253758

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	100	90-110	

MATRIX SPIKE SAMPLE: 2254708

Parameter	Units	60282726007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	725	250	1130	162	90-110	E,M1

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60282726

QC Batch: 549886 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60282726002, 60282726003, 60282726004, 60282726005, 60282726006, 60282726007

METHOD BLANK: 2254736 Matrix: Water
Associated Lab Samples: 60282726002, 60282726003, 60282726004, 60282726005, 60282726006, 60282726007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	10/16/18 09:24	

LABORATORY CONTROL SAMPLE: 2254737

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.3	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2254738 2254739

Parameter	Units	60282725001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	180	100	100	300	298	120	118	90-110	1	15	M1

MATRIX SPIKE SAMPLE: 2254740

Parameter	Units	60282726007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	2180	1000	3430	125	90-110	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: LEC ISI CCR

Pace Project No.: 60282726

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR
Pace Project No.: 60282726

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60282726001	MW-37-100318	EPA 200.7	548701	EPA 200.7	548774
60282726002	MW-38-100318	EPA 200.7	548701	EPA 200.7	548774
60282726003	MW-K-100318	EPA 200.7	548701	EPA 200.7	548774
60282726004	MW-L-100318	EPA 200.7	548701	EPA 200.7	548774
60282726005	MW-39-100318	EPA 200.7	548701	EPA 200.7	548774
60282726006	MW-40-100318	EPA 200.7	548701	EPA 200.7	548774
60282726007	DUP-100318	EPA 200.7	548701	EPA 200.7	548774
60282726001	MW-37-100318	EPA 200.8	548702	EPA 200.8	548775
60282726002	MW-38-100318	EPA 200.8	548702	EPA 200.8	548775
60282726003	MW-K-100318	EPA 200.8	548702	EPA 200.8	548775
60282726004	MW-L-100318	EPA 200.8	548702	EPA 200.8	548775
60282726005	MW-39-100318	EPA 200.8	548702	EPA 200.8	548775
60282726006	MW-40-100318	EPA 200.8	548702	EPA 200.8	548775
60282726007	DUP-100318	EPA 200.8	548702	EPA 200.8	548775
60282726001	MW-37-100318	EPA 245.1	549000	EPA 245.1	549113
60282726002	MW-38-100318	EPA 245.1	549000	EPA 245.1	549113
60282726003	MW-K-100318	EPA 245.1	549000	EPA 245.1	549113
60282726004	MW-L-100318	EPA 245.1	549000	EPA 245.1	549113
60282726005	MW-39-100318	EPA 245.1	549000	EPA 245.1	549113
60282726006	MW-40-100318	EPA 245.1	549000	EPA 245.1	549113
60282726007	DUP-100318	EPA 245.1	549000	EPA 245.1	549113
60282726001	MW-37-100318	SM 2540C	548230		
60282726002	MW-38-100318	SM 2540C	548230		
60282726003	MW-K-100318	SM 2540C	548230		
60282726004	MW-L-100318	SM 2540C	548230		
60282726005	MW-39-100318	SM 2540C	548230		
60282726006	MW-40-100318	SM 2540C	548230		
60282726007	DUP-100318	SM 2540C	548230		
60282726001	MW-37-100318	SM 4500-H+B	548542		
60282726002	MW-38-100318	SM 4500-H+B	548542		
60282726003	MW-K-100318	SM 4500-H+B	548542		
60282726004	MW-L-100318	SM 4500-H+B	548542		
60282726005	MW-39-100318	SM 4500-H+B	548542		
60282726006	MW-40-100318	SM 4500-H+B	548542		
60282726007	DUP-100318	SM 4500-H+B	548313		
60282726001	MW-37-100318	EPA 300.0	549179		
60282726001	MW-37-100318	EPA 300.0	549582		
60282726002	MW-38-100318	EPA 300.0	549179		
60282726002	MW-38-100318	EPA 300.0	549886		
60282726003	MW-K-100318	EPA 300.0	549179		
60282726003	MW-K-100318	EPA 300.0	549886		
60282726004	MW-L-100318	EPA 300.0	549179		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

Pace Project No.: 60282726

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60282726004	MW-L-100318	EPA 300.0	549886		
60282726005	MW-39-100318	EPA 300.0	549179		
60282726005	MW-39-100318	EPA 300.0	549886		
60282726006	MW-40-100318	EPA 300.0	549179		
60282726006	MW-40-100318	EPA 300.0	549550		
60282726006	MW-40-100318	EPA 300.0	549886		
60282726007	DUP-100318	EPA 300.0	549179		
60282726007	DUP-100318	EPA 300.0	549582		
60282726007	DUP-100318	EPA 300.0	549886		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60282726



60282726

Client Name: Westar

Courier: FedEx UPS VIA Clay PEX ECI Pace Xroads Client Other

Tracking #: _____ Pace Shipping Label Used? Yes No

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No

Packing Material: Bubble Wrap Bubble Bags Foam None Other

Thermometer Used: T-298 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 1.7 Corr. Factor 0.0 Corrected 1.7

Date and initials of person examining contents:

10/5/18

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>PH</u>
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution: Copy COC to Client? Y N Field Data Required? Y N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review:

REVIEWED
By hwilson at 10:49 am, 10/5/18

Date: _____

October 22, 2018

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC ISI CCR
Pace Project No.: 60283090

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on October 05, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC ISI CCR

Pace Project No.: 60283090

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC ISI CCR

Pace Project No.: 60283090

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60283090001	MW-37-100318	Water	10/03/18 09:42	10/05/18 10:00
60283090002	MW-38-100318	Water	10/03/18 11:04	10/05/18 10:00
60283090003	MW-K-100318	Water	10/03/18 12:10	10/05/18 10:00
60283090004	MW-L-100318	Water	10/03/18 13:29	10/05/18 10:00
60283090005	MW-39-100318	Water	10/03/18 14:54	10/05/18 10:00
60283090006	MW-40-100318	Water	10/03/18 15:43	10/05/18 10:00
60283090007	DUP-100318	Water	10/03/18 06:00	10/05/18 10:00

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60283090

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60283090001	MW-37-100318	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60283090002	MW-38-100318	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60283090003	MW-K-100318	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60283090004	MW-L-100318	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60283090005	MW-39-100318	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60283090006	MW-40-100318	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60283090007	DUP-100318	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60283090

Sample: MW-37-100318 **Lab ID: 60283090001** Collected: 10/03/18 09:42 Received: 10/05/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.115 ± 0.390 (0.752) C:NA T:86%	pCi/L	10/19/18 17:41	13982-63-3	
Radium-228	EPA 904.0	0.446 ± 0.410 (0.835) C:72% T:85%	pCi/L	10/18/18 11:41	15262-20-1	
Total Radium	Total Radium Calculation	0.561 ± 0.800 (1.59)	pCi/L	10/22/18 12:23	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60283090

Sample: MW-38-100318 **Lab ID: 60283090002** Collected: 10/03/18 11:04 Received: 10/05/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	-0.195 ± 0.297 (0.779) C:NA T:84%	pCi/L	10/19/18 17:41	13982-63-3	
Radium-228	EPA 904.0	0.136 ± 0.374 (0.836) C:78% T:80%	pCi/L	10/18/18 11:41	15262-20-1	
Total Radium	Total Radium Calculation	0.136 ± 0.671 (1.62)	pCi/L	10/22/18 12:23	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60283090

Sample: MW-K-100318 **Lab ID: 60283090003** Collected: 10/03/18 12:10 Received: 10/05/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	-0.064 ± 0.374 (0.833) C:NA T:80%	pCi/L	10/19/18 17:41	13982-63-3	
Radium-228	EPA 904.0	0.253 ± 0.461 (1.01) C:77% T:82%	pCi/L	10/18/18 11:41	15262-20-1	
Total Radium	Total Radium Calculation	0.253 ± 0.835 (1.84)	pCi/L	10/22/18 12:23	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60283090

Sample: MW-L-100318 **Lab ID: 60283090004** Collected: 10/03/18 13:29 Received: 10/05/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0732 ± 0.518 (1.03) C:NA T:73%	pCi/L	10/19/18 17:41	13982-63-3	
Radium-228	EPA 904.0	0.524 ± 0.409 (0.806) C:75% T:82%	pCi/L	10/18/18 11:41	15262-20-1	
Total Radium	Total Radium Calculation	0.597 ± 0.927 (1.84)	pCi/L	10/22/18 12:23	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60283090

Sample: MW-39-100318 **Lab ID: 60283090005** Collected: 10/03/18 14:54 Received: 10/05/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.372 ± 0.457 (0.745) C:NA T:88%	pCi/L	10/19/18 17:59	13982-63-3	
Radium-228	EPA 904.0	0.210 ± 0.349 (0.759) C:77% T:86%	pCi/L	10/18/18 11:41	15262-20-1	
Total Radium	Total Radium Calculation	0.582 ± 0.806 (1.50)	pCi/L	10/22/18 12:23	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60283090

Sample: MW-40-100318 **Lab ID: 60283090006** Collected: 10/03/18 15:43 Received: 10/05/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.184 ± 0.434 (0.804) C:NA T:85%	pCi/L	10/19/18 17:59	13982-63-3	
Radium-228	EPA 904.0	-0.297 ± 0.341 (0.846) C:75% T:85%	pCi/L	10/18/18 11:41	15262-20-1	
Total Radium	Total Radium Calculation	0.184 ± 0.775 (1.65)	pCi/L	10/22/18 12:23	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60283090

Sample: DUP-100318 **Lab ID: 60283090007** Collected: 10/03/18 06:00 Received: 10/05/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.124 ± 0.486 (0.929) C:NA T:81%	pCi/L	10/19/18 17:59	13982-63-3	
Radium-228	EPA 904.0	0.493 ± 0.400 (0.795) C:75% T:77%	pCi/L	10/18/18 11:42	15262-20-1	
Total Radium	Total Radium Calculation	0.617 ± 0.886 (1.72)	pCi/L	10/22/18 12:23	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60283090

QC Batch: 316244

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60283090001, 60283090002, 60283090003, 60283090004, 60283090005, 60283090006, 60283090007

METHOD BLANK: 1543373

Matrix: Water

Associated Lab Samples: 60283090001, 60283090002, 60283090003, 60283090004, 60283090005, 60283090006, 60283090007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.253 ± 0.352 (0.587) C:NA T:84%	pCi/L	10/19/18 17:41	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60283090

QC Batch: 316246

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60283090001, 60283090002, 60283090003, 60283090004, 60283090005, 60283090006, 60283090007

METHOD BLANK: 1543378

Matrix: Water

Associated Lab Samples: 60283090001, 60283090002, 60283090003, 60283090004, 60283090005, 60283090006, 60283090007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.170 ± 0.310 (0.756) C:77% T:86%	pCi/L	10/18/18 11:41	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: LEC ISI CCR

Pace Project No.: 60283090

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

Pace Project No.: 60283090

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60283090001	MW-37-100318	EPA 903.1	316244		
60283090002	MW-38-100318	EPA 903.1	316244		
60283090003	MW-K-100318	EPA 903.1	316244		
60283090004	MW-L-100318	EPA 903.1	316244		
60283090005	MW-39-100318	EPA 903.1	316244		
60283090006	MW-40-100318	EPA 903.1	316244		
60283090007	DUP-100318	EPA 903.1	316244		
60283090001	MW-37-100318	EPA 904.0	316246		
60283090002	MW-38-100318	EPA 904.0	316246		
60283090003	MW-K-100318	EPA 904.0	316246		
60283090004	MW-L-100318	EPA 904.0	316246		
60283090005	MW-39-100318	EPA 904.0	316246		
60283090006	MW-40-100318	EPA 904.0	316246		
60283090007	DUP-100318	EPA 904.0	316246		
60283090001	MW-37-100318	Total Radium Calculation	317513		
60283090002	MW-38-100318	Total Radium Calculation	317513		
60283090003	MW-K-100318	Total Radium Calculation	317513		
60283090004	MW-L-100318	Total Radium Calculation	317513		
60283090005	MW-39-100318	Total Radium Calculation	317513		
60283090006	MW-40-100318	Total Radium Calculation	317513		
60283090007	DUP-100318	Total Radium Calculation	317513		

REPORT OF LABORATORY ANALYSIS

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Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Westar Energy

Project # 60283090

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 454227829379

Label _____
LIMS Login _____

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used 9 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 18.5 °C Correction Factor: -0.1 °C Final Temp: 18.4 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and initials of person examining contents:
				<u>10D4671</u>	<u>ET 10-8-18</u>
Chain of Custody Present:	/			1.	
Chain of Custody Filled Out:	/			2.	
Chain of Custody Relinquished:	/			3.	
Sampler Name & Signature on COC:	/			4.	
Sample Labels match COC:	/			5.	
-Includes date/time/ID Matrix: <u>WT</u>					
Samples Arrived within Hold Time:	/			6.	
Short Hold Time Analysis (<72hr remaining):	/			7.	
Rush Turn Around Time Requested:	/			8.	
Sufficient Volume:	/			9.	
Correct Containers Used:	/			10.	
-Pace Containers Used:	/				
Containers Intact:	/			11.	
Orthophosphate field filtered			/	12.	
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.	
Organic Samples checked for dechlorination:			/	14.	
Filtered volume received for Dissolved tests			/	15.	
All containers have been checked for preservation.	/			16.	
All containers needing preservation are found to be in compliance with EPA recommendation.					<u>pH < 2</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed	Date/Time of preservation
				<u>ET</u>	
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):			/	17.	
Trip Blank Present:			/	18.	
Trip Blank Custody Seals Present			/		
Rad Aqueous Samples Screened > 0.5 mrem/hr			/	Initial when completed:	Date:
				<u>ET</u>	<u>10-8-18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



WO#: 30267679
 The **PM: CAF** Due Date: **10/26/18**
CLIENT: PACE_60_LEKS

Document
 eted accurately.

Page: _____ of _____

Section A Required Client Information:		Section B Required Project Information:		Invoice Information:	
Company: WESTAR ENERGY		Report To: Brandon Griffin		Attention:	
Address: 818 Kansas Ave		Copy To: Jared Morrison		Company Name:	
Topeka, KS 66612				Address:	
Email To: brandon.l.griffin@westarenergy.com		Purchase Order No.: 10LEC-0000012756		Pace Quote Reference:	
Phone: 785-575-8135 Fax:		Project Name: LEC ISI CCR		Pace Project Manager: Heather Wilson 913-563-1407	
Requested Due Date/TAT: 15 day		Project Number:		Pace Profile #: 9655, 1	
				REGULATORY AGENCY	
				<input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER _____	
				Site Location STATE: KS	

ITEM #	Section D Required Client Information	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL OL WIPE WP AIR AR OTHER OT TISSUE TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Analysis Test Y/N	Requested Analysis Filtered (Y/N)						Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.					
					COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃		Methanol	Other	Radium-226	Radium-228	Total Radium								
					DATE	TIME	DATE	TIME																						
1	MW-37-100318		WT G			10/3	0942		2		2																			
2	MW-38-100318		WT G			10/3	1104		2		2																			
3	MW-K-100318		WT G			10/3	1210		2		2																			
4	MW-L-100318		WT G			10/3	1329		2		2																			
5	MW-39-100318		WT G			10/3	1454		2		2																			
6	MW-40-100318		WT G			10/3	1543		2		2																			
7																														
8																														
9	DUP-100318		WT G			10/3	0600		2		2																			
10																														
11																														
12																														

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	<i>[Signature]</i>	10/4/18	0900	<i>[Signature]</i>	10-5-18	1000	18.4	Y	N	Y

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: <i>Brandon Griffin</i>					
SIGNATURE of SAMPLER: <i>[Signature]</i>					
DATE Signed (MM/DD/YY): <i>10/04/18</i>					

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Westar Energy

Project # # 30267679

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 454227829379

Label	<u>MDS</u>
LIMS Login	<u>MDS</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used 9 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 18.5 °C Correction Factor: -0.11 °C Final Temp: 18.4 °C
Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>ET 10-8-18</u>
	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:	/			4.
Sample Labels match COC:	/			5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):	/			7.
Rush Turn Around Time Requested:	/			8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:	/			
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.
Organic Samples checked for dechlorination:			/	14.
Filtered volume received for Dissolved tests			/	15.
All containers have been checked for preservation.	/			16.
All containers needing preservation are found to be in compliance with EPA recommendation.	/			<u>PH < 2</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>ET</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):			/	17.
Trip Blank Present:	/			18.
Trip Blank Custody Seals Present	/			
Rad Aqueous Samples Screened > 0.5 mrem/hr			/	Initial when completed: <u>ET</u> Date: <u>10-8-18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

ATTACHMENT 1-6
November 2018 Sampling Event
Laboratory Analytical Report

December 06, 2018

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC ISI CCR
Pace Project No.: 60287551

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on November 20, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC ISI CCR

Pace Project No.: 60287551

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Certification Number: 10090

Arkansas Drinking Water

WY STR Certification #: 2456.01

Arkansas Certification #: 18-016-0

Arkansas Drinking Water

Illinois Certification #: 004455

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116 / E10426

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407-18-11

Utah Certification #: KS000212018-8

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC ISI CCR

Pace Project No.: 60287551

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60287551001	MW-37-111918	Water	11/19/18 09:43	11/20/18 14:30
60287551002	MW-38-111918	Water	11/19/18 10:51	11/20/18 14:30
60287551003	MW-K-111918	Water	11/19/18 11:52	11/20/18 14:30
60287551004	MW-L-111918	Water	11/19/18 13:03	11/20/18 14:30
60287551005	MW-39-111918	Water	11/19/18 14:01	11/20/18 14:30
60287551006	MW-40-111918	Water	11/19/18 15:22	11/20/18 14:30
60287551007	DUP-111918	Water	11/19/18 06:00	11/20/18 14:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60287551

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60287551001	MW-37-111918	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	JDE	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60287551002	MW-38-111918	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	JDE	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60287551003	MW-K-111918	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	JDE	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60287551004	MW-L-111918	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	JDE	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60287551005	MW-39-111918	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	JDE	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60287551006	MW-40-111918	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	JDE	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60287551007	DUP-111918	EPA 200.7	EMR	7	PASI-K

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60287551

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	JDE	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60287551

Sample: MW-37-111918	Lab ID: 60287551001	Collected: 11/19/18 09:43	Received: 11/20/18 14:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.051	mg/L	0.0050	1	11/30/18 09:35	11/30/18 23:48	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 23:48	7440-41-7	
Boron, Total Recoverable	2.0	mg/L	0.10	1	11/30/18 09:35	11/30/18 23:48	7440-42-8	
Calcium, Total Recoverable	143	mg/L	0.20	1	11/30/18 09:35	11/30/18 23:48	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	11/30/18 09:35	11/30/18 23:48	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	11/30/18 09:35	11/30/18 23:48	7439-92-1	
Lithium	0.010	mg/L	0.010	1	11/30/18 09:35	12/01/18 15:58	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 16:56	7440-36-0	
Arsenic, Total Recoverable	0.0054	mg/L	0.0010	1	11/30/18 09:35	11/30/18 16:56	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	11/30/18 09:35	11/30/18 16:56	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 16:56	7440-48-4	
Molybdenum, Total Recoverable	0.13	mg/L	0.0010	1	11/30/18 09:35	11/30/18 16:56	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 16:56	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 16:56	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	11/30/18 14:25	12/03/18 11:19	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3120	mg/L	5.0	1		11/26/18 09:06		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2	Std. Units	0.10	1		11/24/18 14:35		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	29.7	mg/L	10.0	10		12/05/18 21:23	16887-00-6	
Fluoride	0.44	mg/L	0.20	1		12/05/18 20:35	16984-48-8	
Sulfate	275	mg/L	50.0	50		12/05/18 21:39	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60287551

Sample: MW-38-111918		Lab ID: 60287551002		Collected: 11/19/18 10:51	Received: 11/20/18 14:30	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.032	mg/L	0.0050	1	11/30/18 09:35	11/30/18 23:50	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 23:50	7440-41-7	
Boron, Total Recoverable	4.9	mg/L	0.10	1	11/30/18 09:35	11/30/18 23:50	7440-42-8	
Calcium, Total Recoverable	320	mg/L	0.20	1	11/30/18 09:35	11/30/18 23:50	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	11/30/18 09:35	11/30/18 23:50	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	11/30/18 09:35	11/30/18 23:50	7439-92-1	
Lithium	0.071	mg/L	0.010	1	11/30/18 09:35	12/01/18 16:00	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 16:58	7440-36-0	
Arsenic, Total Recoverable	0.014	mg/L	0.0010	1	11/30/18 09:35	11/30/18 16:58	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	11/30/18 09:35	11/30/18 16:58	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 16:58	7440-48-4	
Molybdenum, Total Recoverable	0.087	mg/L	0.0010	1	11/30/18 09:35	11/30/18 16:58	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 16:58	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 16:58	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	11/30/18 14:25	12/03/18 11:20	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	1400	mg/L	5.0	1		11/26/18 09:06		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.5	Std. Units	0.10	1		11/24/18 14:37		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	206	mg/L	50.0	50		12/05/18 22:11	16887-00-6	
Fluoride	4.8	mg/L	0.20	1		12/05/18 21:55	16984-48-8	
Sulfate	1220	mg/L	100	100		12/05/18 22:27	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60287551

Sample: MW-K-111918		Lab ID: 60287551003	Collected: 11/19/18 11:52	Received: 11/20/18 14:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.044	mg/L	0.0050	1	11/30/18 09:35	11/30/18 23:52	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 23:52	7440-41-7	
Boron, Total Recoverable	2.2	mg/L	0.10	1	11/30/18 09:35	11/30/18 23:52	7440-42-8	
Calcium, Total Recoverable	554	mg/L	0.20	1	11/30/18 09:35	11/30/18 23:52	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	11/30/18 09:35	11/30/18 23:52	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	11/30/18 09:35	11/30/18 23:52	7439-92-1	
Lithium	0.066	mg/L	0.010	1	11/30/18 09:35	12/01/18 16:07	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:00	7440-36-0	
Arsenic, Total Recoverable	0.069	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:00	7440-38-2	
Cadmium, Total Recoverable	<0.0050	mg/L	0.00050	1	11/30/18 09:35	11/30/18 17:00	7440-43-9	
Cobalt, Total Recoverable	0.0011	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:00	7440-48-4	
Molybdenum, Total Recoverable	0.018	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:00	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:00	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:00	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	11/30/18 14:25	12/03/18 11:22	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3840	mg/L	5.0	1		11/29/18 08:05		H1,L1
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2	Std. Units	0.10	1		11/24/18 14:38		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	638	mg/L	200	200		12/05/18 22:59	16887-00-6	
Fluoride	3.2	mg/L	0.20	1		12/05/18 22:43	16984-48-8	
Sulfate	1960	mg/L	200	200		12/05/18 22:59	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60287551

Sample: MW-L-111918		Lab ID: 60287551004	Collected: 11/19/18 13:03	Received: 11/20/18 14:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.050	mg/L	0.0050	1	11/30/18 09:35	11/30/18 23:54	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 23:54	7440-41-7	
Boron, Total Recoverable	1.7	mg/L	0.10	1	11/30/18 09:35	11/30/18 23:54	7440-42-8	
Calcium, Total Recoverable	668	mg/L	0.20	1	11/30/18 09:35	11/30/18 23:54	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	11/30/18 09:35	11/30/18 23:54	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	11/30/18 09:35	11/30/18 23:54	7439-92-1	
Lithium	0.051	mg/L	0.010	1	11/30/18 09:35	12/01/18 16:09	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:02	7440-36-0	
Arsenic, Total Recoverable	0.024	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:02	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	11/30/18 09:35	11/30/18 17:02	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:02	7440-48-4	
Molybdenum, Total Recoverable	0.041	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:02	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:02	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:02	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	11/30/18 14:25	12/03/18 11:23	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3250	mg/L	5.0	1		11/26/18 09:09		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	6.9	Std. Units	0.10	1		11/24/18 14:39		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	860	mg/L	200	200		12/05/18 23:31	16887-00-6	
Fluoride	1.8	mg/L	0.20	1		12/05/18 23:15	16984-48-8	
Sulfate	2280	mg/L	200	200		12/05/18 23:31	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60287551

Sample: MW-39-111918	Lab ID: 60287551005	Collected: 11/19/18 14:01	Received: 11/20/18 14:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.032	mg/L	0.0050	1	11/30/18 09:35	11/30/18 23:57	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 23:57	7440-41-7	
Boron, Total Recoverable	4.3	mg/L	0.10	1	11/30/18 09:35	11/30/18 23:57	7440-42-8	
Calcium, Total Recoverable	486	mg/L	0.20	1	11/30/18 09:35	11/30/18 23:57	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	11/30/18 09:35	11/30/18 23:57	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	11/30/18 09:35	11/30/18 23:57	7439-92-1	
Lithium	0.062	mg/L	0.010	1	11/30/18 09:35	12/01/18 16:11	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:04	7440-36-0	
Arsenic, Total Recoverable	0.014	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:04	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	11/30/18 09:35	11/30/18 17:04	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:04	7440-48-4	
Molybdenum, Total Recoverable	0.14	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:04	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:04	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:04	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	11/30/18 14:25	12/03/18 11:25	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3640	mg/L	5.0	1		11/26/18 09:09		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.4	Std. Units	0.10	1		11/24/18 14:41		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	443	mg/L	200	200		12/06/18 01:02	16887-00-6	
Fluoride	3.5	mg/L	0.20	1		12/05/18 23:47	16984-48-8	
Sulfate	1880	mg/L	200	200		12/06/18 01:02	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60287551

Sample: MW-40-111918	Lab ID: 60287551006	Collected: 11/19/18 15:22		Received: 11/20/18 14:30		Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.035	mg/L	0.0050	1	11/30/18 09:35	11/30/18 23:59	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 23:59	7440-41-7	
Boron, Total Recoverable	6.1	mg/L	0.10	1	11/30/18 09:35	11/30/18 23:59	7440-42-8	
Calcium, Total Recoverable	536	mg/L	0.20	1	11/30/18 09:35	11/30/18 23:59	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	11/30/18 09:35	11/30/18 23:59	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	11/30/18 09:35	11/30/18 23:59	7439-92-1	
Lithium	0.047	mg/L	0.010	1	11/30/18 09:35	12/01/18 16:14	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:09	7440-36-0	
Arsenic, Total Recoverable	0.027	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:09	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	11/30/18 09:35	11/30/18 17:09	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:09	7440-48-4	
Molybdenum, Total Recoverable	0.062	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:09	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:09	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:09	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	11/30/18 14:25	12/03/18 11:27	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3100	mg/L	5.0	1		11/26/18 09:09		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.0	Std. Units	0.10	1		11/24/18 14:42		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	351	mg/L	200	200		12/06/18 01:34	16887-00-6	
Fluoride	1.7	mg/L	0.20	1		12/06/18 01:18	16984-48-8	
Sulfate	1780	mg/L	200	200		12/06/18 01:34	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60287551

Sample: DUP-111918		Lab ID: 60287551007	Collected: 11/19/18 06:00	Received: 11/20/18 14:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.032	mg/L	0.0050	1	11/30/18 09:35	12/01/18 00:01	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	12/01/18 00:01	7440-41-7	
Boron, Total Recoverable	4.2	mg/L	0.10	1	11/30/18 09:35	12/01/18 00:01	7440-42-8	
Calcium, Total Recoverable	488	mg/L	0.20	1	11/30/18 09:35	12/01/18 00:01	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	11/30/18 09:35	12/01/18 00:01	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	11/30/18 09:35	12/01/18 00:01	7439-92-1	
Lithium	0.059	mg/L	0.010	1	11/30/18 09:35	12/01/18 16:16	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:11	7440-36-0	
Arsenic, Total Recoverable	0.027	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:11	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	11/30/18 09:35	11/30/18 17:11	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:11	7440-48-4	
Molybdenum, Total Recoverable	0.062	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:11	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:11	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/30/18 09:35	11/30/18 17:11	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	11/30/18 14:25	12/03/18 11:28	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3350	mg/L	5.0	1		11/26/18 09:09		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.3	Std. Units	0.10	1		11/24/18 14:33		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	451	mg/L	200	200		12/06/18 02:06	16887-00-6	
Fluoride	3.6	mg/L	0.20	1		12/06/18 01:50	16984-48-8	
Sulfate	1850	mg/L	200	200		12/06/18 02:06	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60287551

QC Batch: 557803 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60287551001, 60287551002, 60287551003, 60287551004, 60287551005, 60287551006, 60287551007

METHOD BLANK: 2288438 Matrix: Water
Associated Lab Samples: 60287551001, 60287551002, 60287551003, 60287551004, 60287551005, 60287551006, 60287551007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	12/03/18 11:16	

LABORATORY CONTROL SAMPLE: 2288439

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0051	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2288440 2288441

Parameter	Units	60287462002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	ND	.005	.005	0.0049	0.0049	97	99	70-130	1	20	

MATRIX SPIKE SAMPLE: 2288442

Parameter	Units	60287463002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	.005	0.0049	99	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60287551

QC Batch: 557645 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60287551001, 60287551002, 60287551003, 60287551004, 60287551005, 60287551006, 60287551007

METHOD BLANK: 2287734 Matrix: Water
Associated Lab Samples: 60287551001, 60287551002, 60287551003, 60287551004, 60287551005, 60287551006, 60287551007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	11/30/18 23:03	
Beryllium	mg/L	<0.0010	0.0010	11/30/18 23:03	
Boron	mg/L	<0.10	0.10	11/30/18 23:03	
Calcium	mg/L	<0.20	0.20	11/30/18 23:03	
Chromium	mg/L	<0.0050	0.0050	11/30/18 23:03	
Lead	mg/L	<0.010	0.010	11/30/18 23:03	
Lithium	mg/L	<0.010	0.010	12/01/18 15:32	

LABORATORY CONTROL SAMPLE: 2287735

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.0	101	85-115	
Beryllium	mg/L	1	1.0	101	85-115	
Boron	mg/L	1	0.90	90	85-115	
Calcium	mg/L	10	10.4	104	85-115	
Chromium	mg/L	1	0.91	91	85-115	
Lead	mg/L	1	0.97	97	85-115	
Lithium	mg/L	1	0.95	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2287736 2287737

Parameter	Units	60287115002		60287115004		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Barium	mg/L	92.2 ug/L	1	1	1.1	1.1	102	101	70-130	1	20		
Beryllium	mg/L	ND	1	1	1.0	1.0	103	102	70-130	1	20		
Boron	mg/L	ND	1	1	0.93	0.92	91	90	70-130	1	20		
Calcium	mg/L	50900 ug/L	10	10	61.6	61.2	107	103	70-130	1	20		
Chromium	mg/L	ND	1	1	0.92	0.92	92	92	70-130	0	20		
Lead	mg/L	ND	1	1	0.98	0.97	98	97	70-130	1	20		
Lithium	mg/L	ND	1	1	0.98	0.97	98	97	70-130	1	20		

MATRIX SPIKE SAMPLE: 2287738

Parameter	Units	60287115004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	53.6 ug/L	1	1.1	102	70-130	
Beryllium	mg/L	ND	1	1.0	103	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60287551

MATRIX SPIKE SAMPLE:		2287738					
Parameter	Units	60287115004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	mg/L	ND	1	0.95	93	70-130	
Calcium	mg/L	60400 ug/L	10	70.4	100	70-130	
Chromium	mg/L	ND	1	0.92	92	70-130	
Lead	mg/L	ND	1	0.98	98	70-130	
Lithium	mg/L	ND	1	0.98	98	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60287551

QC Batch: 557646 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
 Associated Lab Samples: 60287551001, 60287551002, 60287551003, 60287551004, 60287551005, 60287551006, 60287551007

METHOD BLANK: 2287742 Matrix: Water
 Associated Lab Samples: 60287551001, 60287551002, 60287551003, 60287551004, 60287551005, 60287551006, 60287551007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	11/30/18 16:47	
Arsenic	mg/L	<0.0010	0.0010	11/30/18 16:47	
Cadmium	mg/L	<0.00050	0.00050	11/30/18 16:47	
Cobalt	mg/L	<0.0010	0.0010	11/30/18 16:47	
Molybdenum	mg/L	<0.0010	0.0010	11/30/18 16:47	
Selenium	mg/L	<0.0010	0.0010	11/30/18 16:47	
Thallium	mg/L	<0.0010	0.0010	11/30/18 16:47	

LABORATORY CONTROL SAMPLE: 2287743

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.040	99	85-115	
Arsenic	mg/L	.04	0.038	96	85-115	
Cadmium	mg/L	.04	0.040	101	85-115	
Cobalt	mg/L	.04	0.039	98	85-115	
Molybdenum	mg/L	.04	0.040	101	85-115	
Selenium	mg/L	.04	0.040	99	85-115	
Thallium	mg/L	.04	0.038	94	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2287744 2287745

Parameter	Units	60287213001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony	mg/L	<1.0 ug/L	.04	.04	0.039	0.041	98	101	70-130	3	20		
Arsenic	mg/L	<1.0 ug/L	.04	.04	0.039	0.040	96	98	70-130	2	20		
Cadmium	mg/L	<0.50 ug/L	.04	.04	0.036	0.037	90	92	70-130	3	20		
Cobalt	mg/L	<1.0 ug/L	.04	.04	0.038	0.039	93	96	70-130	2	20		
Molybdenum	mg/L	<1.0 ug/L	.04	.04	0.040	0.042	99	102	70-130	3	20		
Selenium	mg/L	<1.0 ug/L	.04	.04	0.036	0.038	90	94	70-130	5	20		
Thallium	mg/L	<1.0 ug/L	.04	.04	0.034	0.035	86	87	70-130	2	20		

MATRIX SPIKE SAMPLE: 2287746

Parameter	Units	60287575001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	<0.078 ug/L	.04	0.038	94	70-130	
Arsenic	mg/L	0.28J ug/L	.04	0.038	95	70-130	
Cadmium	mg/L	0.22J ug/L	.04	0.033	82	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60287551

MATRIX SPIKE SAMPLE:		2287746					
Parameter	Units	60287575001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cobalt	mg/L	0.067J ug/L	.04	0.036	89	70-130	
Molybdenum	mg/L	0.97J ug/L	.04	0.041	100	70-130	
Selenium	mg/L	0.15J ug/L	.04	0.041	103	70-130	
Thallium	mg/L	2.7 ug/L	.04	0.035	81	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60287551

QC Batch: 556732

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60287551001, 60287551002, 60287551004, 60287551005, 60287551006, 60287551007

METHOD BLANK: 2284609

Matrix: Water

Associated Lab Samples: 60287551001, 60287551002, 60287551003, 60287551004, 60287551005, 60287551006, 60287551007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	11/26/18 09:06	

LABORATORY CONTROL SAMPLE: 2284610

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	983	98	80-120	

SAMPLE DUPLICATE: 2284611

Parameter	Units	60287327002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1010	971	4	10	

SAMPLE DUPLICATE: 2284612

Parameter	Units	60287289004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	388	404	4	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60287551

QC Batch: 557437

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60287551003

METHOD BLANK: 2286880

Matrix: Water

Associated Lab Samples: 60287551003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	11/29/18 08:05	

LABORATORY CONTROL SAMPLE: 2286881

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1640	164	80-120	L1

SAMPLE DUPLICATE: 2286882

Parameter	Units	60287751001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	9.5	7.5	24	10	D6

SAMPLE DUPLICATE: 2286883

Parameter	Units	60287798001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	13600	12900	5	10	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60287551

QC Batch: 556708

Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B

Analysis Description: 4500H+B pH

Associated Lab Samples: 60287551001, 60287551002, 60287551003, 60287551004, 60287551005, 60287551006, 60287551007

SAMPLE DUPLICATE: 2284435

Parameter	Units	60287551007 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.3	0	5	H6

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60287551

QC Batch: 557950 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60287551001, 60287551002, 60287551003, 60287551004, 60287551005, 60287551006, 60287551007

METHOD BLANK: 2289240 Matrix: Water
Associated Lab Samples: 60287551001, 60287551002, 60287551003, 60287551004, 60287551005, 60287551006, 60287551007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	12/05/18 17:55	
Fluoride	mg/L	<0.20	0.20	12/05/18 17:55	
Sulfate	mg/L	<1.0	1.0	12/05/18 17:55	

LABORATORY CONTROL SAMPLE: 2289241

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	90-110	
Fluoride	mg/L	2.5	2.4	95	90-110	
Sulfate	mg/L	5	4.9	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2289242 2289243

Parameter	Units	60287388001 Result	MS Spike Conc.	MSD Spike Conc.	2289242		2289243		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Chloride	mg/L	1470	1000	1000	2660	2550	118	108	90-110	4	15	M1
Fluoride	mg/L	ND	500	500	632	518	119	96	90-110	20	15	M1, R1
Sulfate	mg/L	349	1000	1000	1330	1340	98	100	90-110	1	15	

MATRIX SPIKE SAMPLE: 2289244

Parameter	Units	60287745001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	201	250	443	97	90-110	
Sulfate	mg/L	554	250	815	105	90-110	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: LEC ISI CCR

Pace Project No.: 60287551

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

D6 The precision between the sample and sample duplicate exceeded laboratory control limits.

H1 Analysis conducted outside the EPA method holding time.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

R1 RPD value was outside control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

Pace Project No.: 60287551

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60287551001	MW-37-111918	EPA 200.7	557645	EPA 200.7	557703
60287551002	MW-38-111918	EPA 200.7	557645	EPA 200.7	557703
60287551003	MW-K-111918	EPA 200.7	557645	EPA 200.7	557703
60287551004	MW-L-111918	EPA 200.7	557645	EPA 200.7	557703
60287551005	MW-39-111918	EPA 200.7	557645	EPA 200.7	557703
60287551006	MW-40-111918	EPA 200.7	557645	EPA 200.7	557703
60287551007	DUP-111918	EPA 200.7	557645	EPA 200.7	557703
60287551001	MW-37-111918	EPA 200.8	557646	EPA 200.8	557704
60287551002	MW-38-111918	EPA 200.8	557646	EPA 200.8	557704
60287551003	MW-K-111918	EPA 200.8	557646	EPA 200.8	557704
60287551004	MW-L-111918	EPA 200.8	557646	EPA 200.8	557704
60287551005	MW-39-111918	EPA 200.8	557646	EPA 200.8	557704
60287551006	MW-40-111918	EPA 200.8	557646	EPA 200.8	557704
60287551007	DUP-111918	EPA 200.8	557646	EPA 200.8	557704
60287551001	MW-37-111918	EPA 245.1	557803	EPA 245.1	557853
60287551002	MW-38-111918	EPA 245.1	557803	EPA 245.1	557853
60287551003	MW-K-111918	EPA 245.1	557803	EPA 245.1	557853
60287551004	MW-L-111918	EPA 245.1	557803	EPA 245.1	557853
60287551005	MW-39-111918	EPA 245.1	557803	EPA 245.1	557853
60287551006	MW-40-111918	EPA 245.1	557803	EPA 245.1	557853
60287551007	DUP-111918	EPA 245.1	557803	EPA 245.1	557853
60287551001	MW-37-111918	SM 2540C	556732		
60287551002	MW-38-111918	SM 2540C	556732		
60287551003	MW-K-111918	SM 2540C	557437		
60287551004	MW-L-111918	SM 2540C	556732		
60287551005	MW-39-111918	SM 2540C	556732		
60287551006	MW-40-111918	SM 2540C	556732		
60287551007	DUP-111918	SM 2540C	556732		
60287551001	MW-37-111918	SM 4500-H+B	556708		
60287551002	MW-38-111918	SM 4500-H+B	556708		
60287551003	MW-K-111918	SM 4500-H+B	556708		
60287551004	MW-L-111918	SM 4500-H+B	556708		
60287551005	MW-39-111918	SM 4500-H+B	556708		
60287551006	MW-40-111918	SM 4500-H+B	556708		
60287551007	DUP-111918	SM 4500-H+B	556708		
60287551001	MW-37-111918	EPA 300.0	557950		
60287551002	MW-38-111918	EPA 300.0	557950		
60287551003	MW-K-111918	EPA 300.0	557950		
60287551004	MW-L-111918	EPA 300.0	557950		
60287551005	MW-39-111918	EPA 300.0	557950		
60287551006	MW-40-111918	EPA 300.0	557950		
60287551007	DUP-111918	EPA 300.0	557950		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60287551



Client Name: Westar Energy

Courier: FedEx UPS VIA Clay PEX ECI Pace Xroads Client Other

Tracking #: _____ Pace Shipping Label Used? Yes No

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No

Packing Material: Bubble Wrap Bubble Bags Foam None Other

Thermometer Used: T-298 Type of Ice: (wet) Blue None

Cooler Temperature (°C): As-read 1.7 Corr. Factor 0.0 Corrected 1.7

Date and initials of person examining contents:

P-11/21/18

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>PH</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<u>Hmw</u>

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

REVIEWED
By hwilson at 11:21 am, 11/25/18

Pace Container Order #420901

Addresses

Order By :	Ship To :	Return To:
Company <u>WESTAR ENERGY</u>	Company <u>WESTAR ENERGY</u>	Company <u>Pace Analytical Kansas</u>
Contact <u>Griffin, Brandon</u>	Contact <u>Griffin, Brandon</u>	Contact <u>Wilson, Heather</u>
Email <u>brandon.l.griffin@westarenergy.</u>	Email <u>brandon.l.griffin@westarenergy.</u>	Email <u>heather.wilson@pacelabs.com</u>
Address <u>818 S. Kansas Ave</u>	Address <u>818 S. Kansas Ave</u>	Address <u>9608 Loiret Blvd.</u>
Address 2 _____	Address 2 _____	Address 2 _____
City <u>Topeka</u>	City <u>Topeka</u>	City <u>Lenexa</u>
State <u>KS</u> Zip <u>66612</u>	State <u>KS</u> Zip <u>66612</u>	State <u>KS</u> Zip <u>66219</u>
Phone <u>785-575-8135</u>	Phone <u>785-575-8135</u>	Phone <u>1(913)563-1407</u>

Info

Project Name <u>LEC ISI CCR</u>	Due Date <u>11/14/2018</u>	Profile <u>9655</u>	Quote _____
Project Manager <u>Wilson, Heather</u>	Return _____	Carrier <u>Most Economical</u>	Location _____

Trip Blanks <input type="checkbox"/> Include Trip Blanks	Bottle Labels <input type="checkbox"/> Blank <input checked="" type="checkbox"/> Pre-Printed No Sample IDs <input type="checkbox"/> Pre-Printed With Sample IDs	Bottles <input type="checkbox"/> Boxed Cases <input type="checkbox"/> Individually Wrapped <input type="checkbox"/> Grouped By Sample
Return Shipping Labels <input checked="" type="checkbox"/> No Shipper Number <input type="checkbox"/> With Shipper Number	Misc <input type="checkbox"/> Sampling Instructions <input checked="" type="checkbox"/> Custody Seal <input checked="" type="checkbox"/> Temp. Blanks <input checked="" type="checkbox"/> Coolers _____ <input type="checkbox"/> Syringes _____	
COC Options <input type="checkbox"/> Number of Blanks _____ <input checked="" type="checkbox"/> Pre-Printed <u>1</u>	<input type="checkbox"/> Extra Bubble Wrap <input type="checkbox"/> Short Hold/Rush Stickers <input type="checkbox"/> DI Water <u>Liter(s)</u> <input type="checkbox"/> USDA Regulated Soils	

# of Samples	Matrix	Test	Container	Total	# of QC	Lot #	Notes
7	WT	Metals	1-1L plastic w/HNO3	7	0	091718-1DDN	
7	WT	300.0 Anions/pH/TDS	1L plastic unpreserved	7	0	100118-2APJ	
4	WT	1L Unpreserved (extra containers requested)	None	4	0		

Hazard Shipping Placard In Place : NO

- *Sample receiving hours are Mon-Fri 7:00am-6:00pm and Sat 8:00am-2:00pm unless special arrangements are made with your project manager.
- *Pace Analytical reserves the right to return hazardous, toxic, or radioactive samples to you.
- *Pace Analytical reserves the right to charge for unused bottles, as well as cost associated with sample storage and disposal.
- *Payment term are net 30 days.
- *Please include the proposal number on the chain of custody to insure proper billing.

Sample Notes	Ship Date :
PP COC (1), PP labels w/o sample IDs Lenexa return	11/15/2018
	Prepared By:
	robin
	Verified By:

December 17, 2018

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC ISI CCR
Pace Project No.: 60287923

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on November 27, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC ISI CCR

Pace Project No.: 60287923

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC ISI CCR

Pace Project No.: 60287923

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60287923001	MW-37-111918	Water	11/19/18 09:43	11/27/18 11:30
60287923002	MW-38-111918	Water	11/19/18 10:51	11/27/18 11:30
60287923003	MW-K-111918	Water	11/19/18 11:52	11/27/18 11:30
60287923004	MW-L-111918	Water	11/19/18 13:03	11/27/18 11:30
60287923005	MW-39-111918	Water	11/19/18 14:01	11/27/18 11:30
60287923006	MW-40-111918	Water	11/19/18 15:22	11/27/18 11:30
60287923007	DUP-111918	Water	11/19/18 06:00	11/27/18 11:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60287923

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60287923001	MW-37-111918	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60287923002	MW-38-111918	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60287923003	MW-K-111918	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60287923004	MW-L-111918	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60287923005	MW-39-111918	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60287923006	MW-40-111918	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60287923007	DUP-111918	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60287923

Sample: MW-37-111918 **Lab ID: 60287923001** Collected: 11/19/18 09:43 Received: 11/27/18 11:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.000 ± 0.376 (0.766) C:NA T:84%	pCi/L	12/14/18 22:16	13982-63-3	
Radium-228	EPA 904.0	0.449 ± 0.388 (0.783) C:66% T:90%	pCi/L	12/14/18 11:07	15262-20-1	
Total Radium	Total Radium Calculation	0.449 ± 0.764 (1.55)	pCi/L	12/17/18 13:55	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60287923

Sample: MW-38-111918 **Lab ID: 60287923002** Collected: 11/19/18 10:51 Received: 11/27/18 11:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.443 ± 0.413 (0.544) C:NA T:94%	pCi/L	12/14/18 22:29	13982-63-3	
Radium-228	EPA 904.0	0.508 ± 0.385 (0.759) C:71% T:90%	pCi/L	12/14/18 11:07	15262-20-1	
Total Radium	Total Radium Calculation	0.951 ± 0.798 (1.30)	pCi/L	12/17/18 13:55	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60287923

Sample: MW-K-111918 **Lab ID: 60287923003** Collected: 11/19/18 11:52 Received: 11/27/18 11:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0711 ± 0.324 (0.193) C:NA T:97%	pCi/L	12/14/18 22:29	13982-63-3	
Radium-228	EPA 904.0	0.793 ± 0.440 (0.798) C:68% T:85%	pCi/L	12/14/18 11:07	15262-20-1	
Total Radium	Total Radium Calculation	0.864 ± 0.764 (0.991)	pCi/L	12/17/18 13:55	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60287923

Sample: MW-L-111918 **Lab ID: 60287923004** Collected: 11/19/18 13:03 Received: 11/27/18 11:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.703 ± 0.672 (1.02) C:NA T:85%	pCi/L	12/14/18 22:38	13982-63-3	
Radium-228	EPA 904.0	1.38 ± 0.555 (0.885) C:70% T:83%	pCi/L	12/14/18 11:07	15262-20-1	
Total Radium	Total Radium Calculation	2.08 ± 1.23 (1.91)	pCi/L	12/17/18 13:55	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60287923

Sample: MW-39-111918 **Lab ID: 60287923005** Collected: 11/19/18 14:01 Received: 11/27/18 11:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0875 ± 0.515 (1.05) C:NA T:79%	pCi/L	12/14/18 22:49	13982-63-3	
Radium-228	EPA 904.0	1.14 ± 0.460 (0.713) C:66% T:94%	pCi/L	12/14/18 11:07	15262-20-1	
Total Radium	Total Radium Calculation	1.23 ± 0.975 (1.76)	pCi/L	12/17/18 13:55	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60287923

Sample: MW-40-111918 **Lab ID: 60287923006** Collected: 11/19/18 15:22 Received: 11/27/18 11:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0732 ± 0.334 (0.539) C:NA T:94%	pCi/L	12/14/18 22:38	13982-63-3	
Radium-228	EPA 904.0	0.737 ± 0.456 (0.858) C:70% T:81%	pCi/L	12/14/18 11:07	15262-20-1	
Total Radium	Total Radium Calculation	0.810 ± 0.790 (1.40)	pCi/L	12/17/18 13:55	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60287923

Sample: DUP-111918 **Lab ID: 60287923007** Collected: 11/19/18 06:00 Received: 11/27/18 11:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.453 ± 0.515 (0.812) C:NA T:92%	pCi/L	12/14/18 22:29	13982-63-3	
Radium-228	EPA 904.0	1.37 ± 0.491 (0.685) C:70% T:84%	pCi/L	12/14/18 11:08	15262-20-1	
Total Radium	Total Radium Calculation	1.82 ± 1.01 (1.50)	pCi/L	12/17/18 13:55	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60287923

QC Batch:	322685	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60287923001, 60287923002, 60287923003, 60287923004, 60287923005, 60287923006, 60287923007		

METHOD BLANK:	1572868	Matrix:	Water
Associated Lab Samples:	60287923001, 60287923002, 60287923003, 60287923004, 60287923005, 60287923006, 60287923007		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0834 ± 0.490 (1.00) C:NA T:88%	pCi/L	12/14/18 21:48	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60287923

QC Batch: 322730

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60287923001, 60287923002, 60287923003, 60287923004, 60287923005, 60287923006, 60287923007

METHOD BLANK: 1572968

Matrix: Water

Associated Lab Samples: 60287923001, 60287923002, 60287923003, 60287923004, 60287923005, 60287923006, 60287923007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.149 ± 0.353 (0.784) C:77% T:84%	pCi/L	12/14/18 11:06	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: LEC ISI CCR

Pace Project No.: 60287923

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

Pace Project No.: 60287923

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60287923001	MW-37-111918	EPA 903.1	322685		
60287923002	MW-38-111918	EPA 903.1	322685		
60287923003	MW-K-111918	EPA 903.1	322685		
60287923004	MW-L-111918	EPA 903.1	322685		
60287923005	MW-39-111918	EPA 903.1	322685		
60287923006	MW-40-111918	EPA 903.1	322685		
60287923007	DUP-111918	EPA 903.1	322685		
60287923001	MW-37-111918	EPA 904.0	322730		
60287923002	MW-38-111918	EPA 904.0	322730		
60287923003	MW-K-111918	EPA 904.0	322730		
60287923004	MW-L-111918	EPA 904.0	322730		
60287923005	MW-39-111918	EPA 904.0	322730		
60287923006	MW-40-111918	EPA 904.0	322730		
60287923007	DUP-111918	EPA 904.0	322730		
60287923001	MW-37-111918	Total Radium Calculation	324218		
60287923002	MW-38-111918	Total Radium Calculation	324218		
60287923003	MW-K-111918	Total Radium Calculation	324218		
60287923004	MW-L-111918	Total Radium Calculation	324218		
60287923005	MW-39-111918	Total Radium Calculation	324218		
60287923006	MW-40-111918	Total Radium Calculation	324218		
60287923007	DUP-111918	Total Radium Calculation	324218		

REPORT OF LABORATORY ANALYSIS

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A

Required Client Information:

Company: **WESTAR ENERGY**

Address: **818 Kansas Ave**
Topeka, KS 66612

Email To: **brandon.l.griffin@westarenergy.com**

Phone: **785-575-8135** Fax: _____

Requested Due Date/TAT: **15 day**

Section B

Required Project Information:

Report To: **Brandon Griffin**

Copy To: **Jared Morrison**

Purchase Order No.: **10LEC-0000012756**

Project Name: **LEC ISI CCR**

Project Number: _____

Section C

Invoice Information:

Attention: _____

Company Name: _____

Address: _____

Pace Quote Reference: _____

Pace Project Manager: **Heather Wilson 913-563-1407**

Pace Profile #: **9655, 1**

Page: 1 of 1

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER

UST RCRA OTHER _____

Site Location: **KS**

STATE: _____

ITEM #	Section D Required Client Information SAMPLE ID (A-Z, 0-9 / . -) Sample IDs MUST BE UNIQUE	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL OL WIPE WP AIR AR OTHER OT TISSUE TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test ↓	Requested Analysis Filtered (Y/N)			Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.					
					COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other		Radium-226	Radium-228	Total Radium							
					DATE	TIME	DATE	TIME																					
1	MW-37-111918		WTG	G			11/19	0943	2		2																		
2	MW-38-111918		WTG	G			11/19	1051	2		2																		
3	MW-K-111918		WTG	G			11/19	1152	2		2																		
4	MW-L-111918		WTG	G			11/19	1303	2		2																		
5	MW-39-111918		WTG	G			11/19	1401	2		2																		
6	MW-40-111918		WTG	G			11/19	1522	2		2																		
7																													
8																													
9																													
10																													
11	Dup-111918		WTG	G			11/19	0600	2		2																		
12																													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS							
	<i>APRY / westar</i>	<i>11/19/18</i>	<i>1630</i>	<i>Emily</i>	<i>11/27/18</i>	<i>1130</i>	<i>28</i>	<i>Y</i>	<i>N</i>	<i>Y</i>				
		<i>11/26/18</i>	<i>0730</i>											

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: <i>Brandon Griffin</i>					
SIGNATURE of SAMPLER: <i>[Signature]</i>	DATE Signed (MM/DD/YY): <i>11/19/18</i>				

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace KS Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 4542 2786 1143

Label _____
LIMS Login _____

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used 9 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 2.9 °C Correction Factor: -0.1 °C Final Temp: 2.8 °C
Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>10D2981</u>	<u>ET 11-28-18</u>
Chain of Custody Present:	/				
Chain of Custody Filled Out:	/				
Chain of Custody Relinquished:	/				
Sampler Name & Signature on COC:	/				
Sample Labels match COC:	/				
-Includes date/time/ID Matrix: <u>WT</u>					
Samples Arrived within Hold Time:	/				
Short Hold Time Analysis (<72hr remaining):	/				
Rush Turn Around Time Requested:	/				
Sufficient Volume:	/				
Correct Containers Used:	/				
-Pace Containers Used:	/				
Containers Intact:	/				
Orthophosphate field filtered			/		
Hex Cr Aqueous Compliance/NPDES sample field filtered			/		
Organic Samples checked for dechlorination:			/		
Filtered volume received for Dissolved tests			/		
All containers have been checked for preservation.	/				
All containers needing preservation are found to be in compliance with EPA recommendation.	/				
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed <u>ET</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):			/		
Trip Blank Present:			/		
Trip Blank Custody Seals Present			/		
Rad Aqueous Samples Screened > 0.5 mrem/hr			/	Initial when completed: <u>ET</u>	Date: <u>11-28-18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: WESTAR ENERGY		Report To: Brandon Griffin		Attention:	
Address: 818 Kansas Ave Topeka, KS 66612		Copy To: Jared Morrison		Company Name:	
Email To: brandon.l.griffin@westarenergy.com		Purchase Order No.: 10LEC-0000012756		Address:	
Phone: 785-575-8135 Fax:		Project Name: LEC ISI CCR		Pace Quote Reference:	
Requested Due Date/TAT: 15 day		Project Number:		Pace Project Manager: Heather Wilson 913-563-1407	
				Pace Profile #: 9655, 1	
				REGULATORY AGENCY	
				<input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER	
				Site Location: KS	
				STATE: KS	

ITEM #	Section D Required Client Information SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL OL WIPE WP AIR AR OTHER OT TISSUE TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test ↓ Radium-226 Radium-228 Total Radium	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.				
					COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other								
					DATE	TIME	DATE	TIME																		
1	MW-37-111918		WTG				11/19	0943	2		2															
2	MW-38-111918		WTG				11/19	1051	2		2															
3	MW-K-111918		WTG				11/19	1152	2		2															
4	MW-L-111918		WTG				11/19	1303	2		2															
5	MW-39-111918		WTG				11/19	1401	2		2															
6	MW-40-111918		WTG				11/19	1522	2		2															
7																										
8																										
9																										
10																										
11	Dup-111918		WTG				11/19	0600	2		2															
12																										

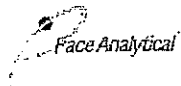
ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS							
	MJG / westar	11/24/18	1630	Emily	11/27/18	1130	2-8	Y	N	Y				
		11/26/18	0730											

SAMPLER NAME AND SIGNATURE			Temp in °C	Received on ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: Brandon Griffin						
SIGNATURE of SAMPLER: <i>MJG</i>		DATE Signed (MM/DD/YY): 11/19/18				

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt

#. 30273145



Client Name: Pace KS Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 454227861143

Label	<u>MD</u>
LIMS Login	<u>MD</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used 9 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 2.9 °C Correction Factor: -0.1 °C Final Temp: 2.8 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>10DZ981</u>	<u>ET 11-28-18</u>
Chain of Custody Present:	/			1.	
Chain of Custody Filled Out:	/			2.	
Chain of Custody Relinquished:	/			3.	
Sampler Name & Signature on COC:	/			4.	
Sample Labels match COC:	/			5.	
-Includes date/time/ID Matrix: <u>WT</u>	/				
Samples Arrived within Hold Time:	/			6.	
Short Hold Time Analysis (<72hr remaining):	/			7.	
Rush Turn Around Time Requested:	/			8.	
Sufficient Volume:	/			9.	
Correct Containers Used:	/			10.	
-Pace Containers Used:	/				
Containers Intact:	/			11.	
Orthophosphate field filtered	/			12.	
Hex Cr Aqueous Compliance/NPDES sample field filtered	/			13.	
Organic Samples checked for dechlorination:	/			14.	
Filtered volume received for Dissolved tests	/			15.	
All containers have been checked for preservation.	/			16.	<u>PHLZ</u>
All containers needing preservation are found to be in compliance with EPA recommendation.	/				
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed	Date/time of preservation
				<u>ET</u>	
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):	/			17.	
Trip Blank Present:	/			18.	
Trip Blank Custody Seals Present	/				
Rad Aqueous Samples Screened > 0.5 mrem/hr	/			Initial when completed:	Date:
				<u>ET</u>	<u>11-28-18</u>

Client Notification/ Resolution:
 Person Contacted: _____ Date/Time: _____ Contacted By: _____
 Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)
 *PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

ATTACHMENT 1-7
December 2018 Sampling Event
Laboratory Analytical Report

December 21, 2018

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC ISI CCR
Pace Project No.: 60289359

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on December 12, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC ISI CCR

Pace Project No.: 60289359

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Certification Number: 10090

Arkansas Drinking Water

WY STR Certification #: 2456.01

Arkansas Certification #: 18-016-0

Arkansas Drinking Water

Illinois Certification #: 004455

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116 / E10426

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407-18-11

Utah Certification #: KS000212018-8

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC ISI CCR

Pace Project No.: 60289359

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60289359001	MW-K-121218	Water	12/12/18 10:15	12/12/18 16:15
60289359002	MW-L-121218	Water	12/12/18 12:00	12/12/18 16:15
60289359003	DUP-121218	Water	12/12/18 06:00	12/12/18 16:15

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60289359

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60289359001	MW-K-121218	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	JDE	1	PASI-K
		SM 2540C	AJS	1	PASI-K
		SM 4500-H+B	RMT	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60289359002	MW-L-121218	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	JDE	1	PASI-K
		SM 2540C	AJS	1	PASI-K
		SM 4500-H+B	RMT	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60289359003	DUP-121218	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	JDE	1	PASI-K
		SM 2540C	AJS	1	PASI-K
		SM 4500-H+B	RMT	1	PASI-K
		EPA 300.0	WNM	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60289359

Sample: MW-K-121218		Lab ID: 60289359001	Collected: 12/12/18 10:15	Received: 12/12/18 16:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.042	mg/L	0.0050	1	12/18/18 15:14	12/20/18 22:59	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/18/18 15:14	12/20/18 22:59	7440-41-7	
Boron, Total Recoverable	2.6	mg/L	0.10	1	12/18/18 15:14	12/20/18 22:59	7440-42-8	
Calcium, Total Recoverable	541	mg/L	0.20	1	12/18/18 15:14	12/20/18 22:59	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	12/18/18 15:14	12/20/18 22:59	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	12/18/18 15:14	12/20/18 22:59	7439-92-1	
Lithium	0.076	mg/L	0.010	1	12/18/18 15:14	12/20/18 22:59	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:40	7440-36-0	
Arsenic, Total Recoverable	0.069	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:40	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	12/17/18 17:30	12/20/18 14:40	7440-43-9	
Cobalt, Total Recoverable	0.0015	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:40	7440-48-4	
Molybdenum, Total Recoverable	0.022	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:40	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:40	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:40	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	12/18/18 11:35	12/19/18 10:28	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	4010	mg/L	5.0	1		12/14/18 11:08		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2	Std. Units	0.10	1		12/14/18 17:20		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	587	mg/L	50.0	50		12/18/18 21:17	16887-00-6	
Fluoride	3.1	mg/L	0.20	1		12/18/18 20:49	16984-48-8	
Sulfate	1920	mg/L	200	200		12/19/18 23:41	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60289359

Sample: MW-L-121218	Lab ID: 60289359002	Collected: 12/12/18 12:00	Received: 12/12/18 16:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.042	mg/L	0.0050	1	12/18/18 15:14	12/20/18 23:01	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/18/18 15:14	12/20/18 23:01	7440-41-7	
Boron, Total Recoverable	1.9	mg/L	0.10	1	12/18/18 15:14	12/20/18 23:01	7440-42-8	
Calcium, Total Recoverable	624	mg/L	0.20	1	12/18/18 15:14	12/20/18 23:01	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	12/18/18 15:14	12/20/18 23:01	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	12/18/18 15:14	12/20/18 23:01	7439-92-1	
Lithium	0.049	mg/L	0.010	1	12/18/18 15:14	12/20/18 23:01	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:46	7440-36-0	
Arsenic, Total Recoverable	0.025	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:46	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	12/17/18 17:30	12/20/18 14:46	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:46	7440-48-4	
Molybdenum, Total Recoverable	0.047	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:46	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:46	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:46	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	12/18/18 11:35	12/19/18 10:31	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	4900	mg/L	5.0	1		12/14/18 11:08		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	6.8	Std. Units	0.10	1		12/17/18 11:02		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	822	mg/L	50.0	50		12/18/18 22:00	16887-00-6	
Fluoride	2.1	mg/L	0.20	1		12/18/18 21:32	16984-48-8	
Sulfate	2310	mg/L	200	200		12/20/18 00:23	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60289359

Sample: DUP-121218		Lab ID: 60289359003	Collected: 12/12/18 06:00	Received: 12/12/18 16:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.041	mg/L	0.0050	1	12/18/18 15:14	12/20/18 23:04	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/18/18 15:14	12/20/18 23:04	7440-41-7	
Boron, Total Recoverable	2.5	mg/L	0.10	1	12/18/18 15:14	12/20/18 23:04	7440-42-8	
Calcium, Total Recoverable	532	mg/L	0.20	1	12/18/18 15:14	12/20/18 23:04	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	12/18/18 15:14	12/20/18 23:04	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	12/18/18 15:14	12/20/18 23:04	7439-92-1	
Lithium	0.077	mg/L	0.010	1	12/18/18 15:14	12/20/18 23:04	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:48	7440-36-0	
Arsenic, Total Recoverable	0.070	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:48	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	12/17/18 17:30	12/20/18 14:48	7440-43-9	
Cobalt, Total Recoverable	0.0014	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:48	7440-48-4	
Molybdenum, Total Recoverable	0.022	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:48	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:48	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/17/18 17:30	12/20/18 14:48	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	12/18/18 11:35	12/19/18 10:33	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3950	mg/L	5.0	1		12/14/18 11:08		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2	Std. Units	0.10	1		12/14/18 17:02		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	571	mg/L	50.0	50		12/18/18 23:11	16887-00-6	
Fluoride	3.1	mg/L	0.20	1		12/18/18 22:43	16984-48-8	
Sulfate	1890	mg/L	200	200		12/20/18 00:38	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60289359

QC Batch: 560769 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60289359001, 60289359002, 60289359003

METHOD BLANK: 2301779 Matrix: Water
Associated Lab Samples: 60289359001, 60289359002, 60289359003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	12/19/18 10:10	

LABORATORY CONTROL SAMPLE: 2301780

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0049	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2301781 2301782

Parameter	Units	60288834001		2301781		2301782		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Mercury	mg/L	ND	0.005	0.005	0.005	0.0046	0.0046	90	90	70-130	0	20

MATRIX SPIKE SAMPLE: 2301783

Parameter	Units	60289092002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	0.005	0.0048	96	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60289359

QC Batch: 560802 Analysis Method: EPA 200.7
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
 Associated Lab Samples: 60289359001, 60289359002, 60289359003

METHOD BLANK: 2301840 Matrix: Water

Associated Lab Samples: 60289359001, 60289359002, 60289359003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	12/20/18 22:11	
Beryllium	mg/L	<0.0010	0.0010	12/20/18 22:11	
Boron	mg/L	<0.10	0.10	12/20/18 22:11	
Calcium	mg/L	<0.20	0.20	12/20/18 22:11	
Chromium	mg/L	<0.0050	0.0050	12/20/18 22:11	
Lead	mg/L	<0.010	0.010	12/20/18 22:11	
Lithium	mg/L	<0.010	0.010	12/20/18 22:11	

LABORATORY CONTROL SAMPLE: 2301841

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.0	100	85-115	
Beryllium	mg/L	1	0.99	99	85-115	
Boron	mg/L	1	0.95	95	85-115	
Calcium	mg/L	10	10.4	104	85-115	
Chromium	mg/L	1	0.97	97	85-115	
Lead	mg/L	1	0.97	97	85-115	
Lithium	mg/L	1	1.0	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2301842 2301843

Parameter	Units	60288818001		2301843		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Barium	mg/L	73.3 ug/L	1	1	1.0	1.0	97	95	70-130	2	20
Beryllium	mg/L	<0.16 ug/L	1	1	0.96	0.95	96	95	70-130	2	20
Boron	mg/L	9410 ug/L	1	1	10.6	10.2	117	77	70-130	4	20
Calcium	mg/L	85100 ug/L	10	10	95.8	92.5	107	74	70-130	4	20
Chromium	mg/L	<1.1 ug/L	1	1	0.93	0.91	93	91	70-130	2	20
Lead	mg/L	<3.0 ug/L	1	1	0.93	0.91	93	91	70-130	3	20
Lithium	mg/L	16.5 ug/L	1	1	1.0	0.99	100	98	70-130	2	20

MATRIX SPIKE SAMPLE: 2301844

Parameter	Units	60289240001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	49.0 ug/L	1	1.0	98	70-130	
Beryllium	mg/L	ND	1	0.98	98	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60289359

MATRIX SPIKE SAMPLE:		2301844					
Parameter	Units	60289240001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	mg/L	143 ug/L	1	1.1	97	70-130	
Calcium	mg/L	35500 ug/L	10	45.6	101	70-130	
Chromium	mg/L	ND	1	0.95	94	70-130	
Lead	mg/L	ND	1	0.92	92	70-130	
Lithium	mg/L	39.3 ug/L	1	1.0	101	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60289359

QC Batch: 560656 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60289359001, 60289359002, 60289359003

METHOD BLANK: 2301396 Matrix: Water
Associated Lab Samples: 60289359001, 60289359002, 60289359003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	12/20/18 14:30	
Arsenic	mg/L	<0.0010	0.0010	12/20/18 14:30	
Cadmium	mg/L	<0.00050	0.00050	12/20/18 14:30	
Cobalt	mg/L	<0.0010	0.0010	12/20/18 14:30	
Molybdenum	mg/L	<0.0010	0.0010	12/20/18 14:30	
Selenium	mg/L	<0.0010	0.0010	12/20/18 14:30	
Thallium	mg/L	<0.0010	0.0010	12/20/18 14:30	

LABORATORY CONTROL SAMPLE: 2301397

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	0.04	0.039	98	85-115	
Arsenic	mg/L	0.04	0.039	99	85-115	
Cadmium	mg/L	0.04	0.039	98	85-115	
Cobalt	mg/L	0.04	0.040	99	85-115	
Molybdenum	mg/L	0.04	0.040	100	85-115	
Selenium	mg/L	0.04	0.039	97	85-115	
Thallium	mg/L	0.04	0.037	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2301398 2301399

Parameter	Units	60289359001		2301398		2301399		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Antimony	mg/L	<0.0010	0.04	0.04	0.04	0.038	0.038	95	94	70-130	1	20	
Arsenic	mg/L	0.069	0.04	0.04	0.04	0.11	0.11	98	96	70-130	1	20	
Cadmium	mg/L	<0.00050	0.04	0.04	0.04	0.034	0.034	86	85	70-130	1	20	
Cobalt	mg/L	0.0015	0.04	0.04	0.04	0.044	0.043	106	104	70-130	1	20	
Molybdenum	mg/L	0.022	0.04	0.04	0.04	0.064	0.064	105	104	70-130	1	20	
Selenium	mg/L	<0.0010	0.04	0.04	0.04	0.040	0.039	99	96	70-130	3	20	
Thallium	mg/L	<0.0010	0.04	0.04	0.04	0.031	0.031	79	78	70-130	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60289359

QC Batch: 560131

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60289359001, 60289359002, 60289359003

METHOD BLANK: 2298937

Matrix: Water

Associated Lab Samples: 60289359001, 60289359002, 60289359003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	12/14/18 11:08	

LABORATORY CONTROL SAMPLE: 2298938

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1020	102	80-120	

SAMPLE DUPLICATE: 2298939

Parameter	Units	60289287002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1210	1210	0	10	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60289359

QC Batch: 560284 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60289359001, 60289359003

SAMPLE DUPLICATE: 2299718

Parameter	Units	60289172008 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.9	6.9	0	5	H6

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60289359

QC Batch: 560490

Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B

Analysis Description: 4500H+B pH

Associated Lab Samples: 60289359002

SAMPLE DUPLICATE: 2301034

Parameter	Units	60289693001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.1	7.0	0	5	H6

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60289359

QC Batch: 560519 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60289359001, 60289359002, 60289359003

METHOD BLANK: 2301123 Matrix: Water

Associated Lab Samples: 60289359001, 60289359002, 60289359003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	12/18/18 15:23	
Fluoride	mg/L	<0.20	0.20	12/18/18 15:23	

LABORATORY CONTROL SAMPLE: 2301124

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.5	91	90-110	
Fluoride	mg/L	2.5	2.4	98	90-110	

MATRIX SPIKE SAMPLE: 2301127

Parameter	Units	60289640001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	227	250	481	101	90-110	
Fluoride	mg/L	1.0	2.5	3.6	103	90-110	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60289359

QC Batch: 561048 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60289359001, 60289359002, 60289359003

METHOD BLANK: 2302742 Matrix: Water

Associated Lab Samples: 60289359001, 60289359002, 60289359003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	12/19/18 15:52	

LABORATORY CONTROL SAMPLE: 2302743

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.1	102	90-110	

MATRIX SPIKE SAMPLE: 2302744

Parameter	Units	60287798002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	9080	5000	14400	107	90-110	

MATRIX SPIKE SAMPLE: 2302746

Parameter	Units	60288978001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	1110	500	1650	109	90-110	

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QUALIFIERS

Project: LEC ISI CCR

Pace Project No.: 60289359

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

H6 Analysis initiated outside of the 15 minute EPA required holding time.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

Pace Project No.: 60289359

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60289359001	MW-K-121218	EPA 200.7	560802	EPA 200.7	560932
60289359002	MW-L-121218	EPA 200.7	560802	EPA 200.7	560932
60289359003	DUP-121218	EPA 200.7	560802	EPA 200.7	560932
60289359001	MW-K-121218	EPA 200.8	560656	EPA 200.8	560729
60289359002	MW-L-121218	EPA 200.8	560656	EPA 200.8	560729
60289359003	DUP-121218	EPA 200.8	560656	EPA 200.8	560729
60289359001	MW-K-121218	EPA 245.1	560769	EPA 245.1	560834
60289359002	MW-L-121218	EPA 245.1	560769	EPA 245.1	560834
60289359003	DUP-121218	EPA 245.1	560769	EPA 245.1	560834
60289359001	MW-K-121218	SM 2540C	560131		
60289359002	MW-L-121218	SM 2540C	560131		
60289359003	DUP-121218	SM 2540C	560131		
60289359001	MW-K-121218	SM 4500-H+B	560284		
60289359002	MW-L-121218	SM 4500-H+B	560490		
60289359003	DUP-121218	SM 4500-H+B	560284		
60289359001	MW-K-121218	EPA 300.0	560519		
60289359001	MW-K-121218	EPA 300.0	561048		
60289359002	MW-L-121218	EPA 300.0	560519		
60289359002	MW-L-121218	EPA 300.0	561048		
60289359003	DUP-121218	EPA 300.0	560519		
60289359003	DUP-121218	EPA 300.0	561048		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60289359



Client Name: Westar Energy

Courier: FedEx UPS VIA Clay PEX ECI Pace Xroads Client Other

Tracking #: _____ Pace Shipping Label Used? Yes No

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No

Packing Material: Bubble Wrap Bubble Bags Foam None Other

Thermometer Used: T-298 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 1.1 Corr. Factor 0.0 Corrected 1.1

Date and initials of person examining contents:

12/12/18

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Hmw

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review:

REVIEWED
By hwilson at 9:11 am, 12/14/18

Date: _____

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: WESTAR ENERGY		Report To: Brandon Griffin		Attention:	
Address: 818 Kansas Ave Topeka, KS 66612		Copy To: Jared Morrison		Company Name: REGULATORY AGENCY	
Email To: brandon.l.griffin@westarenergy.com		Purchase Order No.: 10LEC-0000012756		Address:	
Phone: 785-575-8135 Fax:		Project Name: LEC ISI CCR		<input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER	
Requested Due Date/TAT: 7 day		Project Number:		Pace Quote Reference: Pace Project Manager: Heather Wilson 913-563-1407 Pace Profile #: 9655, 1	
				Site Location: KS STATE:	

ITEM #	Section D Required Client Information	Valid Matrix Codes MATRIX CODE	COLLECTED COMPOSITE START COMPOSITE END/GRAB	SAMPLE TYPE (G=GRAB C=COMP)	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Requested Analysis Filtered (Y/N)					Residual Chlorine (Y/N)		
							Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other	Analysis Test	200.7 Total Metals*	200.8 Total Metals**	245.1 Total Hg		300: Cl, F, SO ₄	4500 H+H
1	MW-K-121218 (A-Z, 0-9 /, -) Sample IDs MUST BE UNIQUE	WTG	12/12 1015	WTG		2	1	1													60289359
2	MW-L-121218	WTG	12/12 1200	WTG		2	1	1													Pace Project No./ Lab I.D.
9	DUP-121218	WTG	12/12 0600	WTG		2	1	1													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
200.7 Total Metals*: B, Ca, Ba, Be, Cr, Pb, Li	[Signature] / Westar	12/12/18	1315	[Signature]	12/12/18	1615	1/1 7 7 7
200.8 Total Metals**: Sb, As, Cd, Co, Mo, Se, Ti							

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: Brandon Griffin					
SIGNATURE of SAMPLER: [Signature]					
		DATE Signed (MM/DD/YY): 12/12/18			

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

January 07, 2019

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC ISI CCR
Pace Project No.: 60289938

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on December 13, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC ISI CCR

Pace Project No.: 60289938

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: LEC ISI CCR

Pace Project No.: 60289938

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60289938001	MW-K-121218	Water	12/12/18 10:15	12/13/18 10:00
60289938002	MW-L-121218	Water	12/12/18 12:00	12/13/18 10:00
60289938003	DUP-121218	Water	12/12/18 06:00	12/13/18 10:00

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60289938

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60289938001	MW-K-121218	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60289938002	MW-L-121218	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60289938003	DUP-121218	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60289938

Sample: MW-K-121218 **Lab ID: 60289938001** Collected: 12/12/18 10:15 Received: 12/13/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.361 ± 0.336 (0.442) C:NA T:93%	pCi/L	01/03/19 11:16	13982-63-3	
Radium-228	EPA 904.0	0.802 ± 0.425 (0.741) C:71% T:78%	pCi/L	01/07/19 12:58	15262-20-1	
Total Radium	Total Radium Calculation	1.16 ± 0.761 (1.18)	pCi/L	01/07/19 16:25	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60289938

Sample: MW-L-121218 **Lab ID: 60289938002** Collected: 12/12/18 12:00 Received: 12/13/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.168 ± 0.396 (0.734) C:NA T:93%	pCi/L	01/03/19 11:16	13982-63-3	
Radium-228	EPA 904.0	0.990 ± 0.484 (0.836) C:76% T:73%	pCi/L	01/07/19 12:58	15262-20-1	
Total Radium	Total Radium Calculation	1.16 ± 0.880 (1.57)	pCi/L	01/07/19 16:25	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60289938

Sample: DUP-121218 **Lab ID: 60289938003** Collected: 12/12/18 06:00 Received: 12/13/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.798 ± 0.590 (0.798) C:NA T:83%	pCi/L	01/03/19 11:16	13982-63-3	
Radium-228	EPA 904.0	0.860 ± 0.433 (0.750) C:74% T:79%	pCi/L	01/07/19 12:59	15262-20-1	
Total Radium	Total Radium Calculation	1.66 ± 1.02 (1.55)	pCi/L	01/07/19 16:25	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60289938

QC Batch: 324573

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60289938001, 60289938002, 60289938003

METHOD BLANK: 1581922

Matrix: Water

Associated Lab Samples: 60289938001, 60289938002, 60289938003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.200 ± 0.434 (0.802) C:NA T:81%	pCi/L	01/03/19 10:38	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60289938

QC Batch: 324575

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60289938001, 60289938002, 60289938003

METHOD BLANK: 1581926

Matrix: Water

Associated Lab Samples: 60289938001, 60289938002, 60289938003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.196 ± 0.325 (0.706) C:81% T:70%	pCi/L	01/07/19 12:59	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: LEC ISI CCR

Pace Project No.: 60289938

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

Pace Project No.: 60289938

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60289938001	MW-K-121218	EPA 903.1	324573		
60289938002	MW-L-121218	EPA 903.1	324573		
60289938003	DUP-121218	EPA 903.1	324573		
60289938001	MW-K-121218	EPA 904.0	324575		
60289938002	MW-L-121218	EPA 904.0	324575		
60289938003	DUP-121218	EPA 904.0	324575		
60289938001	MW-K-121218	Total Radium Calculation	326186		
60289938002	MW-L-121218	Total Radium Calculation	326186		
60289938003	DUP-121218	Total Radium Calculation	326186		

REPORT OF LABORATORY ANALYSIS

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: () of ()

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: WESTAR ENERGY		Report To: Brandon Griffin		Attention:	
Address: 818 Kansas Ave Topeka, KS 66612		Copy To: Jared Morrison		Company Name:	
Email To: brandon.l.griffin@westarenergy.com		Purchase Order No.: 10LEC-0000012756		Address:	
Phone: 785-575-8135 Fax:		Project Name: LEC ISI CCR		Pace Quote Reference:	
Requested Due Date/TAT: 15 day		Project Number:		Pace Project Manager: Heather Wilson 913-563-1407	
				Pace Profile #: 9655, 1	
				REGULATORY AGENCY	
				<input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER _____	
				Site Location: KS	
				STATE: _____	

ITEM #	Section D Required Client Information	Valid Matrix Codes MATRIX CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives										Analysis Test ↓	Requested Analysis Filtered (Y/N)			Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.			
					COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other	Radium-226	Radium-228		Total Radium							
					DATE	TIME	DATE	TIME																					
1	MW-K-121218		WT G				12/12	1015		2	2																		
2	MW-L-121218		WT G				12/12	1200		2	2																		
3																													
4																													
5																													
6																													
7																													
8	DUP-12-12-18		WT G				12/12	0600		2	2																		
9																													
10																													
11																													
12																													

ADDITIONAL COMMENTS		RELINQUISHED BY / AFFILIATION		DATE	TIME	ACCEPTED BY / AFFILIATION		DATE	TIME	SAMPLE CONDITIONS			
		Brynn Westar		12/12/18	1315	Ben Munton		12-13-18	1000	1.5	Y	Y	Y

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples intact (Y/N)
PRINT Name of SAMPLER:	Brandon Griffin				
SIGNATURE of SAMPLER:	Brynn	DATE Signed (MM/DD/YY):	12/12/18		

Page 12 of 17

Pace Container Order #417580

Addresses

Order By :	Ship To :	Return To:
Company <u>WESTAR ENERGY</u>	Company <u>WESTAR ENERGY</u>	Company <u>Pace Analytical Pittsburgh</u>
Contact <u>Griffin, Brandon</u>	Contact <u>Griffin, Brandon</u>	Contact <u>Ferris, Carin</u>
Email <u>brandon.l.griffin@westarenergy.</u>	Email <u>brandon.l.griffin@westarenergy.</u>	Email <u>carin.ferris@pacelabs.com</u>
Address <u>818 S. Kansas Ave</u>	Address <u>818 S. Kansas Ave</u>	Address <u>1638 Roseytown Road</u>
Address 2 _____	Address 2 _____	Address 2 <u>Suites 2,3,4</u>
City <u>Topeka</u>	City <u>Topeka</u>	City <u>Greensburg</u>
State <u>KS</u> Zip <u>66612</u>	State <u>KS</u> Zip <u>66612</u>	State <u>PA</u> Zip <u>15601</u>
Phone <u>785-575-8135</u>	Phone <u>785-575-8135</u>	Phone <u>724-850-5615</u>

Info

Project Name <u>LEC ISI CCR- Radium</u>	Due Date <u>12/03/2018</u>	Profile <u>9655</u>	Quote _____
Project Manager <u>Wilson, Heather</u>	Return _____	Carrier <u>Most Economical</u>	Location _____

Trip Blanks

Include Trip Blanks

Bottle Labels

- Blank
 Pre-Printed No Sample IDs
 Pre-Printed With Sample IDs

Bottles

- Boxed Cases
 Individually Wrapped
 Grouped By Sample

Return Shipping Labels

- No Shipper Number
 With Shipper Number

Misc

- Sampling Instructions
 Custody Seal
 Temp. Blanks
 Coolers _____
 Syringes _____
- Extra Bubble Wrap
 Short Hold/Rush Stickers
 DI Water
 USDA Regulated Soils

COC Options

- Number of Blanks _____
 Pre-Printed

# of Samples	Matrix	Test	Container	Total	# of QC	Lot #	Notes
3	WT	Radium 226	1-1L Plastic w/ HNO3	3	0	100118-2AJN	
3	WT	Radium 228	1-1L Plastic w/ HNO3	3	0	100118-2AJN	
1	OT	Fedex Prepaid Weekday Shipping Labels	Return to Pace Pittsburgh	0	0		

Hazard Shipping Placard In Place : NO

*Sample receiving hours are Monday through Friday 8:00 am to 6:00 pm and Saturday from 9:00 am to 12:00 pm unless special arrangements are made with your project manager.

*Pace Analytical reserves the right to return hazardous, toxic, or radioactive samples to you.

*Pace Analytical reserves the right to charge for unused bottles, as well as cost associated with sample storage and disposal.

*Payment term are net 30 days.

*Please include the proposal number on the chain of custody to insure proper billing.

Sample Notes

PP COC (1), PP labels w/o sample IDs
prepaid Fedex return shipping label to Pace Pittsburgh

Ship Date : 11/30/2018

Prepared By: JEIMY

Verified By:

Page 13 of 17

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace Kansas Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 4746 8737 8235

Label _____
LIMS Login _____

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used 9 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 1.6 °C Correction Factor: -0.1 °C Final Temp: 1.5 °C
Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>BLM 12-13-18</u>
	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:	/			4.
Sample Labels match COC:	/			5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):		/		7.
Rush Turn Around Time Requested:		/		8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:	/			
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.
Organic Samples checked for dechlorination:			/	14.
Filtered volume received for Dissolved tests			/	15.
All containers have been checked for preservation.	/			16.
All containers needing preservation are found to be in compliance with EPA recommendation.	/			
exceptions: VOA, coliform, TOC, O&G, Phenolics				
				Initial when completed <u>BLM</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			/	17.
Trip Blank Present:			/	18.
Trip Blank Custody Seals Present			/	
Rad Aqueous Samples Screened > 0.5 mrem/hr	/			Initial when completed: <u>BLM</u> Date: <u>12-13-18</u>

Client Notification/ Resolution:
 Person Contacted: _____ Date/Time: _____ Contacted By: _____
 Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)
 *PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: KS
 Cert. Needed: Yes No
 Owner Received Date: 12/13/2018 Results Requested By: 1/7/2019



Workorder: 60289938 Workorder Name: LEC ISI CCR

Report To: Heather Wilson
 Subcontract To: Pace Analytical Pittsburgh
 Requested Analysis: Radium-226 & Total Radium, Radium-228

Heather Wilson
 Pace Analytical Kansas
 9608 Loiret Blvd.
 Lenexa, KS 66219
 Phone 1(913)563-1407

Pace Analytical Pittsburgh
 1638 Roseytown Road
 Suites 2,3, & 4
 Greensburg, PA 15601
 Phone (724)850-5600

WO#: 30274844

LAB USE ONLY

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers								Radium-226 & Total Radium	Radium-228	LAB USE ONLY
						Other										
1	MW-K-121218	PS	12/12/2018 10:15	60289938001	Water	1								X	X	001
2	MW-L-121218	PS	12/12/2018 12:00	60289938002	Water	1								X	X	002
3	DUP-121218	PS	12/12/2018 06:00	60289938003	Water	1								X	X	003
4																
5																

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1			<i>Emily</i>	12-13-18 1000	ET 12-19-18
2					
3					

Cooler Temperature on Receipt 1.5 °C Custody Seal (Y) or N Received on Ice (Y) or N Samples Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: () of ()

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: WESTAR ENERGY		Report To: Brandon Griffin		Attention:	
Address: 818 Kansas Ave Topeka, KS 66612		Copy To: Jared Morrison		Company Name:	
Email To: brandon.l.griffin@westarenergy.com		Purchase Order No.: 10LEC-0000012756		Address:	
Phone: 785-575-8135 Fax:		Project Name: LEC ISI CCR		Pace Quote Reference:	
Requested Due Date/TAT: 15 day		Project Number:		Pace Project Manager: Heather Wilson 913-563-1407	
				Pace Profile #: 9655, 1	
				REGULATORY AGENCY	
				<input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER _____	
				Site Location: _____	
				STATE: KS	

ITEM #	Section D Required Client Information	Valid Matrix Codes MATRIX CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test ↓	Requested Analysis Filtered (Y/N)			Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.						
					COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other		Radium-226	Radium-228	Total Radium								
					DATE	TIME	DATE	TIME																						
1	MW-K-121218 (A-Z, 0-9 / . -)		WT G	G			12/12	1015		2	2																			
2	MW-L-121218		WT G	G			12/12	1200		2	2																			
3																														
4																														
5																														
6																														
7																														
8	DUP-121218		WT G	G			12/12	0600		2	2																			
9																														
10																														
11																														
12																														

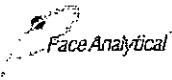
30274844

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	<i>[Signature]</i> Westar	12/12/18	1315	<i>[Signature]</i> Ben Morrison	12-13-18	1000	1.5	Y	Y	Y

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: Brandon Griffin	SIGNATURE of SAMPLER: <i>[Signature]</i>				
		DATE Signed (MM/DD/YY): 12/12/18			

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace Kansas Project # 30274844

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 4746 8737 8235

Label	<u>ET</u>
LIMS Login	<u>BLM</u>

Custody Seal on Cooler/Box Present: yes no Seals Intact: yes no

Thermometer Used 9 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 1.6 °C Correction Factor: -0.1 °C Final Temp: 1.5 °C
Temp should be above freezing to 6°C

pH paper Lot#	<u>1002481</u>
Date and Initials of person examining contents:	<u>BLM 12-13-18</u>

Comments:

	Yes	No	N/A
Chain of Custody Present:	/		
Chain of Custody Filled Out:	/		
Chain of Custody Relinquished:	/		
Sampler Name & Signature on COC:	/		
Sample Labels match COC:	/		
-Includes date/time/ID Matrix: <u>WT</u>			
Samples Arrived within Hold Time:	/		
Short Hold Time Analysis (<72hr remaining):		/	
Rush Turn Around Time Requested:		/	
Sufficient Volume:	/		
Correct Containers Used:	/		
-Pace Containers Used:	/		
Containers Intact:	/		
Orthophosphate field filtered			/
Hex Cr Aqueous Compliance/NPDES sample field filtered			/
Organic Samples checked for dechlorination:			/
Filtered volume received for Dissolved tests			/
All containers have been checked for preservation.	/		
All containers needing preservation are found to be in compliance with EPA recommendation.	/		
exceptions: VOA, coliform, TOC, O&G, Phenolics			
Headspace in VOA Vials (>6mm):			/
Trip Blank Present:			/
Trip Blank Custody Seals Present			/
Rad Aqueous Samples Screened > 0.5 mrem/hr	/		

16. PhC2

Initial when completed	<u>BLM</u>	Date/time of preservation	
Lot # of added preservative			
Initial when completed:	<u>BLM</u>	Date:	<u>12-13-18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____
 Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)
 *PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

ATTACHMENT 1-8
January 2019 Sampling Event
Laboratory Analytical Report

January 22, 2019

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC ISI CCR
Pace Project No.: 60291851

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on January 14, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC ISI CCR

Pace Project No.: 60291851

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Arkansas Drinking Water

Missouri Certification Number: 10090

WY STR Certification #: 2456.01

Arkansas Certification #: 18-016-0

Arkansas Drinking Water

Illinois Certification #: 004455

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116 / E10426

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407-18-11

Utah Certification #: KS000212018-8

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC ISI CCR

Pace Project No.: 60291851

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60291851001	MW-37-011119	Water	01/11/19 08:14	01/14/19 15:40
60291851002	MW-38-011119	Water	01/11/19 09:22	01/14/19 15:40
60291851003	MW-K-011119	Water	01/11/19 10:55	01/14/19 15:40
60291851004	MW-L-011119	Water	01/11/19 12:10	01/14/19 15:40
60291851005	MW-39-011119	Water	01/11/19 13:09	01/14/19 15:40
60291851006	MW-40-011119	Water	01/11/19 14:12	01/14/19 15:40
60291851007	DUP-011119	Water	01/11/19 06:00	01/14/19 15:40

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR
Pace Project No.: 60291851

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60291851001	MW-37-011119	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	HKC	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60291851002	MW-38-011119	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	HKC	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60291851003	MW-K-011119	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	HKC	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60291851004	MW-L-011119	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	HKC	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60291851005	MW-39-011119	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	HKC	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60291851006	MW-40-011119	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	HKC	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60291851007	DUP-011119	EPA 200.7	EMR	7	PASI-K

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60291851

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	HKC	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	MGS	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60291851

Sample: MW-37-011119	Lab ID: 60291851001	Collected: 01/11/19 08:14	Received: 01/14/19 15:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium, Total Recoverable	0.058	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:52	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 11:51	01/17/19 11:52	7440-41-7	
Boron, Total Recoverable	2.1	mg/L	0.10	1	01/16/19 11:51	01/17/19 11:52	7440-42-8	
Calcium, Total Recoverable	140	mg/L	0.20	1	01/16/19 11:51	01/17/19 11:52	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:52	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	01/16/19 11:51	01/17/19 11:52	7439-92-1	
Lithium	0.018	mg/L	0.010	1	01/16/19 11:51	01/17/19 11:52	7439-93-2	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:01	7440-36-0	
Arsenic, Total Recoverable	0.0089	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:01	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	01/16/19 09:40	01/17/19 11:01	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:01	7440-48-4	
Molybdenum, Total Recoverable	0.14	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:01	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:01	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:01	7440-28-0	
245.1 Mercury								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	<0.00020	mg/L	0.00020	1	01/17/19 10:57	01/22/19 08:39	7439-97-6	
2540C Total Dissolved Solids								
Analytical Method: SM 2540C								
Total Dissolved Solids	722	mg/L	5.0	1		01/16/19 09:45		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	7.4	Std. Units	0.10	1		01/18/19 11:51		H6
300.0 IC Anions 28 Days								
Analytical Method: EPA 300.0								
Chloride	28.8	mg/L	10.0	10		01/18/19 22:28	16887-00-6	
Fluoride	0.28	mg/L	0.20	1		01/18/19 22:14	16984-48-8	
Sulfate	283	mg/L	50.0	50		01/18/19 22:43	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60291851

Sample: MW-38-011119	Lab ID: 60291851002	Collected: 01/11/19 09:22	Received: 01/14/19 15:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium, Total Recoverable	0.032	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:54	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 11:51	01/17/19 11:54	7440-41-7	
Boron, Total Recoverable	5.4	mg/L	0.10	1	01/16/19 11:51	01/17/19 11:54	7440-42-8	
Calcium, Total Recoverable	322	mg/L	0.20	1	01/16/19 11:51	01/17/19 11:54	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:54	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	01/16/19 11:51	01/17/19 11:54	7439-92-1	
Lithium	0.076	mg/L	0.010	1	01/16/19 11:51	01/17/19 11:54	7439-93-2	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:06	7440-36-0	
Arsenic, Total Recoverable	0.014	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:06	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	01/16/19 09:40	01/17/19 11:06	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:06	7440-48-4	
Molybdenum, Total Recoverable	0.088	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:06	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:06	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:06	7440-28-0	
245.1 Mercury								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	<0.00020	mg/L	0.00020	1	01/17/19 10:57	01/22/19 08:41	7439-97-6	
2540C Total Dissolved Solids								
Analytical Method: SM 2540C								
Total Dissolved Solids	2600	mg/L	5.0	1		01/16/19 09:45		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	7.6	Std. Units	0.10	1		01/18/19 11:52		H6
300.0 IC Anions 28 Days								
Analytical Method: EPA 300.0								
Chloride	202	mg/L	50.0	50		01/18/19 23:54	16887-00-6	
Fluoride	4.7	mg/L	0.20	1		01/18/19 23:25	16984-48-8	
Sulfate	1210	mg/L	100	100		01/21/19 12:06	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60291851

Sample: MW-K-011119		Lab ID: 60291851003	Collected: 01/11/19 10:55	Received: 01/14/19 15:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.041	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:56	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 11:51	01/17/19 11:56	7440-41-7	
Boron, Total Recoverable	2.1	mg/L	0.10	1	01/16/19 11:51	01/17/19 11:56	7440-42-8	
Calcium, Total Recoverable	533	mg/L	0.20	1	01/16/19 11:51	01/17/19 11:56	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:56	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	01/16/19 11:51	01/17/19 11:56	7439-92-1	
Lithium	0.076	mg/L	0.010	1	01/16/19 11:51	01/17/19 11:56	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:14	7440-36-0	
Arsenic, Total Recoverable	0.070	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:14	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	01/16/19 09:40	01/17/19 11:14	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:14	7440-48-4	
Molybdenum, Total Recoverable	0.014	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:14	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:14	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:14	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	01/17/19 10:57	01/22/19 08:43	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	4090	mg/L	5.0	1		01/16/19 09:45		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.4	Std. Units	0.10	1		01/18/19 11:54		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	653	mg/L	50.0	50		01/19/19 00:22	16887-00-6	
Fluoride	3.0	mg/L	0.20	1		01/19/19 00:08	16984-48-8	
Sulfate	2000	mg/L	200	200		01/19/19 00:36	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60291851

Sample: MW-L-011119		Lab ID: 60291851004		Collected: 01/11/19 12:10	Received: 01/14/19 15:40	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.043	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:59	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 11:51	01/17/19 11:59	7440-41-7	
Boron, Total Recoverable	2.0	mg/L	0.10	1	01/16/19 11:51	01/17/19 11:59	7440-42-8	
Calcium, Total Recoverable	651	mg/L	0.20	1	01/16/19 11:51	01/17/19 11:59	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:59	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	01/16/19 11:51	01/17/19 11:59	7439-92-1	
Lithium	0.046	mg/L	0.010	1	01/16/19 11:51	01/17/19 11:59	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:18	7440-36-0	
Arsenic, Total Recoverable	0.025	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:18	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	01/16/19 09:40	01/17/19 11:18	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:18	7440-48-4	
Molybdenum, Total Recoverable	0.047	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:18	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:18	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:18	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	01/17/19 10:57	01/22/19 08:45	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	4350	mg/L	5.0	1		01/16/19 09:45		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.1	Std. Units	0.10	1		01/18/19 11:55		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	809	mg/L	200	200		01/19/19 01:19	16887-00-6	
Fluoride	2.0	mg/L	0.20	1		01/19/19 00:51	16984-48-8	
Sulfate	2410	mg/L	200	200		01/19/19 01:19	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60291851

Sample: MW-39-011119		Lab ID: 60291851005	Collected: 01/11/19 13:09	Received: 01/14/19 15:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.030	mg/L	0.0050	1	01/16/19 11:51	01/17/19 12:01	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 11:51	01/17/19 12:01	7440-41-7	
Boron, Total Recoverable	4.8	mg/L	0.10	1	01/16/19 11:51	01/17/19 12:01	7440-42-8	
Calcium, Total Recoverable	510	mg/L	0.20	1	01/16/19 11:51	01/17/19 12:01	7440-70-2	M1
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	01/16/19 11:51	01/17/19 12:01	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	01/16/19 11:51	01/17/19 12:01	7439-92-1	
Lithium	0.043	mg/L	0.010	1	01/16/19 11:51	01/17/19 12:01	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:26	7440-36-0	
Arsenic, Total Recoverable	0.010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:26	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	01/16/19 09:40	01/17/19 11:26	7440-43-9	
Cobalt, Total Recoverable	0.0013	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:26	7440-48-4	
Molybdenum, Total Recoverable	0.11	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:26	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:26	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:26	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	01/17/19 10:57	01/22/19 08:48	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3770	mg/L	5.0	1		01/16/19 09:45		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2	Std. Units	0.10	1		01/18/19 11:56		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	373	mg/L	50.0	50		01/18/19 00:39	16887-00-6	
Fluoride	2.9	mg/L	0.20	1		01/18/19 00:10	16984-48-8	
Sulfate	1730	mg/L	200	200		01/21/19 12:22	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60291851

Sample: MW-40-011119	Lab ID: 60291851006	Collected: 01/11/19 14:12	Received: 01/14/19 15:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium, Total Recoverable	0.034	mg/L	0.0050	1	01/16/19 11:51	01/17/19 12:12	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 11:51	01/17/19 12:12	7440-41-7	
Boron, Total Recoverable	6.4	mg/L	0.10	1	01/16/19 11:51	01/17/19 12:12	7440-42-8	
Calcium, Total Recoverable	504	mg/L	0.20	1	01/16/19 11:51	01/17/19 12:12	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	01/16/19 11:51	01/17/19 12:12	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	01/16/19 11:51	01/17/19 12:12	7439-92-1	
Lithium	0.045	mg/L	0.010	1	01/16/19 11:51	01/17/19 12:12	7439-93-2	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:30	7440-36-0	
Arsenic, Total Recoverable	0.014	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:30	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	01/16/19 09:40	01/17/19 11:30	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:30	7440-48-4	
Molybdenum, Total Recoverable	0.15	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:30	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:30	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:30	7440-28-0	
245.1 Mercury								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	<0.00020	mg/L	0.00020	1	01/17/19 10:57	01/22/19 08:52	7439-97-6	
2540C Total Dissolved Solids								
Analytical Method: SM 2540C								
Total Dissolved Solids	3100	mg/L	5.0	1		01/16/19 09:45		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	7.0	Std. Units	0.10	1		01/18/19 11:58		H6
300.0 IC Anions 28 Days								
Analytical Method: EPA 300.0								
Chloride	306	mg/L	50.0	50		01/18/19 01:21	16887-00-6	
Fluoride	1.5	mg/L	0.20	1		01/18/19 00:53	16984-48-8	
Sulfate	1610	mg/L	200	200		01/21/19 13:10	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60291851

Sample: DUP-011119		Lab ID: 60291851007	Collected: 01/11/19 06:00	Received: 01/14/19 15:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.034	mg/L	0.0050	1	01/16/19 11:51	01/17/19 12:14	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 11:51	01/17/19 12:14	7440-41-7	
Boron, Total Recoverable	5.5	mg/L	0.10	1	01/16/19 11:51	01/17/19 12:14	7440-42-8	
Calcium, Total Recoverable	326	mg/L	0.20	1	01/16/19 11:51	01/17/19 12:14	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	01/16/19 11:51	01/17/19 12:14	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	01/16/19 11:51	01/17/19 12:14	7439-92-1	
Lithium	0.076	mg/L	0.010	1	01/16/19 11:51	01/17/19 12:14	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:34	7440-36-0	
Arsenic, Total Recoverable	0.014	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:34	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	01/16/19 09:40	01/17/19 11:34	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:34	7440-48-4	
Molybdenum, Total Recoverable	0.087	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:34	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:34	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 11:34	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	01/17/19 10:57	01/22/19 08:55	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	2540	mg/L	5.0	1		01/16/19 09:45		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.6	Std. Units	0.10	1		01/18/19 12:01		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	207	mg/L	50.0	50		01/18/19 02:04	16887-00-6	
Fluoride	5.0	mg/L	0.20	1		01/18/19 01:35	16984-48-8	
Sulfate	1310	mg/L	200	200		01/21/19 13:26	14808-79-8	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60291851

QC Batch: 565098 Analysis Method: EPA 245.1
 QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
 Associated Lab Samples: 60291851001, 60291851002, 60291851003, 60291851004, 60291851005, 60291851006, 60291851007

METHOD BLANK: 2318580 Matrix: Water
 Associated Lab Samples: 60291851001, 60291851002, 60291851003, 60291851004, 60291851005, 60291851006, 60291851007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	01/22/19 10:07	

LABORATORY CONTROL SAMPLE: 2318581

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0050	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2318582 2318583

Parameter	Units	60291923001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Mercury	mg/L	ND	0.005	0.0049	0.005	0.0050	98	99	70-130	1	20	

MATRIX SPIKE SAMPLE: 2318612

Parameter	Units	60291851005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	<0.00020	0.005	0.0046	92	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60291851

QC Batch:	564849	Analysis Method:	EPA 200.7
QC Batch Method:	EPA 200.7	Analysis Description:	200.7 Metals, Total
Associated Lab Samples:	60291851001, 60291851002, 60291851003, 60291851004, 60291851005, 60291851006, 60291851007		

METHOD BLANK:	2317616	Matrix:	Water
Associated Lab Samples:	60291851001, 60291851002, 60291851003, 60291851004, 60291851005, 60291851006, 60291851007		

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	01/17/19 11:09	
Beryllium	mg/L	<0.0010	0.0010	01/17/19 11:09	
Boron	mg/L	<0.10	0.10	01/17/19 11:09	
Calcium	mg/L	<0.20	0.20	01/17/19 11:09	
Chromium	mg/L	<0.0050	0.0050	01/17/19 11:09	
Lead	mg/L	<0.010	0.010	01/17/19 11:09	
Lithium	mg/L	<0.010	0.010	01/17/19 11:09	

LABORATORY CONTROL SAMPLE: 2317617

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	0.99	99	85-115	
Beryllium	mg/L	1	0.98	98	85-115	
Boron	mg/L	1	0.94	94	85-115	
Calcium	mg/L	10	10.2	102	85-115	
Chromium	mg/L	1	0.99	99	85-115	
Lead	mg/L	1	0.96	96	85-115	
Lithium	mg/L	1	1.0	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2317618 2317619

Parameter	Units	60291850002		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Barium	mg/L	0.019	1	1	1.0	1.0	99	99	70-130	0	20		
Beryllium	mg/L	<0.0010	1	1	0.97	0.97	97	97	70-130	0	20		
Boron	mg/L	0.26	1	1	1.2	1.2	98	98	70-130	0	20		
Calcium	mg/L	263	10	10	272	271	86	76	70-130	0	20		
Chromium	mg/L	<0.0050	1	1	0.96	0.95	96	95	70-130	0	20		
Lead	mg/L	<0.010	1	1	0.94	0.94	94	94	70-130	0	20		
Lithium	mg/L	0.019	1	1	1.1	1.1	104	104	70-130	0	20		

MATRIX SPIKE SAMPLE: 2317620

Parameter	Units	60291851005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	0.030	1	1.0	98	70-130	
Beryllium	mg/L	<0.0010	1	0.95	95	70-130	
Boron	mg/L	4.8	1	5.8	99	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60291851

MATRIX SPIKE SAMPLE:		2317620					
Parameter	Units	60291851005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Calcium	mg/L	510	10	511	8	70-130	M1
Chromium	mg/L	<0.0050	1	0.93	93	70-130	
Lead	mg/L	<0.010	1	0.92	92	70-130	
Lithium	mg/L	0.043	1	1.1	104	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60291851

QC Batch: 564846 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60291851001, 60291851002, 60291851003, 60291851004, 60291851005, 60291851006, 60291851007

METHOD BLANK: 2317603 Matrix: Water
Associated Lab Samples: 60291851001, 60291851002, 60291851003, 60291851004, 60291851005, 60291851006, 60291851007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	01/16/19 15:09	
Arsenic	mg/L	<0.0010	0.0010	01/16/19 15:09	
Cadmium	mg/L	<0.00050	0.00050	01/16/19 15:09	
Cobalt	mg/L	<0.0010	0.0010	01/16/19 15:09	
Molybdenum	mg/L	<0.0010	0.0010	01/16/19 15:09	
Selenium	mg/L	<0.0010	0.0010	01/16/19 15:09	
Thallium	mg/L	<0.0010	0.0010	01/16/19 15:09	

LABORATORY CONTROL SAMPLE: 2317604

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	0.04	0.042	106	85-115	
Arsenic	mg/L	0.04	0.041	103	85-115	
Cadmium	mg/L	0.04	0.041	103	85-115	
Cobalt	mg/L	0.04	0.043	107	85-115	
Molybdenum	mg/L	0.04	0.043	107	85-115	
Selenium	mg/L	0.04	0.039	97	85-115	
Thallium	mg/L	0.04	0.039	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2317605 2317606

Parameter	Units	60291893001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony	mg/L	1.2 ug/L	0.04	0.04	0.044	0.044	107	106	70-130	1	20		
Arsenic	mg/L	0.34J ug/L	0.04	0.04	0.043	0.043	106	107	70-130	1	20		
Cadmium	mg/L	0.17J ug/L	0.04	0.04	0.040	0.040	99	99	70-130	0	20		
Cobalt	mg/L	30.5 ug/L	0.04	0.04	0.072	0.072	103	103	70-130	0	20		
Molybdenum	mg/L	13.7 ug/L	0.04	0.04	0.059	0.060	115	115	70-130	0	20		
Selenium	mg/L	<0.085 ug/L	0.04	0.04	0.038	0.038	95	96	70-130	0	20		
Thallium	mg/L	<0.099 ug/L	0.04	0.04	0.036	0.036	90	89	70-130	0	20		

MATRIX SPIKE SAMPLE: 2317607

Parameter	Units	60291851002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	<0.0010	0.04	0.040	101	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60291851

MATRIX SPIKE SAMPLE:		2317607					
Parameter	Units	60291851002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	0.014	0.04	0.055	103	70-130	
Cadmium	mg/L	<0.00050	0.04	0.037	92	70-130	
Cobalt	mg/L	<0.0010	0.04	0.046	116	70-130	
Molybdenum	mg/L	0.088	0.04	0.14	119	70-130	
Selenium	mg/L	<0.0010	0.04	0.037	92	70-130	
Thallium	mg/L	<0.0010	0.04	0.034	84	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60291851

QC Batch: 564893 Analysis Method: SM 2540C
 QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
 Associated Lab Samples: 60291851001, 60291851002, 60291851003, 60291851004, 60291851005, 60291851006, 60291851007

METHOD BLANK: 2317749 Matrix: Water
 Associated Lab Samples: 60291851001, 60291851002, 60291851003, 60291851004, 60291851005, 60291851006, 60291851007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	01/16/19 09:45	

LABORATORY CONTROL SAMPLE: 2317750

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1010	101	80-120	

SAMPLE DUPLICATE: 2317751

Parameter	Units	60291692001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	892	901	1	10	

SAMPLE DUPLICATE: 2317753

Parameter	Units	60291850003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1470	1330	10	10	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60291851

QC Batch: 565255

Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B

Analysis Description: 4500H+B pH

Associated Lab Samples: 60291851001, 60291851002, 60291851003, 60291851004, 60291851005, 60291851006, 60291851007

SAMPLE DUPLICATE: 2319279

Parameter	Units	60291832001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.1	7.0	0	5	H6

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60291851

QC Batch: 565118 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60291851005, 60291851006, 60291851007

METHOD BLANK: 2318673 Matrix: Water

Associated Lab Samples: 60291851005, 60291851006, 60291851007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	01/17/19 10:04	
Fluoride	mg/L	<0.20	0.20	01/17/19 10:04	

LABORATORY CONTROL SAMPLE: 2318674

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	
Fluoride	mg/L	2.5	2.5	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2318675 2318676

Parameter	Units	60291832007		2318675		2318676		% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Chloride	mg/L	3.7	5	5	8.9	8.9	104	104	90-110	0	15	
Fluoride	mg/L	ND	2.5	2.5	2.7	2.7	108	108	90-110	1	15	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60291851

QC Batch: 565284 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60291851001, 60291851002, 60291851003, 60291851004

METHOD BLANK: 2319400 Matrix: Water
 Associated Lab Samples: 60291851001, 60291851002, 60291851003, 60291851004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	01/18/19 09:43	
Fluoride	mg/L	<0.20	0.20	01/18/19 09:43	
Sulfate	mg/L	<1.0	1.0	01/18/19 09:43	

LABORATORY CONTROL SAMPLE: 2319401

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	99	90-110	
Fluoride	mg/L	2.5	2.6	104	90-110	
Sulfate	mg/L	5	5.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2319402 2319403

Parameter	Units	60292185001		60292229009		60292229009		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
Chloride	mg/L	15.1	5	5	19.9	20.0	96	98	90-110	0	15		
Fluoride	mg/L	0.82	2.5	2.5	3.5	3.5	106	107	90-110	1	15		
Sulfate	mg/L	37.3	50	50	88.4	88.7	102	103	90-110	0	15		

MATRIX SPIKE SAMPLE: 2319404

Parameter	Units	60292229009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	476	250	713	95	90-110	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60291851

QC Batch: 565521

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60291851002, 60291851005, 60291851006, 60291851007

METHOD BLANK: 2320329

Matrix: Water

Associated Lab Samples: 60291851002, 60291851005, 60291851006, 60291851007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	01/21/19 09:38	

LABORATORY CONTROL SAMPLE: 2320330

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2320331 2320332

Parameter	Units	2320331		2320332		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60292229002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Sulfate	mg/L	74.9	50	50	125	125	100	101	90-110	1	15

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QUALIFIERS

Project: LEC ISI CCR

Pace Project No.: 60291851

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

Pace Project No.: 60291851

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60291851001	MW-37-011119	EPA 200.7	564849	EPA 200.7	564962
60291851002	MW-38-011119	EPA 200.7	564849	EPA 200.7	564962
60291851003	MW-K-011119	EPA 200.7	564849	EPA 200.7	564962
60291851004	MW-L-011119	EPA 200.7	564849	EPA 200.7	564962
60291851005	MW-39-011119	EPA 200.7	564849	EPA 200.7	564962
60291851006	MW-40-011119	EPA 200.7	564849	EPA 200.7	564962
60291851007	DUP-011119	EPA 200.7	564849	EPA 200.7	564962
60291851001	MW-37-011119	EPA 200.8	564846	EPA 200.8	564916
60291851002	MW-38-011119	EPA 200.8	564846	EPA 200.8	564916
60291851003	MW-K-011119	EPA 200.8	564846	EPA 200.8	564916
60291851004	MW-L-011119	EPA 200.8	564846	EPA 200.8	564916
60291851005	MW-39-011119	EPA 200.8	564846	EPA 200.8	564916
60291851006	MW-40-011119	EPA 200.8	564846	EPA 200.8	564916
60291851007	DUP-011119	EPA 200.8	564846	EPA 200.8	564916
60291851001	MW-37-011119	EPA 245.1	565098	EPA 245.1	565315
60291851002	MW-38-011119	EPA 245.1	565098	EPA 245.1	565315
60291851003	MW-K-011119	EPA 245.1	565098	EPA 245.1	565315
60291851004	MW-L-011119	EPA 245.1	565098	EPA 245.1	565315
60291851005	MW-39-011119	EPA 245.1	565098	EPA 245.1	565315
60291851006	MW-40-011119	EPA 245.1	565098	EPA 245.1	565315
60291851007	DUP-011119	EPA 245.1	565098	EPA 245.1	565315
60291851001	MW-37-011119	SM 2540C	564893		
60291851002	MW-38-011119	SM 2540C	564893		
60291851003	MW-K-011119	SM 2540C	564893		
60291851004	MW-L-011119	SM 2540C	564893		
60291851005	MW-39-011119	SM 2540C	564893		
60291851006	MW-40-011119	SM 2540C	564893		
60291851007	DUP-011119	SM 2540C	564893		
60291851001	MW-37-011119	SM 4500-H+B	565255		
60291851002	MW-38-011119	SM 4500-H+B	565255		
60291851003	MW-K-011119	SM 4500-H+B	565255		
60291851004	MW-L-011119	SM 4500-H+B	565255		
60291851005	MW-39-011119	SM 4500-H+B	565255		
60291851006	MW-40-011119	SM 4500-H+B	565255		
60291851007	DUP-011119	SM 4500-H+B	565255		
60291851001	MW-37-011119	EPA 300.0	565284		
60291851002	MW-38-011119	EPA 300.0	565284		
60291851002	MW-38-011119	EPA 300.0	565521		
60291851003	MW-K-011119	EPA 300.0	565284		
60291851004	MW-L-011119	EPA 300.0	565284		
60291851005	MW-39-011119	EPA 300.0	565118		
60291851005	MW-39-011119	EPA 300.0	565521		
60291851006	MW-40-011119	EPA 300.0	565118		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

Pace Project No.: 60291851

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60291851006	MW-40-011119	EPA 300.0	565521		
60291851007	DUP-011119	EPA 300.0	565118		
60291851007	DUP-011119	EPA 300.0	565521		

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Sample Condition Upon Receipt

WO#: 60291851



Client Name: Westar Energy
Courier: FedEx [] UPS [] VIA [x] Clay [] PEX [] ECI [] Pace [x] Xroads [] Client [] Other []
Tracking #: 7114 Pace Shipping Label Used? Yes [] No [x]
Custody Seal on Cooler/Box Present: Yes [x] No [] Seals intact: Yes [x] No []
Packing Material: Bubble Wrap [] Bubble Bags [] Foam [] None [x] Other []
Thermometer Used: T-298 Type of Ice: Wet [x] Blue [] None []
Cooler Temperature (°C): As-read 1.1 Corr. Factor 0.0 Corrected 1.1

Date and initials of person examining contents:

7/14/19

Temperature should be above freezing to 6°C

Table with 2 columns: Question/Field and Answer (Yes/No/N/A). Rows include Chain of Custody, Samples arrived, Short Hold Time, Rush Turn Around Time, Sufficient volume, Correct containers used, Pace containers used, Containers intact, Unpreserved soils, Filtered volume, Sample labels match, Samples contain multiple phases, Containers requiring pH preservation, Cyanide water sample checks, Trip Blank present, Headspace in VOA vials, Samples from USDA Regulated Area, Additional labels attached.

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review:

REVIEWED
By hwilson at 5:00 pm, 1/15/19

Date:

January 30, 2019

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC ISI CCR
Pace Project No.: 60292061

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on January 15, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC ISI CCR

Pace Project No.: 60292061

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC ISI CCR

Pace Project No.: 60292061

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60292061001	MW-37-011119	Water	01/11/19 08:45	01/15/19 10:00
60292061002	MW-38-011119	Water	01/11/19 09:22	01/15/19 10:00
60292061003	MW-K-011119	Water	01/11/19 10:55	01/15/19 10:00
60292061004	MW-L-011119	Water	01/11/19 12:10	01/15/19 10:00
60292061005	MW-39-011119	Water	01/11/19 13:09	01/15/19 10:00
60292061006	MW-40-011119	Water	01/11/19 14:12	01/15/19 10:00
60292061007	DUP-011119	Water	01/11/19 06:00	01/15/19 10:00

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60292061

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60292061001	MW-37-011119	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60292061002	MW-38-011119	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60292061003	MW-K-011119	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60292061004	MW-L-011119	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60292061005	MW-39-011119	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60292061006	MW-40-011119	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60292061007	DUP-011119	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60292061

Sample: MW-37-011119 **Lab ID: 60292061001** Collected: 01/11/19 08:45 Received: 01/15/19 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.388 ± 0.423 (0.666) C:NA T:90%	pCi/L	01/29/19 20:05	13982-63-3	
Radium-228	EPA 904.0	0.714 ± 0.441 (0.829) C:75% T:74%	pCi/L	01/24/19 12:31	15262-20-1	
Total Radium	Total Radium Calculation	1.10 ± 0.864 (1.50)	pCi/L	01/30/19 13:41	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60292061

Sample: MW-38-011119 **Lab ID: 60292061002** Collected: 01/11/19 09:22 Received: 01/15/19 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.418 ± 0.456 (0.718) C:NA T:84%	pCi/L	01/29/19 20:05	13982-63-3	
Radium-228	EPA 904.0	0.444 ± 0.349 (0.690) C:75% T:86%	pCi/L	01/24/19 12:32	15262-20-1	
Total Radium	Total Radium Calculation	0.862 ± 0.805 (1.41)	pCi/L	01/30/19 13:41	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60292061

Sample: MW-K-011119 **Lab ID: 60292061003** Collected: 01/11/19 10:55 Received: 01/15/19 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.000 ± 0.449 (0.918) C:NA T:85%	pCi/L	01/29/19 20:05	13982-63-3	
Radium-228	EPA 904.0	0.800 ± 0.399 (0.681) C:75% T:78%	pCi/L	01/24/19 12:32	15262-20-1	
Total Radium	Total Radium Calculation	0.800 ± 0.848 (1.60)	pCi/L	01/30/19 13:41	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60292061

Sample: MW-L-011119 **Lab ID: 60292061004** Collected: 01/11/19 12:10 Received: 01/15/19 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.309 ± 0.438 (0.741) C:NA T:88%	pCi/L	01/29/19 20:05	13982-63-3	
Radium-228	EPA 904.0	0.951 ± 0.409 (0.655) C:77% T:82%	pCi/L	01/24/19 12:32	15262-20-1	
Total Radium	Total Radium Calculation	1.26 ± 0.847 (1.40)	pCi/L	01/30/19 13:41	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60292061

Sample: MW-39-011119 **Lab ID: 60292061005** Collected: 01/11/19 13:09 Received: 01/15/19 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.432 ± 0.602 (1.02) C:NA T:71%	pCi/L	01/29/19 20:05	13982-63-3	
Radium-228	EPA 904.0	0.350 ± 0.410 (0.864) C:74% T:74%	pCi/L	01/24/19 12:32	15262-20-1	
Total Radium	Total Radium Calculation	0.782 ± 1.01 (1.88)	pCi/L	01/30/19 13:41	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60292061

Sample: MW-40-011119 **Lab ID: 60292061006** Collected: 01/11/19 14:12 Received: 01/15/19 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.179 ± 0.423 (0.784) C:NA T:88%	pCi/L	01/29/19 20:19	13982-63-3	
Radium-228	EPA 904.0	0.302 ± 0.294 (0.601) C:78% T:85%	pCi/L	01/24/19 12:32	15262-20-1	
Total Radium	Total Radium Calculation	0.481 ± 0.717 (1.39)	pCi/L	01/30/19 13:41	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60292061

Sample: DUP-011119 **Lab ID: 60292061007** Collected: 01/11/19 06:00 Received: 01/15/19 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.640 ± 0.503 (0.699) C:NA T:86%	pCi/L	01/29/19 20:19	13982-63-3	
Radium-228	EPA 904.0	0.524 ± 0.343 (0.649) C:78% T:84%	pCi/L	01/24/19 12:32	15262-20-1	
Total Radium	Total Radium Calculation	1.16 ± 0.846 (1.35)	pCi/L	01/30/19 13:41	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60292061

QC Batch:	327435	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60292061001, 60292061002, 60292061003, 60292061004, 60292061005, 60292061006, 60292061007		

METHOD BLANK:	1594117	Matrix:	Water
Associated Lab Samples:	60292061001, 60292061002, 60292061003, 60292061004, 60292061005, 60292061006, 60292061007		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.246 ± 0.453 (0.807) C:NA T:84%	pCi/L	01/29/19 19:51	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60292061

QC Batch: 327436

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60292061001, 60292061002, 60292061003, 60292061004, 60292061005, 60292061006, 60292061007

METHOD BLANK: 1594118

Matrix: Water

Associated Lab Samples: 60292061001, 60292061002, 60292061003, 60292061004, 60292061005, 60292061006, 60292061007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.536 ± 0.335 (0.623) C:84% T:82%	pCi/L	01/24/19 12:33	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: LEC ISI CCR

Pace Project No.: 60292061

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

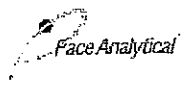
Pace Project No.: 60292061

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60292061001	MW-37-011119	EPA 903.1	327435		
60292061002	MW-38-011119	EPA 903.1	327435		
60292061003	MW-K-011119	EPA 903.1	327435		
60292061004	MW-L-011119	EPA 903.1	327435		
60292061005	MW-39-011119	EPA 903.1	327435		
60292061006	MW-40-011119	EPA 903.1	327435		
60292061007	DUP-011119	EPA 903.1	327435		
60292061001	MW-37-011119	EPA 904.0	327436		
60292061002	MW-38-011119	EPA 904.0	327436		
60292061003	MW-K-011119	EPA 904.0	327436		
60292061004	MW-L-011119	EPA 904.0	327436		
60292061005	MW-39-011119	EPA 904.0	327436		
60292061006	MW-40-011119	EPA 904.0	327436		
60292061007	DUP-011119	EPA 904.0	327436		
60292061001	MW-37-011119	Total Radium Calculation	328569		
60292061002	MW-38-011119	Total Radium Calculation	328569		
60292061003	MW-K-011119	Total Radium Calculation	328569		
60292061004	MW-L-011119	Total Radium Calculation	328569		
60292061005	MW-39-011119	Total Radium Calculation	328569		
60292061006	MW-40-011119	Total Radium Calculation	328569		
60292061007	DUP-011119	Total Radium Calculation	328569		

REPORT OF LABORATORY ANALYSIS

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Pittsburgh Lab Sample Condition Upon Receipt



Client Name: face KS

Project # # 30277227

Courier: Fed Ex UPS USPS Client Commercial Pace Other

Tracking #: 474687395970

Label DW
LIMS Login DW3

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used 9 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 1.3 °C Correction Factor: +0.1 °C Final Temp: 1.4 °C
Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>10D3581</u>	<u>MDS-1579</u>
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Hex Cr Aqueous Compliance/NPDES sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>MDS</u>	Date/time of preservation:
				Lot # of added preservative:	
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Rad Aqueous Samples Screened > 0.5 mrem/hr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>MDS</u>	Date: <u>1-15-79</u>

Client Notification/ Resolution:
 Person Contacted: _____ Date/Time: _____ Contacted By: _____
 Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)
 *PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

ATTACHMENT 1-9
March 2019 Sampling Event
Laboratory Analytical Report

April 15, 2019

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC ISI CCR
Pace Project No.: 60297249

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on March 19, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Revised Report_rev.1 During an investigation of the 200.7 Results for sample 60297249006, we found that the original results were not accurate. The 200.7 metals were re-analyzed and reported.

Revised Report_rev.2 During an investigation of the TDS, we found that the original result for sample 60297249001 was inaccurate. The sample has been re-analyzed and reported.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.

JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC ISI CCR

Pace Project No.: 60297249

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Certification Number: 10090

Arkansas Drinking Water

WY STR Certification #: 2456.01

Arkansas Certification #: 18-016-0

Arkansas Drinking Water

Illinois Certification #: 004455

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116 / E10426

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407-18-11

Utah Certification #: KS000212018-8

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC ISI CCR

Pace Project No.: 60297249

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60297249001	MW-37-031819	Water	03/18/19 17:10	03/19/19 15:35
60297249002	MW-38-031919	Water	03/19/19 08:37	03/19/19 15:35
60297249003	MW-K-031919	Water	03/19/19 09:38	03/19/19 15:35
60297249004	MW-L-031919	Water	03/19/19 10:54	03/19/19 15:35
60297249005	MW-39-031919	Water	03/19/19 11:50	03/19/19 15:35
60297249006	MW-40-031919	Water	03/19/19 12:58	03/19/19 15:35
60297249007	DUP-031919	Water	03/19/19 06:00	03/19/19 15:35

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60297249

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60297249001	MW-37-031819	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LRS	1	PASI-K
		SM 2540C	JES	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60297249002	MW-38-031919	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LRS	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60297249003	MW-K-031919	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LRS	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60297249004	MW-L-031919	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LRS	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60297249005	MW-39-031919	EPA 200.7	EMR	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LRS	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60297249006	MW-40-031919	EPA 200.7	JDE	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LRS	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60297249007	DUP-031919	EPA 200.7	EMR	7	PASI-K

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR
Pace Project No.: 60297249

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LRS	1	PASI-K
		SM 2540C	ZMH	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60297249

Sample: MW-37-031819		Lab ID: 60297249001		Collected: 03/18/19 17:10		Received: 03/19/19 15:35		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.054	mg/L	0.0050	1	03/21/19 15:19	03/22/19 17:36	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 15:19	03/22/19 17:36	7440-41-7		
Boron, Total Recoverable	1.9	mg/L	0.10	1	03/21/19 15:19	03/22/19 17:36	7440-42-8		
Calcium, Total Recoverable	138	mg/L	0.20	1	03/21/19 15:19	03/22/19 17:36	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	03/21/19 15:19	03/22/19 17:36	7440-47-3		
Lead, Total Recoverable	<0.010	mg/L	0.010	1	03/21/19 15:19	03/22/19 17:36	7439-92-1		
Lithium	0.018	mg/L	0.010	1	03/21/19 15:19	03/22/19 17:36	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/26/19 11:47	7440-36-0		
Arsenic, Total Recoverable	0.0074	mg/L	0.0010	1	03/21/19 13:01	03/26/19 11:47	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	03/21/19 13:01	03/26/19 11:47	7440-43-9		
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/26/19 11:47	7440-48-4		
Molybdenum, Total Recoverable	0.13	mg/L	0.0010	1	03/21/19 13:01	03/26/19 11:47	7439-98-7		
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/26/19 11:47	7782-49-2		
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/25/19 13:52	7440-28-0		
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	03/22/19 11:16	03/25/19 11:48	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	734	mg/L	5.0	1		04/11/19 16:51		H1	
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.2	Std. Units	0.10	1		03/25/19 08:29		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	33.5	mg/L	10.0	10		03/27/19 02:58	16887-00-6		
Fluoride	0.38	mg/L	0.20	1		03/27/19 02:43	16984-48-8		
Sulfate	297	mg/L	50.0	50		03/27/19 03:14	14808-79-8		

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60297249

Sample: MW-38-031919		Lab ID: 60297249002		Collected: 03/19/19 08:37		Received: 03/19/19 15:35		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.031	mg/L	0.0050	1	03/21/19 15:19	03/22/19 17:39	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 15:19	03/22/19 17:39	7440-41-7		
Boron, Total Recoverable	5.2	mg/L	0.10	1	03/21/19 15:19	03/22/19 17:39	7440-42-8		
Calcium, Total Recoverable	302	mg/L	0.20	1	03/21/19 15:19	03/22/19 17:39	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	03/21/19 15:19	03/22/19 17:39	7440-47-3		
Lead, Total Recoverable	<0.010	mg/L	0.010	1	03/21/19 15:19	03/22/19 17:39	7439-92-1		
Lithium	0.076	mg/L	0.010	1	03/21/19 15:19	03/22/19 17:39	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/25/19 13:56	7440-36-0		
Arsenic, Total Recoverable	0.015	mg/L	0.0010	1	03/21/19 13:01	03/25/19 13:56	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	03/21/19 13:01	03/25/19 13:56	7440-43-9		
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/25/19 13:56	7440-48-4		
Molybdenum, Total Recoverable	0.094	mg/L	0.0010	1	03/21/19 13:01	03/25/19 13:56	7439-98-7		
Selenium, Total Recoverable	<0.0050	mg/L	0.0050	5	03/21/19 13:01	03/26/19 13:29	7782-49-2	D3	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/25/19 13:56	7440-28-0		
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	03/22/19 11:16	03/25/19 11:51	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	2140	mg/L	5.0	1		03/22/19 15:40			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.5	Std. Units	0.10	1		03/25/19 08:29		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	199	mg/L	50.0	50		03/27/19 07:58	16887-00-6		
Fluoride	4.7	mg/L	0.20	1		03/27/19 03:30	16984-48-8		
Sulfate	1350	mg/L	100	100		03/28/19 08:52	14808-79-8		

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60297249

Sample: MW-K-031919		Lab ID: 60297249003		Collected: 03/19/19 09:38		Received: 03/19/19 15:35		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.043	mg/L	0.0050	1	03/21/19 15:19	03/22/19 17:41	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 15:19	03/22/19 17:41	7440-41-7		
Boron, Total Recoverable	2.4	mg/L	0.10	1	03/21/19 15:19	03/22/19 17:41	7440-42-8		
Calcium, Total Recoverable	538	mg/L	0.20	1	03/21/19 15:19	03/22/19 17:41	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	03/21/19 15:19	03/22/19 17:41	7440-47-3		
Lead, Total Recoverable	<0.010	mg/L	0.010	1	03/21/19 15:19	03/22/19 17:41	7439-92-1		
Lithium	0.084	mg/L	0.010	1	03/21/19 15:19	03/22/19 17:41	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/26/19 11:55	7440-36-0		
Arsenic, Total Recoverable	0.075	mg/L	0.0010	1	03/21/19 13:01	03/26/19 11:55	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	03/21/19 13:01	03/26/19 11:55	7440-43-9		
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/26/19 11:55	7440-48-4		
Molybdenum, Total Recoverable	0.014	mg/L	0.0010	1	03/21/19 13:01	03/26/19 11:55	7439-98-7		
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/26/19 11:55	7782-49-2		
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:00	7440-28-0		
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	03/22/19 11:16	03/25/19 11:55	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	4370	mg/L	5.0	1		03/22/19 15:40			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.3	Std. Units	0.10	1		03/25/19 08:29		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	825	mg/L	200	200		03/28/19 09:37	16887-00-6		
Fluoride	2.2	mg/L	0.20	1		03/27/19 08:13	16984-48-8		
Sulfate	2160	mg/L	200	200		03/28/19 09:37	14808-79-8		

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60297249

Sample: MW-L-031919		Lab ID: 60297249004		Collected: 03/19/19 10:54		Received: 03/19/19 15:35		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.039	mg/L	0.0050	1	03/21/19 15:19	03/22/19 17:48	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 15:19	03/22/19 17:48	7440-41-7		
Boron, Total Recoverable	2.1	mg/L	0.10	1	03/21/19 15:19	03/22/19 17:48	7440-42-8		
Calcium, Total Recoverable	612	mg/L	0.20	1	03/21/19 15:19	03/22/19 17:48	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	03/21/19 15:19	03/22/19 17:48	7440-47-3		
Lead, Total Recoverable	<0.010	mg/L	0.010	1	03/21/19 15:19	03/22/19 17:48	7439-92-1		
Lithium	0.053	mg/L	0.010	1	03/21/19 15:19	03/22/19 17:48	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:09	7440-36-0		
Arsenic, Total Recoverable	0.026	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:09	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	03/21/19 13:01	03/25/19 14:09	7440-43-9		
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:09	7440-48-4		
Molybdenum, Total Recoverable	0.051	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:09	7439-98-7		
Selenium, Total Recoverable	<0.0050	mg/L	0.0050	5	03/21/19 13:01	03/26/19 13:32	7782-49-2	D3	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:09	7440-28-0		
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	03/22/19 11:16	03/25/19 11:58	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	4710	mg/L	5.0	1		03/22/19 15:40			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.2	Std. Units	0.10	1		03/25/19 08:29		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	946	mg/L	50.0	50		03/27/19 20:41	16887-00-6	M1	
Fluoride	1.0	mg/L	0.20	1		03/27/19 19:53	16984-48-8	M1	
Sulfate	2180	mg/L	200	200		03/27/19 21:29	14808-79-8	M1	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60297249

Sample: MW-39-031919		Lab ID: 60297249005	Collected: 03/19/19 11:50	Received: 03/19/19 15:35	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.030	mg/L	0.0050	1	03/21/19 15:19	03/22/19 17:50	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 15:19	03/22/19 17:50	7440-41-7	
Boron, Total Recoverable	4.6	mg/L	0.10	1	03/21/19 15:19	03/22/19 17:50	7440-42-8	
Calcium, Total Recoverable	490	mg/L	0.20	1	03/21/19 15:19	03/22/19 17:50	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	03/21/19 15:19	03/22/19 17:50	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	03/21/19 15:19	03/22/19 17:50	7439-92-1	
Lithium	0.045	mg/L	0.010	1	03/21/19 15:19	03/22/19 17:50	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:13	7440-36-0	
Arsenic, Total Recoverable	0.011	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:13	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	03/21/19 13:01	03/25/19 14:13	7440-43-9	
Cobalt, Total Recoverable	0.0012	mg/L	0.0010	1	03/21/19 13:01	03/26/19 12:12	7440-48-4	
Molybdenum, Total Recoverable	0.15	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:13	7439-98-7	
Selenium, Total Recoverable	<0.0050	mg/L	0.0050	5	03/21/19 13:01	03/26/19 13:36	7782-49-2	D3
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:13	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	03/22/19 11:16	03/25/19 12:00	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3480	mg/L	5.0	1		03/22/19 15:40		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.3	Std. Units	0.10	1		03/25/19 08:29		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	399	mg/L	50.0	50		03/27/19 23:04	16887-00-6	
Fluoride	1.9	mg/L	0.20	1		03/27/19 22:48	16984-48-8	
Sulfate	1810	mg/L	200	200		03/27/19 23:20	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60297249

Sample: MW-40-031919		Lab ID: 60297249006	Collected: 03/19/19 12:58	Received: 03/19/19 15:35	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.033	mg/L	0.0050	1	04/02/19 11:21	04/03/19 18:21	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	04/02/19 11:21	04/03/19 18:21	7440-41-7	
Boron, Total Recoverable	5.8	mg/L	0.10	1	04/02/19 11:21	04/03/19 18:21	7440-42-8	
Calcium, Total Recoverable	468	mg/L	0.20	1	04/02/19 11:21	04/03/19 18:21	7440-70-2	M1
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	04/02/19 11:21	04/03/19 18:21	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	04/02/19 11:21	04/03/19 18:21	7439-92-1	
Lithium	0.049	mg/L	0.010	1	04/02/19 11:21	04/03/19 18:21	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:17	7440-36-0	
Arsenic, Total Recoverable	0.015	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:17	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	03/21/19 13:01	03/25/19 14:17	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:17	7440-48-4	
Molybdenum, Total Recoverable	0.15	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:17	7439-98-7	
Selenium, Total Recoverable	<0.0050	mg/L	0.0050	5	03/21/19 13:01	03/26/19 13:42	7782-49-2	D3
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:17	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	03/22/19 11:16	03/25/19 12:02	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3060	mg/L	5.0	1		03/22/19 15:40		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2	Std. Units	0.10	1		03/25/19 08:29		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	329	mg/L	50.0	50		03/27/19 23:51	16887-00-6	
Fluoride	1.2	mg/L	0.20	1		03/27/19 23:36	16984-48-8	
Sulfate	1730	mg/L	200	200		03/28/19 00:07	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC ISI CCR

Pace Project No.: 60297249

Sample: DUP-031919		Lab ID: 60297249007	Collected: 03/19/19 06:00	Received: 03/19/19 15:35	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.043	mg/L	0.0050	1	03/21/19 15:19	03/22/19 17:56	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 15:19	03/22/19 17:56	7440-41-7	
Boron, Total Recoverable	2.4	mg/L	0.10	1	03/21/19 15:19	03/22/19 17:56	7440-42-8	
Calcium, Total Recoverable	532	mg/L	0.20	1	03/21/19 15:19	03/22/19 17:56	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	03/21/19 15:19	03/22/19 17:56	7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	03/21/19 15:19	03/22/19 17:56	7439-92-1	
Lithium	0.084	mg/L	0.010	1	03/21/19 15:19	03/22/19 17:56	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:21	7440-36-0	
Arsenic, Total Recoverable	0.079	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:21	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	03/21/19 13:01	03/25/19 14:21	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:21	7440-48-4	
Molybdenum, Total Recoverable	0.015	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:21	7439-98-7	
Selenium, Total Recoverable	<0.0050	mg/L	0.0050	5	03/21/19 13:01	03/26/19 13:45	7782-49-2	D3
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	03/21/19 13:01	03/25/19 14:21	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	03/22/19 11:16	03/25/19 12:04	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	4370	mg/L	5.0	1		03/22/19 15:40		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.3	Std. Units	0.10	1		03/25/19 08:29		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	838	mg/L	50.0	50		03/28/19 00:39	16887-00-6	
Fluoride	2.0	mg/L	0.20	1		03/28/19 00:23	16984-48-8	
Sulfate	3930	mg/L	200	200		03/28/19 00:55	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60297249

QC Batch: 574975 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60297249001, 60297249002, 60297249003, 60297249004, 60297249005, 60297249006, 60297249007

METHOD BLANK: 2358314 Matrix: Water
Associated Lab Samples: 60297249001, 60297249002, 60297249003, 60297249004, 60297249005, 60297249006, 60297249007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	03/25/19 11:18	

LABORATORY CONTROL SAMPLE: 2358315

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0047	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2358316 2358317

Parameter	Units	60297249004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	<0.00020	0.005	0.005	0.0040	0.0044	79	88	70-130	10	20	

MATRIX SPIKE SAMPLE: 2358318

Parameter	Units	75104735001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	0.005	0.0047	95	70-130	

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60297249

QC Batch: 574891 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60297249001, 60297249002, 60297249003, 60297249004, 60297249005, 60297249007

METHOD BLANK: 2358046 Matrix: Water
Associated Lab Samples: 60297249001, 60297249002, 60297249003, 60297249004, 60297249005, 60297249006, 60297249007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	03/22/19 17:34	
Beryllium	mg/L	<0.0010	0.0010	03/22/19 17:34	
Boron	mg/L	<0.10	0.10	03/22/19 17:34	
Calcium	mg/L	<0.20	0.20	03/22/19 17:34	
Chromium	mg/L	<0.0050	0.0050	03/22/19 17:34	
Lead	mg/L	<0.010	0.010	03/22/19 17:34	
Lithium	mg/L	<0.010	0.010	03/22/19 17:34	

LABORATORY CONTROL SAMPLE: 2358047

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	0.95	95	85-115	
Beryllium	mg/L	1	0.96	96	85-115	
Boron	mg/L	1	0.94	94	85-115	
Calcium	mg/L	10	10.0	100	85-115	
Chromium	mg/L	1	0.93	93	85-115	
Lead	mg/L	1	1.0	100	85-115	
Lithium	mg/L	1	1.0	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2358048 2358049

Parameter	Units	75104891001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.	MS Result	MSD Result						
Barium	mg/L	65.0 ug/L	1	1	1.0	1.0	97	96	70-130	1	20	
Beryllium	mg/L	ND	1	1	0.98	0.98	98	98	70-130	0	20	
Boron	mg/L	ND	1	1	1.0	1.0	98	98	70-130	0	20	
Calcium	mg/L	35.4	10	10	45.3	45.4	99	100	70-130	0	20	
Chromium	mg/L	ND	1	1	0.95	0.94	94	94	70-130	0	20	
Lead	mg/L	ND	1	1	0.97	0.97	97	97	70-130	0	20	
Lithium	mg/L	ND	1	1	1.0	1.1	104	105	70-130	1	20	

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60297249

QC Batch: 576903 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60297249006

METHOD BLANK: 2367097 Matrix: Water
Associated Lab Samples: 60297249006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	04/03/19 18:19	
Beryllium	mg/L	<0.0010	0.0010	04/03/19 18:19	
Boron	mg/L	<0.10	0.10	04/03/19 18:19	
Calcium	mg/L	<0.20	0.20	04/03/19 18:19	
Chromium	mg/L	<0.0050	0.0050	04/03/19 18:19	
Lead	mg/L	<0.010	0.010	04/03/19 18:19	
Lithium	mg/L	<0.010	0.010	04/03/19 18:19	

LABORATORY CONTROL SAMPLE: 2367098

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	0.95	95	85-115	
Beryllium	mg/L	1	0.95	95	85-115	
Boron	mg/L	1	0.93	93	85-115	
Calcium	mg/L	10	9.6	96	85-115	
Chromium	mg/L	1	0.90	90	85-115	
Lead	mg/L	1	0.98	98	85-115	
Lithium	mg/L	1	0.98	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2367099 2367100

Parameter	Units	60297249006		2367100		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Barium	mg/L	0.033	1	1	0.97	0.98	94	94	70-130	1	20
Beryllium	mg/L	<0.0010	1	1	0.93	0.93	93	93	70-130	1	20
Boron	mg/L	5.8	1	1	6.8	6.9	97	107	70-130	1	20
Calcium	mg/L	468	10	10	474	480	52	116	70-130	1	20 M1
Chromium	mg/L	<0.0050	1	1	0.87	0.89	87	89	70-130	1	20
Lead	mg/L	<0.010	1	1	0.91	0.91	91	91	70-130	0	20
Lithium	mg/L	0.049	1	1	1.1	1.1	103	103	70-130	0	20

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60297249

QC Batch: 574798 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
 Associated Lab Samples: 60297249001, 60297249002, 60297249003, 60297249004, 60297249005, 60297249006, 60297249007

METHOD BLANK: 2357687 Matrix: Water
 Associated Lab Samples: 60297249001, 60297249002, 60297249003, 60297249004, 60297249005, 60297249006, 60297249007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	03/25/19 13:45	
Arsenic	mg/L	<0.0010	0.0010	03/25/19 13:45	
Cadmium	mg/L	<0.00050	0.00050	03/25/19 13:45	
Cobalt	mg/L	<0.0010	0.0010	03/25/19 13:45	
Molybdenum	mg/L	<0.0010	0.0010	03/26/19 11:25	
Selenium	mg/L	<0.0010	0.0010	03/25/19 13:45	
Thallium	mg/L	<0.0010	0.0010	03/25/19 13:45	

LABORATORY CONTROL SAMPLE: 2357688

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	0.04	0.037	92	85-115	
Arsenic	mg/L	0.04	0.038	94	85-115	
Cadmium	mg/L	0.04	0.037	94	85-115	
Cobalt	mg/L	0.04	0.037	93	85-115	
Molybdenum	mg/L	0.04	0.035	87	85-115	
Selenium	mg/L	0.04	0.037	94	85-115	
Thallium	mg/L	0.04	0.036	89	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2357689 2357690

Parameter	Units	60297284001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Antimony	mg/L	ND	0.04	0.04	0.037	0.038	93	95	70-130	2	20		
Arsenic	mg/L	1.4 ug/L	0.04	0.04	0.040	0.039	97	95	70-130	2	20		
Cadmium	mg/L	ND	0.04	0.04	0.036	0.036	89	91	70-130	2	20		
Cobalt	mg/L	ND	0.04	0.04	0.040	0.040	99	98	70-130	1	20		
Molybdenum	mg/L	2.1 ug/L	0.04	0.04	0.039	0.039	93	91	70-130	2	20		
Selenium	mg/L	2.3 ug/L	0.04	0.04	0.034	0.033	79	78	70-130	1	20		
Thallium	mg/L	ND	0.04	0.04	0.032	0.033	80	81	70-130	2	20		

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60297249

QC Batch: 575162

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60297249002, 60297249003, 60297249004, 60297249005, 60297249006, 60297249007

METHOD BLANK: 2359339

Matrix: Water

Associated Lab Samples: 60297249001, 60297249002, 60297249003, 60297249004, 60297249005, 60297249006, 60297249007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	03/22/19 15:39	

LABORATORY CONTROL SAMPLE: 2359340

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	992	99	80-120	

SAMPLE DUPLICATE: 2359341

Parameter	Units	60297248003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	6680	6630	1	10	

SAMPLE DUPLICATE: 2359342

Parameter	Units	60297249004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	4710	4720	0	10	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60297249

QC Batch: 578645	Analysis Method: SM 2540C
QC Batch Method: SM 2540C	Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60297249001	

METHOD BLANK: 2374471 Matrix: Water
Associated Lab Samples: 60297249001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	04/11/19 16:51	

LABORATORY CONTROL SAMPLE: 2374472

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	975	98	80-120	

SAMPLE DUPLICATE: 2374473

Parameter	Units	60297249001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	734	734	0	10	H1

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60297249

QC Batch: 575161 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60297249001, 60297249002, 60297249003, 60297249004, 60297249005, 60297249006, 60297249007

SAMPLE DUPLICATE: 2359338

Parameter	Units	60297249001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.4	4	5	H6

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60297249

QC Batch: 575578 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60297249001, 60297249002, 60297249003

METHOD BLANK: 2361195 Matrix: Water
Associated Lab Samples: 60297249001, 60297249002, 60297249003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	03/26/19 14:04	
Fluoride	mg/L	<0.20	0.20	03/26/19 14:04	
Sulfate	mg/L	<1.0	1.0	03/26/19 14:04	

LABORATORY CONTROL SAMPLE: 2361196

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	97	90-110	
Fluoride	mg/L	2.5	2.6	102	90-110	
Sulfate	mg/L	5	5.2	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2361197 2361198

Parameter	Units	60297248001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	583	250	250	900	844	127	104	90-110	6	15	M1

MATRIX SPIKE SAMPLE: 2361199

Parameter	Units	60297300004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	53.4	50	102	98	90-110	

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QUALITY CONTROL DATA

Project: LEC ISI CCR
Pace Project No.: 60297249

QC Batch: 575850 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60297249004, 60297249005, 60297249006, 60297249007

METHOD BLANK: 2362353 Matrix: Water
Associated Lab Samples: 60297249004, 60297249005, 60297249006, 60297249007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	03/27/19 18:51	
Fluoride	mg/L	<0.20	0.20	03/27/19 18:51	
Sulfate	mg/L	<1.0	1.0	03/27/19 18:51	

LABORATORY CONTROL SAMPLE: 2362354

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	
Fluoride	mg/L	2.5	2.6	103	90-110	
Sulfate	mg/L	5	5.2	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2362355 2362356

Parameter	Units	60297249004		2362355		2362356		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MS Result	MS Spike Conc.	MS Result	MS Spike Conc.				
Chloride	mg/L	946	250	250	1110	1120	65	71	90-110	1	15 E, M1
Fluoride	mg/L	1.0	2.5	2.5	2.6	2.7	62	65	90-110	3	15 M1
Sulfate	mg/L	2180	1000	1000	3260	3300	108	112	90-110	1	15 M1

MATRIX SPIKE SAMPLE: 2362357

Parameter	Units	60297824002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	36.2	50	87.2	102	90-110	

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QUALITY CONTROL DATA

Project: LEC ISI CCR

Pace Project No.: 60297249

QC Batch: 575869 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60297249002, 60297249003

METHOD BLANK: 2362446 Matrix: Water

Associated Lab Samples: 60297249002, 60297249003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	03/28/19 08:22	
Sulfate	mg/L	<1.0	1.0	03/28/19 08:22	

LABORATORY CONTROL SAMPLE: 2362447

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	95	90-110	
Sulfate	mg/L	5	5.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2362448 2362449

Parameter	Units	60297249002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	1350	500	500	1880	1880	106	106	90-110	0	15	

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QUALIFIERS

Project: LEC ISI CCR

Pace Project No.: 60297249

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

H1 Analysis conducted outside the EPA method holding time.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

Pace Project No.: 60297249

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60297249001	MW-37-031819	EPA 200.7	574891	EPA 200.7	575049
60297249002	MW-38-031919	EPA 200.7	574891	EPA 200.7	575049
60297249003	MW-K-031919	EPA 200.7	574891	EPA 200.7	575049
60297249004	MW-L-031919	EPA 200.7	574891	EPA 200.7	575049
60297249005	MW-39-031919	EPA 200.7	574891	EPA 200.7	575049
60297249006	MW-40-031919	EPA 200.7	576903	EPA 200.7	576945
60297249007	DUP-031919	EPA 200.7	574891	EPA 200.7	575049
60297249001	MW-37-031819	EPA 200.8	574798	EPA 200.8	574994
60297249002	MW-38-031919	EPA 200.8	574798	EPA 200.8	574994
60297249003	MW-K-031919	EPA 200.8	574798	EPA 200.8	574994
60297249004	MW-L-031919	EPA 200.8	574798	EPA 200.8	574994
60297249005	MW-39-031919	EPA 200.8	574798	EPA 200.8	574994
60297249006	MW-40-031919	EPA 200.8	574798	EPA 200.8	574994
60297249007	DUP-031919	EPA 200.8	574798	EPA 200.8	574994
60297249001	MW-37-031819	EPA 245.1	574975	EPA 245.1	575133
60297249002	MW-38-031919	EPA 245.1	574975	EPA 245.1	575133
60297249003	MW-K-031919	EPA 245.1	574975	EPA 245.1	575133
60297249004	MW-L-031919	EPA 245.1	574975	EPA 245.1	575133
60297249005	MW-39-031919	EPA 245.1	574975	EPA 245.1	575133
60297249006	MW-40-031919	EPA 245.1	574975	EPA 245.1	575133
60297249007	DUP-031919	EPA 245.1	574975	EPA 245.1	575133
60297249001	MW-37-031819	SM 2540C	578645		
60297249002	MW-38-031919	SM 2540C	575162		
60297249003	MW-K-031919	SM 2540C	575162		
60297249004	MW-L-031919	SM 2540C	575162		
60297249005	MW-39-031919	SM 2540C	575162		
60297249006	MW-40-031919	SM 2540C	575162		
60297249007	DUP-031919	SM 2540C	575162		
60297249001	MW-37-031819	SM 4500-H+B	575161		
60297249002	MW-38-031919	SM 4500-H+B	575161		
60297249003	MW-K-031919	SM 4500-H+B	575161		
60297249004	MW-L-031919	SM 4500-H+B	575161		
60297249005	MW-39-031919	SM 4500-H+B	575161		
60297249006	MW-40-031919	SM 4500-H+B	575161		
60297249007	DUP-031919	SM 4500-H+B	575161		
60297249001	MW-37-031819	EPA 300.0	575578		
60297249002	MW-38-031919	EPA 300.0	575578		
60297249002	MW-38-031919	EPA 300.0	575869		
60297249003	MW-K-031919	EPA 300.0	575578		
60297249003	MW-K-031919	EPA 300.0	575869		
60297249004	MW-L-031919	EPA 300.0	575850		
60297249005	MW-39-031919	EPA 300.0	575850		
60297249006	MW-40-031919	EPA 300.0	575850		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR
Pace Project No.: 60297249

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60297249007	DUP-031919	EPA 300.0	575850		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60297249
60297249

Client Name: Westar Energy

Courier: FedEx UPS VIA Clay PEX ECI Pace Xroads Client Other

Tracking #: _____ Pace Shipping Label Used? Yes No

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No

Packing Material: Bubble Wrap Bubble Bags Foam None Other

Thermometer Used: T-296 Type of Ice: Yes Blue None

Cooler Temperature (°C): As-read 2.7 Corr. Factor -1.0 Corrected 1.7

Date and initials of person examining contents:
MJ/19/19

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Pace Container Order #468038

Order By :	Ship To :	Return To:
Company <u>WESTAR ENERGY</u>	Company <u>WESTAR ENERGY</u>	Company <u>Pace Analytical Kansas</u>
Contact <u>Griffin, Brandon</u>	Contact <u>Griffin, Brandon</u>	Contact <u>Wilson, Heather</u>
Email <u>brandon.l.griffin@westarenergy.</u>	Email <u>brandon.l.griffin@westarenergy.</u>	Email <u>heather.wilson@pacelabs.com</u>
Address <u>818 S. Kansas Ave</u>	Address <u>818 S. Kansas Ave</u>	Address <u>9608 Loiret Blvd.</u>
Address 2 _____	Address 2 _____	Address 2 _____
City <u>Topeka</u>	City <u>Topeka</u>	City <u>Lenexa</u>
State <u>KS</u> Zip <u>66612</u>	State <u>KS</u> Zip <u>66612</u>	State <u>KS</u> Zip <u>66219</u>
Phone <u>785-575-8135</u>	Phone <u>785-575-8135</u>	Phone <u>1(913)563-1407</u>

Info			
Project Name <u>LEC ISI CCR- App III & IV</u>	Due Date <u>02/27/2019</u>	Profile <u>9655</u>	Quote _____
Project <u>Wilson, Heather</u>	Return _____	Carrier <u>Most Economical</u>	Locatio _____

Trip Blanks

Include Trip Blanks

Bottle

Blank

Pre-Printed No Sample IDs

Pre-Printed With Sample IDs

Boxed Cases

Individually Wrapped

Grouped By Sample

Return Shipping

No Shipper

With Shipper

Misc

Sampling Instructions

Custody Seal

Temp. Blanks

Coolers _____

Syringes _____

Extra Bubble Wrap

Short Hold/Rush

DI

USDA Regulated Soils

COC Options

Number of Blanks

Pre-Printed

# of Samples	Matrix	Test	Container	Total	# of	Lot #	Notes
7	WT	Metals	1-1L plastic w/HNO3	7	0	010719-2AJN	
7	WT	300.0 Anions/pH/TDS	1L unpreserved plastic	7	0	010719-2APJ	

Hazard Shipping Placard In Place : NO

- *Sample receiving hours are Mon-Fri 7:00am-6:00pm and Sat 8:00am-2:00pm unless special arrangements are made with your project manager.
- *Pace Analytical reserves the right to return hazardous, toxic, or radioactive samples to you.
- *Pace Analytical reserves the right to charge for unused bottles, as well as cost associated with sample storage and disposal.
- *Payment term are net 30 days.
- *Please include the proposal number on the chain of custody to insure proper billing.

Sample

PP COC (1), PP labels w/o sample IDs
 Lenexa return
 Scott to take on 2/28/19

Ship Date :

Prepared

Verified By: _____

April 03, 2019

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC ISI CCR
Pace Project No.: 60297333

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on March 20, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC ISI CCR

Pace Project No.: 60297333

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: LEC ISI CCR

Pace Project No.: 60297333

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60297333001	MW-37-031819	Water	03/18/19 17:10	03/20/19 09:40
60297333002	MW-38-031919	Water	03/19/19 08:37	03/20/19 09:40
60297333003	MW-K-031919	Water	03/19/19 09:38	03/20/19 09:40
60297333004	MW-L-031919	Water	03/19/19 10:54	03/20/19 09:40
60297333005	MW-39-031919	Water	03/19/19 11:50	03/20/19 09:40
60297333006	MW-40-031919	Water	03/19/19 12:58	03/20/19 09:40
60297333007	DUP-031919	Water	03/19/19 06:00	03/20/19 09:40

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC ISI CCR

Pace Project No.: 60297333

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60297333001	MW-37-031819	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60297333002	MW-38-031919	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60297333003	MW-K-031919	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60297333004	MW-L-031919	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60297333005	MW-39-031919	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60297333006	MW-40-031919	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60297333007	DUP-031919	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60297333

Sample: MW-37-031819 **Lab ID: 60297333001** Collected: 03/18/19 17:10 Received: 03/20/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.511 ± 0.437 (0.593) C:NA T:86%	pCi/L	03/29/19 09:55	13982-63-3	
Radium-228	EPA 904.0	0.634 ± 0.483 (0.948) C:76% T:69%	pCi/L	03/29/19 15:49	15262-20-1	
Total Radium	Total Radium Calculation	1.15 ± 0.920 (1.54)	pCi/L	04/02/19 13:32	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60297333

Sample: MW-38-031919 **Lab ID: 60297333002** Collected: 03/19/19 08:37 Received: 03/20/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.495 ± 0.388 (0.455) C:NA T:94%	pCi/L	03/29/19 10:09	13982-63-3	
Radium-228	EPA 904.0	1.28 ± 0.573 (0.991) C:78% T:83%	pCi/L	03/29/19 15:49	15262-20-1	
Total Radium	Total Radium Calculation	1.78 ± 0.961 (1.45)	pCi/L	04/02/19 13:32	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60297333

Sample: MW-K-031919 **Lab ID: 60297333003** Collected: 03/19/19 09:38 Received: 03/20/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.122 ± 0.294 (0.568) C:NA T:93%	pCi/L	03/29/19 10:09	13982-63-3	
Radium-228	EPA 904.0	0.829 ± 0.545 (1.03) C:77% T:83%	pCi/L	03/29/19 18:23	15262-20-1	
Total Radium	Total Radium Calculation	0.951 ± 0.839 (1.60)	pCi/L	04/02/19 13:32	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60297333

Sample: MW-L-031919 **Lab ID: 60297333004** Collected: 03/19/19 10:54 Received: 03/20/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.169 ± 0.293 (0.524) C:NA T:101%	pCi/L	03/29/19 10:09	13982-63-3	
Radium-228	EPA 904.0	0.314 ± 0.453 (0.975) C:79% T:91%	pCi/L	03/29/19 18:23	15262-20-1	
Total Radium	Total Radium Calculation	0.483 ± 0.746 (1.50)	pCi/L	04/02/19 13:32	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60297333

Sample: MW-39-031919 **Lab ID: 60297333005** Collected: 03/19/19 11:50 Received: 03/20/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.566 ± 0.624 (0.997) C:NA T:83%	pCi/L	03/29/19 10:09	13982-63-3	
Radium-228	EPA 904.0	1.05 ± 0.686 (1.31) C:72% T:75%	pCi/L	03/29/19 18:23	15262-20-1	
Total Radium	Total Radium Calculation	1.62 ± 1.31 (2.31)	pCi/L	04/02/19 13:32	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60297333

Sample: MW-40-031919 **Lab ID: 60297333006** Collected: 03/19/19 12:58 Received: 03/20/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.435 ± 0.407 (0.577) C:NA T:91%	pCi/L	03/29/19 10:09	13982-63-3	
Radium-228	EPA 904.0	0.824 ± 0.549 (1.05) C:77% T:84%	pCi/L	03/29/19 18:23	15262-20-1	
Total Radium	Total Radium Calculation	1.26 ± 0.956 (1.63)	pCi/L	04/02/19 13:32	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60297333

Sample: DUP-031919 **Lab ID: 60297333007** Collected: 03/19/19 06:00 Received: 03/20/19 09:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.500 ± 0.388 (0.490) C:NA T:85%	pCi/L	03/29/19 10:59	13982-63-3	
Radium-228	EPA 904.0	1.43 ± 0.643 (1.04) C:77% T:86%	pCi/L	03/29/19 19:41	15262-20-1	
Total Radium	Total Radium Calculation	1.93 ± 1.03 (1.53)	pCi/L	04/02/19 13:32	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60297333

QC Batch: 334671

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60297333001, 60297333002

METHOD BLANK: 1628633

Matrix: Water

Associated Lab Samples: 60297333001, 60297333002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.487 ± 0.369 (0.727) C:79% T:84%	pCi/L	03/29/19 12:44	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60297333

QC Batch: 334664

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60297333001, 60297333002, 60297333003, 60297333004, 60297333005, 60297333006

METHOD BLANK: 1628619

Matrix: Water

Associated Lab Samples: 60297333001, 60297333002, 60297333003, 60297333004, 60297333005, 60297333006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.184 ± 0.361 (0.660) C:NA T:95%	pCi/L	03/29/19 09:41	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60297333

QC Batch: 334665

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60297333007

METHOD BLANK: 1628620

Matrix: Water

Associated Lab Samples: 60297333007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.194 ± 0.341 (0.547) C:NA T:100%	pCi/L	03/29/19 10:59	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC ISI CCR

Pace Project No.: 60297333

QC Batch:	334672	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60297333003, 60297333004, 60297333005, 60297333006, 60297333007		

METHOD BLANK:	1628635	Matrix:	Water
Associated Lab Samples:	60297333003, 60297333004, 60297333005, 60297333006, 60297333007		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.701 ± 0.355 (0.605) C:81% T:86%	pCi/L	03/29/19 15:47	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: LEC ISI CCR

Pace Project No.: 60297333

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC ISI CCR

Pace Project No.: 60297333

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60297333001	MW-37-031819	EPA 903.1	334664		
60297333002	MW-38-031919	EPA 903.1	334664		
60297333003	MW-K-031919	EPA 903.1	334664		
60297333004	MW-L-031919	EPA 903.1	334664		
60297333005	MW-39-031919	EPA 903.1	334664		
60297333006	MW-40-031919	EPA 903.1	334664		
60297333007	DUP-031919	EPA 903.1	334665		
60297333001	MW-37-031819	EPA 904.0	334671		
60297333002	MW-38-031919	EPA 904.0	334671		
60297333003	MW-K-031919	EPA 904.0	334672		
60297333004	MW-L-031919	EPA 904.0	334672		
60297333005	MW-39-031919	EPA 904.0	334672		
60297333006	MW-40-031919	EPA 904.0	334672		
60297333007	DUP-031919	EPA 904.0	334672		
60297333001	MW-37-031819	Total Radium Calculation	336606		
60297333002	MW-38-031919	Total Radium Calculation	336606		
60297333003	MW-K-031919	Total Radium Calculation	336606		
60297333004	MW-L-031919	Total Radium Calculation	336606		
60297333005	MW-39-031919	Total Radium Calculation	336606		
60297333006	MW-40-031919	Total Radium Calculation	336606		
60297333007	DUP-031919	Total Radium Calculation	336606		

REPORT OF LABORATORY ANALYSIS

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Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Westar Energy Project # # 30285038

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 4746 8742 5289

Label	<u>DB</u>
LIMS Login	<u>DB</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used 10 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 0.5 °C Correction Factor: 0 °C Final Temp: 0.5 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>1003581</u>	<u>03/20/19 JLB</u>
Chain of Custody Present:	/				
Chain of Custody Filled Out:	/				
Chain of Custody Relinquished:	/				
Sampler Name & Signature on COC:	/				
Sample Labels match COC:	/				
-Includes date/time/ID Matrix: <u>WT</u>					
Samples Arrived within Hold Time:	/				
Short Hold Time Analysis (<72hr remaining):		/			
Rush Turn Around Time Requested:	/				
Sufficient Volume:	/				
Correct Containers Used:	/				
-Pace Containers Used:	/				
Containers Intact:	/				
Orthophosphate field filtered			/		
Hex Cr Aqueous Compliance/NPDES sample field filtered			/		
Organic Samples checked for dechlorination:			/		
Filtered volume received for Dissolved tests			/		
All containers have been checked for preservation.	/				
All containers needing preservation are found to be in compliance with EPA recommendation.	/				
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed <u>DB</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):			/		
Trip Blank Present:		/			
Trip Blank Custody Seals Present		/			
Rad Samples Screened < 0.5 mrem/hr	/			Initial when completed: <u>DB</u>	Date: <u>03/20/19</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

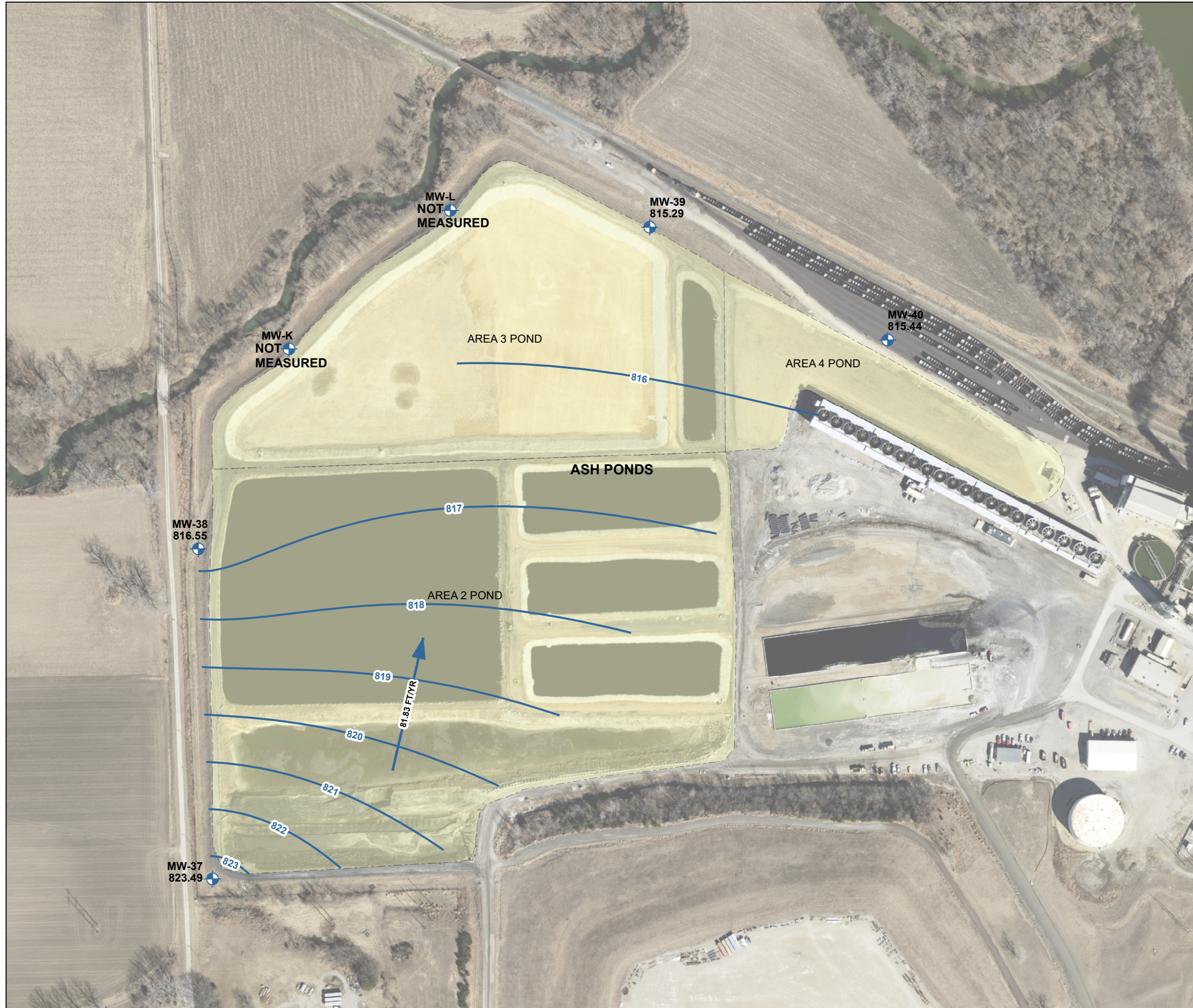
Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

ATTACHMENT 2
Groundwater Potentiometric Maps

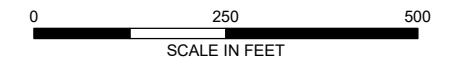


LEGEND

- MW-37** WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), MARCH 2018
- 822.24**
- MONITORING WELL
- ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 1-FT INTERVAL
- GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
- ASH PONDS (INACTIVE)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 05 MARCH 2018.
3. MW-K AND MW-L WERE NOT MEASURED IN MARCH 2018 AND THEREFORE WERE NOT USED IN THE CREATION OF THESE GROUNDWATER CONTOUR LINES.
4. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 05 MARCH 2018 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM PUBLISHED SOURCES AND GROUNDWATER ELEVATION DATA MEASURED BETWEEN MARCH 2018 AND JANUARY 2019.
5. AERIAL IMAGERY SOURCE: ESRI, 17 APRIL 2018



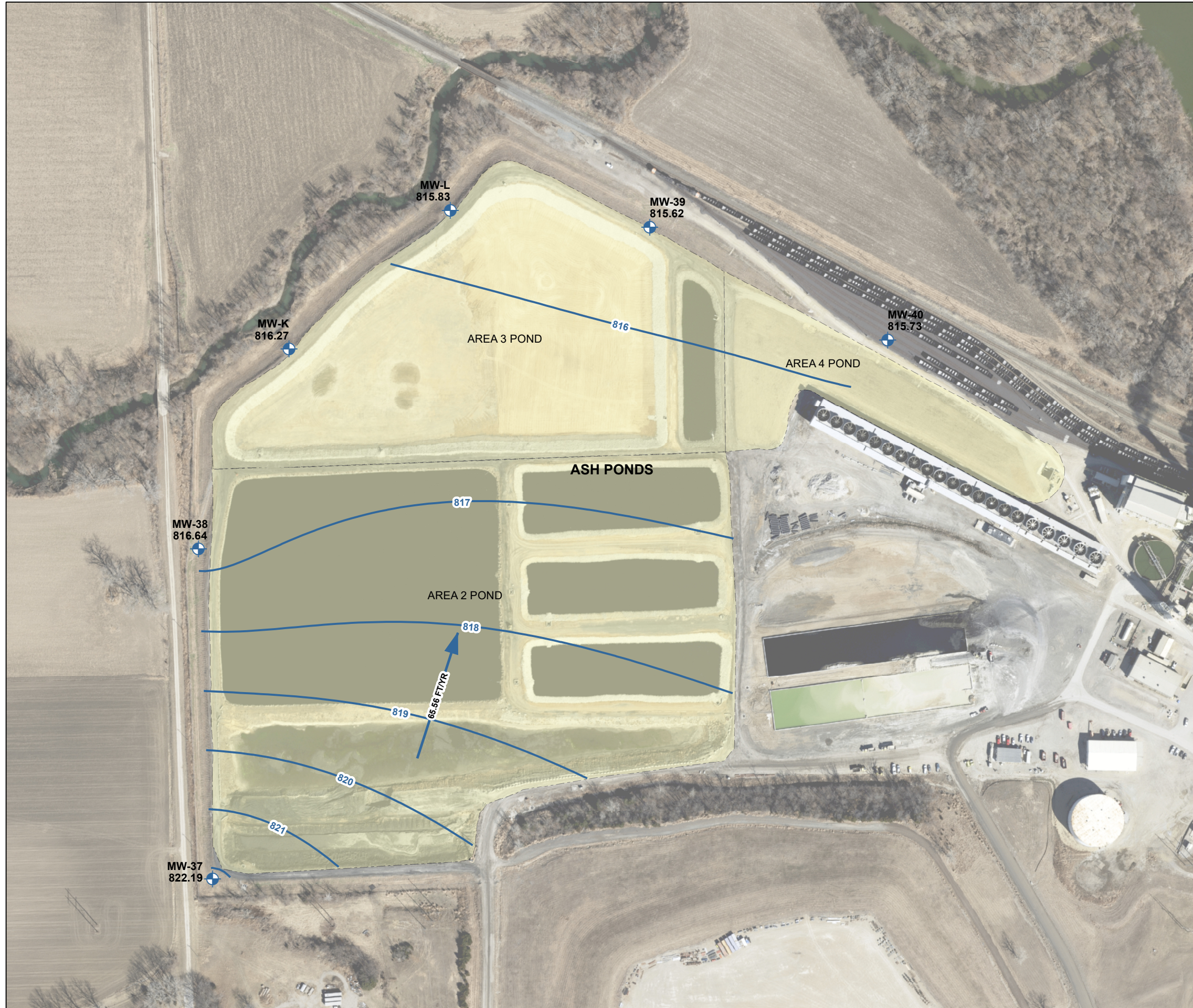
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LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS

ASH PONDS (INACTIVE)
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
MARCH 5, 2018







NOVEMBER 2022

FIGURE 2

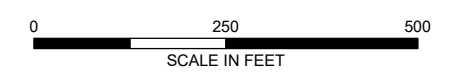


LEGEND

- MW-37** WELL NAME AND GROUNDWATER ELEVATION IN FEET
822.24 ABOVE MEAN SEA LEVEL (AMSL), MAY 2018
-  MONITORING WELL
-  ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 1-FT INTERVAL
-  GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
-  ASH PONDS (INACTIVE)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 09 MAY 2018.
3. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 09 MAY 2018 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM PUBLISHED SOURCES AND GROUNDWATER ELEVATION DATA MEASURED BETWEEN MARCH 2018 AND JANUARY 2019.
4. AERIAL IMAGERY SOURCE: ESRI, 17 APRIL 2018



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LAWRENCE, KANSAS

ASH PONDS (INACTIVE)
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
MAY 9, 2018





evergy

NOVEMBER 2022

FIGURE 3

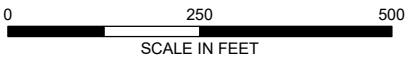


LEGEND

- MW-37** WELL NAME AND GROUNDWATER ELEVATION IN FEET
822.24 ABOVE MEAN SEA LEVEL (AMSL), JULY 2018
-  MONITORING WELL
-  ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 1-FT INTERVAL
-  GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
-  ASH PONDS (INACTIVE)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 02 JULY 2018.
3. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 02 JULY 2018 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM PUBLISHED SOURCES AND GROUNDWATER ELEVATION DATA MEASURED BETWEEN MARCH 2018 AND JANUARY 2019.
4. AERIAL IMAGERY SOURCE: ESRI, 17 APRIL 2018

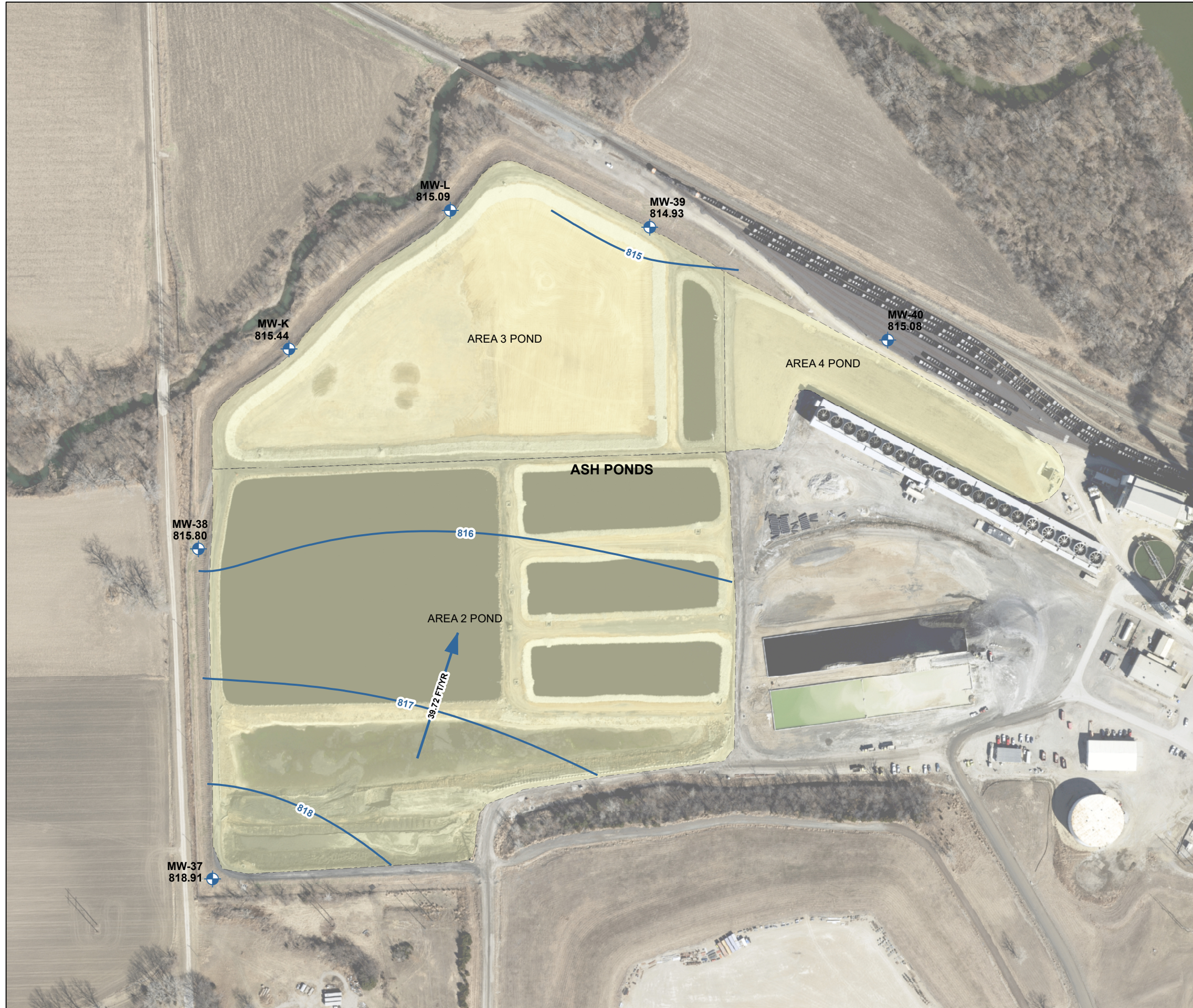


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LAWRENCE, KANSAS





ASH PONDS (INACTIVE)
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
JULY 2, 2018

evergy NOVEMBER 2022

FIGURE 4

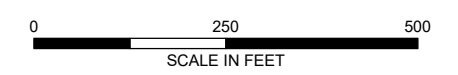


LEGEND

- MW-37** WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), AUGUST 2018
- 822.24**
-  MONITORING WELL
-  ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 1-FT INTERVAL
-  GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
-  ASH PONDS (INACTIVE)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 14 AUGUST 2018.
3. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 14 AUGUST 2018 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM PUBLISHED SOURCES AND GROUNDWATER ELEVATION DATA MEASURED BETWEEN MARCH 2018 AND JANUARY 2019.
4. AERIAL IMAGERY SOURCE: ESRI, 17 APRIL 2018



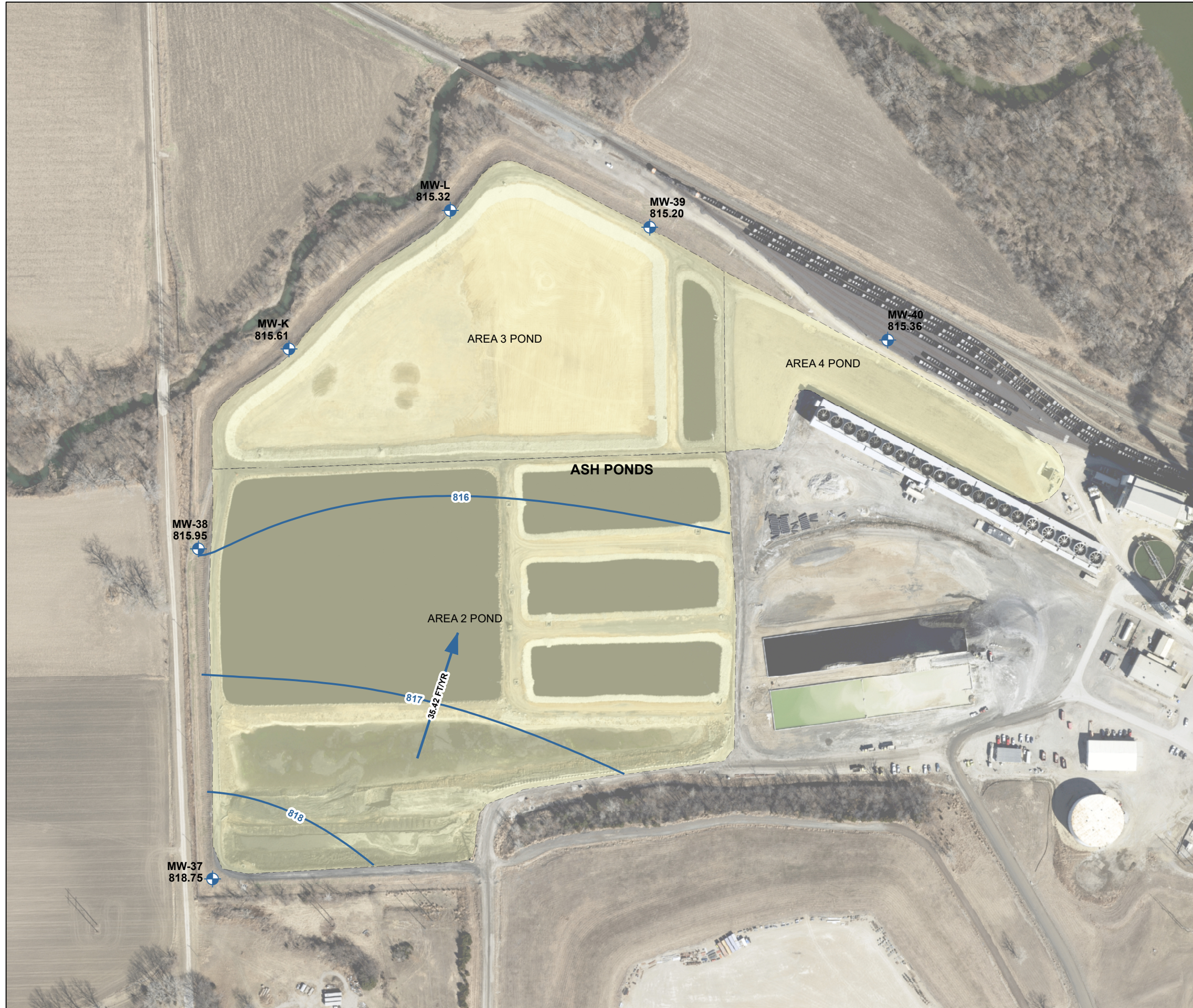
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LAWRENCE, KANSAS

ASH PONDS (INACTIVE)
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
AUGUST 14, 2018



NOVEMBER 2022

FIGURE 5

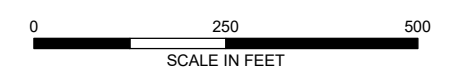


LEGEND

- MW-37** WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), OCTOBER 2018
- 822.24**
- MONITORING WELL
- ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 1-FT INTERVAL
- GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
- ASH PONDS (INACTIVE)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 03 OCTOBER 2018.
3. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 03 OCTOBER 2018 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM PUBLISHED SOURCES AND GROUNDWATER ELEVATION DATA MEASURED BETWEEN MARCH 2018 AND JANUARY 2019.
4. AERIAL IMAGERY SOURCE: ESRI, 17 APRIL 2018



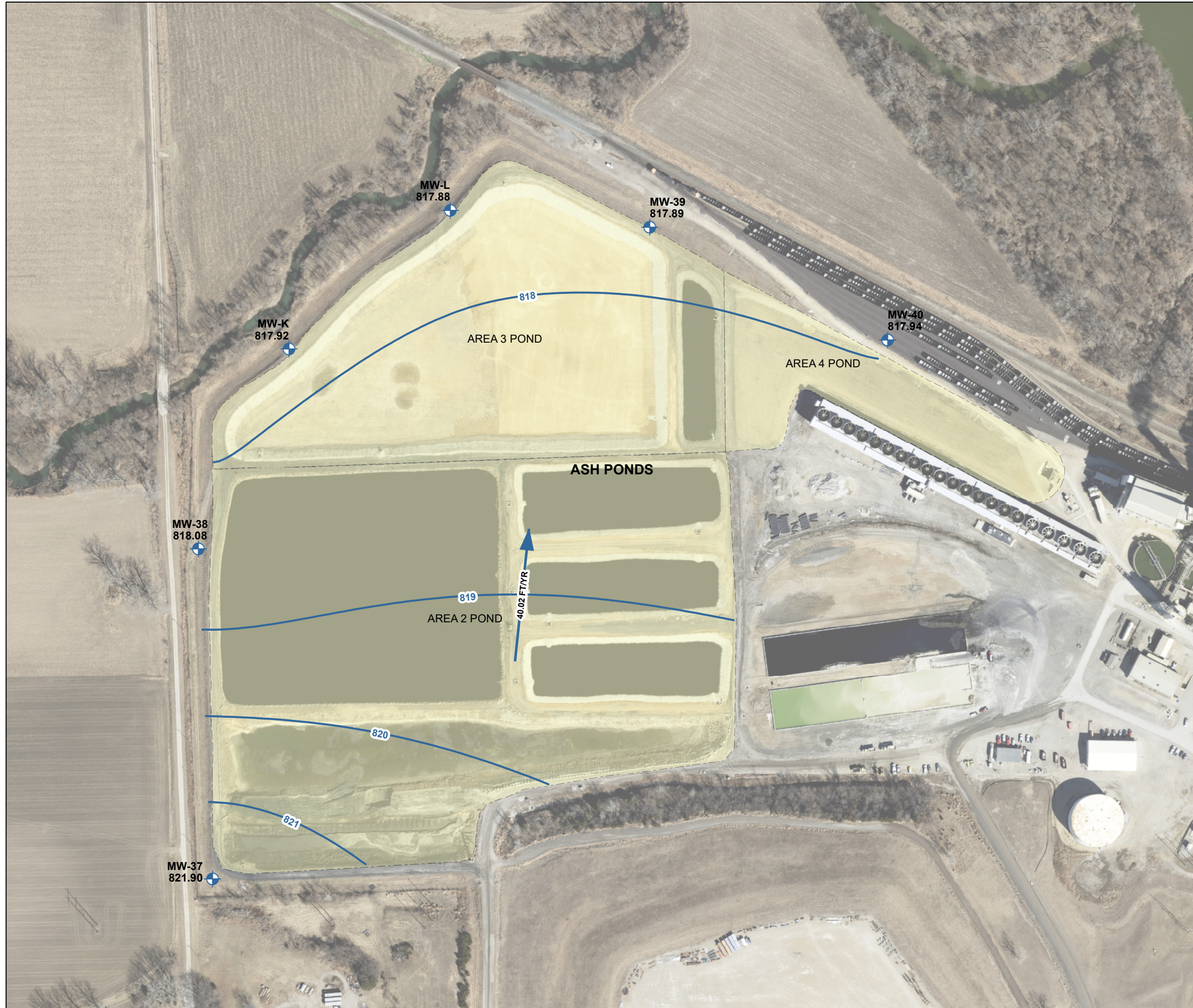
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LAWRENCE, KANSAS

ASH PONDS (INACTIVE)
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
OCTOBER 3, 2018



NOVEMBER 2022

FIGURE 6

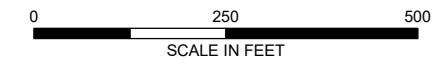


LEGEND

- MW-37** WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), NOVEMBER 2018
- 822.24**
- MONITORING WELL
- ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 1-FT INTERVAL
- GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
- ASH PONDS (INACTIVE)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 19 NOVEMBER 2018.
3. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 19 NOVEMBER 2018 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM PUBLISHED SOURCES AND GROUNDWATER ELEVATION DATA MEASURED BETWEEN MARCH 2018 AND JANUARY 2019.
4. AERIAL IMAGERY SOURCE: ESRI, 17 APRIL 2018



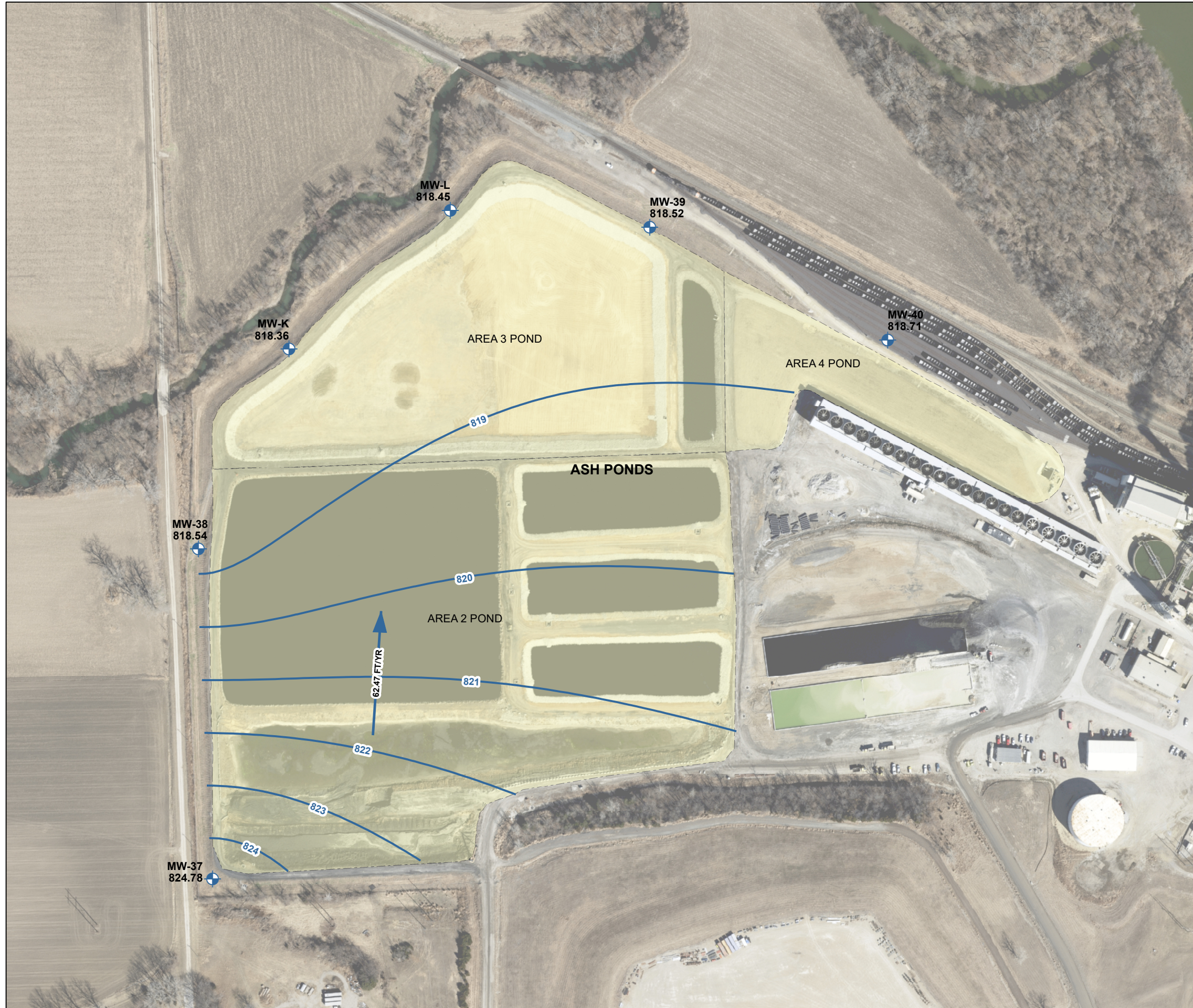
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LAWRENCE, KANSAS

ASH PONDS (INACTIVE)
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
NOVEMBER 19, 2018







NOVEMBER 2022

FIGURE 7

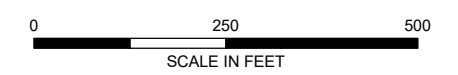


LEGEND

- MW-37** WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), JANUARY 2019
- 822.24**
-  MONITORING WELL
-  ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 1-FT INTERVAL
-  GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
-  ASH PONDS (INACTIVE)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 11 JANUARY 2019.
3. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 11 JANUARY 2019 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM PUBLISHED SOURCES AND GROUNDWATER ELEVATION DATA MEASURED BETWEEN MARCH 2018 AND JANUARY 2019.
4. AERIAL IMAGERY SOURCE: ESRI, 17 APRIL 2018



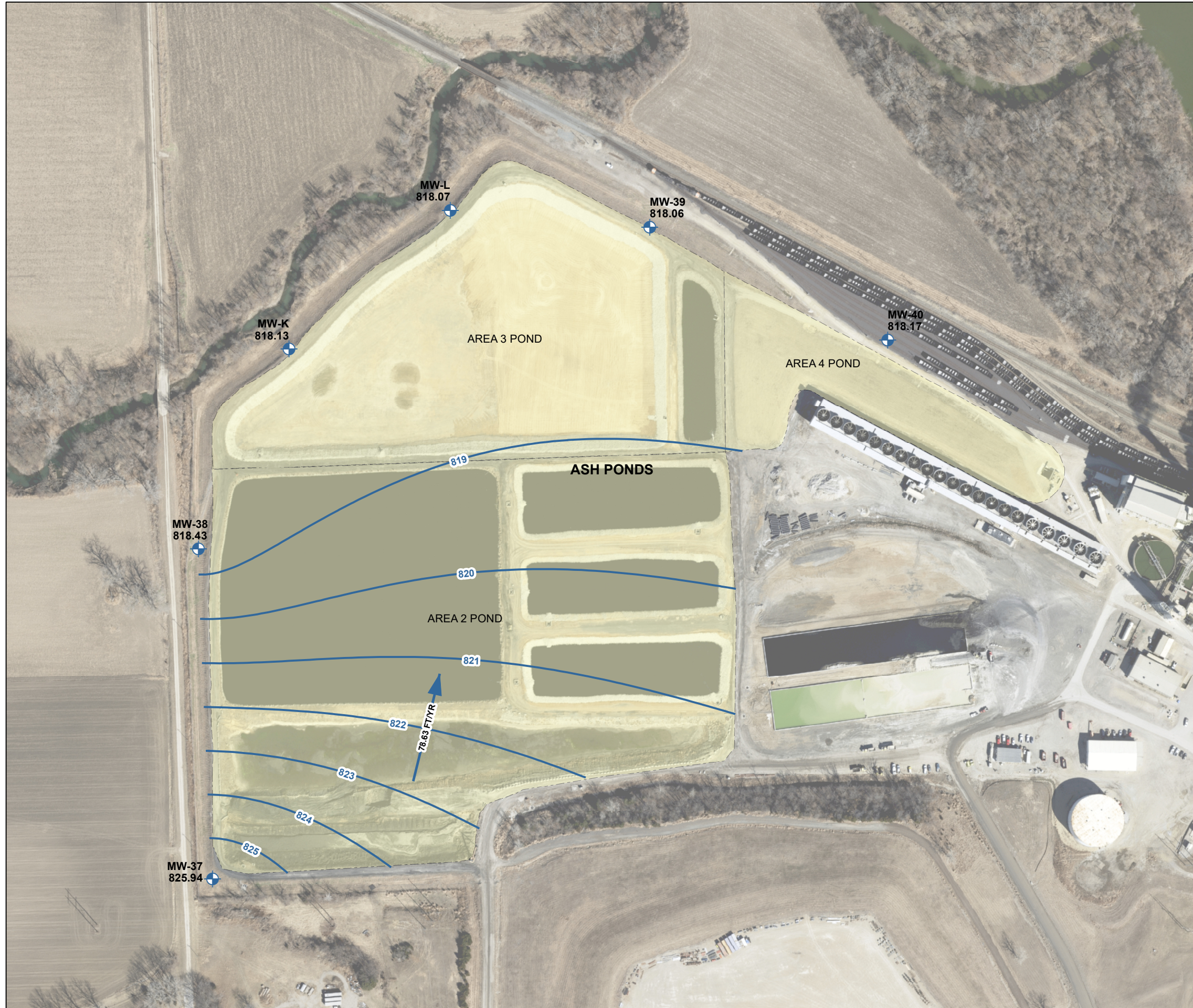
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LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS

ASH PONDS (INACTIVE)
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
JANUARY 11, 2019



NOVEMBER 2022

FIGURE 8

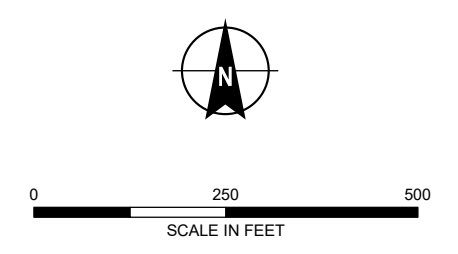


LEGEND

- MW-37** WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), MARCH 2019
- 822.24**
- MONITORING WELL
- ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 1-FT INTERVAL
- GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
- ASH PONDS (INACTIVE)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 18 MARCH 2019.
3. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 18 MARCH 2019 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM PUBLISHED SOURCES AND GROUNDWATER ELEVATION DATA MEASURED BETWEEN MARCH 2018 AND JANUARY 2019.
4. AERIAL IMAGERY SOURCE: ESRI, 17 APRIL 2018



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LAWRENCE, KANSAS

**ASH PONDS (INACTIVE)
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
MARCH 18, 2019**

evergy NOVEMBER 2022

FIGURE 9