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2018 – 2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

BOTTOM ASH POND
JEFFREY ENERGY CENTER
ST. MARYS, KANSAS

by Haley & Aldrich, Inc.
Cleveland, Ohio

for Westar Energy, Inc.
Topeka, Kansas

File No. 129778-018
July 2019

Public

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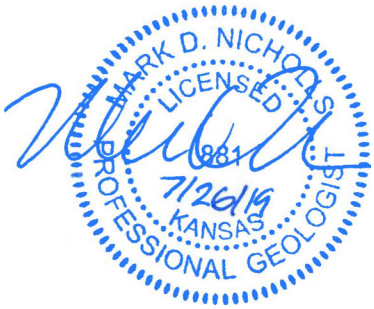
This Annual Groundwater Monitoring and Corrective Action Report documents the groundwater monitoring system results for the Jeffrey Energy Center (JEC) inactive Bottom Ash Pond (BAP) consistent with applicable sections of Code of Federal Regulations Title 40 §§ 257.90 through 257.98, and describes activities 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 JEC BAP 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 Bottom Ash Pond (BAP) at the Jeffrey Energy Center (JEC), 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 BAP 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 BAP.

This Annual Report documents the groundwater monitoring system results for the BAP which is 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 JEC BAP. The BAP is monitored by a single-unit 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 JEC BAP, 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 BAP 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 BAP is currently in the detection monitoring program.

2.2.2 Key Actions Completed

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

2.2.4 Actions to Resolve Problems

No problems were encountered at the BAP 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 BAP 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 BAP at JEC are described in the CCR Groundwater Monitoring Network Description Report dated 3 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 BAP 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 BAP 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
BOTTOM ASH POND
WESTAR JEFFREY ENERGY CENTER
ST. MARYS, 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 (su)	Sulfate	TDS	Antimony, Total	Arsenic, Total	Barium, Total	Beryllium, Total	Cadmium, Total	Chromium, Total	Cobalt, Total	Fluoride	Lead, Total
Up Gradient	IBA-4	1201.86	IBA-4-031318	3/13/2018	Round 1	57.45	1144.41	13.17	861.1	9.00	7.25	**0.24**	**102**	**17.7**	**0.41**	**7.3**	**164**	**599**	<0.0010	<0.0010	**0.021**	<0.0010	<0.00050	<0.0050	<0.0010	**0.41**	<0.010
			IBA-4-051118	5/14/2018	Round 2	57.49	1144.37	18.88	930	18.3	7.28	**0.23**	**108**	**19.3**	**0.58**	**7.3**	**146**	**592**	<0.0010	<0.0010	**0.022**	<0.0010	<0.00050	<0.0050	<0.0010	**0.58**	<0.010
			IBA-4-070518	7/2/2018	Round 3	57.41	1144.45	17.63	885	6.36	7.04	**0.26**	**97.3**	**17.8**	**0.56**	**7.4**	**165**	**629**	<0.0010	<0.0010	**0.019**	<0.0010	<0.00050	<0.0050	<0.0010	**0.56**	<0.010
			IBA-4-081518	8/15/2018	Round 4	56.50	1145.36	17.05	886	5.7	7.09	**0.26**	**107**	**18.4**	**0.59**	**7.2**	**165**	**626**	<0.0010	<0.0010	**0.018**	<0.0010	<0.00050	<0.0050	<0.0010	**0.59**	<0.010
			IBA-4-100218	10/2/2018	Round 5	56.42	1145.44	16.13	913	2.98	6.83	**0.23**	**104**	**18.6**	**0.53**	**7.2**	**180**	**632**	<0.0010	<0.0010	**0.020**	<0.0010	<0.00050	<0.0050	<0.0010	**0.53**	<0.010
			IBA-4-112118	11/21/2018	Round 6	55.92	1145.94	13.00	887	2.84	6.82	**0.26**	**99.2**	**18.5**	**0.51**	**7.3**	**159**	**627**	<0.0010	<0.0010	**0.016**	<0.0010	<0.00050	<0.0050	<0.0010	**0.51**	<0.010
			IBA-4-011019	1/10/2019	Round 7	55.43	1146.43	10.48	875	2.5	6.93	**0.22**	**107**	**18.3**	**0.49**	**7.2**	**172**	**643**	<0.0010	<0.0010	**0.019**	<0.0010	<0.00050	<0.0050	<0.0010	**0.49**	<0.010
			IBA-4-032819	3/28/2019	Round 8	54.14	1147.72	13.2	976	1.43	6.79	**0.23**	**104**	**19.2**	**0.58**	**7.3**	**175**	**614**	<0.0010	<0.0010	**0.019**	<0.0010	<0.00050	<0.0050	<0.0010	**0.58**	<0.010
Down Gradient	IBA-1	1171.65	IBA-1-031418	3/14/2018	Round 1	30.45	1141.20	15.39	2040	6.71	7.35	**0.37**	**300**	**126**	<0.20	**7.2**	**841**	**1740**	<0.0010	<0.0010	**0.037**	<0.0010	<0.00050	<0.0050	**0.0025**	<0.20	<0.010
			IBA-1-051418	5/14/2018	Round 2	28.05	1143.60	18.76	2220	8.83	7.23	**0.37**	**295**	**127**	**0.35**	**7.2**	**904**	**1750**	<0.0010	0.0011	**0.039**	<0.0010	<0.00050	<0.0050	**0.0027**	**0.35**	<0.010
			IBA-1-070518	7/5/2018	Round 3	25.90	1145.75	20.82	2070	5.3	6.95	**0.37**	**296**	**123**	**0.30**	**7.2**	**827**	**1770**	<0.0010	<0.0010	**0.033**	<0.0010	**0.00052**	<0.0050	**0.0023**	**0.30**	<0.010
			IBA-1-081518	8/15/2018	Round 4	26.09	1145.56	19.17	2070	6.54	7.05	**0.37**	**310**	**122**	**0.35**	**7.1**	**877**	**1680**	<0.0010	<0.0010	**0.034**	<0.0010	**0.00053**	<0.0050	**0.0025**	**0.35**	<0.010
			IBA-1-100218	10/2/2018	Round 5	26.97	1144.68	20.42	2140	6.37	6.79	**0.37**	**305**	**150**	**0.63**	**7.1**	**940**	**1820**	<0.0010	<0.0010	**0.034**	<0.0010	<0.00050	<0.0050	**0.0022**	**0.63**	<0.010
			IBA-1-112118	11/21/2018	Round 6	26.38	1145.27	16.18	2070	3.66	6.82	**0.38**	**298**	**124**	**0.28**	**7.3**	**880**	**612**	<0.0010	<0.0010	**0.029**	<0.0010	**0.00059**	<0.0050	**0.0023**	**0.28**	<0.010
			IBA-1-011019	1/10/2019	Round 7	26.20	1145.45	13.80	2070	9.01	6.92	**0.36**	**312**	**128**	**0.24**	**7.3**	**920**	**1720**	<0.0010	<0.0010	**0.038**	<0.0010	**0.00071**	<0.0050	**0.0026**	**0.24**	<0.010
			IBA-1-032819	3/28/2019	Round 8	25.44	1146.21	13.5	2233	3.26	7.10	**0.37**	**312**	**129**	**0.40**	**7.1**	**932**	**1750**	<0.0010	<0.0010	**0.033**	<0.0010	**0.00059**	<0.0050	**0.0021**	**0.40**	<0.010
	IBA-2	1171.66	IBA-2-031418	3/14/2018	Round 1	32.28	1139.38	13.89	1530	1.11	7.34	**0.18**	**196**	**106**	<0.20	**7.1**	**532**	**1220**	<0.0010	<0.0010	**0.036**	<0.0010	<0.00050	<0.0050	**0.0011**	<0.20	<0.010
			IBA-2-051418	5/14/2018	Round 2	30.00	1141.66	18.71	1710	0.18	7.29	**0.18**	**184**	**109**	**0.32**	**7.3**	**552**	**1260**	<0.0010	<0.0010	**0.032**	<0.0010	<0.00050	<0.0050	**0.0012**	**0.32**	<0.010
			IBA-2-070518	7/5/2018	Round 3	28.12	1143.54	19.52	1620	0.08	7.02	**0.20**	**204**	**109**	**0.28**	**6.7**	**566**	**1310**	<0.0010	<0.0010	**0.034**	<0.0010	<0.00050	<0.0050	**0.0011**	**0.28**	<0.010
			IBA-2-081518	8/15/2018	Round 4	28.09	1143.57	17.97	1630	0.01	7.08	**0.20**	**221**	**107**	**0.36**	**7.2**	**583**	**1330**	<0.0010	<0.0010	**0.032**	<0.0010	<0.00050	<0.0050	**0.0012**	**0.36**	<0.010
			IBA-2-100218	10/2/2018	Round 5	28.90	1142.76	19.76	1690	0.72	6.81	**0.19**	**209**	**144**	**0.40**	**7.1**	**771**	**1300**	<0.0010	<0.0010	**0.032**	<0.0010	<0.00050	<0.0050	**0.0011**	**0.40**	<0.010
			IBA-2-112118	11/21/2018	Round 6	28.38	1143.28	14.99	1640	0.52	6.90	**0.20**	**205**	**111**	**0.25**	**7.2**	**572**	**1310**	<0.0010	<0.0010	**0.029**	<0.0010	<0.00050	<0.0050	**0.0011**	**0.25**	<0.010
			IBA-2-011019	1/10/2019	Round 7	27.92	1143.74	13.33	1640	0.87	6.95	**0.18**	**219**	**110**	**0.22**	**7.3**	**585**	**1470**	<0.0010	<0.0010	**0.031**	<0.0010	<0.00050	<0.0050	**0.0013**	**0.22**	<0.010
			IBA-2-032819	3/28/2019	Round 8	27.10	1144.56	13.7	1776	1.14	7.13	**0.19**	**216**	**114**	**0.39**	**7.3**	**582**	**1320**	<0.0010	<0.0010	**0.030**	<0.0010	<0.00050	<0.0050	**0.0010**	**0.39**	<0.010
	IBA-3	1164.95	IBA-3-031418	3/14/2018	Round 1	35.10	1129.85	12.4	1868	0.56	7.16	**0.27**	**246**	**123**	<0.20	**7.4**	**769**	**1490**	<0.0010	<0.0010	**0.020**	<0.0010	<0.00050	<0.0050	**0.0021**	<0.20	<0.010
			IBA-3-051418	5/14/2018	Round 2	33.71	1131.24	17.08	2060	0.04	7.31	**0.27**	**250**	**123**	**0.31**	**7.3**	**789**	**1580**	<0.0010	<0.0010	**0.021**	<0.0010	<0.00050	<0.0050	**0.0021**	**0.31**	<0.010
			IBA-3-070518	7/5/2018	Round 3	32.42	1132.53	19.81	1920	0.02	7.05	**0.28**	**240**	**122**	**0.27**	**7.2**	**735**	**1590**	<0.0010	<0.0010	**0.019**	<0.0010	<0.00050	<0.0050	**0.0018**	**0.27**	<0.010
			IBA-3-081518	8/15/2018	Round 4	32.50	1132.45	17.80	1930	0.07	7.10	**0.29**	**264**	**120**	**0.33**	**7.2**	**774**	**1630**	<0.0010	<0.0010	**0.018**	<0.0010	<0.00050	<0.0050	**0.0021**	**0.33**	<0.010
			IBA-3-100218	10/2/2018	Round 5	33.00	1131.95	18.68	1990	0.55	6.86	**0.27**	**254**	**151**	**0.36**	**7.2**	**998**	**1510**	<0.0010	<0.0010	**0.020**	<0.0010	<0.00050	<0.0050	**0.0019**	**0.36**	<0.010
			IBA-3-112118	11/21/2018	Round 6	32.17	1132.78	13.63	1940	0.39	6.89	**0.30**	**264**	**130**	**0.25**	**7.4**	**824**	**3170**	<0.0010	<0.0010	**0.017**	<0.0010	<0.00050	<0.0050	**0.0019**	**0.25**	<0.010
			IBA-3-011019	1/10/2019	Round 7	31.83	1133.12	12.41	1930	0.43	7.07	**0.26**	**263**	**122**	**0.20**	**7.4**	**761**	**1480**	<0.0010	<0.0010	**0.019**	<0.0010	<0.00050	<0.0050	**0.0021**	**0.20**	<0.010
			IBA-3-032819	3/28/2019	Round 8	30.90	1134.05	12.8	2101	0.52	7.11	**0.27**	**261**	**125**	**0.35**	**7.3**	**817**	**1590**	<0.0010	<0.0010	**0.019**	<0.0010	<0.00050	<0.0050	**0.0011**	**0.35**	<0.010

ABBREVIATIONS AND NOTES:

Bold value: Detection above laboratory reporting limit

µS/cm: microSiemen per centimeter
CCR: Coal Combustion Residuals
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

TABLE I
SUMMARY OF ANALYTICAL RESULTS
BOTTOM ASH POND
WESTAR JEFFREY ENERGY CENTER
ST. MARYS, 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)
								Lithium, Total	Mercury, Total	Molybdenum, Total	Selenium, Total	Thallium, Total	Radium-226 & 228 Combined
Up Gradient	IBA-4	1201.86	IBA-4-031318	3/13/2018	Round 1	57.45	1144.41	**0.037**	<0.00020	**0.0018**	<0.0010	<0.0010	**0.807**
			IBA-4-051118	5/14/2018	Round 2	57.49	1144.37	**0.036**	<0.00020	**0.0020**	<0.0010	<0.0010	**1.27**
			IBA-4-070518	7/2/2018	Round 3	57.41	1144.45	**0.031**	<0.00020	**0.0019**	<0.0010	<0.0010	**1.26**
			IBA-4-081518	8/15/2018	Round 4	56.50	1145.36	**0.035**	<0.00020	**0.0019**	<0.0010	<0.0010	**1.26**
			IBA-4-100218	10/2/2018	Round 5	56.42	1145.44	**0.032**	<0.00020	**0.0018**	<0.0010	<0.0010	**1.00**
			IBA-4-112118	11/21/2018	Round 6	55.92	1145.94	**0.033**	<0.00020	**0.0024**	<0.0010	<0.0010	**0.944**
			IBA-4-011019	1/10/2019	Round 7	55.43	1146.43	**0.035**	<0.00020	**0.0019**	<0.0010	<0.0010	**0.923**
			IBA-4-032819	3/28/2019	Round 8	54.14	1147.72	**0.034**	<0.00020	**0.0018**	<0.0010	<0.0010	**1.07**
Down Gradient	IBA-1	1171.65	IBA-1-031418	3/14/2018	Round 1	30.45	1141.20	**0.026**	<0.00020	**0.0074**	<0.0010	<0.0010	**3.12**
			IBA-1-051418	5/14/2018	Round 2	28.05	1143.60	**0.016**	<0.00020	**0.0071**	<0.0010	<0.0010	**1.66**
			IBA-1-070518	7/5/2018	Round 3	25.90	1145.75	**0.015**	<0.00020	**0.0070**	<0.0010	<0.0010	**0.306**
			IBA-1-081518	8/15/2018	Round 4	26.09	1145.56	**0.015**	<0.00020	**0.0069**	<0.0010	<0.0010	**0.397**
			IBA-1-100218	10/2/2018	Round 5	26.97	1144.68	**0.016**	<0.00020	**0.0071**	<0.0010	<0.0010	**0.730**
			IBA-1-112118	11/21/2018	Round 6	26.38	1145.27	**0.019**	<0.00020	**0.0070**	<0.0010	<0.0010	**1.40**
			IBA-1-011019	1/10/2019	Round 7	26.20	1145.45	**0.015**	<0.00020	**0.0073**	<0.0010	<0.0010	**1.02**
			IBA-1-032819	3/28/2019	Round 8	25.44	1146.21	**0.016**	<0.00020	**0.0074**	<0.0010	<0.0010	**0.182**
	IBA-2	1171.66	IBA-2-031418	3/14/2018	Round 1	32.28	1139.38	**0.028**	<0.00020	**0.0024**	<0.0010	<0.0010	**0.917**
			IBA-2-051418	5/14/2018	Round 2	30.00	1141.66	**0.017**	<0.00020	**0.0023**	<0.0010	<0.0010	**1.07**
			IBA-2-070518	7/5/2018	Round 3	28.12	1143.54	**0.019**	<0.00020	**0.0022**	<0.0010	<0.0010	**0.187**
			IBA-2-081518	8/15/2018	Round 4	28.09	1143.57	**0.020**	<0.00020	**0.0022**	<0.0010	<0.0010	**0.691**
			IBA-2-100218	10/2/2018	Round 5	28.90	1142.76	**0.020**	<0.00020	**0.0022**	<0.0010	<0.0010	**0.445**
			IBA-2-112118	11/21/2018	Round 6	28.38	1143.28	**0.021**	<0.00020	**0.0024**	<0.0010	<0.0010	**0.867**
			IBA-2-011019	1/10/2019	Round 7	27.92	1143.74	**0.021**	<0.00020	**0.0023**	<0.0010	<0.0010	**0.537**
			IBA-2-032819	3/28/2019	Round 8	27.10	1144.56	**0.022**	<0.00020	**0.0022**	<0.0010	<0.0010	**0.321**
	IBA-3	1164.95	IBA-3-031418	3/14/2018	Round 1	35.10	1129.85	**0.028**	<0.00020	**0.0020**	<0.0010	<0.0010	**0.325**
			IBA-3-051418	5/14/2018	Round 2	33.71	1131.24	**0.019**	<0.00020	**0.0021**	<0.0010	<0.0010	**0.349**
			IBA-3-070518	7/5/2018	Round 3	32.42	1132.53	**0.015**	<0.00020	**0.0020**	<0.0010	<0.0010	**0.283**
			IBA-3-081518	8/15/2018	Round 4	32.50	1132.45	**0.019**	<0.00020	**0.0021**	<0.0010	<0.0010	**1.05**
			IBA-3-100218	10/2/2018	Round 5	33.00	1131.95	**0.021**	<0.00020	**0.0021**	<0.0010	<0.0010	**0.427**
			IBA-3-112118	11/21/2018	Round 6	32.17	1132.78	**0.021**	<0.00020	**0.0025**	<0.0010	<0.0010	**0.940**
			IBA-3-011019	1/10/2019	Round 7	31.83	1133.12	**0.019**	<0.00020	**0.0021**	<0.0010	<0.0010	**0.484**
			IBA-3-032819	3/28/2019	Round 8	30.90	1134.05	**0.021**	<0.00020	**0.0022**	<0.0010	<0.0010	**0.256**

ABBREVIATIONS AND NOTES:

Bold value: Detection above laboratory reporting limit

µS/cm: microSiemen per centimeter
CCR: Coal Combustion Residuals
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

LEGEND

BOTTOM ASH POND MONITORING WELL

BOTTOM ASH POND

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI

N

0 400 800

SCALE IN FEET

HALEY ALDRICH

WESTAR ENERGY
JEFFREY ENERGY CENTER
ST. MARYS, KANSAS

BOTTOM ASH POND MONITORING WELL LOCATION MAP

JULY 2019

FIGURE 1

GIS FILE PATH: G:\Projects\Westar\Jeffrey Energy Center (JEC)\GIS\MXDs\2019_071129778_018_0002_IBA Well GWE Contours.mxd — USER: rabrown — LAST SAVED: 7/23/2019 2:48:24 PM

HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44131
216.739.0555

November 10, 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

Mark Nicholls Digitally signed by Mark Nicholls Date: 2022.11.10 09:12:00 -07'00'

SUBJECT: 2018–2019 Annual Groundwater Monitoring and Corrective Action Report Addendum
Evergy Kansas Central, Inc.
Bottom Ash Pond (Inactive)
Jeffrey Energy Center – St. Marys, Kansas

The Evergy Kansas Central, Inc. (Evergy) Bottom Ash Pond (BAP; inactive) at the Jeffrey Energy Center (JEC) 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 BAP was completed and placed in the facility's operating record by 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 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, and November 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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

April 10, 2018

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

RE: Project: JEC IBA CCR
Pace Project No.: 60266067

Dear Brandon Griffin:
Enclosed are the analytical results for sample(s) received by the laboratory on March 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
Melissa Michels, Westar Energy

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: JEC IBA CCR
Pace Project No.: 60266067

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
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

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SAMPLE SUMMARY

Project: JEC IBA CCR
Pace Project No.: 60266067

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60266067001	**IBA-4-031318**	Water	03/13/18 16:37	03/16/18 06:20
60266067002	**IBA-3-031418**	Water	03/14/18 10:02	03/16/18 06:20
60266067003	**IBA-2-031418**	Water	03/14/18 11:22	03/16/18 06:20
60266067004	**IBA-1-031418**	Water	03/14/18 13:30	03/16/18 06:20
60266067005	**DUP-031418**	Water	03/14/18 06:00	03/16/18 06:20

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SAMPLE ANALYTE COUNT

Project: JEC IBA CCR
Pace Project No.: 60266067

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60266067001	**IBA-4-031318**	EPA 200.7	SMW	7	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	JRS	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
60266067002	**IBA-3-031418**	EPA 200.7	SMW	7	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	JRS	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
60266067003	**IBA-2-031418**	EPA 200.7	SMW	7	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	JRS	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	JSS	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
60266067004	**IBA-1-031418**	EPA 200.7	SMW	7	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	JRS	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	JSS	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
60266067005	**DUP-031418**	EPA 200.7	SMW	7	PASI-K

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SAMPLE ANALYTE COUNT

Project: JEC IBA CCR
Pace Project No.: 60266067

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	JRS	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

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60266067

Method: **EPA 200.7**
Description: 200.7 Metals, Total
Client: WESTAR ENERGY
Date: April 10, 2018

General Information:
5 samples were analyzed for EPA 200.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.7 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60266067

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: WESTAR ENERGY
Date: April 10, 2018

General Information:
5 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60266067

Method: **EPA 245.1**
Description: 245.1 Mercury
Client: WESTAR ENERGY
Date: April 10, 2018

General Information:
5 samples were analyzed for EPA 245.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 245.1 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60266067

Method: **EPA 903.1**
Description: 903.1 Radium 226
Client: WESTAR ENERGY
Date: April 10, 2018

General Information:
5 samples were analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60266067

Method: **EPA 904.0**
Description: 904.0 Radium 228
Client: WESTAR ENERGY
Date: April 10, 2018

General Information:
5 samples were analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60266067

Method: **Total Radium Calculation**
Description: Total Radium 228+226
Client: WESTAR ENERGY
Date: April 10, 2018

General Information:
5 samples were analyzed for Total Radium Calculation. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60266067

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: WESTAR ENERGY
Date: April 10, 2018

General Information:
5 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: 518303

D6: The precision between the sample and sample duplicate exceeded laboratory control limits.
- DUP (Lab ID: 2121684)
  - Total Dissolved Solids

Additional Comments:

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60266067

Method: **SM 4500-H+B**
Description: 4500H+ pH, Electrometric
Client: WESTAR ENERGY
Date: April 10, 2018

General Information:
5 samples were analyzed for SM 4500-H+B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

H6: Analysis initiated outside of the 15 minute EPA required holding time.
- DUP-031418 (Lab ID: 60266067005)
- IBA-1-031418 (Lab ID: 60266067004)
- IBA-2-031418 (Lab ID: 60266067003)
- IBA-3-031418 (Lab ID: 60266067002)
- IBA-4-031318 (Lab ID: 60266067001)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60266067

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: WESTAR ENERGY
Date: April 10, 2018

General Information:
5 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60266067

Sample: IBA-4-031318 **Lab ID: 60266067001** Collected: 03/13/18 16:37 Received: 03/16/18 06:20 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	**0.021**	mg/L	0.0050	1	04/03/18 10:15	04/05/18 17:28	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/03/18 10:15	04/05/18 17:28	7440-41-7	
Boron, Total Recoverable	**0.24**	mg/L	0.10	1	04/03/18 10:15	04/05/18 17:28	7440-42-8	
Calcium, Total Recoverable	**102**	mg/L	0.20	1	04/03/18 10:15	04/05/18 17:28	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	04/03/18 10:15	04/05/18 17:28	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	04/03/18 10:15	04/05/18 17:28	7439-92-1	
Lithium	**0.037**	mg/L	0.010	1	04/03/18 10:15	04/05/18 17:28	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	03/27/18 16:35	03/30/18 19:17	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:17	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	03/27/18 16:35	03/30/18 19:17	7440-43-9	
Cobalt, Total Recoverable	**<0.0010**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:17	7440-48-4	
Molybdenum, Total Recoverable	**0.0018**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:17	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:17	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:17	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	03/22/18 15:26	03/23/18 10:40	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**599**	mg/L	5.0	1		03/17/18 12:17		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		03/21/18 10:28		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**17.7**	mg/L	1.0	1		04/04/18 11:22	16887-00-6	
Fluoride	**0.41**	mg/L	0.20	1		04/04/18 11:22	16984-48-8	
Sulfate	**164**	mg/L	20.0	20		04/04/18 21:53	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60266067

Sample: IBA-3-031418 **Lab ID: 60266067002** Collected: 03/14/18 10:02 Received: 03/16/18 06:20 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	**0.020**	mg/L	0.0050	1	04/03/18 10:15	04/05/18 17:36	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/03/18 10:15	04/05/18 17:36	7440-41-7	
Boron, Total Recoverable	**0.27**	mg/L	0.10	1	04/03/18 10:15	04/05/18 17:36	7440-42-8	
Calcium, Total Recoverable	**246**	mg/L	0.20	1	04/03/18 10:15	04/05/18 17:36	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	04/03/18 10:15	04/05/18 17:36	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	04/03/18 10:15	04/05/18 17:36	7439-92-1	
Lithium	**0.028**	mg/L	0.010	1	04/03/18 10:15	04/05/18 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	03/27/18 16:35	03/30/18 19:20	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:20	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	03/27/18 16:35	03/30/18 19:20	7440-43-9	
Cobalt, Total Recoverable	**0.0021**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:20	7440-48-4	
Molybdenum, Total Recoverable	**0.0020**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:20	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:20	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:20	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	03/22/18 15:26	03/23/18 10:43	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1490**	mg/L	5.0	1		03/20/18 13:17		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.4**	Std. Units	0.10	1		03/23/18 10:27		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**123**	mg/L	20.0	20		04/04/18 22:06	16887-00-6	
Fluoride	**<0.20**	mg/L	0.20	1		04/04/18 12:08	16984-48-8	
Sulfate	**769**	mg/L	100	100		04/04/18 22:20	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60266067

Sample: IBA-2-031418 **Lab ID: 60266067003** Collected: 03/14/18 11:22 Received: 03/16/18 06:20 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	04/03/18 10:15	04/05/18 17:39	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/03/18 10:15	04/05/18 17:39	7440-41-7	
Boron, Total Recoverable	**0.18**	mg/L	0.10	1	04/03/18 10:15	04/05/18 17:39	7440-42-8	
Calcium, Total Recoverable	**196**	mg/L	0.20	1	04/03/18 10:15	04/05/18 17:39	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	04/03/18 10:15	04/05/18 17:39	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	04/03/18 10:15	04/05/18 17:39	7439-92-1	
Lithium	**0.028**	mg/L	0.010	1	04/03/18 10:15	04/05/18 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	03/27/18 16:35	03/30/18 19:24	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:24	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	03/27/18 16:35	03/30/18 19:24	7440-43-9	
Cobalt, Total Recoverable	**0.0011**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:24	7440-48-4	
Molybdenum, Total Recoverable	**0.0024**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:24	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:24	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:24	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	03/22/18 15:26	03/23/18 10:45	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1220**	mg/L	5.0	1		03/20/18 13:17		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.1**	Std. Units	0.10	1		03/30/18 12:03		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**106**	mg/L	20.0	20		04/04/18 22:34	16887-00-6	
Fluoride	**<0.20**	mg/L	0.20	1		04/04/18 12:23	16984-48-8	
Sulfate	**532**	mg/L	100	100		04/04/18 22:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60266067

Sample: IBA-1-031418 **Lab ID: 60266067004** Collected: 03/14/18 13:30 Received: 03/16/18 06:20 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	04/03/18 10:15	04/05/18 17:42	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/03/18 10:15	04/05/18 17:42	7440-41-7	
Boron, Total Recoverable	**0.37**	mg/L	0.10	1	04/03/18 10:15	04/05/18 17:42	7440-42-8	
Calcium, Total Recoverable	**300**	mg/L	0.20	1	04/03/18 10:15	04/05/18 17:42	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	04/03/18 10:15	04/05/18 17:42	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	04/03/18 10:15	04/05/18 17:42	7439-92-1	
Lithium	**0.026**	mg/L	0.010	1	04/03/18 10:15	04/05/18 17:42	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	03/27/18 16:35	03/30/18 19:27	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:27	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	03/27/18 16:35	03/30/18 19:27	7440-43-9	
Cobalt, Total Recoverable	**0.0025**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:27	7440-48-4	
Molybdenum, Total Recoverable	**0.0074**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:27	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:27	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:27	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	03/22/18 15:26	03/23/18 10:47	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1740**	mg/L	5.0	1		03/20/18 13:18		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		03/30/18 12:07		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**126**	mg/L	20.0	20		04/04/18 23:01	16887-00-6	
Fluoride	**<0.20**	mg/L	0.20	1		04/04/18 12:39	16984-48-8	
Sulfate	**841**	mg/L	100	100		04/04/18 23:15	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60266067

Sample: DUP-031418 **Lab ID: 60266067005** Collected: 03/14/18 06:00 Received: 03/16/18 06:20 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	04/03/18 10:15	04/05/18 17:50	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/03/18 10:15	04/05/18 17:50	7440-41-7	
Boron, Total Recoverable	**0.18**	mg/L	0.10	1	04/03/18 10:15	04/05/18 17:50	7440-42-8	
Calcium, Total Recoverable	**206**	mg/L	0.20	1	04/03/18 10:15	04/05/18 17:50	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	04/03/18 10:15	04/05/18 17:50	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	04/03/18 10:15	04/05/18 17:50	7439-92-1	
Lithium	**0.027**	mg/L	0.010	1	04/03/18 10:15	04/05/18 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	03/27/18 16:35	03/30/18 19:31	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:31	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	03/27/18 16:35	03/30/18 19:31	7440-43-9	
Cobalt, Total Recoverable	**0.0011**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:31	7440-48-4	
Molybdenum, Total Recoverable	**0.0024**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:31	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:31	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	03/27/18 16:35	03/30/18 19:31	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	03/22/18 15:26	03/23/18 10:49	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1220**	mg/L	5.0	1		03/20/18 13:18		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.1**	Std. Units	0.10	1		03/21/18 10:29		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**106**	mg/L	20.0	20		04/04/18 23:28	16887-00-6	
Fluoride	**<0.20**	mg/L	0.20	1		04/04/18 13:40	16984-48-8	
Sulfate	**528**	mg/L	100	100		04/04/18 23:42	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60266067

QC Batch: 518498 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60266067001, 60266067002, 60266067003, 60266067004, 60266067005

METHOD BLANK: 2122377 Matrix: Water
Associated Lab Samples: 60266067001, 60266067002, 60266067003, 60266067004, 60266067005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	03/23/18 10:12	

LABORATORY CONTROL SAMPLE: 2122378

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0052	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2122379 2122380

Parameter	Units	60265852001 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	0.0053	0.0054	106	109	70-130	2	20	

MATRIX SPIKE SAMPLE: 2122381

Parameter	Units	60266067005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	<0.00020	.005	0.0052	103	70-130	

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: JEC IBA CCR
Pace Project No.: 60266067

QC Batch: 520220 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60266067001, 60266067002, 60266067003, 60266067004, 60266067005

METHOD BLANK: 2129139 Matrix: Water
Associated Lab Samples: 60266067001, 60266067002, 60266067003, 60266067004, 60266067005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	04/05/18 17:25	
Beryllium	mg/L	<0.0010	0.0010	04/05/18 17:25	
Boron	mg/L	<0.10	0.10	04/05/18 17:25	
Calcium	mg/L	<0.20	0.20	04/05/18 17:25	
Chromium	mg/L	<0.0050	0.0050	04/05/18 17:25	
Lead	mg/L	<0.010	0.010	04/05/18 17:25	
Lithium	mg/L	<0.010	0.010	04/05/18 17:25	

LABORATORY CONTROL SAMPLE: 2129140

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.0	103	85-115	
Beryllium	mg/L	1	1.0	103	85-115	
Boron	mg/L	1	1.0	103	85-115	
Calcium	mg/L	10	9.8	98	85-115	
Chromium	mg/L	1	1.0	101	85-115	
Lead	mg/L	1	1.0	104	85-115	
Lithium	mg/L	1	1.0	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2129141 2129142

Parameter	Units	60266067001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	mg/L	0.021	1	1	1.1	1.0	104	102	70-130	1	20	
Beryllium	mg/L	<0.0010	1	1	1.0	1.0	102	102	70-130	1	20	
Boron	mg/L	0.24	1	1	1.3	1.3	102	101	70-130	1	20	
Calcium	mg/L	102	10	10	113	112	111	95	70-130	1	20	
Chromium	mg/L	<0.0050	1	1	1.0	1.0	100	100	70-130	0	20	
Lead	mg/L	<0.010	1	1	1.0	1.0	100	99	70-130	1	20	
Lithium	mg/L	0.037	1	1	1.1	1.0	102	101	70-130	1	20	

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: JEC IBA CCR
Pace Project No.: 60266067

QC Batch: 519351 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60266067001, 60266067002, 60266067003, 60266067004, 60266067005

METHOD BLANK: 2125938 Matrix: Water
Associated Lab Samples: 60266067001, 60266067002, 60266067003, 60266067004, 60266067005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	03/30/18 19:00	
Arsenic	mg/L	<0.0010	0.0010	03/30/18 19:00	
Cadmium	mg/L	<0.00050	0.00050	03/30/18 19:00	
Cobalt	mg/L	<0.0010	0.0010	03/30/18 19:00	
Molybdenum	mg/L	<0.0010	0.0010	03/30/18 19:00	
Selenium	mg/L	<0.0010	0.0010	03/30/18 19:00	
Thallium	mg/L	<0.0010	0.0010	03/30/18 19:00	

LABORATORY CONTROL SAMPLE: 2125939

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.039	98	85-115	
Arsenic	mg/L	.04	0.040	100	85-115	
Cadmium	mg/L	.04	0.039	98	85-115	
Cobalt	mg/L	.04	0.039	99	85-115	
Molybdenum	mg/L	.04	0.040	99	85-115	
Selenium	mg/L	.04	0.039	98	85-115	
Thallium	mg/L	.04	0.036	91	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2125940 2125941

Parameter	Units	60266743001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/L	2.5 ug/L	.04	.04	0.042	0.041	98	97	70-130	1	20	
Arsenic	mg/L	0.57J ug/L	.04	.04	0.041	0.041	100	101	70-130	0	20	
Cadmium	mg/L	0.033J ug/L	.04	.04	0.038	0.038	95	94	70-130	1	20	
Cobalt	mg/L	19.4 ug/L	.04	.04	0.057	0.057	95	95	70-130	0	20	
Molybdenum	mg/L	14.5 ug/L	.04	.04	0.056	0.056	104	105	70-130	0	20	
Selenium	mg/L	10.9 ug/L	.04	.04	0.048	0.049	92	94	70-130	2	20	
Thallium	mg/L	0.39J ug/L	.04	.04	0.039	0.039	97	97	70-130	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60266067

QC Batch: 518013 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60266067001

METHOD BLANK: 2120266 Matrix: Water
Associated Lab Samples: 60266067001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	03/17/18 12:10	

LABORATORY CONTROL SAMPLE: 2120267

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	976	98	80-120	

SAMPLE DUPLICATE: 2120268

Parameter	Units	60265785007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	320	302	6	10	

SAMPLE DUPLICATE: 2120269

Parameter	Units	60266066001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	491	520	6	10	

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60266067

QC Batch: 518303 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60266067002, 60266067003, 60266067004, 60266067005

METHOD BLANK: 2121682 Matrix: Water
Associated Lab Samples: 60266067002, 60266067003, 60266067004, 60266067005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	03/20/18 13:12	

LABORATORY CONTROL SAMPLE: 2121683

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	908	91	80-120	

SAMPLE DUPLICATE: 2121684

Parameter	Units	60265958001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1090	1280	16	10	D6

SAMPLE DUPLICATE: 2121685

Parameter	Units	60265991001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	76.0	68.5	10	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60266067

QC Batch: 518470 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 60266067001, 60266067005

SAMPLE DUPLICATE: 2122272

Parameter	Units	60266063001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.0	7.2	2	5	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60266067

QC Batch: 518868
QC Batch Method: SM 4500-H+B
Analysis Method: SM 4500-H+B
Analysis Description: 4500H+B pH
Associated Lab Samples: 60266067002

SAMPLE DUPLICATE: 2123717

Parameter	Units	60265885002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.9	7.9	0	5	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60266067

QC Batch: 519635 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 60266067003, 60266067004

SAMPLE DUPLICATE: 2126887

Parameter	Units	60266067003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.1	7.2	1	5	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60266067

QC Batch: 520326 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60266067001, 60266067002, 60266067003, 60266067004, 60266067005

METHOD BLANK: 2129599 Matrix: Water
Associated Lab Samples: 60266067001, 60266067002, 60266067003, 60266067004, 60266067005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	04/04/18 10:51	
Fluoride	mg/L	<0.20	0.20	04/04/18 10:51	

LABORATORY CONTROL SAMPLE: 2129600

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	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2129601 2129602

Parameter	Units	60266067001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.41	2.5	2.5	2.9	2.9	100	101	80-120	0	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60266067

QC Batch: 520525 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60266067001, 60266067002, 60266067003, 60266067004, 60266067005

METHOD BLANK: 2130427 Matrix: Water
Associated Lab Samples: 60266067001, 60266067002, 60266067003, 60266067004, 60266067005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	04/04/18 20:03	
Sulfate	mg/L	<1.0	1.0	04/04/18 20:03	

LABORATORY CONTROL SAMPLE: 2130428

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	93	90-110	
Sulfate	mg/L	5	4.8	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2130429 2130430

Parameter	Units	2073155005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	2.0	5	5	7.3	7.2	107	105	80-120	2	15	

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60266067

Sample: IBA-4-031318 **Lab ID: 60266067001** Collected: 03/13/18 16:37 Received: 03/16/18 06:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.356 ± 0.542 (0.934) C:NA T:80%**	pCi/L	04/04/18 11:14	13982-63-3	
Radium-228	EPA 904.0	**0.451 ± 0.410 (0.837) C:67% T:86%**	pCi/L	04/03/18 10:57	15262-20-1	
Total Radium	Total Radium Calculation	**0.807 ± 0.952 (1.77)**	pCi/L	04/10/18 13:59	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60266067

Sample: IBA-3-031418 **Lab ID: 60266067002** Collected: 03/14/18 10:02 Received: 03/16/18 06:20 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 ± 0.449 (0.863) C:NA T:88%**	pCi/L	04/04/18 11:28	13982-63-3	
Radium-228	EPA 904.0	**0.203 ± 0.377 (0.826) C:68% T:82%**	pCi/L	04/03/18 10:57	15262-20-1	
Total Radium	Total Radium Calculation	**0.325 ± 0.826 (1.69)**	pCi/L	04/10/18 13:59	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60266067

Sample: IBA-2-031418 **Lab ID: 60266067003** Collected: 03/14/18 11:22 Received: 03/16/18 06:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.188 ± 0.475 (0.882) C:NA T:95%**	pCi/L	04/04/18 11:14	13982-63-3	
Radium-228	EPA 904.0	**0.729 ± 0.429 (0.791) C:70% T:80%**	pCi/L	04/03/18 10:57	15262-20-1	
Total Radium	Total Radium Calculation	**0.917 ± 0.904 (1.67)**	pCi/L	04/10/18 13:59	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60266067

Sample: IBA-1-031418 **Lab ID: 60266067004** Collected: 03/14/18 13:30 Received: 03/16/18 06:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.187 ± 0.405 (0.747) C:NA T:86%**	pCi/L	04/04/18 11:14	13982-63-3	
Radium-228	EPA 904.0	**2.93 ± 0.808 (0.972) C:69% T:85%**	pCi/L	04/03/18 10:57	15262-20-1	
Total Radium	Total Radium Calculation	**3.12 ± 1.21 (1.72)**	pCi/L	04/10/18 13:59	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60266067

Sample: DUP-031418 **Lab ID: 60266067005** Collected: 03/14/18 06:00 Received: 03/16/18 06:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.261 ± 0.479 (0.855) C:NA T:85%**	pCi/L	04/04/18 11:14	13982-63-3	
Radium-228	EPA 904.0	**1.20 ± 0.471 (0.719) C:72% T:89%**	pCi/L	04/03/18 10:57	15262-20-1	
Total Radium	Total Radium Calculation	**1.46 ± 0.950 (1.57)**	pCi/L	04/10/18 13:59	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60266067

QC Batch: 292073 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60266067001, 60266067002, 60266067003, 60266067004, 60266067005

METHOD BLANK: 1429361 Matrix: Water
Associated Lab Samples: 60266067001, 60266067002, 60266067003, 60266067004, 60266067005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.567 ± 0.483 (0.678) C:NA T:90%	pCi/L	04/04/18 11:14	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60266067

QC Batch: 292079 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60266067001, 60266067002, 60266067003, 60266067004, 60266067005

METHOD BLANK: 1429370 Matrix: Water
Associated Lab Samples: 60266067001, 60266067002, 60266067003, 60266067004, 60266067005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.658 ± 0.387 (0.714) C:72% T:86%	pCi/L	04/03/18 10:56	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: JEC IBA CCR
Pace Project No.: 60266067

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

D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
H6	Analysis initiated outside of the 15 minute EPA required holding time.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: JEC IBA CCR
Pace Project No.: 60266067

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60266067001	**IBA-4-031318**	EPA 200.7	520220	EPA 200.7	520274
60266067002	**IBA-3-031418**	EPA 200.7	520220	EPA 200.7	520274
60266067003	**IBA-2-031418**	EPA 200.7	520220	EPA 200.7	520274
60266067004	**IBA-1-031418**	EPA 200.7	520220	EPA 200.7	520274
60266067005	**DUP-031418**	EPA 200.7	520220	EPA 200.7	520274
60266067001	**IBA-4-031318**	EPA 200.8	519351	EPA 200.8	519373
60266067002	**IBA-3-031418**	EPA 200.8	519351	EPA 200.8	519373
60266067003	**IBA-2-031418**	EPA 200.8	519351	EPA 200.8	519373
60266067004	**IBA-1-031418**	EPA 200.8	519351	EPA 200.8	519373
60266067005	**DUP-031418**	EPA 200.8	519351	EPA 200.8	519373
60266067001	**IBA-4-031318**	EPA 245.1	518498	EPA 245.1	518777
60266067002	**IBA-3-031418**	EPA 245.1	518498	EPA 245.1	518777
60266067003	**IBA-2-031418**	EPA 245.1	518498	EPA 245.1	518777
60266067004	**IBA-1-031418**	EPA 245.1	518498	EPA 245.1	518777
60266067005	**DUP-031418**	EPA 245.1	518498	EPA 245.1	518777
60266067001	**IBA-4-031318**	EPA 903.1	292073		
60266067002	**IBA-3-031418**	EPA 903.1	292073		
60266067003	**IBA-2-031418**	EPA 903.1	292073		
60266067004	**IBA-1-031418**	EPA 903.1	292073		
60266067005	**DUP-031418**	EPA 903.1	292073		
60266067001	**IBA-4-031318**	EPA 904.0	292079		
60266067002	**IBA-3-031418**	EPA 904.0	292079		
60266067003	**IBA-2-031418**	EPA 904.0	292079		
60266067004	**IBA-1-031418**	EPA 904.0	292079		
60266067005	**DUP-031418**	EPA 904.0	292079		
60266067001	**IBA-4-031318**	Total Radium Calculation	294162		
60266067002	**IBA-3-031418**	Total Radium Calculation	294162		
60266067003	**IBA-2-031418**	Total Radium Calculation	294162		
60266067004	**IBA-1-031418**	Total Radium Calculation	294162		
60266067005	**DUP-031418**	Total Radium Calculation	294162		
60266067001	**IBA-4-031318**	SM 2540C	518013		
60266067002	**IBA-3-031418**	SM 2540C	518303		
60266067003	**IBA-2-031418**	SM 2540C	518303		
60266067004	**IBA-1-031418**	SM 2540C	518303		
60266067005	**DUP-031418**	SM 2540C	518303		
60266067001	**IBA-4-031318**	SM 4500-H+B	518470		
60266067002	**IBA-3-031418**	SM 4500-H+B	518868		
60266067003	**IBA-2-031418**	SM 4500-H+B	519635		
60266067004	**IBA-1-031418**	SM 4500-H+B	519635		
60266067005	**DUP-031418**	SM 4500-H+B	518470		
60266067001	**IBA-4-031318**	EPA 300.0	520326		
60266067001	**IBA-4-031318**	EPA 300.0	520525		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: JEC IBA CCR
Pace Project No.: 60266067

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60266067002	**IBA-3-031418**	EPA 300.0	520326		
60266067002	**IBA-3-031418**	EPA 300.0	520525		
60266067003	**IBA-2-031418**	EPA 300.0	520326		
60266067003	**IBA-2-031418**	EPA 300.0	520525		
60266067004	**IBA-1-031418**	EPA 300.0	520326		
60266067004	**IBA-1-031418**	EPA 300.0	520525		
60266067005	**DUP-031418**	EPA 300.0	520326		
60266067005	**DUP-031418**	EPA 300.0	520525		

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Sample Condition Upon Receipt

WO# : 60266067

60266067

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 ☑ Zplc

Thermometer Used: _____ **Type of Ice:** Wet Blue None

Cooler Temperature (°C): **As-read** 4.5 **Corr. Factor** +0.2 **Corrected** 4.7

Date and initials of person examining contents: 3/16/18 ab

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☑Yes ☐No ☐N/A	ph
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☑Yes ☐No ☐N/A	
Containers requiring pH preservation in compliance? (HNO3, H2SO4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐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)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑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: AMW Date: 3/16/18

Pace Analytical
www.pacelabs.com

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:	7 day

Section B — Required Project Information:

Report To:	Brandon Griffin
Copy To:	Jared Morrison
Purchase Order No.:	
Project Name:	JEC IBA CCR
Project Number:	

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jenalee Converse 913-563-1401
Pace Profile #:	9657

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: KS

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

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	200.7 Total Metals*	200.8 Total Metals**	245.1 Total Hg	300: Cl, F, SO_4	2540C TDS	4500 H+B	Ra226/ Ra228		Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	IBA-4-031318	WT	G			3/13	1637		5	1		4							BP1U, 2BP1N, 2BP3N									001
2	IBA-3-031418	WT	G			3/14	1002		5	1		4																002
3	IBA-2-031418	WT	G			3/14	1122		5	1		4																003
4	IBA-1-031418	WT	G			3/14	1330		5	1		4																004
5																												
6																												
7																												
8																												
9																												
10	DUP-031418	WT	G			3/14	0600		5	1		4							BP1U, 2BP1N, 2BP3N									005
11																												
12																												

6026607

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
200.7 Total Metals*: B, Ca, Ba, Be, Cr, Pb, Li	[signature] / Westar	3/14/18	1600	EBrackett / Pasi	3/16	0620	4.5	Y	Y	Y
200.8 Total Metals**: Sb, As, Cd, Co, Mo, Se, Tl										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 03/14/18

*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.

Chain of Custody

☐ Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: KS

Pace Analytical® www.pacelabs.com

Workorder: 60266067 **Workorder Name:** JEC IBA CCR

Owner Received Date: 3/16/2018 **Results Requested By:** 4/10/2018

Report To	Subcontract To
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# : 30246760

30246760

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers HNO3	Radium 226	Radium 228	LAB USE ONLY
1	IBA-4-031318	PS	3/13/2018 16:37	60266067001	Water	2	X	X	001
2	IBA-3-031418	PS	3/14/2018 10:02	60266067002	Water	2	X	X	002
3	IBA-2-031418	PS	3/14/2018 11:22	60266067003	Water	2	X	X	003
4	IBA-1-031418	PS	3/14/2018 13:30	60266067004	Water	2	X	X	004
5	DUP-031418	PS	3/14/2018 06:00	60266067005	Water	2	X	X	

Transfers	Released By	Date/Time	Received By	Date/Time
1	EBrockett / Pace	3/15/18 1550	Johnstown / Pace	3-20-18/1010
2				
3				

Comments

Cooler Temperature on Receipt 1.4 °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 # 30246760

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label 95

LIMS Login 95

Tracking #: 4122 4945 0327

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

Thermometer Used 6 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 1.4 °C Correction Factor: +0.0 °C Final Temp: 1.4 °C

Temp should be above freezing to 6°C

pH paper Lot# 10D107 1

Date and Initials of person examining contents: AM 3-20-18

Comments:	Yes	No	N/A	
Chain of Custody Present:	X			1.
Chain of Custody Filled Out:	X			2.
Chain of Custody Relinquished:	X			3.
Sampler Name & Signature on COC:		X		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	X			5.
Samples Arrived within Hold Time:	X			6.
Short Hold Time Analysis (<72hr remaining):		X		7.
Rush Turn Around Time Requested:		X		8.
Sufficient Volume:	X			9.
Correct Containers Used: -Pace Containers Used:	X X			10.
Containers Intact:	X			11.
Orthophosphate field filtered			X	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			X	13.
Organic Samples checked for dechlorination:			X	14.
Filtered volume received for Dissolved tests			X	15.
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	X X			16. PHL2 Initial when completed AM Date/time of preservation Lot # of added preservative
Headspace in VOA Vials (>6mm):			X	17.
Trip Blank Present:		X		18.
Trip Blank Custody Seals Present			X	
Rad Aqueous Samples Screened > 0.5 mrem/hr		X		Initial when completed: AM Date: 3-20-18

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

June 15, 2018

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

RE: Project: JEC IBA CCR
Pace Project No.: 60270293

Dear Brandon Griffin:
Enclosed are the analytical results for sample(s) received by the laboratory on May 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: Andrew Hare, Westar Energy
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY
Melissa Michels, Westar Energy

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: JEC IBA CCR
Pace Project No.: 60270293

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: JEC IBA CCR
Pace Project No.: 60270293

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60270293001	**IBA-4-051118**	Water	05/11/18 14:42	05/12/18 08:40

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SAMPLE ANALYTE COUNT

Project: JEC IBA CCR
Pace Project No.: 60270293

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60270293001	**IBA-4-051118**	EPA 200.7	SMW	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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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270293

Method: **EPA 200.7**
Description: 200.7 Metals, Total
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
1 sample was analyzed for EPA 200.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.7 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 525717

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60270177002,60270179036

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

- MS (Lab ID: 2152937)
  - Calcium
- MSD (Lab ID: 2152938)
  - Calcium

Additional Comments:

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270293

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
1 sample was analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
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(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270293

Method: **EPA 245.1**
Description: 245.1 Mercury
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
1 sample was analyzed for EPA 245.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 245.1 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270293

Method: **EPA 903.1**
Description: 903.1 Radium 226
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
1 sample was analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270293

Method: **EPA 904.0**
Description: 904.0 Radium 228
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
1 sample was analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270293

Method: **Total Radium Calculation**
Description: Total Radium 228+226
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
1 sample was analyzed for Total Radium Calculation. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270293

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
1 sample was analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270293

Method: **SM 4500-H+B**
Description: 4500H+ pH, Electrometric
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
1 sample was analyzed for SM 4500-H+B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

H6: Analysis initiated outside of the 15 minute EPA required holding time.
- IBA-4-051118 (Lab ID: 60270293001)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270293

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
1 sample was analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 528657

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60270293001,60271564001

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

- MS (Lab ID: 2165649)
  - Chloride
- MSD (Lab ID: 2165650)
  - Sulfate

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60270293

Sample: IBA-4-051118 **Lab ID: 60270293001** Collected: 05/11/18 14:42 Received: 05/12/18 08:40 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	**0.022**	mg/L	0.0050	1	05/14/18 15:15	05/15/18 13:37	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	05/14/18 15:15	05/15/18 13:37	7440-41-7	
Boron, Total Recoverable	**0.23**	mg/L	0.10	1	05/14/18 15:15	05/15/18 13:37	7440-42-8	
Calcium, Total Recoverable	**108**	mg/L	0.20	1	05/14/18 15:15	05/15/18 13:37	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	05/14/18 15:15	05/15/18 13:37	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	05/14/18 15:15	05/15/18 13:37	7439-92-1	
Lithium	**0.036**	mg/L	0.010	1	05/14/18 15:15	05/15/18 13:37	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 18:36	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:36	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	05/23/18 09:25	06/14/18 18:36	7440-43-9	
Cobalt, Total Recoverable	**<0.0010**	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:36	7440-48-4	
Molybdenum, Total Recoverable	**0.0020**	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:36	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:36	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	05/23/18 09:25	06/14/18 18:36	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	06/05/18 13:55	06/06/18 09:36	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**592**	mg/L	5.0	1		05/17/18 15:27		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		05/15/18 09:32		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**19.3**	mg/L	1.0	1		06/05/18 12:41	16887-00-6	M1
Fluoride	**0.58**	mg/L	0.20	1		06/05/18 12:41	16984-48-8	
Sulfate	**146**	mg/L	20.0	20		06/05/18 13:22	14808-79-8	M1

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60270293

QC Batch: 528689 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60270293001

METHOD BLANK: 2165763 Matrix: Water
Associated Lab Samples: 60270293001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	06/06/18 09:31	

LABORATORY CONTROL SAMPLE: 2165764

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: 2165765 2165766

Parameter	Units	60270293001 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	.005	.005	0.0050	0.0049	100	97	70-130	3	20	

MATRIX SPIKE SAMPLE: 2165767

Parameter	Units	60271119002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	.005	0.0048	95	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60270293

QC Batch: 525717
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60270293001

METHOD BLANK: 2152935 Matrix: Water
Associated Lab Samples: 60270293001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	05/15/18 12:37	
Beryllium	mg/L	<0.0010	0.0010	05/15/18 12:37	
Boron	mg/L	<0.10	0.10	05/15/18 12:37	
Calcium	mg/L	<0.20	0.20	05/15/18 12:37	
Chromium	mg/L	<0.0050	0.0050	05/15/18 12:37	
Lead	mg/L	<0.010	0.010	05/15/18 12:37	
Lithium	mg/L	<0.010	0.010	05/15/18 12:37	

LABORATORY CONTROL SAMPLE: 2152936

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	0.92	92	85-115	
Calcium	mg/L	10	10	100	85-115	
Chromium	mg/L	1	1.0	102	85-115	
Lead	mg/L	1	1.0	104	85-115	
Lithium	mg/L	1	1.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2152937 2152938

Parameter	Units	60270177002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	mg/L	60.7 ug/L	1	1	1.1	1.1	102	103	70-130	1	20	
Beryllium	mg/L	ND	1	1	1.0	1.0	100	100	70-130	1	20	
Boron	mg/L	180 ug/L	1	1	1.1	1.1	95	97	70-130	1	20	
Calcium	mg/L	92900 ug/L	10	10	109	111	162	177	70-130	1	20	M1
Chromium	mg/L	ND	1	1	1.0	1.0	101	103	70-130	1	20	
Lead	mg/L	ND	1	1	1.0	1.0	101	103	70-130	2	20	
Lithium	mg/L	31.1 ug/L	1	1	1.1	1.1	103	103	70-130	0	20	

MATRIX SPIKE SAMPLE: 2152945

Parameter	Units	60270179036 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	157 ug/L	1	1.2	102	70-130	
Beryllium	mg/L	0.23J ug/L	1	0.99	99	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60270293

MATRIX SPIKE SAMPLE: 2152945

Parameter	Units	60270179036 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	mg/L	67.5J ug/L	1	1.0	95	70-130	
Calcium	mg/L	69700 ug/L	10	78.2	85	70-130	
Chromium	mg/L	6.5 ug/L	1	1.0	101	70-130	
Lead	mg/L	4.2J ug/L	1	1.0	101	70-130	
Lithium	mg/L	30.7 ug/L	1	1.1	102	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60270293

QC Batch: 526944 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60270293001

METHOD BLANK: 2158358 Matrix: Water
Associated Lab Samples: 60270293001

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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60270293

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: JEC IBA CCR
Pace Project No.: 60270293

QC Batch: 526135 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60270293001

METHOD BLANK: 2154376 Matrix: Water
Associated Lab Samples: 60270293001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	9.0	5.0	05/17/18 15:27	

LABORATORY CONTROL SAMPLE: 2154377

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1040	104	80-120	

SAMPLE DUPLICATE: 2154378

Parameter	Units	60270272006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	564	566	0	10	

SAMPLE DUPLICATE: 2154379

Parameter	Units	60270272018 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	616	614	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60270293

QC Batch: 525810
QC Batch Method: SM 4500-H+B
Analysis Method: SM 4500-H+B
Analysis Description: 4500H+B pH
Associated Lab Samples: 60270293001

SAMPLE DUPLICATE: 2153115

Parameter	Units	60270276002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.2	1	5	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60270293

QC Batch: 528657
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60270293001

METHOD BLANK: 2165647 Matrix: Water
Associated Lab Samples: 60270293001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	06/05/18 11:48	
Fluoride	mg/L	<0.20	0.20	06/05/18 11:48	
Sulfate	mg/L	<1.0	1.0	06/05/18 11:48	

LABORATORY CONTROL SAMPLE: 2165648

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	2.5	100	90-110	
Sulfate	mg/L	5	5.3	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2165649 2165650

Parameter	Units	60270293001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	19.3	100	100	105	121	85	102	90-110	15	15	M1
Fluoride	mg/L	0.58	2.5	2.5	3.2	3.1	104	102	90-110	1	15	
Sulfate	mg/L	146	100	100	253	272	107	126	90-110	7	15	M1

MATRIX SPIKE SAMPLE: 2165651

Parameter	Units	60271564001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	8.2	5	13.5	106	90-110	

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60270293

Sample: IBA-4-051118 **Lab ID: 60270293001** Collected: 05/11/18 14:42 Received: 05/12/18 08:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.682 ± 0.445 (0.456) C:NA T:89%**	pCi/L	06/04/18 19:52	13982-63-3	
Radium-228	EPA 904.0	**0.584 ± 0.382 (0.723) C:80% T:75%**	pCi/L	06/04/18 15:18	15262-20-1	
Total Radium	Total Radium Calculation	**1.27 ± 0.827 (1.18)**	pCi/L	06/05/18 14:09	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60270293

QC Batch: 299196
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60270293001

METHOD BLANK: 1464853
Matrix: Water
Associated Lab Samples: 60270293001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.197 ± 0.301 (0.484) C:NA T:90%	pCi/L	06/04/18 19:23	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60270293

QC Batch: 299175 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60270293001

METHOD BLANK: 1464830 Matrix: Water
Associated Lab Samples: 60270293001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.546 ± 0.373 (0.712) C:85% T:77%	pCi/L	06/04/18 11:56	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: JEC IBA CCR
Pace Project No.: 60270293

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

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: JEC IBA CCR
Pace Project No.: 60270293

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60270293001	**IBA-4-051118**	EPA 200.7	525717	EPA 200.7	525755
60270293001	**IBA-4-051118**	EPA 200.8	526944	EPA 200.8	526988
60270293001	**IBA-4-051118**	EPA 245.1	528689	EPA 245.1	528707
60270293001	**IBA-4-051118**	EPA 903.1	299196		
60270293001	**IBA-4-051118**	EPA 904.0	299175		
60270293001	**IBA-4-051118**	Total Radium Calculation	301033		
60270293001	**IBA-4-051118**	SM 2540C	526135		
60270293001	**IBA-4-051118**	SM 4500-H+B	525810		
60270293001	**IBA-4-051118**	EPA 300.0	528657		

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Sample Condition Upon Receipt

WO# : 60270293

60270293

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 ☑ ERC

Thermometer Used: T300 **Type of Ice:** (Wet) Blue None

HW

Date and initials of person examining contents: SRC 5-12-18

Cooler Temperature (°C): **As-read** 1.0 **Corr. Factor** +1.2 **Corrected** 2.2

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐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)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑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: [signature] Date: 5/14/18

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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: 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:	7 day

Section B — **Required** Project Information:

Report To:	Brandon Griffin
Copy To:	Jared Morrison
Purchase Order No.:	10JEC-0000033150
Project Name:	JEC IBA CCR
Project Number:	

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson 913-563-1407
Pace Profile #:	9657, 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: KS

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

Requested Analysis Filtered (Y/N)

ITEM #	Sample ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	200.7 Total Metals*	200.8 Total Metals**	245.1 Total Hg	300: Cl, F, SO_4	2540C TDS	4500 H+B	Radium-226 & 228			Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	IBA-4-051118	WT	G			5/11	1442		4	1		3													BPLN(3), BPLU		60270293 001
2																												
3																												
4																												
5																												
6																												
7																												
8																												
9																												
10																												
11																												
12																												

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	Westar	5/11/18	1600	PACE	5-12-18	0840	2.2	Y	Y	Y
200.8 Total Metals**: Sb, As, Cd, Co, Mo, Se, Tl										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 05/11/18

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.

Chain of Custody

Pace Analytical®
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☐ Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: KS

Workorder: 60270293 **Workorder Name:** JEC IBA CCR

Owner Received Date: 5/12/2018 **Results Requested By:** 5/23/2018

Report To	Subcontract To
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# : 30253031

30253031

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: HNO3	Requested Analysis: Radium-226 & Total Radium	Requested Analysis: Radium-228	LAB USE ONLY
1	IBA-4-051118	PS	5/11/2018 14:42	60270293001	Water	2	X	X	001
2									
3									
4									
5									

Transfers	Released By	Date/Time	Received By	Date/Time
1		5/14 1700		5/15/18 1045
2				
3				

Comments

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 LS

Project # 30253031

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label BBH

LIMS Login BBH

Tracking #: _____

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

Thermometer Used 17 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

pH paper Lot# 10032671 Date and Initials of person examining contents: BS 5-15-18

Comments:	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: -Includes date/time/ID Matrix: WT	✓			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. All containers needing preservation are found to be in compliance with EPA recommendation. exceptions: VOA, coliform, TOC, O&G, Phenolics	✓			16. pH<2 Initial when completed DS 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: DS Date: 5-15-18

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.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

June 15, 2018

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

RE: Project: JEC IBA CCR
Pace Project No.: 60270434

Dear Brandon Griffin:
Enclosed are the analytical results for sample(s) received by the laboratory on May 15, 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: Andrew Hare, Westar Energy
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY
Melissa Michels, Westar Energy

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: JEC IBA CCR
Pace Project No.: 60270434

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

Pace Analytical Services, LLC
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Lenexa, KS 66219
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SAMPLE SUMMARY

Project: JEC IBA CCR
Pace Project No.: 60270434

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60270434001	**IBA-3-051418**	Water	05/14/18 10:30	05/15/18 16:35
60270434002	**IBA-2-051418**	Water	05/14/18 11:52	05/15/18 16:35
60270434003	**IBA-1-051418**	Water	05/14/18 13:18	05/15/18 16:35

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SAMPLE ANALYTE COUNT

Project: JEC IBA CCR
Pace Project No.: 60270434

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60270434001	**IBA-3-051418**	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	OL	3	PASI-K
60270434002	**IBA-2-051418**	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	OL	3	PASI-K
60270434003	**IBA-1-051418**	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	OL	3	PASI-K

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270434

Method: **EPA 200.7**
Description: 200.7 Metals, Total
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
3 samples were analyzed for EPA 200.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.7 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 526040

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60270353020,60270353029

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

- MS (Lab ID: 2154033)
  - Calcium
- MSD (Lab ID: 2154034)
  - Calcium

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270434

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
3 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
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(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270434

Method: **EPA 245.1**
Description: 245.1 Mercury
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
3 samples were analyzed for EPA 245.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 245.1 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270434

Method: **EPA 903.1**
Description: 903.1 Radium 226
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
3 samples were analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270434

Method: **EPA 904.0**
Description: 904.0 Radium 228
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
3 samples were analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270434

Method: **Total Radium Calculation**
Description: Total Radium 228+226
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
3 samples were analyzed for Total Radium Calculation. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
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(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270434

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
3 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: 526136

D6: The precision between the sample and sample duplicate exceeded laboratory control limits.
- DUP (Lab ID: 2154383)
  - Total Dissolved Solids

Additional Comments:

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270434

Method: **SM 4500-H+B**
Description: 4500H+ pH, Electrometric
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
3 samples were analyzed for SM 4500-H+B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

H6: Analysis initiated outside of the 15 minute EPA required holding time.
- IBA-1-051418 (Lab ID: 60270434003)
- IBA-2-051418 (Lab ID: 60270434002)
- IBA-3-051418 (Lab ID: 60270434001)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270434

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: WESTAR ENERGY
Date: June 15, 2018

General Information:
3 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 528282

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60271146006,60271331001

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

- MS (Lab ID: 2164021)
  - Chloride
- MS (Lab ID: 2164024)
  - Sulfate
- MSD (Lab ID: 2164022)
  - Chloride
  - Sulfate

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60270434

Sample: IBA-3-051418 **Lab ID: 60270434001** Collected: 05/14/18 10:30 Received: 05/15/18 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	**0.021**	mg/L	0.0050	1	05/16/18 11:05	05/17/18 14:01	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	05/16/18 11:05	05/17/18 14:01	7440-41-7	
Boron, Total Recoverable	**0.27**	mg/L	0.10	1	05/16/18 11:05	05/17/18 14:01	7440-42-8	
Calcium, Total Recoverable	**250**	mg/L	0.20	1	05/16/18 11:05	05/17/18 14:01	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	05/16/18 11:05	05/17/18 14:01	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	05/16/18 11:05	05/17/18 14:01	7439-92-1	
Lithium	**0.019**	mg/L	0.010	1	05/16/18 11:05	05/17/18 14:01	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	05/23/18 16:20	06/14/18 18:58	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	05/23/18 16:20	06/14/18 18:58	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	05/23/18 16:20	06/14/18 18:58	7440-43-9	
Cobalt, Total Recoverable	**0.0021**	mg/L	0.0010	1	05/23/18 16:20	06/14/18 18:58	7440-48-4	
Molybdenum, Total Recoverable	**0.0021**	mg/L	0.0010	1	05/23/18 16:20	06/14/18 18:58	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	05/23/18 16:20	06/14/18 18:58	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	05/23/18 16:20	06/14/18 18:58	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	06/05/18 13:55	06/06/18 09:58	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1580**	mg/L	5.0	1		05/17/18 15:27		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		05/21/18 13:17		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**123**	mg/L	10.0	10		06/02/18 14:44	16887-00-6	
Fluoride	**0.31**	mg/L	0.20	1		06/02/18 14:30	16984-48-8	
Sulfate	**789**	mg/L	100	100		06/02/18 14:59	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60270434

Sample: IBA-2-051418 **Lab ID: 60270434002** Collected: 05/14/18 11:52 Received: 05/15/18 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	05/16/18 11:05	05/17/18 14:03	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	05/16/18 11:05	05/17/18 14:03	7440-41-7	
Boron, Total Recoverable	**0.18**	mg/L	0.10	1	05/16/18 11:05	05/17/18 14:03	7440-42-8	
Calcium, Total Recoverable	**184**	mg/L	0.20	1	05/16/18 11:05	05/17/18 14:03	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	05/16/18 11:05	05/17/18 14:03	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	05/16/18 11:05	05/17/18 14:03	7439-92-1	
Lithium	**0.017**	mg/L	0.010	1	05/16/18 11:05	05/17/18 14:03	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 16:20	06/14/18 19:01	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	05/23/18 16:20	06/14/18 19:01	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	05/23/18 16:20	06/14/18 19:01	7440-43-9	
Cobalt, Total Recoverable	**0.0012**	mg/L	0.0010	1	05/23/18 16:20	06/14/18 19:01	7440-48-4	
Molybdenum, Total Recoverable	**0.0023**	mg/L	0.0010	1	05/23/18 16:20	06/14/18 19:01	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	05/23/18 16:20	06/14/18 19:01	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	05/23/18 16:20	06/14/18 19:01	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	06/05/18 13:55	06/06/18 10:00	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1260**	mg/L	5.0	1		05/17/18 15:27		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		05/21/18 13:18		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**109**	mg/L	10.0	10		06/02/18 15:29	16887-00-6	
Fluoride	**0.32**	mg/L	0.20	1		06/02/18 15:14	16984-48-8	
Sulfate	**552**	mg/L	100	100		06/02/18 15:44	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60270434

Sample: IBA-1-051418 **Lab ID: 60270434003** Collected: 05/14/18 13:18 Received: 05/15/18 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	**0.039**	mg/L	0.0050	1	05/16/18 11:05	05/17/18 14:06	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	05/16/18 11:05	05/17/18 14:06	7440-41-7	
Boron, Total Recoverable	**0.37**	mg/L	0.10	1	05/16/18 11:05	05/17/18 14:06	7440-42-8	
Calcium, Total Recoverable	**295**	mg/L	0.20	1	05/16/18 11:05	05/17/18 14:06	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	05/16/18 11:05	05/17/18 14:06	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	05/16/18 11:05	05/17/18 14:06	7439-92-1	
Lithium	**0.016**	mg/L	0.010	1	05/16/18 11:05	05/17/18 14:06	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	05/23/18 16:20	06/14/18 19:04	7440-36-0	
Arsenic, Total Recoverable	**0.0011**	mg/L	0.0010	1	05/23/18 16:20	06/14/18 19:04	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	05/23/18 16:20	06/14/18 19:04	7440-43-9	
Cobalt, Total Recoverable	**0.0027**	mg/L	0.0010	1	05/23/18 16:20	06/14/18 19:04	7440-48-4	
Molybdenum, Total Recoverable	**0.0071**	mg/L	0.0010	1	05/23/18 16:20	06/14/18 19:04	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	05/23/18 16:20	06/14/18 19:04	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	05/23/18 16:20	06/14/18 19:04	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	06/05/18 13:55	06/06/18 10:02	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1750**	mg/L	5.0	1		05/17/18 15:27		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		05/21/18 13:19		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**127**	mg/L	10.0	10		06/02/18 16:14	16887-00-6	
Fluoride	**0.35**	mg/L	0.20	1		06/02/18 15:59	16984-48-8	
Sulfate	**904**	mg/L	100	100		06/02/18 16:29	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60270434

QC Batch: 528689 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60270434001, 60270434002, 60270434003

METHOD BLANK: 2165763 Matrix: Water
Associated Lab Samples: 60270434001, 60270434002, 60270434003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	06/06/18 09:31	

LABORATORY CONTROL SAMPLE: 2165764

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: 2165765 2165766

Parameter	Units	60270293001 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	.005	.005	0.0050	0.0049	100	97	70-130	3	20	

MATRIX SPIKE SAMPLE: 2165767

Parameter	Units	60271119002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	.005	0.0048	95	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60270434

QC Batch: 526040 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60270434001, 60270434002, 60270434003

METHOD BLANK: 2154031 Matrix: Water
Associated Lab Samples: 60270434001, 60270434002, 60270434003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	05/17/18 13:08	
Beryllium	mg/L	<0.0010	0.0010	05/17/18 13:08	
Boron	mg/L	<0.10	0.10	05/17/18 13:08	
Calcium	mg/L	<0.20	0.20	05/17/18 13:08	
Chromium	mg/L	<0.0050	0.0050	05/17/18 13:08	
Lead	mg/L	<0.010	0.010	05/17/18 13:08	
Lithium	mg/L	<0.010	0.010	05/17/18 13:08	

LABORATORY CONTROL SAMPLE: 2154032

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	0.92	92	85-115	
Beryllium	mg/L	1	0.92	92	85-115	
Boron	mg/L	1	0.91	91	85-115	
Calcium	mg/L	10	9.1	91	85-115	
Chromium	mg/L	1	0.92	92	85-115	
Lead	mg/L	1	1.0	100	85-115	
Lithium	mg/L	1	0.91	91	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2154033 2154034

Parameter	Units	60270353020 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	mg/L	23.4 ug/L	1	1	1.0	1.0	102	101	70-130	0	20	
Beryllium	mg/L	ND	1	1	1.0	1.0	100	100	70-130	0	20	
Boron	mg/L	3250 ug/L	1	1	4.2	4.2	99	100	70-130	0	20	
Calcium	mg/L	72000 ug/L	10	10	87.2	88.0	151	160	70-130	1	20	M1
Chromium	mg/L	ND	1	1	0.97	0.97	97	97	70-130	0	20	
Lead	mg/L	ND	1	1	0.95	0.95	95	94	70-130	1	20	
Lithium	mg/L	296 ug/L	1	1	1.4	1.4	109	109	70-130	0	20	

MATRIX SPIKE SAMPLE: 2154035

Parameter	Units	60270353029 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	26.4 ug/L	1	1.0	99	70-130	
Beryllium	mg/L	ND	1	0.94	94	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60270434

MATRIX SPIKE SAMPLE: 2154035

Parameter	Units	60270353029 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	mg/L	4230 ug/L	1	5.1	86	70-130	
Calcium	mg/L	167000 ug/L	10	175	82	70-130	
Chromium	mg/L	ND	1	0.91	91	70-130	
Lead	mg/L	ND	1	0.87	87	70-130	
Lithium	mg/L	795 ug/L	1	1.9	111	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60270434

QC Batch: 527058 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60270434001, 60270434002, 60270434003

METHOD BLANK: 2158850 Matrix: Water
Associated Lab Samples: 60270434001, 60270434002, 60270434003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	05/24/18 21:07	
Arsenic	mg/L	<0.0010	0.0010	05/24/18 21:07	
Cadmium	mg/L	<0.00050	0.00050	05/24/18 21:07	
Cobalt	mg/L	<0.0010	0.0010	05/24/18 21:07	
Molybdenum	mg/L	<0.0010	0.0010	05/24/18 21:07	
Selenium	mg/L	<0.0010	0.0010	05/24/18 21:07	
Thallium	mg/L	<0.0010	0.0010	05/24/18 21:07	

LABORATORY CONTROL SAMPLE: 2158851

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.043	107	85-115	
Arsenic	mg/L	.04	0.041	103	85-115	
Cadmium	mg/L	.04	0.040	100	85-115	
Cobalt	mg/L	.04	0.037	93	85-115	
Molybdenum	mg/L	.04	0.039	99	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: 2158852 2158853

Parameter	Units	60270591002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/L	0.36J ug/L	.04	.04	0.044	0.043	109	108	70-130	1	20	
Arsenic	mg/L	0.90J ug/L	.04	.04	0.042	0.042	103	103	70-130	0	20	
Cadmium	mg/L	0.036J ug/L	.04	.04	0.039	0.039	98	98	70-130	0	20	
Cobalt	mg/L	0.22J ug/L	.04	.04	0.037	0.037	91	91	70-130	0	20	
Molybdenum	mg/L	1.6 ug/L	.04	.04	0.044	0.043	105	104	70-130	1	20	
Selenium	mg/L	0.35J ug/L	.04	.04	0.037	0.038	91	94	70-130	3	20	
Thallium	mg/L	ND	.04	.04	0.038	0.038	95	94	70-130	0	20	

MATRIX SPIKE SAMPLE: 2158854

Parameter	Units	60270592004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	0.44J ug/L	.04	0.043	107	70-130	
Arsenic	mg/L	0.76J ug/L	.04	0.042	104	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60270434

MATRIX SPIKE SAMPLE: 2158854

Parameter	Units	60270592004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cadmium	mg/L	0.14J ug/L	.04	0.039	96	70-130	
Cobalt	mg/L	0.45J ug/L	.04	0.037	90	70-130	
Molybdenum	mg/L	1.4 ug/L	.04	0.042	101	70-130	
Selenium	mg/L	1.0J ug/L	.04	0.038	92	70-130	
Thallium	mg/L	ND	.04	0.037	93	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60270434

QC Batch: 526136 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60270434001, 60270434002, 60270434003

METHOD BLANK: 2154380 Matrix: Water
Associated Lab Samples: 60270434001, 60270434002, 60270434003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	05/17/18 15:27	

LABORATORY CONTROL SAMPLE: 2154381

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1040	104	80-120	

SAMPLE DUPLICATE: 2154382

Parameter	Units	60270295004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	824	809	2	10	

SAMPLE DUPLICATE: 2154383

Parameter	Units	60270296005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	572	647	12	10	D6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60270434

QC Batch: 526601 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 60270434001, 60270434002, 60270434003

SAMPLE DUPLICATE: 2156990

Parameter	Units	60270313004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.7	7.7	0	5	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60270434

QC Batch: 528282 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60270434001, 60270434002, 60270434003

METHOD BLANK: 2164019 Matrix: Water
Associated Lab Samples: 60270434001, 60270434002, 60270434003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	06/02/18 12:15	
Fluoride	mg/L	<0.20	0.20	06/02/18 12:15	
Sulfate	mg/L	<1.0	1.0	06/02/18 12:15	

LABORATORY CONTROL SAMPLE: 2164020

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	98	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2164021 2164022

Parameter	Units	60271146006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	ND	250	250	243	242	89	88	90-110	1	15	M1
Fluoride	mg/L	5.2J	125	125	128	127	98	98	90-110	0	15	
Sulfate	mg/L	689	250	250	939	905	100	86	90-110	4	15	M1

MATRIX SPIKE SAMPLE: 2164024

Parameter	Units	60271331001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	ND	250	247	90	90-110	
Fluoride	mg/L	5.5J	125	130	99	90-110	
Sulfate	mg/L	779	250	944	66	90-110	M1

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60270434

Sample: IBA-3-051418 **Lab ID: 60270434001** Collected: 05/14/18 10:30 Received: 05/15/18 16:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.265 ± 0.605 (0.359) C:NA T:94%**	pCi/L	06/06/18 11:12	13982-63-3	
Radium-228	EPA 904.0	**0.0842 ± 0.316 (0.718) C:77% T:86%**	pCi/L	06/06/18 11:38	15262-20-1	
Total Radium	Total Radium Calculation	**0.349 ± 0.921 (1.08)**	pCi/L	06/07/18 15:28	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60270434

Sample: IBA-2-051418 **Lab ID: 60270434002** Collected: 05/14/18 11:52 Received: 05/15/18 16:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.469 ± 0.716 (0.424) C:NA T:90%**	pCi/L	06/06/18 11:12	13982-63-3	
Radium-228	EPA 904.0	**0.601 ± 0.446 (0.871) C:81% T:82%**	pCi/L	06/06/18 11:38	15262-20-1	
Total Radium	Total Radium Calculation	**1.07 ± 1.16 (1.30)**	pCi/L	06/07/18 15:28	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60270434

Sample: IBA-1-051418 **Lab ID: 60270434003** Collected: 05/14/18 13:18 Received: 05/15/18 16:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.54 ± 0.971 (0.418) C:NA T:84%**	pCi/L	06/06/18 11:12	13982-63-3	
Radium-228	EPA 904.0	**0.124 ± 0.302 (0.674) C:82% T:89%**	pCi/L	06/06/18 11:38	15262-20-1	
Total Radium	Total Radium Calculation	**1.66 ± 1.27 (1.09)**	pCi/L	06/07/18 15:28	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60270434

QC Batch: 299181 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60270434001, 60270434002, 60270434003

METHOD BLANK: 1464837 Matrix: Water
Associated Lab Samples: 60270434001, 60270434002, 60270434003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0241 ± 0.344 (0.795) C:78% T:82%	pCi/L	06/06/18 11:36	

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: JEC IBA CCR
Pace Project No.: 60270434

QC Batch: 299205 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60270434001, 60270434002, 60270434003

METHOD BLANK: 1464859 Matrix: Water
Associated Lab Samples: 60270434001, 60270434002, 60270434003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.237 ± 0.330 (0.551) C:NA T:94%	pCi/L	06/06/18 10:46	

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: JEC IBA CCR
Pace Project No.: 60270434

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.
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: JEC IBA CCR
Pace Project No.: 60270434

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60270434001	**IBA-3-051418**	EPA 200.7	526040	EPA 200.7	526064
60270434002	**IBA-2-051418**	EPA 200.7	526040	EPA 200.7	526064
60270434003	**IBA-1-051418**	EPA 200.7	526040	EPA 200.7	526064
60270434001	**IBA-3-051418**	EPA 200.8	527058	EPA 200.8	527066
60270434002	**IBA-2-051418**	EPA 200.8	527058	EPA 200.8	527066
60270434003	**IBA-1-051418**	EPA 200.8	527058	EPA 200.8	527066
60270434001	**IBA-3-051418**	EPA 245.1	528689	EPA 245.1	528707
60270434002	**IBA-2-051418**	EPA 245.1	528689	EPA 245.1	528707
60270434003	**IBA-1-051418**	EPA 245.1	528689	EPA 245.1	528707
60270434001	**IBA-3-051418**	EPA 903.1	299205		
60270434002	**IBA-2-051418**	EPA 903.1	299205		
60270434003	**IBA-1-051418**	EPA 903.1	299205		
60270434001	**IBA-3-051418**	EPA 904.0	299181		
60270434002	**IBA-2-051418**	EPA 904.0	299181		
60270434003	**IBA-1-051418**	EPA 904.0	299181		
60270434001	**IBA-3-051418**	Total Radium Calculation	301400		
60270434002	**IBA-2-051418**	Total Radium Calculation	301400		
60270434003	**IBA-1-051418**	Total Radium Calculation	301400		
60270434001	**IBA-3-051418**	SM 2540C	526136		
60270434002	**IBA-2-051418**	SM 2540C	526136		
60270434003	**IBA-1-051418**	SM 2540C	526136		
60270434001	**IBA-3-051418**	SM 4500-H+B	526601		
60270434002	**IBA-2-051418**	SM 4500-H+B	526601		
60270434003	**IBA-1-051418**	SM 4500-H+B	526601		
60270434001	**IBA-3-051418**	EPA 300.0	528282		
60270434002	**IBA-2-051418**	EPA 300.0	528282		
60270434003	**IBA-1-051418**	EPA 300.0	528282		

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Sample Condition Upon Receipt

WO# : 60270434

60270434

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** 0-8 **Corr. Factor** +1.1 **Corrected** 1.9

Date and initials of person examining contents: pvs 5/15/18

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☑Yes ☐No ☐N/A	pH
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐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)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Hmm

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: 5/16/18

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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: 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:	7 day

Section B Required Project Information:

Report To:	Brandon Griffin
Copy To:	Jared Morrison
Purchase Order No.:	10JEC-0000033150
Project Name:	JEC IBA CCR
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson 913-563-1407
Pace Profile #:	9657, 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: KS

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

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	200.7 Total Metals*	200.8 Total Metals**	245.1 Total Hg	300: Cl, F, SO4	2540C TDS	4500 H+B	Radium-226 & 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 60270434
1	IBA-3-051418	WT	G			5/14	1030		4	1		3															BPIN 2BPIN 001
2	IBA-2-051418	WT	G			5/14	1152		4	1		3															002
3	IBA-1-051418	WT	G			5/14	1318		4	1		3															2BPIN 003
4																											
5																											
6																											
7																											
8																											
9																											
10																											
11																											
12																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
200.7 Total Metals*: B, Ca, Ba, Be, Cr, Pb, Li	Westar	05/15/18	0815	Pace	5/15	1635	1.9	Y	Y	Y
200.8 Total Metals**: Sb, As, Cd, Co, Mo, Se, Tl										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 05/15/18

*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.

Chain of Custody

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☐ Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: KS

Workorder: 60270434 **Workorder Name:** JEC IBA CCR

Owner Received Date: 5/15/2018 **Results Requested By:** 6/7/2018

Report To	Subcontract To
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# : 30253224

30253224

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: HNO3						Radium-226 & Total Radium	Radium-228										LAB USE ONLY
1	IBA-3-051418	PS	5/14/2018 10:30	60270434001	Water	1						X	X										001
2	IBA-2-051418	PS	5/14/2018 11:52	60270434002	Water	1						X	X										002
3	IBA-1-051418	PS	5/14/2018 13:18	60270434003	Water	1						X	X										003
4																							
5																							

Transfers	Released By	Date/Time	Received By	Date/Time
1		5/16 1700		5/17/18 0905
2				
3				

Comments

Cooler Temperature on Receipt 1.8 °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.*

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical EX

Client Name: PaceKS

Project # 30253224

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label QAB

LIMS Login [illegible]

Tracking #: 4368 7275 2214

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

Thermometer Used 60 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 7.9 °C Correction Factor: -0.1 °C Final Temp: 7.8 °C

Temp should be above freezing to 6°C

pH paper Lot# 10D3671 Date and Initials of person examining contents: 5/17/18 QAB

Comments:	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: -Includes date/time/ID Matrix: WT	✓			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:	✓			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. pH<2
All containers needing preservation are found to be in compliance with EPA recommendation.	✓			
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed QAB 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: QAB Date: 5/17/18

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

July 17, 2018

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

RE: Project: JEC IBA CCR
Pace Project No.: 60274227

Dear Brandon Griffin:
Enclosed are the analytical results for sample(s) received by the laboratory on July 06, 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: Andrew Hare, Westar Energy
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY
Melissa Michels, Westar Energy

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: JEC IBA CCR
Pace Project No.: 60274227

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: JEC IBA CCR
Pace Project No.: 60274227

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60274227001	**IBA-4-070518**	Water	07/05/18 09:27	07/06/18 06:30
60274227002	**IBA-3-070518**	Water	07/05/18 10:42	07/06/18 06:30
60274227003	**IBA-2-070518**	Water	07/05/18 12:00	07/06/18 06:30
60274227004	**IBA-1-070518**	Water	07/05/18 13:07	07/06/18 06:30

Pace Analytical Services, LLC
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(913)599-5665

SAMPLE ANALYTE COUNT

Project: JEC IBA CCR
Pace Project No.: 60274227

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60274227001	**IBA-4-070518**	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	CMS1	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60274227002	**IBA-3-070518**	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	CMS1	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60274227003	**IBA-2-070518**	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	CMS1	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60274227004	**IBA-1-070518**	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	CMS1	1	PASI-K
		EPA 300.0	OL	3	PASI-K

Pace Analytical Services, LLC
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(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60274227

Method: **EPA 200.7**
Description: 200.7 Metals, Total
Client: WESTAR ENERGY
Date: July 17, 2018

General Information:
4 samples were analyzed for EPA 200.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.7 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 533255

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60274227003,60274227004

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

- MS (Lab ID: 2183990)
  - Calcium
- MSD (Lab ID: 2183989)
  - Calcium

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60274227

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: WESTAR ENERGY
Date: July 17, 2018

General Information:
4 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60274227

Method: **EPA 245.1**
Description: 245.1 Mercury
Client: WESTAR ENERGY
Date: July 17, 2018

General Information:
4 samples were analyzed for EPA 245.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 245.1 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60274227

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: WESTAR ENERGY
Date: July 17, 2018

General Information:
4 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60274227

Method: **SM 4500-H+B**
Description: 4500H+ pH, Electrometric
Client: WESTAR ENERGY
Date: July 17, 2018

General Information:
4 samples were analyzed for SM 4500-H+B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

H6: Analysis initiated outside of the 15 minute EPA required holding time.
- IBA-1-070518 (Lab ID: 60274227004)
- IBA-2-070518 (Lab ID: 60274227003)
- IBA-3-070518 (Lab ID: 60274227002)
- IBA-4-070518 (Lab ID: 60274227001)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60274227

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: WESTAR ENERGY
Date: July 17, 2018

General Information:
4 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 534413

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60274281001

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

- MS (Lab ID: 2188755)
  - Fluoride

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60274227

Sample: IBA-4-070518 **Lab ID: 60274227001** Collected: 07/05/18 09:27 Received: 07/06/18 06:30 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	**0.019**	mg/L	0.0050	1	07/06/18 16:30	07/16/18 12:47	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	07/06/18 16:30	07/16/18 12:47	7440-41-7	
Boron, Total Recoverable	**0.26**	mg/L	0.10	1	07/06/18 16:30	07/16/18 12:47	7440-42-8	
Calcium, Total Recoverable	**97.3**	mg/L	0.20	1	07/06/18 16:30	07/16/18 12:47	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	07/06/18 16:30	07/16/18 12:47	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	07/06/18 16:30	07/16/18 12:47	7439-92-1	
Lithium	**0.031**	mg/L	0.010	1	07/06/18 16:30	07/16/18 12:47	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	07/10/18 09:00	07/13/18 18:33	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:33	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	07/10/18 09:00	07/13/18 18:33	7440-43-9	
Cobalt, Total Recoverable	**<0.0010**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:33	7440-48-4	
Molybdenum, Total Recoverable	**0.0019**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:33	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:33	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:33	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	07/16/18 10:20	07/16/18 16:49	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**629**	mg/L	5.0	1		07/10/18 13:07		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.4**	Std. Units	0.10	1		07/11/18 11:04		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**17.8**	mg/L	1.0	1		07/14/18 15:32	16887-00-6	
Fluoride	**0.56**	mg/L	0.20	1		07/14/18 15:32	16984-48-8	
Sulfate	**165**	mg/L	20.0	20		07/15/18 22:51	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60274227

Sample: IBA-3-070518 **Lab ID: 60274227002** Collected: 07/05/18 10:42 Received: 07/06/18 06:30 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	**0.019**	mg/L	0.0050	1	07/06/18 16:30	07/16/18 12:50	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	07/06/18 16:30	07/16/18 12:50	7440-41-7	
Boron, Total Recoverable	**0.28**	mg/L	0.10	1	07/06/18 16:30	07/16/18 12:50	7440-42-8	
Calcium, Total Recoverable	**240**	mg/L	0.20	1	07/06/18 16:30	07/16/18 12:50	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	07/06/18 16:30	07/16/18 12:50	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	07/06/18 16:30	07/16/18 12:50	7439-92-1	
Lithium	**0.015**	mg/L	0.010	1	07/06/18 16:30	07/16/18 12:50	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	07/10/18 09:00	07/13/18 18:36	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:36	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	07/10/18 09:00	07/13/18 18:36	7440-43-9	
Cobalt, Total Recoverable	**0.0018**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:36	7440-48-4	
Molybdenum, Total Recoverable	**0.0020**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:36	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:36	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:36	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	07/16/18 10:20	07/16/18 16:51	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1590**	mg/L	5.0	1		07/10/18 13:07		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		07/11/18 11:07		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**122**	mg/L	10.0	10		07/15/18 23:06	16887-00-6	
Fluoride	**0.27**	mg/L	0.20	1		07/14/18 15:47	16984-48-8	
Sulfate	**735**	mg/L	100	100		07/15/18 23:51	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60274227

Sample: IBA-2-070518 **Lab ID: 60274227003** Collected: 07/05/18 12:00 Received: 07/06/18 06:30 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	**0.034**	mg/L	0.0050	1	07/06/18 16:30	07/16/18 12:52	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	07/06/18 16:30	07/16/18 12:52	7440-41-7	
Boron, Total Recoverable	**0.20**	mg/L	0.10	1	07/06/18 16:30	07/16/18 12:52	7440-42-8	
Calcium, Total Recoverable	**204**	mg/L	0.20	1	07/06/18 16:30	07/16/18 12:52	7440-70-2	M1
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	07/06/18 16:30	07/16/18 12:52	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	07/06/18 16:30	07/16/18 12:52	7439-92-1	
Lithium	**0.019**	mg/L	0.010	1	07/06/18 16:30	07/16/18 12:52	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	07/10/18 09:00	07/13/18 18:40	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:40	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	07/10/18 09:00	07/13/18 18:40	7440-43-9	
Cobalt, Total Recoverable	**0.0011**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:40	7440-48-4	
Molybdenum, Total Recoverable	**0.0022**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:40	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:40	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:40	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	07/16/18 10:20	07/16/18 16:53	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1310**	mg/L	5.0	1		07/10/18 13:07		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**6.7**	Std. Units	0.10	1		07/11/18 11:10		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**109**	mg/L	10.0	10		07/16/18 00:06	16887-00-6	
Fluoride	**0.28**	mg/L	0.20	1		07/14/18 16:01	16984-48-8	
Sulfate	**566**	mg/L	50.0	50		07/16/18 00:21	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60274227

Sample: IBA-1-070518 **Lab ID: 60274227004** Collected: 07/05/18 13:07 Received: 07/06/18 06:30 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	**0.033**	mg/L	0.0050	1	07/06/18 16:30	07/16/18 12:54	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	07/06/18 16:30	07/16/18 12:54	7440-41-7	
Boron, Total Recoverable	**0.37**	mg/L	0.10	1	07/06/18 16:30	07/16/18 12:54	7440-42-8	
Calcium, Total Recoverable	**296**	mg/L	0.20	1	07/06/18 16:30	07/16/18 12:54	7440-70-2	M1
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	07/06/18 16:30	07/16/18 12:54	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	07/06/18 16:30	07/16/18 12:54	7439-92-1	
Lithium	**0.015**	mg/L	0.010	1	07/06/18 16:30	07/16/18 12:54	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	07/10/18 09:00	07/13/18 18:43	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:43	7440-38-2	
Cadmium, Total Recoverable	**0.00052**	mg/L	0.00050	1	07/10/18 09:00	07/13/18 18:43	7440-43-9	
Cobalt, Total Recoverable	**0.0023**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:43	7440-48-4	
Molybdenum, Total Recoverable	**0.0070**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:43	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	07/10/18 09:00	07/13/18 18:43	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	07/10/18 09:00	07/16/18 13:09	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	07/16/18 10:20	07/16/18 16:56	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1770**	mg/L	5.0	1		07/10/18 13:07		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		07/11/18 11:13		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**123**	mg/L	10.0	10		07/16/18 00:36	16887-00-6	
Fluoride	**0.30**	mg/L	0.20	1		07/14/18 16:15	16984-48-8	
Sulfate	**827**	mg/L	100	100		07/16/18 00:51	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60274227

QC Batch: 534454 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60274227001, 60274227002, 60274227003, 60274227004

METHOD BLANK: 2189250 Matrix: Water
Associated Lab Samples: 60274227001, 60274227002, 60274227003, 60274227004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	07/16/18 16:20	

LABORATORY CONTROL SAMPLE: 2189251

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0055	109	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2189252 2189253

Parameter	Units	60273843001 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	0.0050	0.0050	101	101	70-130	0	20	

MATRIX SPIKE SAMPLE: 2189254

Parameter	Units	60274221001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	.005	0.0049	98	70-130	

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: JEC IBA CCR
Pace Project No.: 60274227

QC Batch: 533255 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60274227001, 60274227002, 60274227003, 60274227004

METHOD BLANK: 2183986 Matrix: Water
Associated Lab Samples: 60274227001, 60274227002, 60274227003, 60274227004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	07/16/18 12:20	
Beryllium	mg/L	<0.0010	0.0010	07/16/18 12:20	
Boron	mg/L	<0.10	0.10	07/16/18 12:20	
Calcium	mg/L	<0.20	0.20	07/16/18 12:20	
Chromium	mg/L	<0.0050	0.0050	07/16/18 12:20	
Lead	mg/L	<0.010	0.010	07/16/18 12:20	
Lithium	mg/L	<0.010	0.010	07/16/18 12:20	

LABORATORY CONTROL SAMPLE: 2183987

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	9.6	96	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: 2183988 2183989

Parameter	Units	60274227003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	mg/L	0.034	1	1	1.0	0.99	98	96	70-130	2	20	
Beryllium	mg/L	<0.0010	1	1	0.97	0.95	97	95	70-130	2	20	
Boron	mg/L	0.20	1	1	1.2	1.2	100	97	70-130	3	20	
Calcium	mg/L	204	10	10	213	210	85	59	70-130	1	20	M1
Chromium	mg/L	<0.0050	1	1	0.98	0.97	98	97	70-130	1	20	
Lead	mg/L	<0.010	1	1	0.97	0.95	97	94	70-130	2	20	
Lithium	mg/L	0.019	1	1	1.1	1.0	104	102	70-130	2	20	

MATRIX SPIKE SAMPLE: 2183990

Parameter	Units	60274227004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	0.033	1	1.0	98	70-130	
Beryllium	mg/L	<0.0010	1	0.98	98	70-130	
Boron	mg/L	0.37	1	1.4	100	70-130	

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60274227

MATRIX SPIKE SAMPLE: 2183990

Parameter	Units	60274227004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Calcium	mg/L	296	10	313	173	70-130	M1
Chromium	mg/L	<0.0050	1	1.0	100	70-130	
Lead	mg/L	<0.010	1	0.96	96	70-130	
Lithium	mg/L	0.015	1	1.1	104	70-130	

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REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60274227

QC Batch: 533574 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60274227001, 60274227002, 60274227003, 60274227004

METHOD BLANK: 2185207 Matrix: Water
Associated Lab Samples: 60274227001, 60274227002, 60274227003, 60274227004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	07/13/18 18:26	
Arsenic	mg/L	<0.0010	0.0010	07/13/18 18:26	
Cadmium	mg/L	<0.00050	0.00050	07/13/18 18:26	
Cobalt	mg/L	<0.0010	0.0010	07/13/18 18:26	
Molybdenum	mg/L	<0.0010	0.0010	07/13/18 18:26	
Selenium	mg/L	<0.0010	0.0010	07/13/18 18:26	
Thallium	mg/L	<0.0010	0.0010	07/13/18 18:26	

LABORATORY CONTROL SAMPLE: 2185208

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.040	101	85-115	
Arsenic	mg/L	.04	0.040	100	85-115	
Cadmium	mg/L	.04	0.039	99	85-115	
Cobalt	mg/L	.04	0.036	90	85-115	
Molybdenum	mg/L	.04	0.039	97	85-115	
Selenium	mg/L	.04	0.039	99	85-115	
Thallium	mg/L	.04	0.041	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2185209 2185210

Parameter	Units	60274263001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/L	ND	.04	.04	0.038	0.037	94	93	70-130	1	20	
Arsenic	mg/L	ND	.04	.04	0.038	0.038	96	95	70-130	1	20	
Cadmium	mg/L	0.84 ug/L	.04	.04	0.036	0.036	89	87	70-130	2	20	
Cobalt	mg/L	0.019J ug/L	.04	.04	0.035	0.034	86	85	70-130	1	20	
Molybdenum	mg/L	1.6 ug/L	.04	.04	0.041	0.041	100	100	70-130	0	20	
Selenium	mg/L	0.10J ug/L	.04	.04	0.040	0.039	100	98	70-130	2	20	
Thallium	mg/L	0.95J ug/L	.04	.04	0.041	0.041	100	99	70-130	1	20	

MATRIX SPIKE SAMPLE: 2185211

Parameter	Units	60274372007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	<2.0 ug/L	.04	0.042	101	70-130	
Arsenic	mg/L	<2.0 ug/L	.04	0.041	99	70-130	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60274227

MATRIX SPIKE SAMPLE: 2185211

Parameter	Units	60274372007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cadmium	mg/L	<1.0 ug/L	.04	0.036	89	70-130	
Cobalt	mg/L	14.3 ug/L	.04	0.052	95	70-130	
Molybdenum	mg/L	10.6 ug/L	.04	0.053	105	70-130	
Selenium	mg/L	4.5 ug/L	.04	0.041	92	70-130	
Thallium	mg/L	<5.0 ug/L	.04	0.038	94	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60274227

QC Batch: 533628 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60274227001, 60274227002, 60274227003, 60274227004

METHOD BLANK: 2185372 Matrix: Water
Associated Lab Samples: 60274227001, 60274227002, 60274227003, 60274227004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	07/10/18 13:07	

LABORATORY CONTROL SAMPLE: 2185373

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	992	99	80-120	

SAMPLE DUPLICATE: 2185374

Parameter	Units	60274226005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	578	567	2	10	

SAMPLE DUPLICATE: 2185375

Parameter	Units	60274277002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2120	2200	3	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60274227

QC Batch: 533781 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 60274227001, 60274227002, 60274227003, 60274227004

SAMPLE DUPLICATE: 2186057

Parameter	Units	60274353001 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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60274227

QC Batch: 534413 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60274227001, 60274227002, 60274227003, 60274227004

METHOD BLANK: 2188753 Matrix: Water
Associated Lab Samples: 60274227001, 60274227002, 60274227003, 60274227004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	07/14/18 08:50	
Fluoride	mg/L	<0.20	0.20	07/14/18 08:50	

LABORATORY CONTROL SAMPLE: 2188754

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	2.5	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2188755 2188756

Parameter	Units	60274281001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1560	1000	1000	2520	2600	96	104	90-110	3	15	
Fluoride	mg/L	88.7	500	500	522	579	87	98	90-110	10	15	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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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60274227

QC Batch: 534436 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60274227001, 60274227002, 60274227003, 60274227004

METHOD BLANK: 2189075 Matrix: Water
Associated Lab Samples: 60274227001, 60274227002, 60274227003, 60274227004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	07/15/18 14:50	
Sulfate	mg/L	<1.0	1.0	07/15/18 14:50	

LABORATORY CONTROL SAMPLE: 2189076

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	90-110	
Sulfate	mg/L	5	5.3	106	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2189077 2189078

Parameter	Units	60274189001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	693	500	500	1170	1190	94	99	90-110	2	15	

MATRIX SPIKE SAMPLE: 2189079

Parameter	Units	60274190001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	2070	1000	3080	100	90-110	
Sulfate	mg/L	1920	1000	2890	97	90-110	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: JEC IBA CCR
Pace Project No.: 60274227

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

SAMPLE QUALIFIERS

Sample: 60274227001

[1] Samples requiring thermal preservation were received outside of recommended temperature limits of 0-6 degrees Celsius.

Sample: 60274227002

[1] Samples requiring thermal preservation were received outside of recommended temperature limits of 0-6 degrees Celsius.

Sample: 60274227003

[1] Samples requiring thermal preservation were received outside of recommended temperature limits of 0-6 degrees Celsius.

Sample: 60274227004

[1] Samples requiring thermal preservation were received outside of recommended temperature limits of 0-6 degrees Celsius.

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: JEC IBA CCR
Pace Project No.: 60274227

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60274227001	**IBA-4-070518**	EPA 200.7	533255	EPA 200.7	533285
60274227002	**IBA-3-070518**	EPA 200.7	533255	EPA 200.7	533285
60274227003	**IBA-2-070518**	EPA 200.7	533255	EPA 200.7	533285
60274227004	**IBA-1-070518**	EPA 200.7	533255	EPA 200.7	533285
60274227001	**IBA-4-070518**	EPA 200.8	533574	EPA 200.8	533639
60274227002	**IBA-3-070518**	EPA 200.8	533574	EPA 200.8	533639
60274227003	**IBA-2-070518**	EPA 200.8	533574	EPA 200.8	533639
60274227004	**IBA-1-070518**	EPA 200.8	533574	EPA 200.8	533639
60274227001	**IBA-4-070518**	EPA 245.1	534454	EPA 245.1	534552
60274227002	**IBA-3-070518**	EPA 245.1	534454	EPA 245.1	534552
60274227003	**IBA-2-070518**	EPA 245.1	534454	EPA 245.1	534552
60274227004	**IBA-1-070518**	EPA 245.1	534454	EPA 245.1	534552
60274227001	**IBA-4-070518**	SM 2540C	533628		
60274227002	**IBA-3-070518**	SM 2540C	533628		
60274227003	**IBA-2-070518**	SM 2540C	533628		
60274227004	**IBA-1-070518**	SM 2540C	533628		
60274227001	**IBA-4-070518**	SM 4500-H+B	533781		
60274227002	**IBA-3-070518**	SM 4500-H+B	533781		
60274227003	**IBA-2-070518**	SM 4500-H+B	533781		
60274227004	**IBA-1-070518**	SM 4500-H+B	533781		
60274227001	**IBA-4-070518**	EPA 300.0	534413		
60274227001	**IBA-4-070518**	EPA 300.0	534436		
60274227002	**IBA-3-070518**	EPA 300.0	534413		
60274227002	**IBA-3-070518**	EPA 300.0	534436		
60274227003	**IBA-2-070518**	EPA 300.0	534413		
60274227003	**IBA-2-070518**	EPA 300.0	534436		
60274227004	**IBA-1-070518**	EPA 300.0	534413		
60274227004	**IBA-1-070518**	EPA 300.0	534436		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO# : 60274227

60274227

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: T298 **Type of Ice:** (Wet) Blue None

Date and initials of person examining contents: HW 7-6-18

Cooler Temperature (°C): **As-read** 8.6 **Corr. Factor** +1.1 **Corrected** 9.7

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	OUT OF TEMP
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐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)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

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

Person Contacted: Brandon Griffin Date/Time: 7-6-18

Comments/ Resolution: Per client- analyze even though out of temp. SST

Project Manager Review: MJW for HMW Date: 7/6/18

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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: 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:	7 day

Section B — **Required** Project Information:

Report To:	Brandon Griffin
Copy To:	Jared Morrison
Purchase Order No.:	10JEC-0000033150
Project Name:	JEC IBA CCR
Project Number:	

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson 913-563-1407
Pace Profile #:	9657, 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: KS

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	200.7 Total Metals*	200.8 Total Metals**	245.1 Total Hg	300: Cl, F, SO_4	2540C TDS	4500 H+B				Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																												92774227
1	IBA-4-070518	WT	G			7/5	0927		2	1		1							1	1	1	1	1	1	B[1A], B[1U]				001
2	IBA-3-070518	WT	G			7/5	1042		2	1		1							1	1	1	1	1	1					002
3	IBA-2-070518	WT	G			7/5	1200		2	1		1							1	1	1	1	1	1					003
4	IBA-1-070518	WT	G			7/5	1307		2	1		1							1	1	1	1	1	1					004
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

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	BTW / WESTAR	7/5/18	1400	PACE	7-6-18	0630	9.7	Y	Y	Y
200.8 Total Metals**: Sb, As, Cd, Co, Mo, Se, Tl										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: BTW DATE Signed (MM/DD/YY): 07/05/18

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.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

July 30, 2018

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

RE: Project: JEC IBA CCR
Pace Project No.: 60274380

Dear Brandon Griffin:
Enclosed are the analytical results for sample(s) received by the laboratory on July 09, 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
Andrew Hare, Westar Energy
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY
Melissa Michels, Westar Energy

Pace Analytical Services, LLC
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Lenexa, KS 66219
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CERTIFICATIONS

Project: JEC IBA CCR
Pace Project No.: 60274380

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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Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: JEC IBA CCR
Pace Project No.: 60274380

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60274380001	**IBA-4-070518**	Water	07/02/18 09:27	07/09/18 09:30
60274380002	**IBA-3-070518**	Water	07/02/18 10:42	07/09/18 09:30
60274380003	**IBA-2-070518**	Water	07/02/18 12:00	07/09/18 09:30
60274380004	**IBA-1-070518**	Water	07/02/18 13:07	07/09/18 09:30

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: JEC IBA CCR
Pace Project No.: 60274380

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60274380001	**IBA-4-070518**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60274380002	**IBA-3-070518**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60274380003	**IBA-2-070518**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60274380004	**IBA-1-070518**	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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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60274380

Method: **EPA 903.1**
Description: 903.1 Radium 226
Client: WESTAR ENERGY
Date: July 30, 2018

General Information:
4 samples were analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60274380

Method: **EPA 904.0**
Description: 904.0 Radium 228
Client: WESTAR ENERGY
Date: July 30, 2018

General Information:
4 samples were analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60274380

Method: **Total Radium Calculation**
Description: Total Radium 228+226
Client: WESTAR ENERGY
Date: July 30, 2018

General Information:
4 samples were analyzed for Total Radium Calculation. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60274380

Sample: IBA-4-070518 **Lab ID: 60274380001** Collected: 07/02/18 09:27 Received: 07/09/18 09:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.631 ± 0.715 (1.11) C:NA T:82%**	pCi/L	07/20/18 10:53	13982-63-3	
Radium-228	EPA 904.0	**0.632 ± 0.408 (0.760) C:73% T:72%**	pCi/L	07/26/18 14:27	15262-20-1	
Total Radium	Total Radium Calculation	**1.26 ± 1.12 (1.87)**	pCi/L	07/27/18 14:56	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60274380

Sample: IBA-3-070518 **Lab ID: 60274380002** Collected: 07/02/18 10:42 Received: 07/09/18 09:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0691 ± 0.510 (0.974) C:NA T:93%**	pCi/L	07/20/18 11:07	13982-63-3	
Radium-228	EPA 904.0	**0.214 ± 0.302 (0.646) C:71% T:89%**	pCi/L	07/26/18 14:27	15262-20-1	
Total Radium	Total Radium Calculation	**0.283 ± 0.812 (1.62)**	pCi/L	07/27/18 14:56	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60274380

Sample: IBA-2-070518 **Lab ID: 60274380003** Collected: 07/02/18 12:00 Received: 07/09/18 09:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.102 ± 0.316 (0.738) C:NA T:97%**	pCi/L	07/20/18 10:53	13982-63-3	
Radium-228	EPA 904.0	**0.187 ± 0.377 (0.830) C:73% T:79%**	pCi/L	07/26/18 14:27	15262-20-1	
Total Radium	Total Radium Calculation	**0.187 ± 0.693 (1.57)**	pCi/L	07/27/18 14:56	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60274380

Sample: IBA-1-070518 **Lab ID: 60274380004** Collected: 07/02/18 13:07 Received: 07/09/18 09:30 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 ± 0.526 (1.04) C:NA T:90%**	pCi/L	07/20/18 10:53	13982-63-3	
Radium-228	EPA 904.0	**0.306 ± 0.327 (0.676) C:72% T:83%**	pCi/L	07/26/18 14:27	15262-20-1	
Total Radium	Total Radium Calculation	**0.306 ± 0.853 (1.72)**	pCi/L	07/27/18 14:56	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60274380

QC Batch: 305487 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60274380001, 60274380002, 60274380003, 60274380004

METHOD BLANK: 1494000 Matrix: Water
Associated Lab Samples: 60274380001, 60274380002, 60274380003, 60274380004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.102 ± 0.350 (0.725) C:NA T:86%	pCi/L	07/20/18 10:20	

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: JEC IBA CCR
Pace Project No.: 60274380

QC Batch: 305494 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60274380001, 60274380002, 60274380003, 60274380004

METHOD BLANK: 1494007 Matrix: Water
Associated Lab Samples: 60274380001, 60274380002, 60274380003, 60274380004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.597 ± 0.421 (0.814) C:76% T:76%	pCi/L	07/26/18 11:15	

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: JEC IBA CCR
Pace Project No.: 60274380

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: JEC IBA CCR
Pace Project No.: 60274380

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60274380001	**IBA-4-070518**	EPA 903.1	305487		
60274380002	**IBA-3-070518**	EPA 903.1	305487		
60274380003	**IBA-2-070518**	EPA 903.1	305487		
60274380004	**IBA-1-070518**	EPA 903.1	305487		
60274380001	**IBA-4-070518**	EPA 904.0	305494		
60274380002	**IBA-3-070518**	EPA 904.0	305494		
60274380003	**IBA-2-070518**	EPA 904.0	305494		
60274380004	**IBA-1-070518**	EPA 904.0	305494		
60274380001	**IBA-4-070518**	Total Radium Calculation	307486		
60274380002	**IBA-3-070518**	Total Radium Calculation	307486		
60274380003	**IBA-2-070518**	Total Radium Calculation	307486		
60274380004	**IBA-1-070518**	Total Radium Calculation	307486		

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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: 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	Copy To:	Jared Morrison	Company Name:	
	Topeka, KS 66612			Address:	
Email To:	brandon.l.griffin@westarenergy.com	Purchase Order No.:	10JEC-0000033150	Pace Quote Reference:	
Phone:	785-575-8135 Fax:	Project Name:	JEC IBA CCR	Pace Project Manager:	Heather Wilson 913-563-1407
Requested Due Date/TAT:	15 day	Project Number:		Pace Profile #:	9657, 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: KS

Requested Analysis Filtered (Y/N)

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: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test: Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	IBA-4-070518		WT	G			7/2	0927		2			2							1	1	1		
2	IBA-3-070518		WT	G			7/2	1042		2			2							1	1	1		
3	IBA-2-070518		WT	G			7/2	1200		2			2							1	1	1		
4	IBA-1-070518		WT	G			7/2	1307		2			2							1	1	1		
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

WO#: 60274380

60274380

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	BFF / Westar	7/5/18	1500	FEDEX	7/9/18	0930	17.2	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: BFF DATE Signed (MM/DD/YY): 07/05/18

*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.

F-ALL-Q-020rev.08, 12-Oct-2007

Chain of Custody

[X] Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: KS

Pace Analytical® www.pacelabs.com

Workorder: 60274380 **Workorder Name:** JEC IBA CCR

Owner Received Date: 7/9/2018 **Results Requested By:** 7/31/2018

Report To	Subcontract To
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# : 30258582

30258582

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: Other	Requested Analysis: Combined Radium	Requested Analysis: Radium 226 / 228	LAB USE ONLY
1	IBA-4-070518	PS	7/2/2018 09:27	60274380001	Water	2	X	X	001
2	IBA-3-070518	PS	7/2/2018 10:42	60274380002	Water	2	X	X	002
3	IBA-2-070518	PS	7/2/2018 12:00	60274380003	Water	2	X	X	003
4	IBA-1-070518	PS	7/2/2018 13:07	60274380004	Water	2	X	X	004
5									

Transfers	Released By	Date/Time	Received By	Date/Time
1			[signature] PACE	7/9/18 0930
2				
3				

Comments

Cooler Temperature on Receipt — °C

Custody Seal Y or (N)

Received on Ice (Y) or N — JLB 7/10/18

Samples Intact (Y) or N — JLB 7/10/18

****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.*

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CHAIN-OF-CUSTODY / Analytical Request Document

30258582

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.:	10JEC-0000033150
Project Name:	JEC IBA CCR
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson 913-563-1407
Pace Profile #:	9657, 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: KS

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	IBA-4-070518	WT	G			7/2	0927		2			2						Y	1	1	1		
2	IBA-3-070518	WT	G			7/2	1042		2			2						Y	1	1	1		
3	IBA-2-070518	WT	G			7/2	1200		2			2						Y	1	1	1		
4	IBA-1-070518	WT	G			7/2	1307		2			2						Y	1	1	1		
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	WESTAR	7/5/18	1500	[signature] PACE	7/9/18	0930	1.2	Y	N	Y

SAMPLER NAME AND SIGNATURE					
PRINT Name of SAMPLER:	Brandon Griffin		Temp In °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
SIGNATURE of SAMPLER:	[signature]	DATE Signed (MM/DD/YY): 07/05/18				

*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

Pace Analytical

Client Name: Westar Energy Project # 30258582

Label: GW
LIMS Login: CAF

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____ EX

Tracking #: 4268 7276 9542

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

Thermometer Used: SUB 7/9/18 6 Type of Ice: (Wet) Blue None melted

Cooler Temperature: Observed Temp 17.1 °C Correction Factor: +0.1 °C Final Temp: 17.2 °C

Temp should be above freezing to 6°C

pH paper Lot#: 10036711 Date and Initials of person examining contents: 7/9/18 GLP

Comments:	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: -Includes date/time/ID Matrix: WT	✓			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. All containers needing preservation are found to be in compliance with EPA recommendation. exceptions: VOA, coliform, TOC, O&G, Phenolics	✓			16. pH<2 Initial when completed: GLP 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: GLP Date: 7/9/18

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

August 27, 2018

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

RE: Project: JEC IBA CCR
Pace Project No.: 60277958

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
Andrew Hare, Westar Energy
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY
Melissa Michels, Westar Energy

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: JEC IBA CCR
Pace Project No.: 60277958

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: JEC IBA CCR
Pace Project No.: 60277958

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60277958001	**IBA-4-081518**	Water	08/15/18 08:35	08/16/18 16:00
60277958002	**IBA-3-081518**	Water	08/15/18 09:57	08/16/18 16:00
60277958003	**IBA-2-081518**	Water	08/15/18 12:04	08/16/18 16:00
60277958004	**IBA-1-081518**	Water	08/15/18 13:10	08/16/18 16:00
60277958005	**DUP-081518**	Water	08/15/18 06:00	08/16/18 16:00

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SAMPLE ANALYTE COUNT

Project: JEC IBA CCR
Pace Project No.: 60277958

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60277958001	**IBA-4-081518**	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
60277958002	**IBA-3-081518**	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
60277958003	**IBA-2-081518**	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
60277958004	**IBA-1-081518**	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
60277958005	**DUP-081518**	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

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60277958

Method: **EPA 200.7**
Description: 200.7 Metals, Total
Client: WESTAR ENERGY
Date: August 27, 2018

General Information:
5 samples were analyzed for EPA 200.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.7 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 540234

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60277882001,60277958005

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

- MS (Lab ID: 2213787)
  - Calcium
- MS (Lab ID: 2213789)
  - Calcium

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60277958

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: WESTAR ENERGY
Date: August 27, 2018

General Information:
5 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60277958

Method: **EPA 245.1**
Description: 245.1 Mercury
Client: WESTAR ENERGY
Date: August 27, 2018

General Information:
5 samples were analyzed for EPA 245.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 245.1 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 540781

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60277408002,60277973001

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

- MS (Lab ID: 2215599)
  - Mercury
- MS (Lab ID: 2215601)
  - Mercury
- MSD (Lab ID: 2215600)
  - Mercury

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60277958

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: WESTAR ENERGY
Date: August 27, 2018

General Information:
5 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60277958

Method: **SM 4500-H+B**
Description: 4500H+ pH, Electrometric
Client: WESTAR ENERGY
Date: August 27, 2018

General Information:
5 samples were analyzed for SM 4500-H+B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

H6: Analysis initiated outside of the 15 minute EPA required holding time.
- DUP-081518 (Lab ID: 60277958005)
- IBA-1-081518 (Lab ID: 60277958004)
- IBA-2-081518 (Lab ID: 60277958003)
- IBA-3-081518 (Lab ID: 60277958002)
- IBA-4-081518 (Lab ID: 60277958001)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60277958

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: WESTAR ENERGY
Date: August 27, 2018

General Information:
5 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 541421

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60277531001,60277542001

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

- MS (Lab ID: 2218730)
  - Chloride
- MS (Lab ID: 2218732)
  - Chloride
- MSD (Lab ID: 2218731)
  - Chloride

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60277958

Sample: IBA-4-081518 **Lab ID: 60277958001** Collected: 08/15/18 08:35 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	**0.018**	mg/L	0.0050	1	08/20/18 09:10	08/24/18 17:09	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 17:09	7440-41-7	
Boron, Total Recoverable	**0.26**	mg/L	0.10	1	08/20/18 09:10	08/24/18 17:09	7440-42-8	
Calcium, Total Recoverable	**107**	mg/L	0.20	1	08/20/18 09:10	08/24/18 17:09	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	08/20/18 09:10	08/24/18 17:09	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	08/20/18 09:10	08/24/18 17:09	7439-92-1	
Lithium	**0.035**	mg/L	0.010	1	08/20/18 09:10	08/24/18 17:09	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	08/20/18 09:10	08/24/18 12:37	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:37	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	08/20/18 09:10	08/24/18 12:37	7440-43-9	
Cobalt, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:37	7440-48-4	
Molybdenum, Total Recoverable	**0.0019**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:37	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:37	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:37	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 16:37	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**626**	mg/L	5.0	1		08/21/18 12:08		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		08/18/18 15:07		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**18.4**	mg/L	1.0	1		08/25/18 19:26	16887-00-6	
Fluoride	**0.59**	mg/L	0.20	1		08/25/18 19:26	16984-48-8	
Sulfate	**165**	mg/L	20.0	20		08/26/18 14:59	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60277958

Sample: IBA-3-081518 **Lab ID: 60277958002** Collected: 08/15/18 09:57 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	**0.018**	mg/L	0.0050	1	08/20/18 09:10	08/24/18 17:11	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 17:11	7440-41-7	
Boron, Total Recoverable	**0.29**	mg/L	0.10	1	08/20/18 09:10	08/24/18 17:11	7440-42-8	
Calcium, Total Recoverable	**264**	mg/L	0.20	1	08/20/18 09:10	08/24/18 17:11	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	08/20/18 09:10	08/24/18 17:11	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	08/20/18 09:10	08/24/18 17:11	7439-92-1	
Lithium	**0.019**	mg/L	0.010	1	08/20/18 09:10	08/24/18 17:11	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	08/20/18 09:10	08/24/18 12:45	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:45	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	08/20/18 09:10	08/24/18 12:45	7440-43-9	
Cobalt, Total Recoverable	**0.0021**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:45	7440-48-4	
Molybdenum, Total Recoverable	**0.0021**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:45	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:45	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:45	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 16:39	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1630**	mg/L	5.0	1		08/21/18 12:08		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		08/18/18 15:13		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**120**	mg/L	10.0	10		08/26/18 15:12	16887-00-6	
Fluoride	**0.33**	mg/L	0.20	1		08/25/18 19:40	16984-48-8	
Sulfate	**774**	mg/L	100	100		08/26/18 15:26	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60277958

Sample: IBA-2-081518 **Lab ID: 60277958003** Collected: 08/15/18 12:04 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 17:13	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 17:13	7440-41-7	
Boron, Total Recoverable	**0.20**	mg/L	0.10	1	08/20/18 09:10	08/24/18 17:13	7440-42-8	
Calcium, Total Recoverable	**221**	mg/L	0.20	1	08/20/18 09:10	08/24/18 17:13	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	08/20/18 09:10	08/24/18 17:13	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	08/20/18 09:10	08/24/18 17:13	7439-92-1	
Lithium	**0.020**	mg/L	0.010	1	08/20/18 09:10	08/24/18 17:13	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 12:49	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:49	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	08/20/18 09:10	08/24/18 12:49	7440-43-9	
Cobalt, Total Recoverable	**0.0012**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:49	7440-48-4	
Molybdenum, Total Recoverable	**0.0022**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:49	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:49	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:49	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	08/22/18 11:50	08/22/18 17:01	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1330**	mg/L	5.0	1		08/21/18 12:08		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		08/18/18 15:24		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**107**	mg/L	10.0	10		08/26/18 15:40	16887-00-6	
Fluoride	**0.36**	mg/L	0.20	1		08/25/18 20:23	16984-48-8	
Sulfate	**583**	mg/L	50.0	50		08/26/18 15:53	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60277958

Sample: IBA-1-081518 **Lab ID: 60277958004** Collected: 08/15/18 13:10 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	**0.034**	mg/L	0.0050	1	08/20/18 09:10	08/24/18 17:15	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 17:15	7440-41-7	
Boron, Total Recoverable	**0.37**	mg/L	0.10	1	08/20/18 09:10	08/24/18 17:15	7440-42-8	
Calcium, Total Recoverable	**310**	mg/L	0.20	1	08/20/18 09:10	08/24/18 17:15	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	08/20/18 09:10	08/24/18 17:15	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	08/20/18 09:10	08/24/18 17:15	7439-92-1	
Lithium	**0.015**	mg/L	0.010	1	08/20/18 09:10	08/24/18 17:15	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 12:53	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:53	7440-38-2	
Cadmium, Total Recoverable	**0.00053**	mg/L	0.00050	1	08/20/18 09:10	08/24/18 12:53	7440-43-9	
Cobalt, Total Recoverable	**0.0025**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:53	7440-48-4	
Molybdenum, Total Recoverable	**0.0069**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:53	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:53	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:53	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 17:04	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1680**	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 15:25		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**122**	mg/L	10.0	10		08/26/18 16:07	16887-00-6	
Fluoride	**0.35**	mg/L	0.20	1		08/25/18 20:37	16984-48-8	
Sulfate	**877**	mg/L	100	100		08/26/18 16:21	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60277958

Sample: DUP-081518 **Lab ID: 60277958005** Collected: 08/15/18 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	**0.019**	mg/L	0.0050	1	08/20/18 09:10	08/24/18 17:18	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 17:18	7440-41-7	
Boron, Total Recoverable	**0.28**	mg/L	0.10	1	08/20/18 09:10	08/24/18 17:18	7440-42-8	
Calcium, Total Recoverable	**268**	mg/L	0.20	1	08/20/18 09:10	08/24/18 17:18	7440-70-2	M1
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	08/20/18 09:10	08/24/18 17:18	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	08/20/18 09:10	08/24/18 17:18	7439-92-1	
Lithium	**0.019**	mg/L	0.010	1	08/20/18 09:10	08/24/18 17:18	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 12:57	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:57	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	08/20/18 09:10	08/24/18 12:57	7440-43-9	
Cobalt, Total Recoverable	**0.0021**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:57	7440-48-4	
Molybdenum, Total Recoverable	**0.0021**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:57	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:57	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:57	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 17:06	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1710**	mg/L	5.0	1		08/21/18 12:08		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		08/18/18 11:54		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**119**	mg/L	10.0	10		08/26/18 16:35	16887-00-6	
Fluoride	**0.33**	mg/L	0.20	1		08/25/18 20:52	16984-48-8	
Sulfate	**808**	mg/L	100	100		08/26/18 16:48	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60277958

QC Batch: 540772 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60277958001, 60277958002

METHOD BLANK: 2215570 Matrix: Water
Associated Lab Samples: 60277958001, 60277958002

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60277958

QC Batch: 540781 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60277958003, 60277958004, 60277958005

METHOD BLANK: 2215597 Matrix: Water
Associated Lab Samples: 60277958003, 60277958004, 60277958005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	08/22/18 16:57	

LABORATORY CONTROL SAMPLE: 2215598

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0046	91	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2215599 2215600

Parameter	Units	60277973001 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	0.0034	0.0032	68	64	70-130	7	20	M1

MATRIX SPIKE SAMPLE: 2215601

Parameter	Units	60277408002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	.005	0.0032	64	70-130	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60277958

QC Batch: 540234 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60277958001, 60277958002, 60277958003, 60277958004, 60277958005

METHOD BLANK: 2213785 Matrix: Water
Associated Lab Samples: 60277958001, 60277958002, 60277958003, 60277958004, 60277958005

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

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60277958

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60277958

QC Batch: 540242 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60277958001, 60277958002, 60277958003, 60277958004, 60277958005

METHOD BLANK: 2213821 Matrix: Water
Associated Lab Samples: 60277958001, 60277958002, 60277958003, 60277958004, 60277958005

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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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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REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60277958

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: JEC IBA CCR
Pace Project No.: 60277958

QC Batch: 540573 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60277958001, 60277958002, 60277958003, 60277958004, 60277958005

METHOD BLANK: 2214824 Matrix: Water
Associated Lab Samples: 60277958001, 60277958002, 60277958003, 60277958004, 60277958005

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60277958

QC Batch: 540138
QC Batch Method: SM 4500-H+B
Analysis Method: SM 4500-H+B
Analysis Description: 4500H+B pH
Associated Lab Samples: 60277958005

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60277958

QC Batch: 540188 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 60277958001, 60277958002, 60277958003, 60277958004

SAMPLE DUPLICATE: 2213529

Parameter	Units	60277465002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.6	6.7	1	5	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60277958

QC Batch: 541421 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60277958001, 60277958002, 60277958003, 60277958004, 60277958005

METHOD BLANK: 2218728 Matrix: Water
Associated Lab Samples: 60277958001, 60277958002, 60277958003, 60277958004, 60277958005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	08/25/18 14:41	
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
Chloride	mg/L	5	4.7	94	90-110	
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
Chloride	mg/L	251	100	100	319	314	68	63	90-110	2	15	M1
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
Chloride	mg/L	548	250	742	78	90-110	M1
Fluoride	mg/L	ND	125	132	102	90-110	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60277958

QC Batch: 541460 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60277958001, 60277958002, 60277958003, 60277958004, 60277958005

METHOD BLANK: 2219133 Matrix: Water
Associated Lab Samples: 60277958001, 60277958002, 60277958003, 60277958004, 60277958005

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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: JEC IBA CCR
Pace Project No.: 60277958

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: JEC IBA CCR
Pace Project No.: 60277958

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60277958001	**IBA-4-081518**	EPA 200.7	540234	EPA 200.7	540346
60277958002	**IBA-3-081518**	EPA 200.7	540234	EPA 200.7	540346
60277958003	**IBA-2-081518**	EPA 200.7	540234	EPA 200.7	540346
60277958004	**IBA-1-081518**	EPA 200.7	540234	EPA 200.7	540346
60277958005	**DUP-081518**	EPA 200.7	540234	EPA 200.7	540346
60277958001	**IBA-4-081518**	EPA 200.8	540242	EPA 200.8	540344
60277958002	**IBA-3-081518**	EPA 200.8	540242	EPA 200.8	540344
60277958003	**IBA-2-081518**	EPA 200.8	540242	EPA 200.8	540344
60277958004	**IBA-1-081518**	EPA 200.8	540242	EPA 200.8	540344
60277958005	**DUP-081518**	EPA 200.8	540242	EPA 200.8	540344
60277958001	**IBA-4-081518**	EPA 245.1	540772	EPA 245.1	540885
60277958002	**IBA-3-081518**	EPA 245.1	540772	EPA 245.1	540885
60277958003	**IBA-2-081518**	EPA 245.1	540781	EPA 245.1	540889
60277958004	**IBA-1-081518**	EPA 245.1	540781	EPA 245.1	540889
60277958005	**DUP-081518**	EPA 245.1	540781	EPA 245.1	540889
60277958001	**IBA-4-081518**	SM 2540C	540573		
60277958002	**IBA-3-081518**	SM 2540C	540573		
60277958003	**IBA-2-081518**	SM 2540C	540573		
60277958004	**IBA-1-081518**	SM 2540C	540573		
60277958005	**DUP-081518**	SM 2540C	540573		
60277958001	**IBA-4-081518**	SM 4500-H+B	540188		
60277958002	**IBA-3-081518**	SM 4500-H+B	540188		
60277958003	**IBA-2-081518**	SM 4500-H+B	540188		
60277958004	**IBA-1-081518**	SM 4500-H+B	540188		
60277958005	**DUP-081518**	SM 4500-H+B	540138		
60277958001	**IBA-4-081518**	EPA 300.0	541421		
60277958001	**IBA-4-081518**	EPA 300.0	541460		
60277958002	**IBA-3-081518**	EPA 300.0	541421		
60277958002	**IBA-3-081518**	EPA 300.0	541460		
60277958003	**IBA-2-081518**	EPA 300.0	541421		
60277958003	**IBA-2-081518**	EPA 300.0	541460		
60277958004	**IBA-1-081518**	EPA 300.0	541421		
60277958004	**IBA-1-081518**	EPA 300.0	541460		
60277958005	**DUP-081518**	EPA 300.0	541421		
60277958005	**DUP-081518**	EPA 300.0	541460		

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Sample Condition Upon Receipt

WO# : 60277958

60277958

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 1.5 Corr. Factor +1.1 Corrected 2.6

Date and initials of person examining contents: HW 8-17-18

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☑Yes ☐No ☐N/A	pH
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☐Yes ☐No ☐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)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑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 10:38 pm, 8/17/18 Date: _____

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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: 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	Copy To:	Jared Morrison	Company Name:	
	Topeka, KS 66612			Address:	
Email To:	brandon.l.griffin@westarenergy.com	Purchase Order No.:	10JEC-0000033150	Pace Quote Reference:	
Phone:	785-575-8135 Fax:	Project Name:	JEC IBA CCR	Pace Project Manager:	Heather Wilson 913-563-1407
Requested Due Date/TAT:	7 day	Project Number:		Pace Profile #:	9657, 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: KS

Requested Analysis Filtered (Y/N)

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

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	200.7 Total Metals*	200.8 Total Metals**	245.1 Total Hg	300: Cl, F, SO4	2540C TDS	4500 H+B			Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	IBA-4-081518	WT	G			8/15	0835		2	1		1												BP1U,	BP3N		60277958 001
2	IBA-3-081518	WT	G			8/15	0957		2	1		1												BP1N			002
3	IBA-2-081518	WT	G			8/15	1204		2	1		1												BP3N			003
4	IBA-1-081518	WT	G			8/15	1310		2	1		1															004
5																											
6																											
7																											
8																											
9																											
10	DUP-081518	WT				8/15	0600		2	1		1												BP1U,	BP3N		005
11																											
12																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
200.7 Total Metals*: B, Ca, Ba, Be, Cr, Pb, Li	Westar	8/16/18	0830	PACE	8-17-18	1600	2.6	Y	N	Y
200.8 Total Metals**: Sb, As, Cd, Co, Mo, Se, Tl										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY): 08/15/18

*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.

Pace Analytical Services, LLC
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(913)599-5665

September 05, 2018

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

RE: Project: JEC IBA CCR
Pace Project No.: 60278245

Dear Brandon Griffin:
Enclosed are the analytical results for sample(s) received by the laboratory on August 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
Andrew Hare, Westar Energy
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY
Melissa Michels, Westar Energy

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CERTIFICATIONS

Project: JEC IBA CCR
Pace Project No.: 60278245

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: JEC IBA CCR
Pace Project No.: 60278245

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60278245001	**IBA-4-081518**	Water	08/15/18 08:35	08/20/18 09:50
60278245002	**IBA-3-081518**	Water	08/15/18 09:57	08/20/18 09:50
60278245003	**IBA-2-081518**	Water	08/15/18 12:04	08/20/18 09:50
60278245004	**IBA-1-081518**	Water	08/15/18 13:10	08/20/18 09:50
60278245005	**DUP-081518**	Water	08/15/18 06:00	08/20/18 09:50

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SAMPLE ANALYTE COUNT

Project: JEC IBA CCR
Pace Project No.: 60278245

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60278245001	**IBA-4-081518**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60278245002	**IBA-3-081518**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60278245003	**IBA-2-081518**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60278245004	**IBA-1-081518**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60278245005	**DUP-081518**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60278245

Method: **EPA 903.1**
Description: 903.1 Radium 226
Client: WESTAR ENERGY
Date: September 05, 2018

General Information:
5 samples were analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60278245

Method: **EPA 904.0**
Description: 904.0 Radium 228
Client: WESTAR ENERGY
Date: September 05, 2018

General Information:
5 samples were analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60278245

Method: **Total Radium Calculation**
Description: Total Radium 228+226
Client: WESTAR ENERGY
Date: September 05, 2018

General Information:
5 samples were analyzed for Total Radium Calculation. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60278245

Sample: IBA-4-081518 **Lab ID: 60278245001** Collected: 08/15/18 08:35 Received: 08/20/18 09:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.25 ± 0.868 (1.17) C:NA T:82%**	pCi/L	08/31/18 20:22	13982-63-3	
Radium-228	EPA 904.0	**0.00800 ± 0.358 (0.832) C:71% T:78%**	pCi/L	08/31/18 14:15	15262-20-1	
Total Radium	Total Radium Calculation	**1.26 ± 1.23 (2.00)**	pCi/L	09/04/18 16:10	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60278245

Sample: IBA-3-081518 **Lab ID: 60278245002** Collected: 08/15/18 09:57 Received: 08/20/18 09:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.518 ± 0.734 (1.24) C:NA T:68%**	pCi/L	08/31/18 20:22	13982-63-3	
Radium-228	EPA 904.0	**0.533 ± 0.363 (0.689) C:74% T:80%**	pCi/L	08/31/18 14:15	15262-20-1	
Total Radium	Total Radium Calculation	**1.05 ± 1.10 (1.93)**	pCi/L	09/04/18 16:10	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60278245

Sample: IBA-2-081518 **Lab ID: 60278245003** Collected: 08/15/18 12:04 Received: 08/20/18 09:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.402 ± 0.370 (0.218) C:NA T:85%**	pCi/L	08/31/18 20:22	13982-63-3	
Radium-228	EPA 904.0	**0.289 ± 0.364 (0.772) C:69% T:83%**	pCi/L	08/31/18 14:15	15262-20-1	
Total Radium	Total Radium Calculation	**0.691 ± 0.734 (0.990)**	pCi/L	09/04/18 16:10	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60278245

Sample: IBA-1-081518 **Lab ID: 60278245004** Collected: 08/15/18 13:10 Received: 08/20/18 09:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.176 ± 0.546 (1.06) C:NA T:82%**	pCi/L	08/31/18 20:22	13982-63-3	
Radium-228	EPA 904.0	**0.221 ± 0.323 (0.695) C:73% T:84%**	pCi/L	08/31/18 14:15	15262-20-1	
Total Radium	Total Radium Calculation	**0.397 ± 0.869 (1.76)**	pCi/L	09/04/18 16:10	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60278245

Sample: DUP-081518 **Lab ID: 60278245005** Collected: 08/15/18 06:00 Received: 08/20/18 09:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.408 ± 0.621 (1.07) C:NA T:87%**	pCi/L	08/31/18 20:39	13982-63-3	
Radium-228	EPA 904.0	**0.242 ± 0.372 (0.804) C:73% T:78%**	pCi/L	08/31/18 14:15	15262-20-1	
Total Radium	Total Radium Calculation	**0.650 ± 0.993 (1.87)**	pCi/L	09/04/18 16:10	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60278245

QC Batch: 310515 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60278245001, 60278245002, 60278245003, 60278245004, 60278245005

METHOD BLANK: 1516866 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.432 ± 0.395 (0.803) C:77% T:70%	pCi/L	08/31/18 14:13	

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60278245

QC Batch: 310510 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60278245001, 60278245002, 60278245003, 60278245004, 60278245005

METHOD BLANK: 1516849 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.179 ± 0.430 (0.830) C:NA T:78%	pCi/L	08/31/18 19:41	

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: JEC IBA CCR
Pace Project No.: 60278245

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: JEC IBA CCR
Pace Project No.: 60278245

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60278245001	**IBA-4-081518**	EPA 903.1	310510		
60278245002	**IBA-3-081518**	EPA 903.1	310510		
60278245003	**IBA-2-081518**	EPA 903.1	310510		
60278245004	**IBA-1-081518**	EPA 903.1	310510		
60278245005	**DUP-081518**	EPA 903.1	310510		
60278245001	**IBA-4-081518**	EPA 904.0	310515		
60278245002	**IBA-3-081518**	EPA 904.0	310515		
60278245003	**IBA-2-081518**	EPA 904.0	310515		
60278245004	**IBA-1-081518**	EPA 904.0	310515		
60278245005	**DUP-081518**	EPA 904.0	310515		
60278245001	**IBA-4-081518**	Total Radium Calculation	311827		
60278245002	**IBA-3-081518**	Total Radium Calculation	311827		
60278245003	**IBA-2-081518**	Total Radium Calculation	311827		
60278245004	**IBA-1-081518**	Total Radium Calculation	311827		
60278245005	**DUP-081518**	Total Radium Calculation	311827		

Pace Analytical
www.pacelabs.com

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.:	10JEC-0000033150
Project Name:	JEC IBA CCR
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson 913-563-1407
Pace Profile #:	9657, 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: KS

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Requested Analysis Filtered (Y/N): Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	IBA-4-081518	WT	G			8/15	0835		2			2											
2	IBA-3-081518	WT	G			8/15	0957		2			2											
3	IBA-2-081518	WT	G			8/15	1204		2			2											
4	IBA-1-081518	WT	G			8/15	1310		2			2											
5																							
6																							
7																							
8																							
9																							
10	DUP-081518	WT	G			8/15	0600		2			2								X	X	X		
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Westar	8/16/18	0830	Pace	8/20/18	0950	18.7	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 08/15/18

*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 # _____

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____ Label _____

Tracking #: 782383227885 LIMS Login

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

Thermometer Used 9 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 18.7 °C Correction Factor: 0 °C Final Temp: 18.7 °C

Temp should be above freezing to 6°C

pH paper Lot# 10D4671 Date and Initials of person examining contents: 8/21/18 JWB

Comments:	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: -Includes date/time/ID Matrix: WT	✓			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. All containers needing preservation are found to be in compliance with EPA recommendation.	✓			16. pH<2
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed JWB 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: JWB Date: 8/21/18

Client Notification/ Resolution:

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

Comments/ Resolution: _____

REVIEWED

By hwilson at 3:53 pm, 8/21/18

☐ **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

[X] Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: KS

Pace Analytical® www.pacelabs.com

Workorder: 60278245 **Workorder Name:** JEC IBA CCR

Owner Received Date: 8/20/2018 **Results Requested By:** 9/11/2018

Report To	Subcontract To
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

Requested Analysis

WO# : 30262935

30262935

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: Other	Radium-226 & Total Radium	Radium-228	LAB USE ONLY
1	IBA-4-081518	PS	8/15/2018 08:35	60278245001	Water	1	X	X	001
2	IBA-3-081518	PS	8/15/2018 09:57	60278245002	Water	1	X	X	002
3	IBA-2-081518	PS	8/15/2018 12:04	60278245003	Water	1	X	X	003
4	IBA-1-081518	PS	8/15/2018 13:10	60278245004	Water	1	X	X	004
5	DUP-081518	PS	8/15/2018 06:00	60278245005	Water	1	X	X	005

Transfers	Released By	Date/Time	Received By	Date/Time
1			BTH	~~8/22/18~~
2				8/21/18 0950
3				

Comments

BTH 8/22/18

Cooler Temperature on Receipt 18.7 °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.

Pace Analytical
www.pacelabs.com

Page: / of

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.:	10JEC-0000033150
Project Name:	JEC IBA CCR
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson 913-563-1407
Pace Profile #:	9657, 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: KS

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	30262935	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	IBA-4-081518	WT	G			8/15	0835		2			2							X	X	X			
2	IBA-3-081518	WT	G			8/15	0957		2			2							X	X	X			
3	IBA-2-081518	WT	G			8/15	1204		2			2							X	X	X			
4	IBA-1-081518	WT	G			8/15	1310		2			2							X	X	X			
5																								
6																								
7																								
8																								
9																								
10	DUP-081518	WT	G			8/15	0600		2			2							X	X	X	*		
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	[signature] Westar	8/15/18	0830	[signature] PACE	8/16/18	0950	18.7	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 08/15/18

*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: Western Energy Project # 30262935

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____ Label _____

Tracking #: 782383227885 LIMS Login B[illegible]

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

Thermometer Used 9 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 18.7 °C Correction Factor: 0 °C Final Temp: 18.7 °C

Temp should be above freezing to 6°C

pH paper Lot# 10D9671 Date and Initials of person examining contents: 8/21/18 JMB

Comments:	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: -Includes date/time/ID Matrix: WT	✓			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. All containers needing preservation are found to be in compliance with EPA recommendation. exceptions: VOA, coliform, TOC, O&G, Phenolics	✓			16. pH<2 Initial when completed JMB 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: JMB Date: 8/21/18

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 1-5
October 2018 Sampling Event
Laboratory Analytical Report

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

October 22, 2018

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

RE: Project: JEC IBA CCR
Pace Project No.: 60282725

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
Andrew Hare, Westar Energy
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY
Melissa Michels, Westar Energy
JD Schlegel, KCP&L & Westar

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: JEC IBA CCR
Pace Project No.: 60282725

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: JEC IBA CCR
Pace Project No.: 60282725

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60282725001	**IBA-4-100218**	Water	10/02/18 10:21	10/04/18 16:35
60282725002	**IBA-3-100218**	Water	10/02/18 12:11	10/04/18 16:35
60282725003	**IBA-2-100218**	Water	10/02/18 13:58	10/04/18 16:35
60282725004	**IBA-1-100218**	Water	10/02/18 15:05	10/04/18 16:35
60282725005	**DUP-100218**	Water	10/02/18 06:00	10/04/18 16:35

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: JEC IBA CCR
Pace Project No.: 60282725

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60282725001	**IBA-4-100218**	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
60282725002	**IBA-3-100218**	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
60282725003	**IBA-2-100218**	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
60282725004	**IBA-1-100218**	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
60282725005	**DUP-100218**	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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60282725

Method: **EPA 200.7**
Description: 200.7 Metals, Total
Client: WESTAR ENERGY
Date: October 22, 2018

General Information:
5 samples were analyzed for EPA 200.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.7 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 548701

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60282725001,60282726006

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

- MS (Lab ID: 2249584)
  - Calcium

Additional Comments:

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60282725

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: WESTAR ENERGY
Date: October 22, 2018

General Information:
5 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
9608 Loiret Blvd.
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(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60282725

Method: **EPA 245.1**
Description: 245.1 Mercury
Client: WESTAR ENERGY
Date: October 22, 2018

General Information:
5 samples were analyzed for EPA 245.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 245.1 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60282725

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: WESTAR ENERGY
Date: October 22, 2018

General Information:
5 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60282725

Method: **SM 4500-H+B**
Description: 4500H+ pH, Electrometric
Client: WESTAR ENERGY
Date: October 22, 2018

General Information:
5 samples were analyzed for SM 4500-H+B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

H6: Analysis initiated outside of the 15 minute EPA required holding time.
- DUP-100218 (Lab ID: 60282725005)
- IBA-1-100218 (Lab ID: 60282725004)
- IBA-2-100218 (Lab ID: 60282725003)
- IBA-3-100218 (Lab ID: 60282725002)
- IBA-4-100218 (Lab ID: 60282725001)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60282725

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: WESTAR ENERGY
Date: October 22, 2018

General Information:
5 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 549179

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60282726005

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

- MS (Lab ID: 2251784)
  - Fluoride

QC Batch: 549886

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60282725001,60282726007

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

- MS (Lab ID: 2254738)
  - Sulfate
- MS (Lab ID: 2254740)
  - Sulfate
- MSD (Lab ID: 2254739)
  - Sulfate

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60282725

Sample: IBA-4-100218 **Lab ID: 60282725001** Collected: 10/02/18 10:21 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	**0.020**	mg/L	0.0050	1	10/09/18 16:24	10/15/18 19:56	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/13/18 18:28	7440-41-7	
Boron, Total Recoverable	**0.23**	mg/L	0.10	1	10/09/18 16:24	10/13/18 18:28	7440-42-8	
Calcium, Total Recoverable	**104**	mg/L	0.20	1	10/09/18 16:24	10/13/18 18:28	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	10/09/18 16:24	10/13/18 18:28	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	10/09/18 16:24	10/13/18 18:28	7439-92-1	
Lithium	**0.032**	mg/L	0.010	1	10/09/18 16:24	10/15/18 19:56	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	10/09/18 16:24	10/11/18 16:56	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 16:56	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	10/09/18 16:24	10/11/18 16:56	7440-43-9	
Cobalt, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 16:56	7440-48-4	
Molybdenum, Total Recoverable	**0.0018**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 16:56	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:09	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 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	10/11/18 12:55	10/11/18 16:46	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**632**	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		10/05/18 12:10		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**18.6**	mg/L	1.0	1		10/14/18 21:25	16887-00-6	
Fluoride	**0.53**	mg/L	0.20	1		10/14/18 21:25	16984-48-8	
Sulfate	**180**	mg/L	20.0	20		10/16/18 09:53	14808-79-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60282725

Sample: IBA-3-100218 **Lab ID: 60282725002** Collected: 10/02/18 12:11 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	**0.020**	mg/L	0.0050	1	10/09/18 16:24	10/15/18 17:10	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/13/18 18:39	7440-41-7	
Boron, Total Recoverable	**0.27**	mg/L	0.10	1	10/09/18 16:24	10/13/18 18:39	7440-42-8	
Calcium, Total Recoverable	**254**	mg/L	0.20	1	10/09/18 16:24	10/13/18 18:39	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	10/09/18 16:24	10/13/18 18:39	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	10/09/18 16:24	10/13/18 18:39	7439-92-1	
Lithium	**0.021**	mg/L	0.010	1	10/09/18 16:24	10/15/18 17:10	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 16:58	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 16:58	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	10/09/18 16:24	10/11/18 16:58	7440-43-9	
Cobalt, Total Recoverable	**0.0019**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 16:58	7440-48-4	
Molybdenum, Total Recoverable	**0.0021**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 16:58	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:11	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 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	10/11/18 12:55	10/11/18 16:48	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1510**	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		10/05/18 12:11		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**151**	mg/L	50.0	50		10/15/18 05:00	16887-00-6	
Fluoride	**0.36**	mg/L	0.20	1		10/14/18 21:40	16984-48-8	
Sulfate	**998**	mg/L	50.0	50		10/15/18 05:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60282725

Sample: IBA-2-100218 **Lab ID: 60282725003** Collected: 10/02/18 13:58 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 17:12	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/13/18 18:41	7440-41-7	
Boron, Total Recoverable	**0.19**	mg/L	0.10	1	10/09/18 16:24	10/13/18 18:41	7440-42-8	
Calcium, Total Recoverable	**209**	mg/L	0.20	1	10/09/18 16:24	10/13/18 18:41	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	10/09/18 16:24	10/13/18 18:41	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	10/09/18 16:24	10/13/18 18:41	7439-92-1	
Lithium	**0.020**	mg/L	0.010	1	10/09/18 16:24	10/15/18 17:12	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	10/09/18 16:24	10/11/18 17:00	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:00	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	10/09/18 16:24	10/11/18 17:00	7440-43-9	
Cobalt, Total Recoverable	**0.0011**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:00	7440-48-4	
Molybdenum, Total Recoverable	**0.0022**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:00	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:12	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 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	10/11/18 12:55	10/11/18 16:51	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1300**	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		10/05/18 12:13		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**144**	mg/L	50.0	50		10/15/18 05:15	16887-00-6	
Fluoride	**0.40**	mg/L	0.20	1		10/14/18 21:54	16984-48-8	
Sulfate	**771**	mg/L	50.0	50		10/15/18 05:15	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60282725

Sample: IBA-1-100218 **Lab ID: 60282725004** Collected: 10/02/18 15:05 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	**0.034**	mg/L	0.0050	1	10/09/18 16:24	10/15/18 17:14	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/13/18 18:44	7440-41-7	
Boron, Total Recoverable	**0.37**	mg/L	0.10	1	10/09/18 16:24	10/13/18 18:44	7440-42-8	
Calcium, Total Recoverable	**305**	mg/L	0.20	1	10/09/18 16:24	10/13/18 18:44	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	10/09/18 16:24	10/13/18 18:44	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	10/09/18 16:24	10/13/18 18:44	7439-92-1	
Lithium	**0.016**	mg/L	0.010	1	10/09/18 16:24	10/15/18 17:14	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 17:03	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:03	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	10/09/18 16:24	10/11/18 17:03	7440-43-9	
Cobalt, Total Recoverable	**0.0022**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:03	7440-48-4	
Molybdenum, Total Recoverable	**0.0071**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:03	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:14	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:03	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 16:55	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1820**	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		10/05/18 12:14		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**150**	mg/L	50.0	50		10/15/18 05:29	16887-00-6	
Fluoride	**0.63**	mg/L	0.20	1		10/14/18 22:08	16984-48-8	
Sulfate	**940**	mg/L	100	100		10/16/18 16:35	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60282725

Sample: DUP-100218 **Lab ID: 60282725005** Collected: 10/02/18 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	**0.019**	mg/L	0.0050	1	10/09/18 16:24	10/15/18 17:16	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/13/18 18:46	7440-41-7	
Boron, Total Recoverable	**0.23**	mg/L	0.10	1	10/09/18 16:24	10/13/18 18:46	7440-42-8	
Calcium, Total Recoverable	**102**	mg/L	0.20	1	10/09/18 16:24	10/13/18 18:46	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	10/09/18 16:24	10/13/18 18:46	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	10/09/18 16:24	10/13/18 18:46	7439-92-1	
Lithium	**0.033**	mg/L	0.010	1	10/09/18 16:24	10/15/18 17:16	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	10/09/18 16:24	10/11/18 17:05	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:05	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	10/09/18 16:24	10/11/18 17:05	7440-43-9	
Cobalt, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:05	7440-48-4	
Molybdenum, Total Recoverable	**0.0018**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:05	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/15/18 16:16	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:05	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	10/11/18 12:55	10/11/18 16:58	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**626**	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		10/05/18 12:07		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**18.5**	mg/L	1.0	1		10/14/18 23:05	16887-00-6	
Fluoride	**0.52**	mg/L	0.20	1		10/14/18 23:05	16984-48-8	
Sulfate	**208**	mg/L	50.0	50		10/15/18 05:43	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60282725

QC Batch: 549000 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60282725001, 60282725002, 60282725003, 60282725004, 60282725005

METHOD BLANK: 2251088 Matrix: Water
Associated Lab Samples: 60282725001, 60282725002, 60282725003, 60282725004, 60282725005

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	

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

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60282725

QC Batch: 548701 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60282725001, 60282725002, 60282725003, 60282725004, 60282725005

METHOD BLANK: 2249580 Matrix: Water
Associated Lab Samples: 60282725001, 60282725002, 60282725003, 60282725004, 60282725005

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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60282725

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: JEC IBA CCR
Pace Project No.: 60282725

QC Batch: 548702 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60282725001, 60282725002, 60282725003, 60282725004, 60282725005

METHOD BLANK: 2249585 Matrix: Water
Associated Lab Samples: 60282725001, 60282725002, 60282725003, 60282725004, 60282725005

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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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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REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60282725

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60282725

QC Batch: 548229 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60282725001, 60282725002, 60282725003, 60282725004, 60282725005

METHOD BLANK: 2247660 Matrix: Water
Associated Lab Samples: 60282725001, 60282725002, 60282725003, 60282725004, 60282725005

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: 2247661

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1010	101	80-120	

SAMPLE DUPLICATE: 2247662

Parameter	Units	60282451002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1430	1440	0	10	

SAMPLE DUPLICATE: 2247663

Parameter	Units	60282553014 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	732	736	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60282725

QC Batch: 548111 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 60282725001, 60282725002, 60282725003, 60282725004, 60282725005

SAMPLE DUPLICATE: 2247157

Parameter	Units	60282725005 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.1	7.2	1	5	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60282725

QC Batch: 549179 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60282725001, 60282725002, 60282725003, 60282725004, 60282725005

METHOD BLANK: 2251780 Matrix: Water
Associated Lab Samples: 60282725001, 60282725002, 60282725003, 60282725004, 60282725005

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60282725

QC Batch: 549886 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60282725001, 60282725004

METHOD BLANK: 2254736 Matrix: Water
Associated Lab Samples: 60282725001, 60282725004

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

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: JEC IBA CCR
Pace Project No.: 60282725

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: JEC IBA CCR
Pace Project No.: 60282725

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60282725001	**IBA-4-100218**	EPA 200.7	548701	EPA 200.7	548774
60282725002	**IBA-3-100218**	EPA 200.7	548701	EPA 200.7	548774
60282725003	**IBA-2-100218**	EPA 200.7	548701	EPA 200.7	548774
60282725004	**IBA-1-100218**	EPA 200.7	548701	EPA 200.7	548774
60282725005	**DUP-100218**	EPA 200.7	548701	EPA 200.7	548774
60282725001	**IBA-4-100218**	EPA 200.8	548702	EPA 200.8	548775
60282725002	**IBA-3-100218**	EPA 200.8	548702	EPA 200.8	548775
60282725003	**IBA-2-100218**	EPA 200.8	548702	EPA 200.8	548775
60282725004	**IBA-1-100218**	EPA 200.8	548702	EPA 200.8	548775
60282725005	**DUP-100218**	EPA 200.8	548702	EPA 200.8	548775
60282725001	**IBA-4-100218**	EPA 245.1	549000	EPA 245.1	549113
60282725002	**IBA-3-100218**	EPA 245.1	549000	EPA 245.1	549113
60282725003	**IBA-2-100218**	EPA 245.1	549000	EPA 245.1	549113
60282725004	**IBA-1-100218**	EPA 245.1	549000	EPA 245.1	549113
60282725005	**DUP-100218**	EPA 245.1	549000	EPA 245.1	549113
60282725001	**IBA-4-100218**	SM 2540C	548229		
60282725002	**IBA-3-100218**	SM 2540C	548229		
60282725003	**IBA-2-100218**	SM 2540C	548229		
60282725004	**IBA-1-100218**	SM 2540C	548229		
60282725005	**DUP-100218**	SM 2540C	548229		
60282725001	**IBA-4-100218**	SM 4500-H+B	548111		
60282725002	**IBA-3-100218**	SM 4500-H+B	548111		
60282725003	**IBA-2-100218**	SM 4500-H+B	548111		
60282725004	**IBA-1-100218**	SM 4500-H+B	548111		
60282725005	**DUP-100218**	SM 4500-H+B	548111		
60282725001	**IBA-4-100218**	EPA 300.0	549179		
60282725001	**IBA-4-100218**	EPA 300.0	549886		
60282725002	**IBA-3-100218**	EPA 300.0	549179		
60282725003	**IBA-2-100218**	EPA 300.0	549179		
60282725004	**IBA-1-100218**	EPA 300.0	549179		
60282725004	**IBA-1-100218**	EPA 300.0	549886		
60282725005	**DUP-100218**	EPA 300.0	549179		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO# : 60282725

60282725

Client Name: Weitar

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** 0.4 **Corr. Factor** 0.0 **Corrected** 0.4

Date and initials of person examining contents: HW 10/4/18 PW 10/5/18

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr): PH 10/5	☑Yes ☐No ☐N/A	PH
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐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)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑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 10:44 am, 10/5/18 Date: _____

F-KS-C-003-Rev.11, February 28, 2018

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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: 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:	7 day

Section B — **Required** Project Information:

Report To:	Brandon Griffin
Copy To:	Jared Morrison
Purchase Order No.:	10JEC-0000033150
Project Name:	JEC IBA CCR
Project Number:	

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson 913-563-1407
Pace Profile #:	9657, 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: KS

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

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	200.7 Total Metals*	200.8 Total Metals**	245.1 Total Hg	300: Cl, F, SO4	2540C TDS	4500 H+B	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 60282725
1	IBA-4-100218	WT	G			10/2	1021		2	1		1														BP1U BP3N 092
2	IBA-3-100218	WT	G			10/2	1211		2	1		1														092
3	IBA-2-100218	WT	G			10/2	1358		2	1		1														093
4	IBA-1-100218	WT	G			10/2	1505		2	1		1														094
5																										
6																										
7																										
8																										
9																										
10	DUP-100218	WT	G			10/2	0600		2	1		1								X	X	X	X	X	X		095
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
200.7 Total Metals*: B, Ca, Ba, Be, Cr, Pb, Li	BJJ / Westar	10/4/18	0900		10/4/18	1635	0.4	Y	Y	Y
200.8 Total Metals**: Sb, As, Cd, Co, Mo, Se, Tl										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: BJJ

DATE Signed (MM/DD/YY): 10/04/18

*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.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

October 22, 2018

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

RE: Project: JEC IBA CCR
Pace Project No.: 60283097

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
Andrew Hare, Westar Energy
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY
Melissa Michels, Westar Energy
JD Schlegel, KCP&L & Westar

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(913)599-5665

CERTIFICATIONS

Project: JEC IBA CCR
Pace Project No.: 60283097

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: JEC IBA CCR
Pace Project No.: 60283097

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60283097001	**IBA-4-1010218**	Water	10/02/18 10:21	10/05/18 10:00
60283097002	**IBA-3-100218**	Water	10/02/18 12:11	10/05/18 10:00
60283097003	**IBA-2-100218**	Water	10/02/18 13:58	10/05/18 10:00
60283097004	**IBA-1-100218**	Water	10/02/18 15:05	10/05/18 10:00
60283097005	**DUP-100218**	Water	10/02/18 06:00	10/05/18 10:00

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SAMPLE ANALYTE COUNT

Project: JEC IBA CCR
Pace Project No.: 60283097

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60283097001	**IBA-4-1010218**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60283097002	**IBA-3-100218**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60283097003	**IBA-2-100218**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60283097004	**IBA-1-100218**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60283097005	**DUP-100218**	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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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60283097

Method: **EPA 903.1**
Description: 903.1 Radium 226
Client: WESTAR ENERGY
Date: October 22, 2018

General Information:
5 samples were analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60283097

Method: **EPA 904.0**
Description: 904.0 Radium 228
Client: WESTAR ENERGY
Date: October 22, 2018

General Information:
5 samples were analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60283097

Method: **Total Radium Calculation**
Description: Total Radium 228+226
Client: WESTAR ENERGY
Date: October 22, 2018

General Information:
5 samples were analyzed for Total Radium Calculation. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60283097

Sample: IBA-4-1010218 **Lab ID: 60283097001** Collected: 10/02/18 10:21 Received: 10/05/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.753 ± 0.557 (0.753) C:NA T:79%**	pCi/L	10/19/18 17:59	13982-63-3	
Radium-228	EPA 904.0	**0.251 ± 0.309 (0.654) C:75% T:90%**	pCi/L	10/18/18 11:42	15262-20-1	
Total Radium	Total Radium Calculation	**1.00 ± 0.866 (1.41)**	pCi/L	10/22/18 12:23	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60283097

Sample: IBA-3-100218 **Lab ID: 60283097002** Collected: 10/02/18 12:11 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	**0.427 ± 0.524 (0.855) C:NA T:70%**	pCi/L	10/19/18 17:59	13982-63-3	
Radium-228	EPA 904.0	**-0.144 ± 0.361 (0.866) C:76% T:82%**	pCi/L	10/18/18 11:42	15262-20-1	
Total Radium	Total Radium Calculation	**0.427 ± 0.885 (1.72)**	pCi/L	10/22/18 12:23	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60283097

Sample: IBA-2-100218 **Lab ID: 60283097003** Collected: 10/02/18 13:58 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	**0.445 ± 0.416 (0.590) C:NA T:84%**	pCi/L	10/19/18 17:59	13982-63-3	
Radium-228	EPA 904.0	**-0.0405 ± 0.279 (0.664) C:76% T:90%**	pCi/L	10/18/18 11:43	15262-20-1	
Total Radium	Total Radium Calculation	**0.445 ± 0.695 (1.25)**	pCi/L	10/22/18 12:23	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60283097

Sample: IBA-1-100218 **Lab ID: 60283097004** Collected: 10/02/18 15:05 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	**0.596 ± 0.552 (0.840) C:NA T:84%**	pCi/L	10/19/18 18:12	13982-63-3	
Radium-228	EPA 904.0	**0.134 ± 0.311 (0.691) C:75% T:95%**	pCi/L	10/18/18 11:43	15262-20-1	
Total Radium	Total Radium Calculation	**0.730 ± 0.863 (1.53)**	pCi/L	10/22/18 12:23	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60283097

Sample: DUP-100218 **Lab ID: 60283097005** Collected: 10/02/18 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	**0.695 ± 0.615 (0.911) C:NA T:72%**	pCi/L	10/19/18 18:12	13982-63-3	
Radium-228	EPA 904.0	**0.321 ± 0.370 (0.778) C:78% T:81%**	pCi/L	10/18/18 11:43	15262-20-1	
Total Radium	Total Radium Calculation	**1.02 ± 0.985 (1.69)**	pCi/L	10/22/18 12:23	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60283097

QC Batch: 316244 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60283097001, 60283097002, 60283097003, 60283097004, 60283097005

METHOD BLANK: 1543373 Matrix: Water
Associated Lab Samples: 60283097001, 60283097002, 60283097003, 60283097004, 60283097005

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60283097

QC Batch: 316246 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60283097001, 60283097002, 60283097003, 60283097004, 60283097005

METHOD BLANK: 1543378 Matrix: Water
Associated Lab Samples: 60283097001, 60283097002, 60283097003, 60283097004, 60283097005

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	

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

Pace Analytical Services, LLC
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(913)599-5665

QUALIFIERS

Project: JEC IBA CCR
Pace Project No.: 60283097

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: JEC IBA CCR
Pace Project No.: 60283097

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60283097001	**IBA-4-1010218**	EPA 903.1	316244		
60283097002	**IBA-3-100218**	EPA 903.1	316244		
60283097003	**IBA-2-100218**	EPA 903.1	316244		
60283097004	**IBA-1-100218**	EPA 903.1	316244		
60283097005	**DUP-100218**	EPA 903.1	316244		
60283097001	**IBA-4-1010218**	EPA 904.0	316246		
60283097002	**IBA-3-100218**	EPA 904.0	316246		
60283097003	**IBA-2-100218**	EPA 904.0	316246		
60283097004	**IBA-1-100218**	EPA 904.0	316246		
60283097005	**DUP-100218**	EPA 904.0	316246		
60283097001	**IBA-4-1010218**	Total Radium Calculation	317513		
60283097002	**IBA-3-100218**	Total Radium Calculation	317513		
60283097003	**IBA-2-100218**	Total Radium Calculation	317513		
60283097004	**IBA-1-100218**	Total Radium Calculation	317513		
60283097005	**DUP-100218**	Total Radium Calculation	317513		

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Westar Energy Project # 60283097

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label _____

LIMS Login

Tracking #: 2542 2782 9357

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 18.4 °C Correction Factor: -0.1 °C Final Temp: 18.3 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 10D46711 / Date and Initials of person examining contents: ET 10-8-18
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: WT		✓		5. Sample 001 doesn't have a time on bottle
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. All containers needing preservation are found to be in compliance with EPA recommendation.	✓			16. pH<2
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed ET / 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: ET Date: 10-8-18

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.

Pace Analytical
www.pacelabs.com

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	Copy To:	Jared Morrison	Company Name:	
	Topeka, KS 66612			Address:	
Email To:	brandon.l.griffin@westarenergy.com	Purchase Order No.:	10JEC-0000033150	Pace Quote Reference:	
Phone:	785-575-8135 Fax:	Project Name:	JEC IBA CCR	Pace Project Manager:	Heather Wilson 913-563-1407
Requested Due Date/TAT:	15 day	Project Number:		Pace Profile #:	9657, 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: KS

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Analysis Test: Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	IBA-4-100218	WT	G			10/2	1021		2			2							1	1	1		60283097
2	IBA-3-100218	WT	G			10/2	1211		2			2							1	1	1		
3	IBA-2-100218	WT	G			10/2	1358		2			2							1	1	1		
4	IBA-1-100218	WT	G			10/2	1505		2			2							1	1	1		
5																							
6																							
7																							
8																							
9																							
10	DUP-100218	WT	G			10/2	0600		2			2							X	X	X		
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	[signature] / WESTAR	10/4/18	0900	Emily Ryan ET 10-8-18	10-5-18	1000	18.3	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 10/02/18

*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.

F-ALL-Q-020rev.08, 12-Oct-2007

Chain of Custody

[x] Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: KS
Cert. Needed: [ ] Yes [x] No
Owner Received Date: 10/5/2018 **Results Requested By:** 10/26/2018

Pace Analytical® www.pacelabs.com

Workorder: 60283097 **Workorder Name:** JEC IBA CCR

Report To	Subcontract To
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

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: Other	Requested Analysis: Radium-226 & Total Radium	Radium-228	LAB USE ONLY
1	IBA-4-1010218	PS	10/2/2018 10:21	60283097001	Water	1	X	X	001
2	IBA-3-100218	PS	10/2/2018 12:11	60283097002	Water	1	X	X	002
3	IBA-2-100218	PS	10/2/2018 13:58	60283097003	Water	1	X	X	003
4	IBA-1-100218	PS	10/2/2018 15:05	60283097004	Water	1	X	X	004
5	DUP-100218	PS	10/2/2018 06:00	60283097005	Water	1	X	X	005

Transfers	Released By	Date/Time	Received By	Date/Time
1			MSat	10-5-18 1000
2				
3				

Comments: MDS 10-9-18

Cooler Temperature on Receipt 3.3 °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.*

WO#: 30267680

30267680

Pace Analytical
www.pacelabs.com

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	Copy To:	Jared Morrison	Company Name:	
	Topeka, KS 66612			Address:	
Email To:	brandon.l.griffin@westarenergy.com	Purchase Order No.:	10JEC-0000033150	Pace Quote Reference:	
Phone:	785-575-8135 Fax:	Project Name:	JEC IBA CCR	Pace Project Manager:	Heather Wilson 913-563-1407
Requested Due Date/TAT:	15 day	Project Number:		Pace Profile #:	9657, 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: KS

Requested Analysis Filtered (Y/N)

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	IBA-4-100218	WT	G			10/2	1021		2			2						X	X	X		
2	IBA-3-100218	WT	G			10/2	1211		2			2										
3	IBA-2-100218	WT	G			10/2	1358		2			2										
4	IBA-1-100218	WT	G			10/2	1505		2			2										
5																							
6																							
7																							
8																							
9																							
10	DUP-100218	WT	G			10/2	0600		2			2						X	X	X		
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	[signature] / Westar	10/4/18	0900	[signature] ET 10-8-18	10-5-18	1000	18.3	Y	Y	Y

SAMPLER NAME AND SIGNATURE					
PRINT Name of SAMPLER:	Brandon Griffin		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
SIGNATURE of SAMPLER:	[signature]	DATE Signed (MM/DD/YY): 10/02/18				

*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 # # 30267680

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label MJS
LIMS Login MJS

Tracking #: 2542 2782 9357

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 18.4 °C Correction Factor: -0.1 °C Final Temp: 18.3 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 1054671 / Date and Initials of person examining contents: ET 10-8-18
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: WT		✓		5. Sample ool dosent have a time on bottle
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. All containers needing preservation are found to be in compliance with EPA recommendation. exceptions: VOA, coliform, TOC, O&G, Phenolics	✓			16. pH<2 Initial when completed ET 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: ET Date: 10-8-18

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

December 05, 2018

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

RE: Project: JEC IBA CCR
Pace Project No.: 60287645

Dear Brandon Griffin:
Enclosed are the analytical results for sample(s) received by the laboratory on November 26, 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
Andrew Hare, Westar Energy
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY
Melissa Michels, Westar Energy
JD Schlegel, KCP&L & Westar

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: JEC IBA CCR
Pace Project No.: 60287645

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

Salina Certification IDs

525 N 8th Street, Salina, KS 67401
Kansas Cert No. E10146
Texas NELAP: T104704246-17-9
Oklahoma: 2018-100/8815 Non-Potable Water/ Solids
Kansas: Cert No. E-10146 RCRA, Water,Solids
Salina Field Accred. No. E-92593

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: JEC IBA CCR
Pace Project No.: 60287645

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60287645001	**IBA-4-112118**	Water	11/21/18 08:35	11/26/18 15:40
60287645002	**IBA-3-112118**	Water	11/21/18 10:06	11/26/18 15:40
60287645003	**IBA-2-112118**	Water	11/21/18 11:22	11/26/18 15:40
60287645004	**IBA-1-112118**	Water	11/21/18 13:37	11/26/18 15:40
60287645005	**DUP-112118**	Water	11/21/18 06:00	11/26/18 15:40

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9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: JEC IBA CCR
Pace Project No.: 60287645

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60287645001	**IBA-4-112118**	EPA 200.7	EMR, JGP	7	PASI-K
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	JDE	1	PASI-K
		EPA 300.0	MLL	3	PASI-SA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	RLG	1	PASI-K
60287645002	**IBA-3-112118**	EPA 200.7	EMR, JGP	7	PASI-K
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	JDE	1	PASI-K
		EPA 300.0	MLL	3	PASI-SA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	RLG	1	PASI-K
60287645003	**IBA-2-112118**	EPA 200.7	EMR, JGP	7	PASI-K
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	JDE	1	PASI-K
		EPA 300.0	MLL	3	PASI-SA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	RLG	1	PASI-K
60287645004	**IBA-1-112118**	EPA 200.7	EMR, JGP	7	PASI-K
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	JDE	1	PASI-K
		EPA 300.0	MLL	3	PASI-SA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	RLG	1	PASI-K
60287645005	**DUP-112118**	EPA 200.7	EMR, JGP	7	PASI-K
		EPA 200.8	JDH	7	PASI-K
		EPA 245.1	JDE	1	PASI-K
		EPA 300.0	MLL	3	PASI-SA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	RLG	1	PASI-K

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60287645

Method: **EPA 200.7**
Description: 200.7 Metals, Total
Client: WESTAR ENERGY
Date: December 05, 2018

General Information:
5 samples were analyzed for EPA 200.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.7 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 558026

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60287156001,60287156002

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

- MS (Lab ID: 2289493)
  - Calcium
- MS (Lab ID: 2289495)
  - Calcium
- MSD (Lab ID: 2289494)
  - Calcium

Additional Comments:

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60287645

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: WESTAR ENERGY
Date: December 05, 2018

General Information:
5 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60287645

Method: **EPA 245.1**
Description: 245.1 Mercury
Client: WESTAR ENERGY
Date: December 05, 2018

General Information:
5 samples were analyzed for EPA 245.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 245.1 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60287645

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: WESTAR ENERGY
Date: December 05, 2018

General Information:
5 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 558394

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60287645001

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

- MSD (Lab ID: 2290855)
  - Chloride
  - Fluoride

Additional Comments:

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60287645

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: WESTAR ENERGY
Date: December 05, 2018

General Information:
5 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60287645

Method: **SM 4500-H+B**
Description: 4500H+ pH, Electrometric
Client: WESTAR ENERGY
Date: December 05, 2018

General Information:
5 samples were analyzed for SM 4500-H+B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

H6: Analysis initiated outside of the 15 minute EPA required holding time.
- DUP-112118 (Lab ID: 60287645005)
- IBA-1-112118 (Lab ID: 60287645004)
- IBA-2-112118 (Lab ID: 60287645003)
- IBA-3-112118 (Lab ID: 60287645002)
- IBA-4-112118 (Lab ID: 60287645001)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60287645

Sample: IBA-4-112118 **Lab ID: 60287645001** Collected: 11/21/18 08:35 Received: 11/26/18 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	**0.016**	mg/L	0.0050	1	12/03/18 11:17	12/04/18 17:11	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 11:17	12/04/18 16:56	7440-41-7	
Boron, Total Recoverable	**0.26**	mg/L	0.10	1	12/03/18 11:17	12/04/18 16:56	7440-42-8	
Calcium, Total Recoverable	**99.2**	mg/L	0.20	1	12/03/18 11:17	12/04/18 16:56	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	12/03/18 11:17	12/04/18 16:56	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	12/03/18 11:17	12/04/18 16:56	7439-92-1	
Lithium	**0.033**	mg/L	0.010	1	12/03/18 11:17	12/04/18 17:11	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	12/03/18 12:24	12/04/18 10:52	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:52	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	12/03/18 12:24	12/04/18 10:52	7440-43-9	
Cobalt, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:52	7440-48-4	
Molybdenum, Total Recoverable	**0.0024**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:52	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:52	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:52	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	12/01/18 12:10	12/03/18 12:45	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**18.5**	mg/L	5.0	5		12/05/18 16:03	16887-00-6	M1
Fluoride	**0.51**	mg/L	0.20	1		12/05/18 12:22	16984-48-8	M1
Sulfate	**159**	mg/L	20.0	20		12/05/18 13:03	14808-79-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**627**	mg/L	5.0	1		11/28/18 10:58		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		11/28/18 12:06		H6

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60287645

Sample: IBA-3-112118 **Lab ID: 60287645002** Collected: 11/21/18 10:06 Received: 11/26/18 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	**0.017**	mg/L	0.0050	1	12/03/18 11:17	12/04/18 17:13	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 11:17	12/04/18 17:03	7440-41-7	
Boron, Total Recoverable	**0.30**	mg/L	0.10	1	12/03/18 11:17	12/04/18 17:03	7440-42-8	
Calcium, Total Recoverable	**264**	mg/L	0.20	1	12/03/18 11:17	12/04/18 17:03	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	12/03/18 11:17	12/04/18 17:03	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	12/03/18 11:17	12/04/18 17:03	7439-92-1	
Lithium	**0.021**	mg/L	0.010	1	12/03/18 11:17	12/04/18 17:13	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	12/03/18 12:24	12/04/18 10:54	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:54	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	12/03/18 12:24	12/04/18 10:54	7440-43-9	
Cobalt, Total Recoverable	**0.0019**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:54	7440-48-4	
Molybdenum, Total Recoverable	**0.0025**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:54	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:54	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:54	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	12/01/18 12:10	12/03/18 12:53	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**130**	mg/L	50.0	50		12/05/18 13:58	16887-00-6	
Fluoride	**0.25**	mg/L	0.20	1		12/05/18 13:45	16984-48-8	
Sulfate	**824**	mg/L	50.0	50		12/05/18 13:58	14808-79-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**3170**	mg/L	5.0	1		11/28/18 10:58		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.4**	Std. Units	0.10	1		11/28/18 12:09		H6

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60287645

Sample: IBA-2-112118 **Lab ID: 60287645003** Collected: 11/21/18 11:22 Received: 11/26/18 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	**0.029**	mg/L	0.0050	1	12/03/18 11:17	12/04/18 17:15	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 11:17	12/04/18 17:05	7440-41-7	
Boron, Total Recoverable	**0.20**	mg/L	0.10	1	12/03/18 11:17	12/04/18 17:05	7440-42-8	
Calcium, Total Recoverable	**205**	mg/L	0.20	1	12/03/18 11:17	12/04/18 17:05	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	12/03/18 11:17	12/04/18 17:05	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	12/03/18 11:17	12/04/18 17:05	7439-92-1	
Lithium	**0.021**	mg/L	0.010	1	12/03/18 11:17	12/04/18 17:15	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	12/03/18 12:24	12/04/18 10:56	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:56	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	12/03/18 12:24	12/04/18 10:56	7440-43-9	
Cobalt, Total Recoverable	**0.0011**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:56	7440-48-4	
Molybdenum, Total Recoverable	**0.0024**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:56	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:56	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:56	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	12/01/18 12:10	12/03/18 12:54	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**111**	mg/L	50.0	50		12/05/18 15:22	16887-00-6	
Fluoride	**0.25**	mg/L	0.20	1		12/05/18 15:08	16984-48-8	
Sulfate	**572**	mg/L	50.0	50		12/05/18 15:22	14808-79-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1310**	mg/L	5.0	1		11/28/18 10:58		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		11/29/18 08:09		H6

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60287645

Sample: IBA-1-112118 **Lab ID: 60287645004** Collected: 11/21/18 13:37 Received: 11/26/18 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	**0.029**	mg/L	0.0050	1	12/03/18 11:17	12/04/18 17:18	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 11:17	12/04/18 17:08	7440-41-7	
Boron, Total Recoverable	**0.38**	mg/L	0.10	1	12/03/18 11:17	12/04/18 17:08	7440-42-8	
Calcium, Total Recoverable	**298**	mg/L	0.20	1	12/03/18 11:17	12/04/18 17:08	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	12/03/18 11:17	12/04/18 17:08	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	12/03/18 11:17	12/04/18 17:08	7439-92-1	
Lithium	**0.019**	mg/L	0.010	1	12/03/18 11:17	12/04/18 17:18	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	12/03/18 12:24	12/04/18 10:58	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:58	7440-38-2	
Cadmium, Total Recoverable	**0.00059**	mg/L	0.00050	1	12/03/18 12:24	12/04/18 10:58	7440-43-9	
Cobalt, Total Recoverable	**0.0023**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:58	7440-48-4	
Molybdenum, Total Recoverable	**0.0070**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:58	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:58	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:58	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	12/01/18 12:10	12/03/18 12:56	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**124**	mg/L	50.0	50		12/05/18 15:49	16887-00-6	
Fluoride	**0.28**	mg/L	0.20	1		12/05/18 15:35	16984-48-8	
Sulfate	**880**	mg/L	50.0	50		12/05/18 15:49	14808-79-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**612**	mg/L	5.0	1		11/28/18 11:00		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		11/29/18 08:14		H6

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60287645

Sample: DUP-112118 **Lab ID: 60287645005** Collected: 11/21/18 06:00 Received: 11/26/18 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	**0.029**	mg/L	0.0050	1	12/03/18 11:17	12/04/18 17:20	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 11:17	12/04/18 17:10	7440-41-7	
Boron, Total Recoverable	**0.20**	mg/L	0.10	1	12/03/18 11:17	12/04/18 17:10	7440-42-8	
Calcium, Total Recoverable	**208**	mg/L	0.20	1	12/03/18 11:17	12/04/18 17:10	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	12/03/18 11:17	12/04/18 17:10	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	12/03/18 11:17	12/04/18 17:10	7439-92-1	
Lithium	**0.024**	mg/L	0.010	1	12/03/18 11:17	12/04/18 17:20	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	12/03/18 12:24	12/04/18 11:00	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 11:00	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	12/03/18 12:24	12/04/18 11:00	7440-43-9	
Cobalt, Total Recoverable	**0.0011**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 11:00	7440-48-4	
Molybdenum, Total Recoverable	**0.0023**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 11:00	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 11:00	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	12/03/18 12:24	12/04/18 11:00	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	12/01/18 12:10	12/03/18 12:57	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**110**	mg/L	50.0	50		12/05/18 14:54	16887-00-6	
Fluoride	**0.27**	mg/L	0.20	1		12/05/18 14:40	16984-48-8	
Sulfate	**566**	mg/L	50.0	50		12/05/18 14:54	14808-79-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1270**	mg/L	5.0	1		11/28/18 11:00		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		11/28/18 12:04		H6

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60287645

QC Batch: 557920 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60287645001, 60287645002, 60287645003, 60287645004, 60287645005

METHOD BLANK: 2289013 Matrix: Water
Associated Lab Samples: 60287645001, 60287645002, 60287645003, 60287645004, 60287645005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	12/03/18 12:42	

LABORATORY CONTROL SAMPLE: 2289014

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0050	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2289015 2289016

Parameter	Units	60287645001 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	.005	.005	0.0049	0.0050	98	100	70-130	2	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60287645

QC Batch: 558026 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60287645001, 60287645002, 60287645003, 60287645004, 60287645005

METHOD BLANK: 2289491 Matrix: Water
Associated Lab Samples: 60287645001, 60287645002, 60287645003, 60287645004, 60287645005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	12/04/18 16:14	
Beryllium	mg/L	<0.0010	0.0010	12/04/18 16:14	
Boron	mg/L	<0.10	0.10	12/04/18 16:14	
Calcium	mg/L	<0.20	0.20	12/04/18 16:14	
Chromium	mg/L	<0.0050	0.0050	12/04/18 16:14	
Lead	mg/L	<0.010	0.010	12/04/18 16:14	
Lithium	mg/L	<0.010	0.010	12/04/18 16:44	

LABORATORY CONTROL SAMPLE: 2289492

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.1	107	85-115	
Beryllium	mg/L	1	0.99	99	85-115	
Boron	mg/L	1	1.0	103	85-115	
Calcium	mg/L	10	9.8	98	85-115	
Chromium	mg/L	1	1.0	102	85-115	
Lead	mg/L	1	1.0	100	85-115	
Lithium	mg/L	1	0.94	94	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2289493 2289494

Parameter	Units	60287156001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	mg/L	369 ug/L	1	1	1.5	1.5	109	114	70-130	3	20	
Beryllium	mg/L	<0.16 ug/L	1	1	1.0	1.1	103	106	70-130	3	20	
Boron	mg/L	122 ug/L	1	1	1.1	1.2	102	104	70-130	2	20	
Calcium	mg/L	204000 ug/L	10	10	221	231	171	265	70-130	4	20	M1
Chromium	mg/L	<1.1 ug/L	1	1	0.99	1.0	99	102	70-130	3	20	
Lead	mg/L	<3.0 ug/L	1	1	0.95	0.96	95	96	70-130	1	20	
Lithium	mg/L	6.5J ug/L	1	1	0.95	0.94	94	93	70-130	1	20	

MATRIX SPIKE SAMPLE: 2289495

Parameter	Units	60287156002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	212 ug/L	1	1.4	115	70-130	
Beryllium	mg/L	<0.16 ug/L	1	1.1	107	70-130	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60287645

MATRIX SPIKE SAMPLE: 2289495

Parameter	Units	60287156002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	mg/L	293 ug/L	1	1.4	107	70-130	
Calcium	mg/L	78400 ug/L	10	94.5	161	70-130	M1
Chromium	mg/L	<1.1 ug/L	1	1.0	105	70-130	
Lead	mg/L	<3.0 ug/L	1	1.0	101	70-130	
Lithium	mg/L	17.5 ug/L	1	0.96	94	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60287645

QC Batch: 558062 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60287645001, 60287645002, 60287645003, 60287645004, 60287645005

METHOD BLANK: 2289600 Matrix: Water
Associated Lab Samples: 60287645001, 60287645002, 60287645003, 60287645004, 60287645005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	12/04/18 10:49	
Arsenic	mg/L	<0.0010	0.0010	12/04/18 10:49	
Cadmium	mg/L	<0.00050	0.00050	12/04/18 10:49	
Cobalt	mg/L	<0.0010	0.0010	12/04/18 10:49	
Molybdenum	mg/L	<0.0010	0.0010	12/04/18 10:49	
Selenium	mg/L	<0.0010	0.0010	12/04/18 10:49	
Thallium	mg/L	<0.0010	0.0010	12/04/18 10:49	

LABORATORY CONTROL SAMPLE: 2289601

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.040	100	85-115	
Arsenic	mg/L	.04	0.040	100	85-115	
Cadmium	mg/L	.04	0.040	100	85-115	
Cobalt	mg/L	.04	0.040	100	85-115	
Molybdenum	mg/L	.04	0.041	102	85-115	
Selenium	mg/L	.04	0.039	97	85-115	
Thallium	mg/L	.04	0.038	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2289602 2289603

Parameter	Units	60287870001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/L	<0.078 ug/L	.04	.04	0.039	0.039	98	97	70-130	0	20	
Arsenic	mg/L	0.44J ug/L	.04	.04	0.040	0.040	100	98	70-130	1	20	
Cadmium	mg/L	0.25J ug/L	.04	.04	0.038	0.038	95	94	70-130	2	20	
Cobalt	mg/L	0.076J ug/L	.04	.04	0.037	0.037	93	92	70-130	2	20	
Molybdenum	mg/L	1.2 ug/L	.04	.04	0.044	0.043	108	106	70-130	2	20	
Selenium	mg/L	0.088J ug/L	.04	.04	0.042	0.040	104	101	70-130	3	20	
Thallium	mg/L	3.5 ug/L	.04	.04	0.045	0.044	104	102	70-130	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60287645

QC Batch: 558394 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60287645001, 60287645002, 60287645003, 60287645004, 60287645005

METHOD BLANK: 2290852 Matrix: Water
Associated Lab Samples: 60287645001, 60287645002, 60287645003, 60287645004, 60287645005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	12/05/18 11:54	
Fluoride	mg/L	ND	0.20	12/05/18 11:54	
Sulfate	mg/L	<1.0	1.0	12/05/18 11:54	

LABORATORY CONTROL SAMPLE: 2290853

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	4	3.8	95	90-110	
Fluoride	mg/L	2	1.8	92	90-110	
Sulfate	mg/L	8	7.9	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2290854 2290855

Parameter	Units	60287645001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	18.5	20	20	37.1	36.3	93	89	90-110	2	20	M1
Fluoride	mg/L	0.51	2	2	2.4	2.3	92	89	90-110	3	20	M1
Sulfate	mg/L	159	160	160	316	306	98	92	90-110	3	20	

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

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60287645

QC Batch: 557258 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60287645001, 60287645002, 60287645003, 60287645004, 60287645005

METHOD BLANK: 2286174 Matrix: Water
Associated Lab Samples: 60287645001, 60287645002, 60287645003, 60287645004, 60287645005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	11/28/18 10:56	

LABORATORY CONTROL SAMPLE: 2286175

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

SAMPLE DUPLICATE: 2286176

Parameter	Units	60287645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	627	623	1	10	

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: JEC IBA CCR
Pace Project No.: 60287645

QC Batch: 557192 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 60287645001, 60287645002, 60287645005

SAMPLE DUPLICATE: 2285962

Parameter	Units	60287529002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	10.7	10.8	0	5	H6

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

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60287645

QC Batch: 557387 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 60287645003, 60287645004

SAMPLE DUPLICATE: 2286710

Parameter	Units	60287645003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	5	H6

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

Pace Analytical Services, LLC
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QUALIFIERS

Project: JEC IBA CCR
Pace Project No.: 60287645

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
PASI-SA	Pace Analytical Services - Salina

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: JEC IBA CCR
Pace Project No.: 60287645

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60287645001	**IBA-4-112118**	EPA 200.7	558026	EPA 200.7	558094
60287645002	**IBA-3-112118**	EPA 200.7	558026	EPA 200.7	558094
60287645003	**IBA-2-112118**	EPA 200.7	558026	EPA 200.7	558094
60287645004	**IBA-1-112118**	EPA 200.7	558026	EPA 200.7	558094
60287645005	**DUP-112118**	EPA 200.7	558026	EPA 200.7	558094
60287645001	**IBA-4-112118**	EPA 200.8	558062	EPA 200.8	558107
60287645002	**IBA-3-112118**	EPA 200.8	558062	EPA 200.8	558107
60287645003	**IBA-2-112118**	EPA 200.8	558062	EPA 200.8	558107
60287645004	**IBA-1-112118**	EPA 200.8	558062	EPA 200.8	558107
60287645005	**DUP-112118**	EPA 200.8	558062	EPA 200.8	558107
60287645001	**IBA-4-112118**	EPA 245.1	557920	EPA 245.1	558012
60287645002	**IBA-3-112118**	EPA 245.1	557920	EPA 245.1	558012
60287645003	**IBA-2-112118**	EPA 245.1	557920	EPA 245.1	558012
60287645004	**IBA-1-112118**	EPA 245.1	557920	EPA 245.1	558012
60287645005	**DUP-112118**	EPA 245.1	557920	EPA 245.1	558012
60287645001	**IBA-4-112118**	EPA 300.0	558394		
60287645002	**IBA-3-112118**	EPA 300.0	558394		
60287645003	**IBA-2-112118**	EPA 300.0	558394		
60287645004	**IBA-1-112118**	EPA 300.0	558394		
60287645005	**DUP-112118**	EPA 300.0	558394		
60287645001	**IBA-4-112118**	SM 2540C	557258		
60287645002	**IBA-3-112118**	SM 2540C	557258		
60287645003	**IBA-2-112118**	SM 2540C	557258		
60287645004	**IBA-1-112118**	SM 2540C	557258		
60287645005	**DUP-112118**	SM 2540C	557258		
60287645001	**IBA-4-112118**	SM 4500-H+B	557192		
60287645002	**IBA-3-112118**	SM 4500-H+B	557192		
60287645003	**IBA-2-112118**	SM 4500-H+B	557387		
60287645004	**IBA-1-112118**	SM 4500-H+B	557387		
60287645005	**DUP-112118**	SM 4500-H+B	557192		

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Sample Condition Upon Receipt

WO# : 60287645

60287645

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 ☑ ZIPLOC

Thermometer Used: T-299 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): As-read 2.7 Corr. Factor +0.1 Corrected 2.8

Date and initials of person examining contents: 11.26.18 AF

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☑No ☐N/A	
Filtered volume received for dissolved tests?	☐Yes ☑No ☐N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐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)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☑No ☐N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑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: _____ Date: _____

REVIEWED
By hwilson at 10:18 am, 11/27/18

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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: 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:	7 day

Section B — Required Project Information:

Report To:	Brandon Griffin
Copy To:	Jared Morrison
Purchase Order No.:	10JEC-0000033150
Project Name:	JEC IBA CCR
Project Number:	

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson 913-563-1407
Pace Profile #:	9657, 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: KS

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	200.7 Total Metals*	200.8 Total Metals**	245.1 Total Hg	300: Cl, F, SO4	2540C TDS	4500 H+B	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	IBA-4-112118	WT	G			11/21	0835		2	1		1														001
2	IBA-3-112118	WT	G			11/21	1006		2	1		1														002
3	IBA-2-112118	WT	G			11/21	1122		2	1		1														003
4	IBA-1-112118	WT	G			11/21	1337		2	1		1														004
5		WT																								
6																										
7																										
8																										
9																										
10																										
11	OUP-112118	WT	G			11/21	0600		2	1		1								X	X	X	X	X	X		005
12																										

BP1N, BP1U

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	Westar	11/26/18	0730	Joey Fowler PAS1	11.26.18	1540	2.8	Y	N	Y
200.8 Total Metals**: Sb, As, Cd, Co, Mo, Se, Tl										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 11/21/18

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.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

December 17, 2018

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

RE: Project: JEC IBA CCR
Pace Project No.: 60287914

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
Andrew Hare, Westar Energy
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY
Melissa Michels, Westar Energy
JD Schlegel, KCP&L & Westar

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CERTIFICATIONS

Project: JEC IBA CCR
Pace Project No.: 60287914

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: JEC IBA CCR
Pace Project No.: 60287914

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60287914001	**IBA-4-112118**	Water	11/21/18 08:35	11/27/18 11:30
60287914002	**IBA-3-112118**	Water	11/21/18 10:06	11/27/18 11:30
60287914003	**IBA-2-112118**	Water	11/21/18 11:22	11/27/18 11:30
60287914004	**IBA-1-112118**	Water	11/21/18 13:37	11/27/18 11:30
60287914005	**DUP-112118**	Water	11/21/18 06:00	11/27/18 11:30

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SAMPLE ANALYTE COUNT

Project: JEC IBA CCR
Pace Project No.: 60287914

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60287914001	**IBA-4-112118**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60287914002	**IBA-3-112118**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60287914003	**IBA-2-112118**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60287914004	**IBA-1-112118**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60287914005	**DUP-112118**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60287914

Method: **EPA 903.1**
Description: 903.1 Radium 226
Client: WESTAR ENERGY
Date: December 17, 2018

General Information:
5 samples were analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60287914

Method: **EPA 904.0**
Description: 904.0 Radium 228
Client: WESTAR ENERGY
Date: December 17, 2018

General Information:
5 samples were analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60287914

Method: **Total Radium Calculation**
Description: Total Radium 228+226
Client: WESTAR ENERGY
Date: December 17, 2018

General Information:
5 samples were analyzed for Total Radium Calculation. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60287914

Sample: IBA-4-112118 **Lab ID: 60287914001** Collected: 11/21/18 08:35 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	**0.944 ± 0.731 (1.03) C:NA T:87%**	pCi/L	12/14/18 22:16	13982-63-3	
Radium-228	EPA 904.0	**-0.346 ± 0.328 (0.821) C:75% T:87%**	pCi/L	12/14/18 11:06	15262-20-1	
Total Radium	Total Radium Calculation	**0.944 ± 1.06 (1.85)**	pCi/L	12/17/18 13:49	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60287914

Sample: IBA-3-112118 **Lab ID: 60287914002** Collected: 11/21/18 10:06 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	**0.878 ± 0.554 (0.238) C:NA T:83%**	pCi/L	12/14/18 22:16	13982-63-3	
Radium-228	EPA 904.0	**0.0616 ± 0.404 (0.923) C:63% T:93%**	pCi/L	12/14/18 11:07	15262-20-1	
Total Radium	Total Radium Calculation	**0.940 ± 0.958 (1.16)**	pCi/L	12/17/18 13:55	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60287914

Sample: IBA-2-112118 **Lab ID: 60287914003** Collected: 11/21/18 11:22 Received: 11/27/18 11:30 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.867 ± 0.645 (0.848) C:NA T:88%**	pCi/L	12/14/18 22:16	13982-63-3	
Radium-228	EPA 904.0	**-0.299 ± 0.377 (0.926) C:66% T:90%**	pCi/L	12/14/18 11:07	15262-20-1	
Total Radium	Total Radium Calculation	**0.867 ± 1.02 (1.77)**	pCi/L	12/17/18 13:55	7440-14-4	

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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60287914

Sample: IBA-1-112118 **Lab ID: 60287914004** Collected: 11/21/18 13:37 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	**0.948 ± 0.571 (0.233) C:NA T:88%**	pCi/L	12/14/18 22:27	13982-63-3	
Radium-228	EPA 904.0	**0.452 ± 0.473 (0.989) C:70% T:85%**	pCi/L	12/14/18 11:07	15262-20-1	
Total Radium	Total Radium Calculation	**1.40 ± 1.04 (1.22)**	pCi/L	12/17/18 13:55	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60287914

Sample: DUP-112118 **Lab ID: 60287914005** Collected: 11/21/18 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	**0.298 ± 0.415 (0.693) C:NA T:89%**	pCi/L	12/14/18 22:27	13982-63-3	
Radium-228	EPA 904.0	**0.817 ± 0.434 (0.776) C:73% T:90%**	pCi/L	12/14/18 11:07	15262-20-1	
Total Radium	Total Radium Calculation	**1.12 ± 0.849 (1.47)**	pCi/L	12/17/18 13:55	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60287914

QC Batch: 322685 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60287914001, 60287914002, 60287914003, 60287914004, 60287914005

METHOD BLANK: 1572868 Matrix: Water
Associated Lab Samples: 60287914001, 60287914002, 60287914003, 60287914004, 60287914005

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: JEC IBA CCR
Pace Project No.: 60287914

QC Batch: 322730 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60287914001, 60287914002, 60287914003, 60287914004, 60287914005

METHOD BLANK: 1572968 Matrix: Water
Associated Lab Samples: 60287914001, 60287914002, 60287914003, 60287914004, 60287914005

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: JEC IBA CCR
Pace Project No.: 60287914

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: JEC IBA CCR
Pace Project No.: 60287914

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60287914001	**IBA-4-112118**	EPA 903.1	322685		
60287914002	**IBA-3-112118**	EPA 903.1	322685		
60287914003	**IBA-2-112118**	EPA 903.1	322685		
60287914004	**IBA-1-112118**	EPA 903.1	322685		
60287914005	**DUP-112118**	EPA 903.1	322685		
60287914001	**IBA-4-112118**	EPA 904.0	322730		
60287914002	**IBA-3-112118**	EPA 904.0	322730		
60287914003	**IBA-2-112118**	EPA 904.0	322730		
60287914004	**IBA-1-112118**	EPA 904.0	322730		
60287914005	**DUP-112118**	EPA 904.0	322730		
60287914001	**IBA-4-112118**	Total Radium Calculation	324217		
60287914002	**IBA-3-112118**	Total Radium Calculation	324218		
60287914003	**IBA-2-112118**	Total Radium Calculation	324218		
60287914004	**IBA-1-112118**	Total Radium Calculation	324218		
60287914005	**DUP-112118**	Total Radium Calculation	324218		

Pace Analytical
www.pacelabs.com

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:

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.:	10JEC-0000033150
Project Name:	JEC IBA CCR
Project Number:	

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson 913-563-1407
Pace Profile #:	9657, 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: KS

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	IBA-4-112118	WT	G			11/21	0835		2			2						X	X	X		
2	IBA-3-112118	WT	G			11/21	1006		2			2										
3	IBA-2-112118	WT	G			11/21	1122		2			2										
4	IBA-1-112118	WT	G			11/21	1337		2			2										
5																							
6																							
7																							
8																							
9																							
10																							
11	DUP-112118	WT	G			11/21	0600		2			2						X	X	X		
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Westar	11/26/18	0230		11-27-18	1130	4.5	Y	N	Y
							ET 11-28-18			

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: _____ DATE Signed (MM/DD/YY): 11/21/18

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

Pace Analytical

Client Name: Pace KS Project #

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other

Label

LIMS Login

Tracking #: 452 ET 11-28-18 4542 2786 1121

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 4.6 °C Correction Factor: -0.1 °C Final Temp: 4.5 °C

Temp should be above freezing to 6°C

pH paper Lot# 10D2981 Date and Initials of person examining contents: ET 11-28-18

Comments:	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: -Includes date/time/ID Matrix: WT		✓		5. Sample 003 has no time on bottle
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. All containers needing preservation are found to be in compliance with EPA recommendation. exceptions: VOA, coliform, TOC, O&G, Phenolics	✓			16. pH<2 Initial when completed: ET Date/time of preservation: Lot # of added preservative:
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present: Trip Blank Custody Seals Present			✓	18.
Rad Aqueous Samples Screened > 0.5 mrem/hr		✓		Initial when completed: ET Date: 11-28-18

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
January 2019 Sampling Event
Laboratory Analytical Report

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

January 22, 2019

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

RE: Project: JEC IBA CCR
Pace Project No.: 60291850

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
Andrew Hare, Westar Energy
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY
Melissa Michels, Westar Energy
JD Schlegel, KCP&L & Westar

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: JEC IBA CCR
Pace Project No.: 60291850

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

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Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: JEC IBA CCR
Pace Project No.: 60291850

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60291850001	**IBA-4-011019**	Water	01/10/19 10:22	01/14/19 15:40
60291850002	**IBA-3-011019**	Water	01/10/19 12:10	01/14/19 15:40
60291850003	**IBA-2-011019**	Water	01/10/19 12:54	01/14/19 15:40
60291850004	**IBA-1-011019**	Water	01/10/19 15:13	01/14/19 15:40
60291850005	**DUP-011019**	Water	01/10/19 06:00	01/14/19 15:40

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SAMPLE ANALYTE COUNT

Project: JEC IBA CCR
Pace Project No.: 60291850

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60291850001	**IBA-4-011019**	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
60291850002	**IBA-3-011019**	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
60291850003	**IBA-2-011019**	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
60291850004	**IBA-1-011019**	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
60291850005	**DUP-011019**	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

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60291850

Method: **EPA 200.7**
Description: 200.7 Metals, Total
Client: WESTAR ENERGY
Date: January 22, 2019

General Information:
5 samples were analyzed for EPA 200.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.7 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 564849

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 60291850002,60291851005

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

- MS (Lab ID: 2317620)
  - Calcium

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60291850

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: WESTAR ENERGY
Date: January 22, 2019

General Information:
5 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
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(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60291850

Method: **EPA 245.1**
Description: 245.1 Mercury
Client: WESTAR ENERGY
Date: January 22, 2019

General Information:
5 samples were analyzed for EPA 245.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 245.1 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60291850

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: WESTAR ENERGY
Date: January 22, 2019

General Information:
5 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60291850

Method: **SM 4500-H+B**
Description: 4500H+ pH, Electrometric
Client: WESTAR ENERGY
Date: January 22, 2019

General Information:
5 samples were analyzed for SM 4500-H+B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

H6: Analysis initiated outside of the 15 minute EPA required holding time.
- DUP-011019 (Lab ID: 60291850005)
- IBA-1-011019 (Lab ID: 60291850004)
- IBA-2-011019 (Lab ID: 60291850003)
- IBA-3-011019 (Lab ID: 60291850002)
- IBA-4-011019 (Lab ID: 60291850001)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60291850

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: WESTAR ENERGY
Date: January 22, 2019

General Information:
5 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60291850

Sample: IBA-4-011019 **Lab ID: 60291850001** Collected: 01/10/19 10:22 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	**0.019**	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:11	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 11:51	01/17/19 11:11	7440-41-7	
Boron, Total Recoverable	**0.22**	mg/L	0.10	1	01/16/19 11:51	01/17/19 11:11	7440-42-8	
Calcium, Total Recoverable	**107**	mg/L	0.20	1	01/16/19 11:51	01/17/19 11:11	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:11	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	01/16/19 11:51	01/17/19 11:11	7439-92-1	
Lithium	**0.035**	mg/L	0.010	1	01/16/19 11:51	01/17/19 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	01/16/19 09:40	01/17/19 10:37	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:37	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	01/16/19 09:40	01/17/19 10:37	7440-43-9	
Cobalt, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:37	7440-48-4	
Molybdenum, Total Recoverable	**0.0019**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:37	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:37	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:37	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 08:23	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**643**	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 11:42		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**18.3**	mg/L	1.0	1		01/17/19 13:41	16887-00-6	
Fluoride	**0.49**	mg/L	0.20	1		01/17/19 13:41	16984-48-8	
Sulfate	**172**	mg/L	50.0	50		01/18/19 20:35	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60291850

Sample: IBA-3-011019 **Lab ID: 60291850002** Collected: 01/10/19 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	**0.019**	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:14	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 11:51	01/17/19 11:14	7440-41-7	
Boron, Total Recoverable	**0.26**	mg/L	0.10	1	01/16/19 11:51	01/17/19 11:14	7440-42-8	
Calcium, Total Recoverable	**263**	mg/L	0.20	1	01/16/19 11:51	01/17/19 11:14	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:14	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	01/16/19 11:51	01/17/19 11:14	7439-92-1	
Lithium	**0.019**	mg/L	0.010	1	01/16/19 11:51	01/17/19 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	01/16/19 09:40	01/17/19 10:41	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:41	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	01/16/19 09:40	01/17/19 10:41	7440-43-9	
Cobalt, Total Recoverable	**0.0021**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:41	7440-48-4	
Molybdenum, Total Recoverable	**0.0021**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:41	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:41	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:41	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 08:25	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1480**	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 11:45		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**122**	mg/L	10.0	10		01/17/19 14:57	16887-00-6	
Fluoride	**0.20**	mg/L	0.20	1		01/17/19 16:08	16984-48-8	
Sulfate	**761**	mg/L	50.0	50		01/17/19 15:11	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60291850

Sample: IBA-2-011019 **Lab ID: 60291850003** Collected: 01/10/19 12:54 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	**0.031**	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:45	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 11:51	01/17/19 11:45	7440-41-7	
Boron, Total Recoverable	**0.18**	mg/L	0.10	1	01/16/19 11:51	01/17/19 11:45	7440-42-8	
Calcium, Total Recoverable	**219**	mg/L	0.20	1	01/16/19 11:51	01/17/19 11:45	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:45	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	01/16/19 11:51	01/17/19 11:45	7439-92-1	
Lithium	**0.021**	mg/L	0.010	1	01/16/19 11:51	01/17/19 11:45	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	01/16/19 09:40	01/17/19 10:45	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:45	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	01/16/19 09:40	01/17/19 10:45	7440-43-9	
Cobalt, Total Recoverable	**0.0013**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:45	7440-48-4	
Molybdenum, Total Recoverable	**0.0023**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:45	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:45	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:45	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 08:27	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1470**	mg/L	5.0	1		01/16/19 09:45		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		01/18/19 11:47		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**110**	mg/L	10.0	10		01/17/19 15:39	16887-00-6	
Fluoride	**0.22**	mg/L	0.20	1		01/17/19 15:25	16984-48-8	
Sulfate	**585**	mg/L	50.0	50		01/17/19 15:54	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60291850

Sample: IBA-1-011019 **Lab ID: 60291850004** Collected: 01/10/19 15:13 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	**0.038**	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:47	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 11:51	01/17/19 11:47	7440-41-7	
Boron, Total Recoverable	**0.36**	mg/L	0.10	1	01/16/19 11:51	01/17/19 11:47	7440-42-8	
Calcium, Total Recoverable	**312**	mg/L	0.20	1	01/16/19 11:51	01/17/19 11:47	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:47	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	01/16/19 11:51	01/17/19 11:47	7439-92-1	
Lithium	**0.015**	mg/L	0.010	1	01/16/19 11:51	01/17/19 11:47	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	01/16/19 09:40	01/17/19 10:49	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:49	7440-38-2	
Cadmium, Total Recoverable	**0.00071**	mg/L	0.00050	1	01/16/19 09:40	01/17/19 10:49	7440-43-9	
Cobalt, Total Recoverable	**0.0026**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:49	7440-48-4	
Molybdenum, Total Recoverable	**0.0073**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:49	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:49	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:49	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	01/17/19 10:57	01/22/19 08:29	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1720**	mg/L	5.0	1		01/16/19 09:45		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		01/18/19 11:48		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**128**	mg/L	10.0	10		01/18/19 21:03	16887-00-6	
Fluoride	**0.24**	mg/L	0.20	1		01/18/19 20:49	16984-48-8	
Sulfate	**920**	mg/L	50.0	50		01/18/19 21:17	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60291850

Sample: DUP-011019 **Lab ID: 60291850005** Collected: 01/10/19 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	**0.036**	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:50	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 11:51	01/17/19 11:50	7440-41-7	
Boron, Total Recoverable	**0.36**	mg/L	0.10	1	01/16/19 11:51	01/17/19 11:50	7440-42-8	
Calcium, Total Recoverable	**314**	mg/L	0.20	1	01/16/19 11:51	01/17/19 11:50	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	01/16/19 11:51	01/17/19 11:50	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	01/16/19 11:51	01/17/19 11:50	7439-92-1	
Lithium	**0.016**	mg/L	0.010	1	01/16/19 11:51	01/17/19 11:50	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	01/16/19 09:40	01/17/19 10:53	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:53	7440-38-2	
Cadmium, Total Recoverable	**0.00074**	mg/L	0.00050	1	01/16/19 09:40	01/17/19 10:53	7440-43-9	
Cobalt, Total Recoverable	**0.0026**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:53	7440-48-4	
Molybdenum, Total Recoverable	**0.0074**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:53	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:53	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:53	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 08:32	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1770**	mg/L	5.0	1		01/16/19 09:45		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		01/18/19 11:49		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**128**	mg/L	10.0	10		01/18/19 21:46	16887-00-6	
Fluoride	**0.25**	mg/L	0.20	1		01/18/19 21:32	16984-48-8	
Sulfate	**926**	mg/L	50.0	50		01/18/19 22:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60291850

QC Batch: 565098 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60291850001, 60291850002, 60291850003, 60291850004, 60291850005

METHOD BLANK: 2318580 Matrix: Water
Associated Lab Samples: 60291850001, 60291850002, 60291850003, 60291850004, 60291850005

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 Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	ND	0.005	0.005	0.0049	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	

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: JEC IBA CCR
Pace Project No.: 60291850

QC Batch: 564849 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60291850001, 60291850002, 60291850003, 60291850004, 60291850005

METHOD BLANK: 2317616 Matrix: Water
Associated Lab Samples: 60291850001, 60291850002, 60291850003, 60291850004, 60291850005

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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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	

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: JEC IBA CCR
Pace Project No.: 60291850

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	

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60291850

QC Batch: 564846 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60291850001, 60291850002, 60291850003, 60291850004, 60291850005

METHOD BLANK: 2317603 Matrix: Water
Associated Lab Samples: 60291850001, 60291850002, 60291850003, 60291850004, 60291850005

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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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	

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

Pace Analytical Services, LLC
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(913)599-5665

QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60291850

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: JEC IBA CCR
Pace Project No.: 60291850

QC Batch: 564893 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60291850001, 60291850002, 60291850003, 60291850004, 60291850005

METHOD BLANK: 2317749 Matrix: Water
Associated Lab Samples: 60291850001, 60291850002, 60291850003, 60291850004, 60291850005

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60291850

QC Batch: 565255 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 60291850001, 60291850002, 60291850003, 60291850004, 60291850005

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

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

Pace Analytical Services, LLC
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(913)599-5665

QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60291850

QC Batch: 565118 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60291850001, 60291850002, 60291850003

METHOD BLANK: 2318673 Matrix: Water
Associated Lab Samples: 60291850001, 60291850002, 60291850003

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	
Sulfate	mg/L	<1.0	1.0	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	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2318675 2318676

Parameter	Units	60291832007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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	
Sulfate	mg/L	1.9	5	5	7.1	7.0	105	103	90-110	2	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

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60291850

QC Batch: 565284 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60291850001, 60291850004, 60291850005

METHOD BLANK: 2319400 Matrix: Water
Associated Lab Samples: 60291850001, 60291850004, 60291850005

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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: JEC IBA CCR
Pace Project No.: 60291850

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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(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: JEC IBA CCR
Pace Project No.: 60291850

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60291850001	**IBA-4-011019**	EPA 200.7	564849	EPA 200.7	564962
60291850002	**IBA-3-011019**	EPA 200.7	564849	EPA 200.7	564962
60291850003	**IBA-2-011019**	EPA 200.7	564849	EPA 200.7	564962
60291850004	**IBA-1-011019**	EPA 200.7	564849	EPA 200.7	564962
60291850005	**DUP-011019**	EPA 200.7	564849	EPA 200.7	564962
60291850001	**IBA-4-011019**	EPA 200.8	564846	EPA 200.8	564916
60291850002	**IBA-3-011019**	EPA 200.8	564846	EPA 200.8	564916
60291850003	**IBA-2-011019**	EPA 200.8	564846	EPA 200.8	564916
60291850004	**IBA-1-011019**	EPA 200.8	564846	EPA 200.8	564916
60291850005	**DUP-011019**	EPA 200.8	564846	EPA 200.8	564916
60291850001	**IBA-4-011019**	EPA 245.1	565098	EPA 245.1	565315
60291850002	**IBA-3-011019**	EPA 245.1	565098	EPA 245.1	565315
60291850003	**IBA-2-011019**	EPA 245.1	565098	EPA 245.1	565315
60291850004	**IBA-1-011019**	EPA 245.1	565098	EPA 245.1	565315
60291850005	**DUP-011019**	EPA 245.1	565098	EPA 245.1	565315
60291850001	**IBA-4-011019**	SM 2540C	564893		
60291850002	**IBA-3-011019**	SM 2540C	564893		
60291850003	**IBA-2-011019**	SM 2540C	564893		
60291850004	**IBA-1-011019**	SM 2540C	564893		
60291850005	**DUP-011019**	SM 2540C	564893		
60291850001	**IBA-4-011019**	SM 4500-H+B	565255		
60291850002	**IBA-3-011019**	SM 4500-H+B	565255		
60291850003	**IBA-2-011019**	SM 4500-H+B	565255		
60291850004	**IBA-1-011019**	SM 4500-H+B	565255		
60291850005	**DUP-011019**	SM 4500-H+B	565255		
60291850001	**IBA-4-011019**	EPA 300.0	565118		
60291850001	**IBA-4-011019**	EPA 300.0	565284		
60291850002	**IBA-3-011019**	EPA 300.0	565118		
60291850003	**IBA-2-011019**	EPA 300.0	565118		
60291850004	**IBA-1-011019**	EPA 300.0	565284		
60291850005	**DUP-011019**	EPA 300.0	565284		

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Sample Condition Upon Receipt

WO# : 60291850

60291850

Client Name: Westar Energy

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

Tracking #: _____ 01/14/19 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** 1.3 **Corr. Factor** 0.0 **Corrected** 1.3

Date and initials of person examining contents: 01/14/19

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐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)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑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 4:58 pm, 1/15/19 Date: _____

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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: 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:	7 day

Section B — Required Project Information:

Report To:	Brandon Griffin
Copy To:	Jared Morrison
Purchase Order No.:	10JEC-0000033150
Project Name:	JEC IBA CCR
Project Number:	

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson 913-563-1407
Pace Profile #:	9657, 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: KS

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

Requested Analysis Filtered (Y/N)

ITEM #	Sample ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: 200.7 Total Metals*	200.8 Total Metals**	245.1 Total Hg	300: Cl, F, SO4	2540C TDS	4500 H+B	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 60291850
1	IBA-4-011019	WT	G			1/10	1022		2	1		1													BP1U BP1N 001
2	IBA-3-011019	WT	G			1/10	1210		2	1		1													002
3	IBA-2-011019	WT	G			1/10	1354		2	1		1													003
4	IBA-1-011019	WT	G			1/10	1513		2	1		1													004
5																									
6																									
7	DUP-011019	WT	G			1/10	0600		2	1		1						X	X	X	X	X	X		005
8																									
9																									
10																									
11																									
12																									

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	BZF / Westar	1/14/19	0915		1/14/19	1540	1.3	Y	Y	Y
200.8 Total Metals**: Sb, As, Cd, Co, Mo, Se, Tl										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: BZF

DATE Signed (MM/DD/YY): 01/11/19

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.

F-ALL-Q-020rev.08, 12-Oct-2007

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

January 30, 2019

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

RE: Project: JEC IBA CCR
Pace Project No.: 60292064

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
Andrew Hare, Westar Energy
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY
Melissa Michels, Westar Energy
JD Schlegel, KCP&L & Westar

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: JEC IBA CCR
Pace Project No.: 60292064

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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Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: JEC IBA CCR
Pace Project No.: 60292064

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60292064001	**IBA-4-011019**	Water	01/10/19 10:22	01/15/19 10:00
60292064002	**IBA-3-011019**	Water	01/10/19 12:10	01/15/19 10:00
60292064003	**IBA-2-011019**	Water	01/10/19 13:54	01/15/19 10:00
60292064004	**IBA-1-011019**	Water	01/10/19 15:13	01/15/19 10:00
60292064005	**DUP-011019**	Water	01/10/19 06:00	01/15/19 10:00

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SAMPLE ANALYTE COUNT

Project: JEC IBA CCR
Pace Project No.: 60292064

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60292064001	**IBA-4-011019**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60292064002	**IBA-3-011019**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60292064003	**IBA-2-011019**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60292064004	**IBA-1-011019**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60292064005	**DUP-011019**	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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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60292064

Method: **EPA 903.1**
Description: 903.1 Radium 226
Client: WESTAR ENERGY
Date: January 30, 2019

General Information:
5 samples were analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60292064

Method: **EPA 904.0**
Description: 904.0 Radium 228
Client: WESTAR ENERGY
Date: January 30, 2019

General Information:
5 samples were analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60292064

Method: **Total Radium Calculation**
Description: Total Radium 228+226
Client: WESTAR ENERGY
Date: January 30, 2019

General Information:
5 samples were analyzed for Total Radium Calculation. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60292064

Sample: IBA-4-011019 **Lab ID: 60292064001** Collected: 01/10/19 10:22 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	**0.293 ± 0.415 (0.703) C:NA T:90%**	pCi/L	01/29/19 19:51	13982-63-3	
Radium-228	EPA 904.0	**0.630 ± 0.359 (0.654) C:77% T:85%**	pCi/L	01/24/19 12:31	15262-20-1	
Total Radium	Total Radium Calculation	**0.923 ± 0.774 (1.36)**	pCi/L	01/30/19 13:41	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60292064

Sample: IBA-3-011019 **Lab ID: 60292064002** Collected: 01/10/19 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	**0.000 ± 0.458 (0.938) C:NA T:80%**	pCi/L	01/29/19 19:51	13982-63-3	
Radium-228	EPA 904.0	**0.484 ± 0.379 (0.754) C:78% T:82%**	pCi/L	01/24/19 12:31	15262-20-1	
Total Radium	Total Radium Calculation	**0.484 ± 0.837 (1.69)**	pCi/L	01/30/19 13:41	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60292064

Sample: IBA-2-011019 **Lab ID: 60292064003** Collected: 01/10/19 13:54 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	**0.197 ± 0.531 (0.986) C:NA T:76%**	pCi/L	01/29/19 19:51	13982-63-3	
Radium-228	EPA 904.0	**0.340 ± 0.331 (0.677) C:77% T:88%**	pCi/L	01/24/19 12:31	15262-20-1	
Total Radium	Total Radium Calculation	**0.537 ± 0.862 (1.66)**	pCi/L	01/30/19 13:41	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60292064

Sample: IBA-1-011019 **Lab ID: 60292064004** Collected: 01/10/19 15:13 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	**0.560 ± 0.647 (1.05) C:NA T:77%**	pCi/L	01/29/19 19:51	13982-63-3	
Radium-228	EPA 904.0	**0.464 ± 0.366 (0.728) C:77% T:82%**	pCi/L	01/24/19 12:31	15262-20-1	
Total Radium	Total Radium Calculation	**1.02 ± 1.01 (1.78)**	pCi/L	01/30/19 13:41	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60292064

Sample: DUP-011019 **Lab ID: 60292064005** Collected: 01/10/19 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	**0.417 ± 0.511 (0.840) C:NA T:89%**	pCi/L	01/29/19 20:05	13982-63-3	
Radium-228	EPA 904.0	**-0.116 ± 0.314 (0.762) C:76% T:80%**	pCi/L	01/24/19 12:31	15262-20-1	
Total Radium	Total Radium Calculation	**0.417 ± 0.825 (1.60)**	pCi/L	01/30/19 13:41	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60292064

QC Batch: 327435 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60292064001, 60292064002, 60292064003, 60292064004, 60292064005

METHOD BLANK: 1594117 Matrix: Water
Associated Lab Samples: 60292064001, 60292064002, 60292064003, 60292064004, 60292064005

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: JEC IBA CCR
Pace Project No.: 60292064

QC Batch: 327436 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60292064001, 60292064002, 60292064003, 60292064004, 60292064005

METHOD BLANK: 1594118 Matrix: Water
Associated Lab Samples: 60292064001, 60292064002, 60292064003, 60292064004, 60292064005

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: JEC IBA CCR
Pace Project No.: 60292064

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: JEC IBA CCR
Pace Project No.: 60292064

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60292064001	**IBA-4-011019**	EPA 903.1	327435		
60292064002	**IBA-3-011019**	EPA 903.1	327435		
60292064003	**IBA-2-011019**	EPA 903.1	327435		
60292064004	**IBA-1-011019**	EPA 903.1	327435		
60292064005	**DUP-011019**	EPA 903.1	327435		
60292064001	**IBA-4-011019**	EPA 904.0	327436		
60292064002	**IBA-3-011019**	EPA 904.0	327436		
60292064003	**IBA-2-011019**	EPA 904.0	327436		
60292064004	**IBA-1-011019**	EPA 904.0	327436		
60292064005	**DUP-011019**	EPA 904.0	327436		
60292064001	**IBA-4-011019**	Total Radium Calculation	328569		
60292064002	**IBA-3-011019**	Total Radium Calculation	328569		
60292064003	**IBA-2-011019**	Total Radium Calculation	328569		
60292064004	**IBA-1-011019**	Total Radium Calculation	328569		
60292064005	**DUP-011019**	Total Radium Calculation	328569		

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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: 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	Copy To:	Jared Morrison	Company Name:	
	Topeka, KS 66612			Address:	
Email To:	brandon.l.griffin@westarenergy.com	Purchase Order No.:	10JEC-0000033150	Pace Quote Reference:	
Phone:	785-575-8135 Fax:	Project Name:	JEC IBA CCR	Pace Project Manager:	Heather Wilson 913-563-1407
Requested Due Date/TAT:	15 day	Project Number:		Pace Profile #:	9657, 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: KS

Requested Analysis Filtered (Y/N)

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

ITEM #	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	IBA-4-011019	WT	G			1/10	1022	2			2											
2	IBA-3-011019	WT	G			1/10	1210	2			2											
3	IBA-2-011019	WT	G			1/10	1354	2			2											
4	IBA-1-011019	WT	G			1/10	1513	2			2											
5																						
6																						
7	DUP-011019	WT	G			1/10	0600	2			2							X	X	X		
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Westar	01/14/19	0915		1-15-19	1000	1.9	4	4	4

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: _____ DATE Signed (MM/DD/YY): 01/11/19

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

Face Analytical

Client Name: Pace Kansas Project #

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other

Label

LIMS Login

Tracking #: 474687356090

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 1.8 °C Correction Factor: +0.1 °C Final Temp: 1.9 °C

Temp should be above freezing to 6°C

pH paper Lot# 10D3581 Date and Initials of person examining contents: MJS 1-15-19

Comments:	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: -Includes date/time/ID Matrix: WT	✓			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. All containers needing preservation are found to be in compliance with EPA recommendation.	✓ ✓			16. PHL2
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed MJS Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present: Trip Blank Custody Seals Present			✓ ✓	18.
Rad Aqueous Samples Screened > 0.5 mrem/hr		✓		Initial when completed: MJS Date: 1-15-19

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

[X] Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: ks

Cert. Needed: [X] Yes [ ] No

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Workorder: 60292064 **Workorder Name:** JEC IBA CCR

Owner Received Date: 1/15/2019 **Results Requested By:** 2/5/2019

Report To	Subcontract To
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# : 30277226

30277226

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: Other	Requested Analysis: Radium-226 & Total Radium	Requested Analysis: Radium-228	LAB USE ONLY
1	IBA-4-011019	PS	1/10/2019 10:22	60292064001	Water	1	X	X	001
2	IBA-3-011019	PS	1/10/2019 12:10	60292064002	Water	1	X	X	002
3	IBA-2-011019	PS	1/10/2019 13:54	60292064003	Water	1	X	X	003
4	IBA-1-011019	PS	1/10/2019 15:13	60292064004	Water	1	X	X	004
5	DUP-011019	PS	1/10/2019 06:00	60292064005	Water	1	X	X	005

Transfers	Released By	Date/Time	Received By	Date/Time
1			[signature] PACE	01/15/19 1000
2			JLB	01/17/19
3				

Comments

Cooler Temperature on Receipt 1.9 °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.*

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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.

30277226

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.:	10JEC-0000033150
Project Name:	JEC IBA CCR
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson 913-563-1407
Pace Profile #:	9657, 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: KS

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	IBA-4-011019	WT	G			1/10	1022		2			2											
2	IBA-3-011019	WT	G			1/10	1210		2			2											
3	IBA-2-011019	WT	G			1/10	1354		2			2											
4	IBA-1-011019	WT	G			1/10	1513		2			2											
5																							
6																							
7	DUP-011019	WT	G			1/10	0600		2			2							X	X	X		
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Westar	01/14/19	0915		1-15-19	1008	1.9	4	4	4

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

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 01/11/19

*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: Pace Kansas Project # 30277226

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other ____

Label JNB

LIMS Login JNB

Tracking #: 474687396000

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 1.8 °C Correction Factor: +0.1 °C Final Temp: 1.9 °C

Temp should be above freezing to 6°C

pH paper Lot# 10035581 Date and Initials of person examining contents: MDS 1-15-19

Comments:	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: -Includes date/time/ID Matrix: WA	✓			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. All containers needing preservation are found to be in compliance with EPA recommendation. exceptions: VOA, coliform, TOC, O&G, Phenolics	✓ ✓			16. pH<2 Initial when completed MDS Date/time of preservation Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present: Trip Blank Custody Seals Present			✓ ✓	18.
Rad Aqueous Samples Screened > 0.5 mrem/hr		✓		Initial when completed: MDS Date: 1-15-19

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
March 2019 Sampling Event
Laboratory Analytical Report

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

April 09, 2019

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

RE: Project: JEC IBA CCR
Pace Project No.: 60298392

Dear Brandon Griffin:
Enclosed are the analytical results for sample(s) received by the laboratory on March 29, 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
Andrew Hare, Westar Energy
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY
Melissa Michels, Westar Energy
JD Schlegel, KCP&L & Westar

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: JEC IBA CCR
Pace Project No.: 60298392

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

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Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: JEC IBA CCR
Pace Project No.: 60298392

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60298392001	**IBA-4-032819**	Water	03/28/19 09:02	03/29/19 15:00
60298392002	**IBA-3-032819**	Water	03/28/19 11:40	03/29/19 15:00
60298392003	**IBA-2-032819**	Water	03/28/19 13:10	03/29/19 15:00
60298392004	**IBA-1-032819**	Water	03/28/19 14:15	03/29/19 15:00
60298392005	**DUP-032819**	Water	03/28/19 06:00	03/29/19 15:00

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SAMPLE ANALYTE COUNT

Project: JEC IBA CCR
Pace Project No.: 60298392

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60298392001	**IBA-4-032819**	EPA 200.7	JDE	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LRS	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60298392002	**IBA-3-032819**	EPA 200.7	JDE	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LRS	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60298392003	**IBA-2-032819**	EPA 200.7	JDE	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LRS	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60298392004	**IBA-1-032819**	EPA 200.7	JDE	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LRS	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60298392005	**DUP-032819**	EPA 200.7	JDE	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	LRS	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	MGS	3	PASI-K

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60298392

Method: **EPA 200.7**
Description: 200.7 Metals, Total
Client: WESTAR ENERGY
Date: April 09, 2019

General Information:
5 samples were analyzed for EPA 200.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.7 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60298392

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: WESTAR ENERGY
Date: April 09, 2019

General Information:
5 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60298392

Method: **EPA 245.1**
Description: 245.1 Mercury
Client: WESTAR ENERGY
Date: April 09, 2019

General Information:
5 samples were analyzed for EPA 245.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 245.1 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60298392

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: WESTAR ENERGY
Date: April 09, 2019

General Information:
5 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60298392

Method: **SM 4500-H+B**
Description: 4500H+ pH, Electrometric
Client: WESTAR ENERGY
Date: April 09, 2019

General Information:
5 samples were analyzed for SM 4500-H+B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

H6: Analysis initiated outside of the 15 minute EPA required holding time.
- DUP-032819 (Lab ID: 60298392005)
- IBA-1-032819 (Lab ID: 60298392004)
- IBA-2-032819 (Lab ID: 60298392003)
- IBA-3-032819 (Lab ID: 60298392002)
- IBA-4-032819 (Lab ID: 60298392001)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60298392

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: WESTAR ENERGY
Date: April 09, 2019

General Information:
5 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60298392

Sample: IBA-4-032819 **Lab ID: 60298392001** Collected: 03/28/19 09:02 Received: 03/29/19 15:00 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	**0.019**	mg/L	0.0050	1	04/04/19 13:05	04/05/19 10:49	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 10:49	7440-41-7	
Boron, Total Recoverable	**0.23**	mg/L	0.10	1	04/04/19 13:05	04/05/19 10:49	7440-42-8	
Calcium, Total Recoverable	**104**	mg/L	0.20	1	04/04/19 13:05	04/05/19 10:49	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	04/04/19 13:05	04/05/19 10:49	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	04/04/19 13:05	04/05/19 10:49	7439-92-1	
Lithium	**0.034**	mg/L	0.010	1	04/04/19 13:05	04/05/19 10:49	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	04/04/19 13:05	04/05/19 14:59	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 14:59	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	04/04/19 13:05	04/05/19 14:59	7440-43-9	
Cobalt, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 14:59	7440-48-4	
Molybdenum, Total Recoverable	**0.0018**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 14:59	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 14:59	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 14:59	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	04/04/19 14:16	04/05/19 09:47	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**614**	mg/L	5.0	1		04/02/19 11:50		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		04/05/19 11:24		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**19.2**	mg/L	1.0	1		04/06/19 20:33	16887-00-6	
Fluoride	**0.58**	mg/L	0.20	1		04/06/19 20:33	16984-48-8	
Sulfate	**175**	mg/L	10.0	10		04/06/19 20:50	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60298392

Sample: IBA-3-032819 **Lab ID: 60298392002** Collected: 03/28/19 11:40 Received: 03/29/19 15:00 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	**0.019**	mg/L	0.0050	1	04/04/19 13:05	04/05/19 10:52	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 10:52	7440-41-7	
Boron, Total Recoverable	**0.27**	mg/L	0.10	1	04/04/19 13:05	04/05/19 10:52	7440-42-8	
Calcium, Total Recoverable	**261**	mg/L	0.20	1	04/04/19 13:05	04/05/19 10:52	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	04/04/19 13:05	04/05/19 10:52	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	04/04/19 13:05	04/05/19 10:52	7439-92-1	
Lithium	**0.021**	mg/L	0.010	1	04/04/19 13:05	04/05/19 10:52	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	04/04/19 13:05	04/05/19 15:03	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:03	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	04/04/19 13:05	04/05/19 15:03	7440-43-9	
Cobalt, Total Recoverable	**0.0011**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:03	7440-48-4	
Molybdenum, Total Recoverable	**0.0022**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:03	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:03	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:03	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	04/04/19 14:16	04/05/19 09:49	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1590**	mg/L	5.0	1		04/02/19 11:50		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		04/05/19 14:47		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**125**	mg/L	10.0	10		04/06/19 22:14	16887-00-6	
Fluoride	**0.35**	mg/L	0.20	1		04/06/19 22:31	16984-48-8	
Sulfate	**817**	mg/L	50.0	50		04/06/19 21:24	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60298392

Sample: IBA-2-032819 **Lab ID: 60298392003** Collected: 03/28/19 13:10 Received: 03/29/19 15:00 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	**0.030**	mg/L	0.0050	1	04/04/19 13:05	04/05/19 10:54	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 10:54	7440-41-7	
Boron, Total Recoverable	**0.19**	mg/L	0.10	1	04/04/19 13:05	04/05/19 10:54	7440-42-8	
Calcium, Total Recoverable	**216**	mg/L	0.20	1	04/04/19 13:05	04/05/19 10:54	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	04/04/19 13:05	04/05/19 10:54	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	04/04/19 13:05	04/05/19 10:54	7439-92-1	
Lithium	**0.022**	mg/L	0.010	1	04/04/19 13:05	04/05/19 10:54	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	04/04/19 13:05	04/05/19 15:07	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:07	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	04/04/19 13:05	04/05/19 15:07	7440-43-9	
Cobalt, Total Recoverable	**0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:07	7440-48-4	
Molybdenum, Total Recoverable	**0.0022**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:07	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:07	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:07	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	04/04/19 14:16	04/05/19 09:51	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1320**	mg/L	5.0	1		04/02/19 11:50		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		04/05/19 14:52		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**114**	mg/L	10.0	10		04/06/19 23:05	16887-00-6	
Fluoride	**0.39**	mg/L	0.20	1		04/06/19 22:48	16984-48-8	
Sulfate	**582**	mg/L	50.0	50		04/06/19 23:22	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60298392

Sample: IBA-1-032819 **Lab ID: 60298392004** Collected: 03/28/19 14:15 Received: 03/29/19 15:00 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	04/04/19 13:05	04/05/19 10:56	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 10:56	7440-41-7	
Boron, Total Recoverable	**0.37**	mg/L	0.10	1	04/04/19 13:05	04/05/19 10:56	7440-42-8	
Calcium, Total Recoverable	**312**	mg/L	0.20	1	04/04/19 13:05	04/05/19 10:56	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	04/04/19 13:05	04/05/19 10:56	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	04/04/19 13:05	04/05/19 10:56	7439-92-1	
Lithium	**0.016**	mg/L	0.010	1	04/04/19 13:05	04/05/19 10:56	7439-93-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Cobalt, Total Recoverable	**0.0021**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:11	7440-48-4	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:11	7440-38-2	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:11	7782-49-2	
Molybdenum, Total Recoverable	**0.0074**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:11	7439-98-7	
Cadmium, Total Recoverable	**0.00059**	mg/L	0.00050	1	04/04/19 13:05	04/05/19 15:11	7440-43-9	
Antimony, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:11	7440-36-0	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:11	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	04/04/19 14:16	04/05/19 09:54	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1750**	mg/L	5.0	1		04/02/19 11:50		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.1**	Std. Units	0.10	1		04/05/19 14:57		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**129**	mg/L	10.0	10		04/06/19 23:55	16887-00-6	
Fluoride	**0.40**	mg/L	0.20	1		04/06/19 23:39	16984-48-8	
Sulfate	**932**	mg/L	50.0	50		04/07/19 00:12	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JEC IBA CCR
Pace Project No.: 60298392

Sample: DUP-032819 **Lab ID: 60298392005** Collected: 03/28/19 06:00 Received: 03/29/19 15:00 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	**0.019**	mg/L	0.0050	1	04/04/19 13:05	04/05/19 10:58	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 10:58	7440-41-7	
Boron, Total Recoverable	**0.23**	mg/L	0.10	1	04/04/19 13:05	04/05/19 10:58	7440-42-8	
Calcium, Total Recoverable	**104**	mg/L	0.20	1	04/04/19 13:05	04/05/19 10:58	7440-70-2	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	04/04/19 13:05	04/05/19 10:58	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	04/04/19 13:05	04/05/19 10:58	7439-92-1	
Lithium	**0.032**	mg/L	0.010	1	04/04/19 13:05	04/05/19 10:58	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	04/04/19 13:05	04/05/19 15:29	7440-36-0	
Arsenic, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:29	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	04/04/19 13:05	04/05/19 15:29	7440-43-9	
Cobalt, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:29	7440-48-4	
Molybdenum, Total Recoverable	**0.0019**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:29	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:29	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:29	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	04/04/19 14:16	04/05/19 09:56	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**621**	mg/L	5.0	1		04/03/19 11:17		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		04/05/19 11:19		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**19.2**	mg/L	1.0	1		04/07/19 00:29	16887-00-6	
Fluoride	**0.58**	mg/L	0.20	1		04/07/19 00:29	16984-48-8	
Sulfate	**177**	mg/L	10.0	10		04/07/19 00:46	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60298392

QC Batch: 577282 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60298392001, 60298392002, 60298392003, 60298392004, 60298392005

METHOD BLANK: 2368553 Matrix: Water
Associated Lab Samples: 60298392001, 60298392002, 60298392003, 60298392004, 60298392005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	04/05/19 09:35	

LABORATORY CONTROL SAMPLE: 2368554

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0051	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2368555 2368556

Parameter	Units	60298429002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	<0.066 ug/L	0.005	0.005	0.0047	0.0047	94	95	70-130	0	20	

MATRIX SPIKE SAMPLE: 2368557

Parameter	Units	60298392001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	<0.00020	0.005	0.0050	101	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60298392

QC Batch: 577239 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60298392001, 60298392002, 60298392003, 60298392004, 60298392005

METHOD BLANK: 2368378 Matrix: Water
Associated Lab Samples: 60298392001, 60298392002, 60298392003, 60298392004, 60298392005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	04/05/19 10:11	
Beryllium	mg/L	<0.0010	0.0010	04/05/19 10:11	
Boron	mg/L	<0.10	0.10	04/05/19 10:11	
Calcium	mg/L	<0.20	0.20	04/05/19 10:11	
Chromium	mg/L	<0.0050	0.0050	04/05/19 10:11	
Lead	mg/L	<0.010	0.010	04/05/19 10:11	
Lithium	mg/L	<0.010	0.010	04/05/19 10:11	

LABORATORY CONTROL SAMPLE: 2368379

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	100	85-115	
Boron	mg/L	1	0.96	96	85-115	
Calcium	mg/L	10	10.2	102	85-115	
Chromium	mg/L	1	0.99	99	85-115	
Lead	mg/L	1	1.0	100	85-115	
Lithium	mg/L	1	0.98	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2368380 2368381

Parameter	Units	60298184001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	mg/L	47.7 ug/L	1	1	1.1	1.0	100	99	70-130	1	20	
Beryllium	mg/L	ND	1	1	1.0	1.0	102	101	70-130	1	20	
Boron	mg/L	123 ug/L	1	1	1.1	1.1	100	99	70-130	1	20	
Calcium	mg/L	30500 ug/L	10	10	40.1	39.7	95	91	70-130	1	20	
Chromium	mg/L	ND	1	1	0.99	0.98	99	98	70-130	0	20	
Lead	mg/L	ND	1	1	0.96	0.96	96	96	70-130	1	20	
Lithium	mg/L	35.2 ug/L	1	1	1.0	1.0	101	100	70-130	1	20	

MATRIX SPIKE SAMPLE: 2368382

Parameter	Units	60298203001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	382 ug/L	1	1.4	100	70-130	
Beryllium	mg/L	ND	1	1.0	101	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60298392

MATRIX SPIKE SAMPLE: 2368382

Parameter	Units	60298203001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	mg/L	427 ug/L	1	1.4	101	70-130	
Calcium	mg/L	224000 ug/L	10	231	79	70-130	
Chromium	mg/L	7.9 ug/L	1	0.99	98	70-130	
Lead	mg/L	ND	1	0.95	95	70-130	
Lithium	mg/L	207 ug/L	1	1.2	103	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60298392

QC Batch: 577170 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60298392001, 60298392002, 60298392003, 60298392004, 60298392005

METHOD BLANK: 2368138 Matrix: Water
Associated Lab Samples: 60298392001, 60298392002, 60298392003, 60298392004, 60298392005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	04/05/19 14:34	
Arsenic	mg/L	<0.0010	0.0010	04/05/19 14:34	
Cadmium	mg/L	<0.00050	0.00050	04/08/19 16:03	
Cobalt	mg/L	<0.0010	0.0010	04/05/19 14:34	
Molybdenum	mg/L	<0.0010	0.0010	04/05/19 14:34	
Selenium	mg/L	<0.0010	0.0010	04/05/19 14:34	
Thallium	mg/L	<0.0010	0.0010	04/05/19 14:34	

LABORATORY CONTROL SAMPLE: 2368139

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	0.04	0.036	90	85-115	
Arsenic	mg/L	0.04	0.037	93	85-115	
Cadmium	mg/L	0.04	0.038	95	85-115	
Cobalt	mg/L	0.04	0.039	98	85-115	
Molybdenum	mg/L	0.04	0.036	91	85-115	
Selenium	mg/L	0.04	0.036	90	85-115	
Thallium	mg/L	0.04	0.037	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2368140 2368141

Parameter	Units	60298392004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/L	<0.0010	0.04	0.04	0.035	0.035	88	87	70-130	1	20	
Arsenic	mg/L	<0.0010	0.04	0.04	0.036	0.036	90	89	70-130	0	20	
Cadmium	mg/L	0.00059	0.04	0.04	0.035	0.034	86	84	70-130	1	20	
Cobalt	mg/L	0.0021	0.04	0.04	0.040	0.040	93	94	70-130	0	20	
Molybdenum	mg/L	0.0074	0.04	0.04	0.045	0.045	95	94	70-130	1	20	
Selenium	mg/L	<0.0010	0.04	0.04	0.033	0.033	84	84	70-130	0	20	
Thallium	mg/L	<0.0010	0.04	0.04	0.033	0.032	81	80	70-130	1	20	

MATRIX SPIKE SAMPLE: 2368142

Parameter	Units	60298103001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	3.5 ug/L	0.04	0.040	91	70-130	
Arsenic	mg/L	2.6 ug/L	0.04	0.040	93	70-130	
Cadmium	mg/L	0.044J ug/L	0.04	0.036	90	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60298392

MATRIX SPIKE SAMPLE: 2368142

Parameter	Units	60298103001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cobalt	mg/L	14.6 ug/L	0.04	0.057	106	70-130	
Molybdenum	mg/L	17.8 ug/L	0.04	0.056	97	70-130	
Selenium	mg/L	11.7 ug/L	0.04	0.047	89	70-130	
Thallium	mg/L	0.13J ug/L	0.04	0.034	84	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60298392

QC Batch: 576827 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60298392001, 60298392002, 60298392003, 60298392004

METHOD BLANK: 2366799 Matrix: Water
Associated Lab Samples: 60298392001, 60298392002, 60298392003, 60298392004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	04/02/19 11:50	

LABORATORY CONTROL SAMPLE: 2366800

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	985	98	80-120	

SAMPLE DUPLICATE: 2366801

Parameter	Units	60298378002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	106	110	4	10	

SAMPLE DUPLICATE: 2366802

Parameter	Units	60298258002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	583	571	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60298392

QC Batch: 577044 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60298392005

METHOD BLANK: 2367537 Matrix: Water
Associated Lab Samples: 60298392005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	04/03/19 11:17	

LABORATORY CONTROL SAMPLE: 2367538

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	979	98	80-120	

SAMPLE DUPLICATE: 2367539

Parameter	Units	60298560001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	14800	14300	3	10	

SAMPLE DUPLICATE: 2367540

Parameter	Units	60298508005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	201	202	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60298392

QC Batch: 577337
QC Batch Method: SM 4500-H+B
Analysis Method: SM 4500-H+B
Analysis Description: 4500H+B pH
Associated Lab Samples: 60298392001, 60298392005

SAMPLE DUPLICATE: 2368911

Parameter	Units	60297940002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.5	7.5	0	5	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60298392

QC Batch: 577565 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 60298392002, 60298392003, 60298392004

SAMPLE DUPLICATE: 2369938

Parameter	Units	60298339002 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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: JEC IBA CCR
Pace Project No.: 60298392

QC Batch: 577644 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60298392001, 60298392002, 60298392003, 60298392004, 60298392005

METHOD BLANK: 2370150 Matrix: Water
Associated Lab Samples: 60298392001, 60298392002, 60298392003, 60298392004, 60298392005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	04/06/19 10:54	
Fluoride	mg/L	<0.20	0.20	04/06/19 10:54	
Sulfate	mg/L	<1.0	1.0	04/06/19 10:54	

LABORATORY CONTROL SAMPLE: 2370151

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	2.4	97	90-110	
Sulfate	mg/L	5	5.0	101	90-110	

MATRIX SPIKE SAMPLE: 2370154

Parameter	Units	60298271007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	ND	25	23.8	90	90-110	
Sulfate	mg/L	132	50	181	98	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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: JEC IBA CCR
Pace Project No.: 60298392

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: JEC IBA CCR
Pace Project No.: 60298392

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60298392001	**IBA-4-032819**	EPA 200.7	577239	EPA 200.7	577348
60298392002	**IBA-3-032819**	EPA 200.7	577239	EPA 200.7	577348
60298392003	**IBA-2-032819**	EPA 200.7	577239	EPA 200.7	577348
60298392004	**IBA-1-032819**	EPA 200.7	577239	EPA 200.7	577348
60298392005	**DUP-032819**	EPA 200.7	577239	EPA 200.7	577348
60298392001	**IBA-4-032819**	EPA 200.8	577170	EPA 200.8	577349
60298392002	**IBA-3-032819**	EPA 200.8	577170	EPA 200.8	577349
60298392003	**IBA-2-032819**	EPA 200.8	577170	EPA 200.8	577349
60298392004	**IBA-1-032819**	EPA 200.8	577170	EPA 200.8	577349
60298392005	**DUP-032819**	EPA 200.8	577170	EPA 200.8	577349
60298392001	**IBA-4-032819**	EPA 245.1	577282	EPA 245.1	577350
60298392002	**IBA-3-032819**	EPA 245.1	577282	EPA 245.1	577350
60298392003	**IBA-2-032819**	EPA 245.1	577282	EPA 245.1	577350
60298392004	**IBA-1-032819**	EPA 245.1	577282	EPA 245.1	577350
60298392005	**DUP-032819**	EPA 245.1	577282	EPA 245.1	577350
60298392001	**IBA-4-032819**	SM 2540C	576827		
60298392002	**IBA-3-032819**	SM 2540C	576827		
60298392003	**IBA-2-032819**	SM 2540C	576827		
60298392004	**IBA-1-032819**	SM 2540C	576827		
60298392005	**DUP-032819**	SM 2540C	577044		
60298392001	**IBA-4-032819**	SM 4500-H+B	577337		
60298392002	**IBA-3-032819**	SM 4500-H+B	577565		
60298392003	**IBA-2-032819**	SM 4500-H+B	577565		
60298392004	**IBA-1-032819**	SM 4500-H+B	577565		
60298392005	**DUP-032819**	SM 4500-H+B	577337		
60298392001	**IBA-4-032819**	EPA 300.0	577644		
60298392002	**IBA-3-032819**	EPA 300.0	577644		
60298392003	**IBA-2-032819**	EPA 300.0	577644		
60298392004	**IBA-1-032819**	EPA 300.0	577644		
60298392005	**DUP-032819**	EPA 300.0	577644		

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Sample Condition Upon Receipt

WO# : 60298392

60298392

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:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 2.1 **Corr. Factor** -1.0 **Corrected** 1.1

Date and initials of person examining contents: JN 3/29/19

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐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)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑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: _____

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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: 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	Copy To:	Jared Morrison	Company Name:	
	Topeka, KS 66612			Address:	
Email To:	brandon.l.griffin@westarenergy.com	Purchase Order No.:	10JEC-0000040383	Pace Quote Reference:	
Phone:	785-575-8135 Fax:	Project Name:	JEC IBA CCR	Pace Project Manager:	Heather Wilson 913-563-1407
Requested Due Date/TAT:	7 day	Project Number:		Pace Profile #:	9657, 1

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: KS

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

ITEM #	Section D Required Client Information / SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test: 200.7 Total Metals*	200.8 Total Metals**	245.1 Total Hg	300: Cl, F, SO4	2540C TDS	4500 H+B	Residual Chlorine (Y/N)	60298392 Pace Project No./ Lab I.D.
1	IBA-4-032819	WT	G			3/28	0902		2	1		1							X	X	X	X	X	X		BPW BPW 001
2	IBA-3-032819	WT	G			3/28	1140		2	1		1													pw 7/29/19		002
3	IBA-2-032819	WT	G			3/28	1310		2	1		1															003
4	IBA-1-032819	WT	G			3/28	1415		2	1		1															004
5																											
6																											
7																											
8																											
9																											
10	DUP-032819	WT	G			3/28	0600		2	1		1							X	X	X	X	X	X			005
11																											
12																											

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	BPW / Westar	3/29	0830		3/29	1500	1.1	Y	Y	Y
200.8 Total Metals**: Sb, As, Cd, Co, Mo, Se, Tl										

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:		DATE Signed (MM/DD/YY): 03/28/19				

*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.

F-ALL-Q-020rev.08, 12-Oct-2007

Pace Container Order #468035

Order By :		Ship To :		Return To:	
Company	WESTAR ENERGY	Company	WESTAR ENERGY	Company	Pace Analytical Kansas
Contact	Griffin, Brandon	Contact	Griffin, Brandon	Contact	Wilson, Heather
Email	brandon.l.griffin@westarenergy.	Email	brandon.l.griffin@westarenergy.	Email	heather.wilson@pacelabs.com
Address	818 S. Kansas Ave	Address	818 S. Kansas Ave	Address	9608 Loiret Blvd.
Address 2		Address 2		Address 2	
City	Topeka	City	Topeka	City	Lenexa
State	KS Zip 66612	State	KS Zip 66612	State	KS Zip 66219
Phone	785-575-8135	Phone	785-575-8135	Phone	1(913)563-1407

Info

Project Name	JEC IBA CCR- App III & IV	**Due Date**	02/27/2019	**Profile**	9657	**Quote**	
Project	Wilson, Heather	**Return**		**Carrier**	Most Economical	**Locatio**	KS

Trip Blanks

- [ ] Include Trip Blanks

Bottle

- [ ] Blank
- [X] Pre-Printed No Sample IDs
- [ ] Pre-Printed With Sample IDs

- [ ] Boxed Cases
- [ ] Individually Wrapped
- [ ] Grouped By Sample

Return Shipping

- [X] No Shipper
- [ ] With Shipper

COC Options

- [ ] Number of Blanks
- [X] Pre-Printed 1

Misc

- [ ] Sampling Instructions
- [X] Custody Seal
- [X] Temp. Blanks
- [X] Coolers
- [ ] Syringes
- [ ] Extra Bubble Wrap
- [ ] Short Hold/Rush
- [ ] DI Liter(s)
- [ ] USDA Regulated Soils

# of Samples	Matrix	Test	Container	Total	# of	Lot #	Notes
5	WT	Metals	1-1L plastic w/HNO3	5	0	010719-2AJN	
5	WT	300.0 Anions/pH/TDS	1L plastic unpreserved	5	0	020419-2APJ	

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 :	02/28/2019
Prepared	robin
Verified By:	

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

April 09, 2019

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

RE: Project: JEC IBA CCR
Pace Project No.: 60298488

Dear Brandon Griffin:
Enclosed are the analytical results for sample(s) received by the laboratory on March 29, 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
Andrew Hare, Westar Energy
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY
Melissa Michels, Westar Energy
JD Schlegel, KCP&L & Westar

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CERTIFICATIONS

Project: JEC IBA CCR
Pace Project No.: 60298488

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: JEC IBA CCR
Pace Project No.: 60298488

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60298488001	**IBA-4-032819**	Water	03/28/19 09:02	03/29/19 09:45
60298488002	**IBA-3-032819**	Water	03/28/19 11:40	03/29/19 09:45
60298488003	**IBA-2-032819**	Water	03/28/19 13:10	03/29/19 09:45
60298488004	**IBA-1-032819**	Water	03/28/19 14:15	03/29/19 09:45
60298488005	**DUP-032819**	Water	03/28/19 06:00	03/29/19 09:45

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SAMPLE ANALYTE COUNT

Project: JEC IBA CCR
Pace Project No.: 60298488

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60298488001	**IBA-4-032819**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60298488002	**IBA-3-032819**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60298488003	**IBA-2-032819**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60298488004	**IBA-1-032819**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60298488005	**DUP-032819**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60298488

Method: **EPA 903.1**
Description: 903.1 Radium 226
Client: WESTAR ENERGY
Date: April 09, 2019

General Information:
5 samples were analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60298488

Method: **EPA 904.0**
Description: 904.0 Radium 228
Client: WESTAR ENERGY
Date: April 09, 2019

General Information:
5 samples were analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
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PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60298488

Method: **Total Radium Calculation**
Description: Total Radium 228+226
Client: WESTAR ENERGY
Date: April 09, 2019

General Information:
5 samples were analyzed for Total Radium Calculation. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60298488

Sample: IBA-4-032819 **Lab ID: 60298488001** Collected: 03/28/19 09:02 Received: 03/29/19 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.509 ± 0.590 (0.952) C:NA T:89%**	pCi/L	04/08/19 22:26	13982-63-3	
Radium-228	EPA 904.0	**0.563 ± 0.446 (0.895) C:74% T:82%**	pCi/L	04/08/19 15:28	15262-20-1	
Total Radium	Total Radium Calculation	**1.07 ± 1.04 (1.85)**	pCi/L	04/09/19 12:30	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60298488

Sample: IBA-3-032819 **Lab ID: 60298488002** Collected: 03/28/19 11:40 Received: 03/29/19 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.256 ± 0.443 (0.792) C:NA T:87%**	pCi/L	04/08/19 22:26	13982-63-3	
Radium-228	EPA 904.0	**-0.0128 ± 0.404 (0.934) C:76% T:80%**	pCi/L	04/08/19 15:28	15262-20-1	
Total Radium	Total Radium Calculation	**0.256 ± 0.847 (1.73)**	pCi/L	04/09/19 12:30	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60298488

Sample: IBA-2-032819 **Lab ID: 60298488003** Collected: 03/28/19 13:10 Received: 03/29/19 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.321 ± 0.387 (0.590) C:NA T:89%**	pCi/L	04/08/19 22:26	13982-63-3	
Radium-228	EPA 904.0	**-0.0104 ± 0.438 (1.01) C:73% T:76%**	pCi/L	04/08/19 15:28	15262-20-1	
Total Radium	Total Radium Calculation	**0.321 ± 0.825 (1.60)**	pCi/L	04/09/19 12:30	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60298488

Sample: IBA-1-032819 **Lab ID: 60298488004** Collected: 03/28/19 14:15 Received: 03/29/19 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.182 ± 0.415 (0.669) C:NA T:71%**	pCi/L	04/08/19 22:26	13982-63-3	
Radium-228	EPA 904.0	**-0.425 ± 0.435 (1.05) C:75% T:83%**	pCi/L	04/08/19 15:28	15262-20-1	
Total Radium	Total Radium Calculation	**0.182 ± 0.850 (1.72)**	pCi/L	04/09/19 12:30	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60298488

Sample: DUP-032819 **Lab ID: 60298488005** Collected: 03/28/19 06:00 Received: 03/29/19 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.319 ± 0.443 (0.740) C:NA T:84%**	pCi/L	04/08/19 22:26	13982-63-3	
Radium-228	EPA 904.0	**0.259 ± 0.462 (1.01) C:73% T:85%**	pCi/L	04/08/19 15:20	15262-20-1	
Total Radium	Total Radium Calculation	**0.578 ± 0.905 (1.75)**	pCi/L	04/09/19 12:30	7440-14-4	

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60298488

QC Batch: 336631 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60298488001, 60298488002, 60298488003, 60298488004, 60298488005

METHOD BLANK: 1638160 Matrix: Water
Associated Lab Samples: 60298488001, 60298488002, 60298488003, 60298488004, 60298488005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0745 ± 0.340 (0.802) C:NA T:91%	pCi/L	04/08/19 21:55	

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60298488

QC Batch: 336829 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60298488005

METHOD BLANK: 1639157 Matrix: Water
Associated Lab Samples: 60298488005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0153 ± 0.384 (0.895) C:76% T:74%	pCi/L	04/08/19 15:20	

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

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: JEC IBA CCR
Pace Project No.: 60298488

QC Batch: 336663 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60298488001, 60298488002, 60298488003, 60298488004

METHOD BLANK: 1638239 Matrix: Water
Associated Lab Samples: 60298488001, 60298488002, 60298488003, 60298488004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0797 ± 0.337 (0.805) C:75% T:79%	pCi/L	04/08/19 12:08	

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

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: JEC IBA CCR
Pace Project No.: 60298488

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: JEC IBA CCR
Pace Project No.: 60298488

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60298488001	**IBA-4-032819**	EPA 903.1	336631		
60298488002	**IBA-3-032819**	EPA 903.1	336631		
60298488003	**IBA-2-032819**	EPA 903.1	336631		
60298488004	**IBA-1-032819**	EPA 903.1	336631		
60298488005	**DUP-032819**	EPA 903.1	336631		
60298488001	**IBA-4-032819**	EPA 904.0	336663		
60298488002	**IBA-3-032819**	EPA 904.0	336663		
60298488003	**IBA-2-032819**	EPA 904.0	336663		
60298488004	**IBA-1-032819**	EPA 904.0	336663		
60298488005	**DUP-032819**	EPA 904.0	336829		
60298488001	**IBA-4-032819**	Total Radium Calculation	337506		
60298488002	**IBA-3-032819**	Total Radium Calculation	337506		
60298488003	**IBA-2-032819**	Total Radium Calculation	337506		
60298488004	**IBA-1-032819**	Total Radium Calculation	337506		
60298488005	**DUP-032819**	Total Radium Calculation	337506		

Chain of Custody

[X] Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: KS
Cert. Needed: [X] Yes [ ] No
Owner Received Date: 3/29/2019 Results Requested By: 4/11/2019

Pace Analytical®
www.pacelabs.com

Workorder: 60298488 **Workorder Name:** JEC IBA CCR

Report To	Subcontract To
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# : 30287081
30287081

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: Other	Requested Analysis: Radium-226 & Total Radium	Requested Analysis: Radium-228	LAB USE ONLY
1	IBA-4-032819	PS	3/28/2019 09:02	60298488001	Water	1	X	X	601
2	IBA-3-032819	PS	3/28/2019 11:40	60298488002	Water	1	X	X	602
3	IBA-2-032819	PS	3/28/2019 13:10	60298488003	Water	1	X	X	603
4	IBA-1-032819	PS	3/28/2019 14:15	60298488004	Water	1	X	X	604
5	DUP-032819	PS	3/28/2019 06:00	60298488005	Water	1	X	X	605

Transfers	Released By	Date/Time	Received By	Date/Time
1			[illegible]	3/29/19 9:45
2			mg 4/2/19	
3				

Comments

Cooler Temperature on Receipt 1.2 °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.*

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RUSH

CHAIN-OF-CUSTODY / Analytical Request Document

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

30287081

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	Copy To:	Jared Morrison	Company Name:	
	Topeka, KS 66612			Address:	
Email To:	brandon.l.griffin@westarenergy.com	Purchase Order No.:	10JEC-0000040383	Pace Quote Reference:	
Phone:	785-575-8135 Fax:	Project Name:	JEC IBA CCR	Pace Project Manager:	Heather Wilson 913-563-1407
Requested Due Date/TAT:	~~15 day~~ 4/12/19	Project Number:		Pace Profile #:	9657, 1

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: KS

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WIPE WP; AIR AR; OTHER OT; TISSUE TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	IBA-4-032819	WT	G			3/28	0902		2			2											
2	IBA-3-032819	WT	G			3/28	1140		2			2											
3	IBA-2-032819	WT	G			3/28	1310		2			2											
4	IBA-1-032819	WT	G			3/28	1415		2			2											
5																							
6																							
7																							
8																							
9																							
10	DUP-032819	WT	G			3/28	0800		2			2								X	X	X		
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Brandon G / Westar	3/28/19	1530	DATE	03/29/19	0945	1.2	Y	N Y 03/29/19 JLB	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 03/28/19

*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

Pace Analytical

Client Name: Westar

Project # 30287081

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label ET

Tracking #: 4746 8742 5370

LIMS Login ET

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

Thermometer Used 11 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 1.2 °C Correction Factor: 0 °C Final Temp: 1.2 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 10022481 / Date and Initials of person examining contents: 03/29/19 JLB
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: WT	✓			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. All containers needing preservation are found to be in compliance with EPA recommendation. exceptions: VOA, coliform, TOC, O&G, Phenolics	✓ ✓			16. pH<2 Initial when completed JLB Date/time of preservation Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: JLB Date: 03/29/19

Client Notification/ Resolution:

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

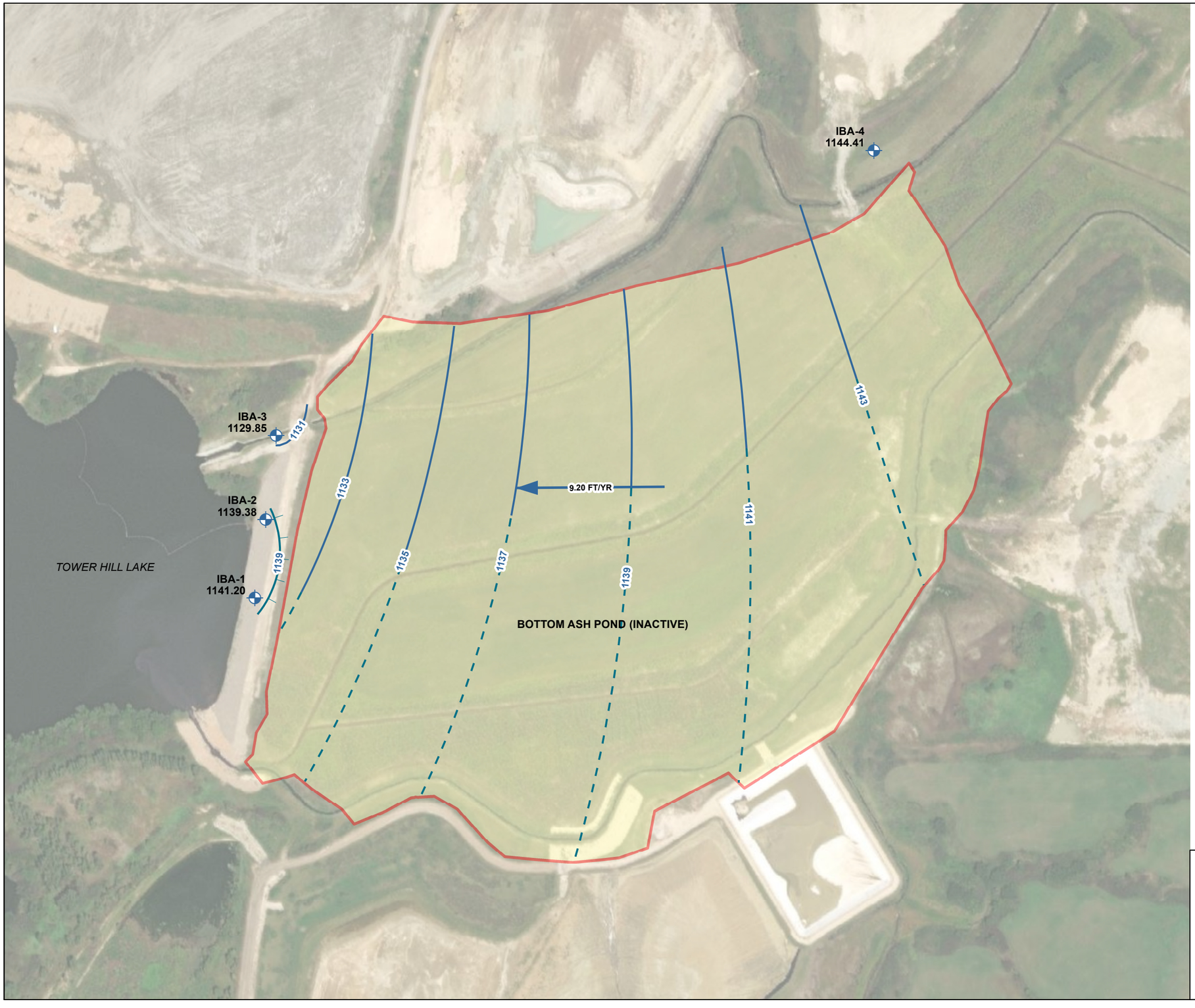
Comments/ Resolution: _____

☐ **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

- **IBA-3 1133.73** — WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), MARCH 2018
- MONITORING WELL
- PIEZOMETER OBSERVATION ONLY
- ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 2-FT INTERVAL (AMSL), DASHED WHERE INFERRED
- GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
- BOTTOM ASH POND (INACTIVE)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 14 MARCH 2018.

3. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETIRIC ELEVATIONS MEASURED 14 MARCH 2018 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.

4. AERIAL IMAGERY SOURCE: ESRI, 3 SEPTEMBER 2019

N

0 300 600
SCALE IN FEET

HALEY ALDRICH

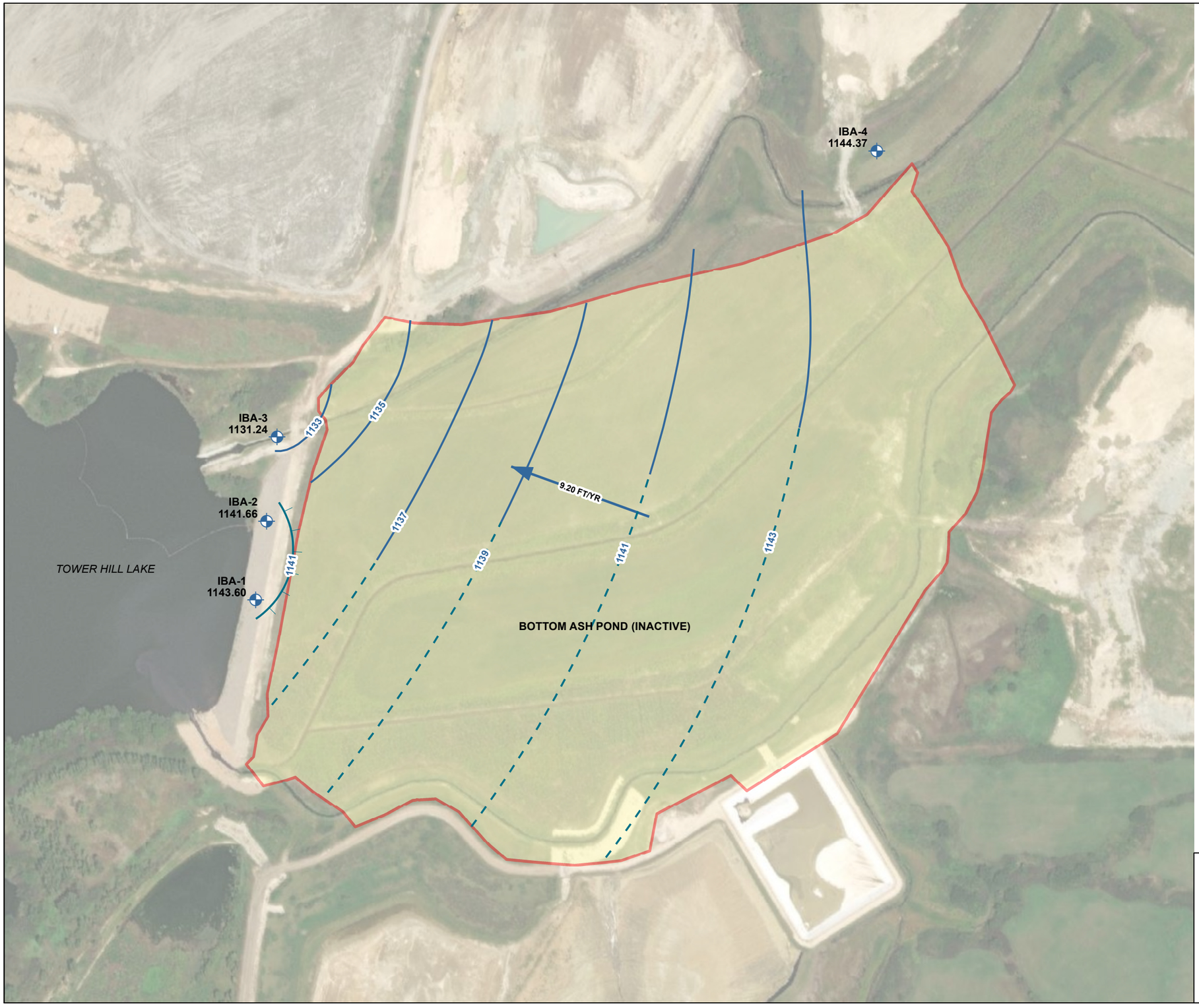
EVERGY KANSAS CENTRAL, INC.
JEFFREY ENERGY CENTER
ST. MARY'S, KANSAS

BOTTOM ASH POND (INACTIVE) GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR MAP MARCH 14, 2018

evergy

NOVEMBER 2022

FIGURE 2



LEGEND

IBA-3
1133.73 WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), MAY 2018

MONITORING WELL

PIEZOMETER OBSERVATION ONLY

ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 2-FT INTERVAL (AMSL), DASHED WHERE INFERRED

GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)

BOTTOM ASH POND (INACTIVE)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 14 MAY 2018.

3. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETIRIC ELEVATIONS MEASURED 14 MAY 2018 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.

4. AERIAL IMAGERY SOURCE: ESRI, 3 SEPTEMBER 2019

N

0 300 600
SCALE IN FEET

HALEY ALDRICH

EVERGY KANSAS CENTRAL, INC.
JEFFREY ENERGY CENTER
ST. MARY'S, KANSAS

BOTTOM ASH POND (INACTIVE) GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR MAP MAY 14, 2018

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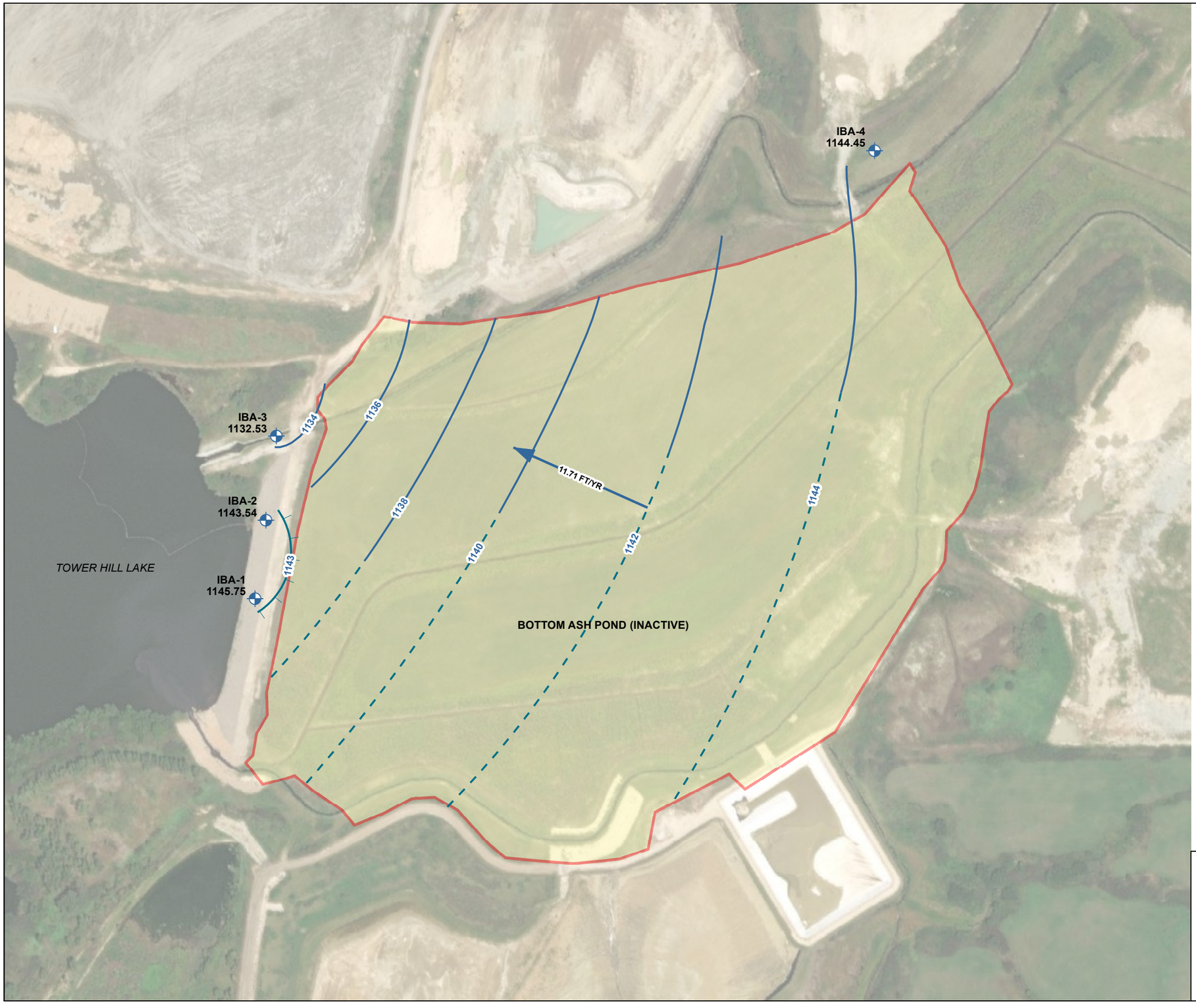
NOVEMBER 2022

FIGURE 3



LEGEND

IBA-3
1133.73 WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), JULY 2018

MONITORING WELL

PIEZOMETER OBSERVATION ONLY

ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 2-FT INTERVAL (AMSL), DASHED WHERE INFERRED

GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)

BOTTOM ASH POND (INACTIVE)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 05 JULY 2018.

3. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETIRIC ELEVATIONS MEASURED 05 JULY 2018 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.

4. AERIAL IMAGERY SOURCE: ESRI, 3 SEPTEMBER 2019

N

0 300 600
SCALE IN FEET

HALEY ALDRICH

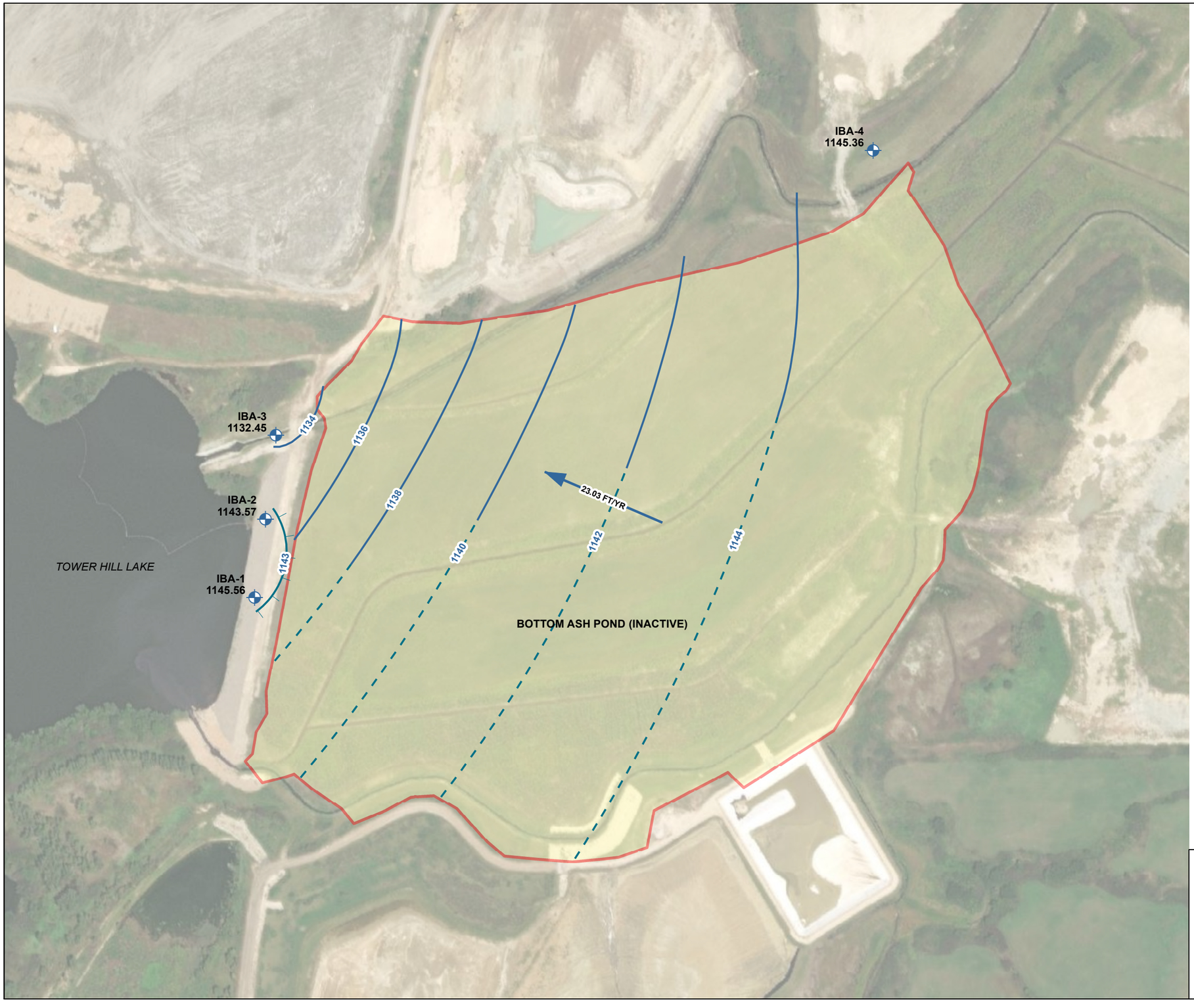
EVERGY KANSAS CENTRAL, INC.
JEFFREY ENERGY CENTER
ST. MARY'S, KANSAS

BOTTOM ASH POND (INACTIVE) GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR MAP JULY 5, 2018

evergy

NOVEMBER 2022

FIGURE 4



LEGEND

IBA-3 1133.73	WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), AUGUST 2018
	MONITORING WELL
	PIEZOMETER OBSERVATION ONLY
	ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 2-FT INTERVAL (AMSL), DASHED WHERE INFERRED
	GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
	BOTTOM ASH POND (INACTIVE)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 15 AUGUST 2018.

3. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETIRIC ELEVATIONS MEASURED 15 AUGUST 2018 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.

4. AERIAL IMAGERY SOURCE: ESRI, 3 SEPTEMBER 2019

N

0 300 600
SCALE IN FEET

HALEY ALDRICH

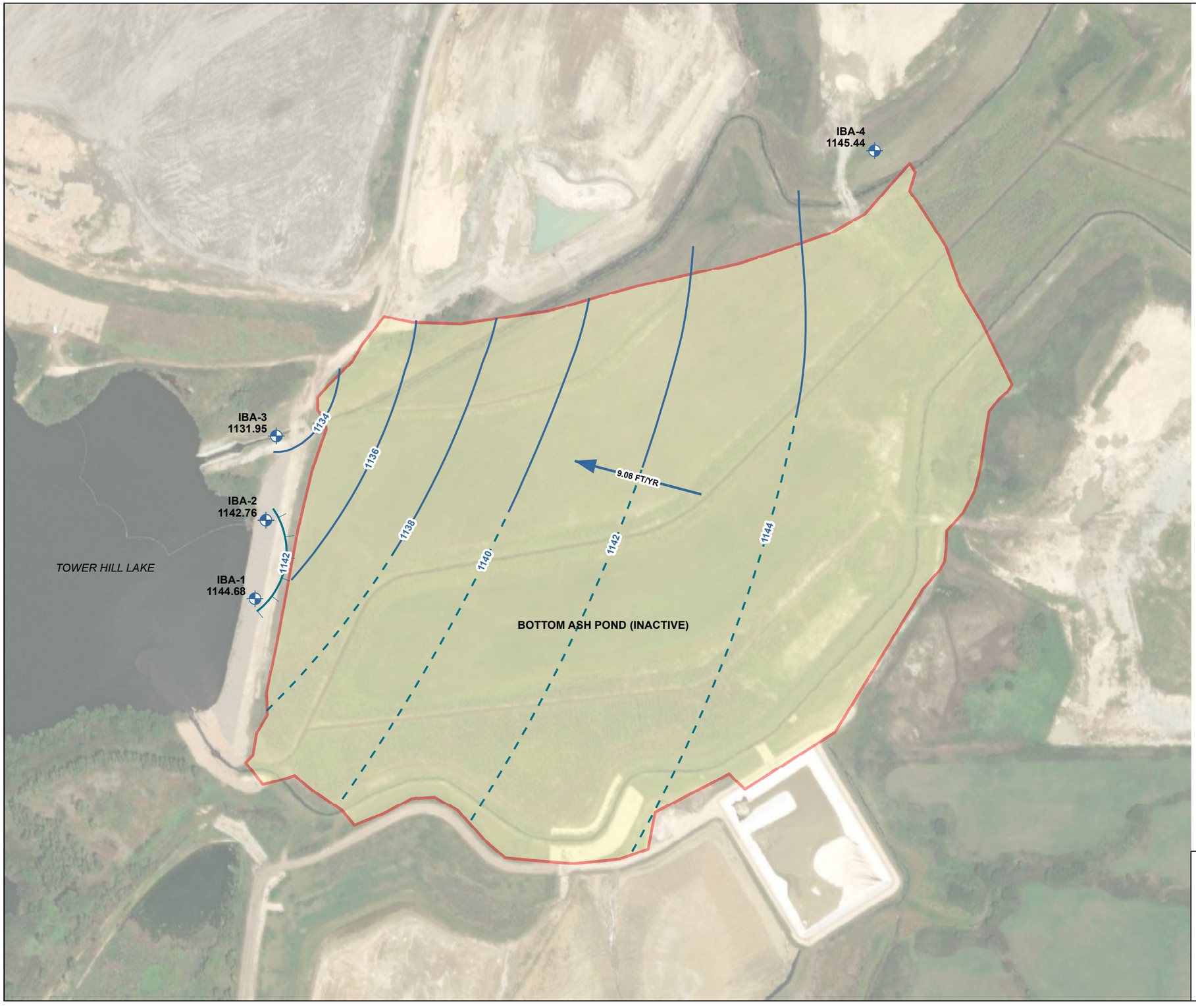
EVERGY KANSAS CENTRAL, INC.
JEFFREY ENERGY CENTER
ST. MARY'S, KANSAS

BOTTOM ASH POND (INACTIVE) GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR MAP AUGUST 15, 2018

evergy

NOVEMBER 2022

FIGURE 5



LEGEND

IBA-3 1133.73	WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), OCTOBER 2018
	MONITORING WELL
	PIEZOMETER OBSERVATION ONLY
	ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 2-FT INTERVAL (AMSL), DASHED WHERE INFERRED
	GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
	BOTTOM ASH POND (INACTIVE)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 02 OCTOBER 2018.

3. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETIRIC ELEVATIONS MEASURED 02 OCTOBER 2018 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.

4. AERIAL IMAGERY SOURCE: ESRI, 3 SEPTEMBER 2019

N

0 300 600

SCALE IN FEET

HALEY ALDRICH

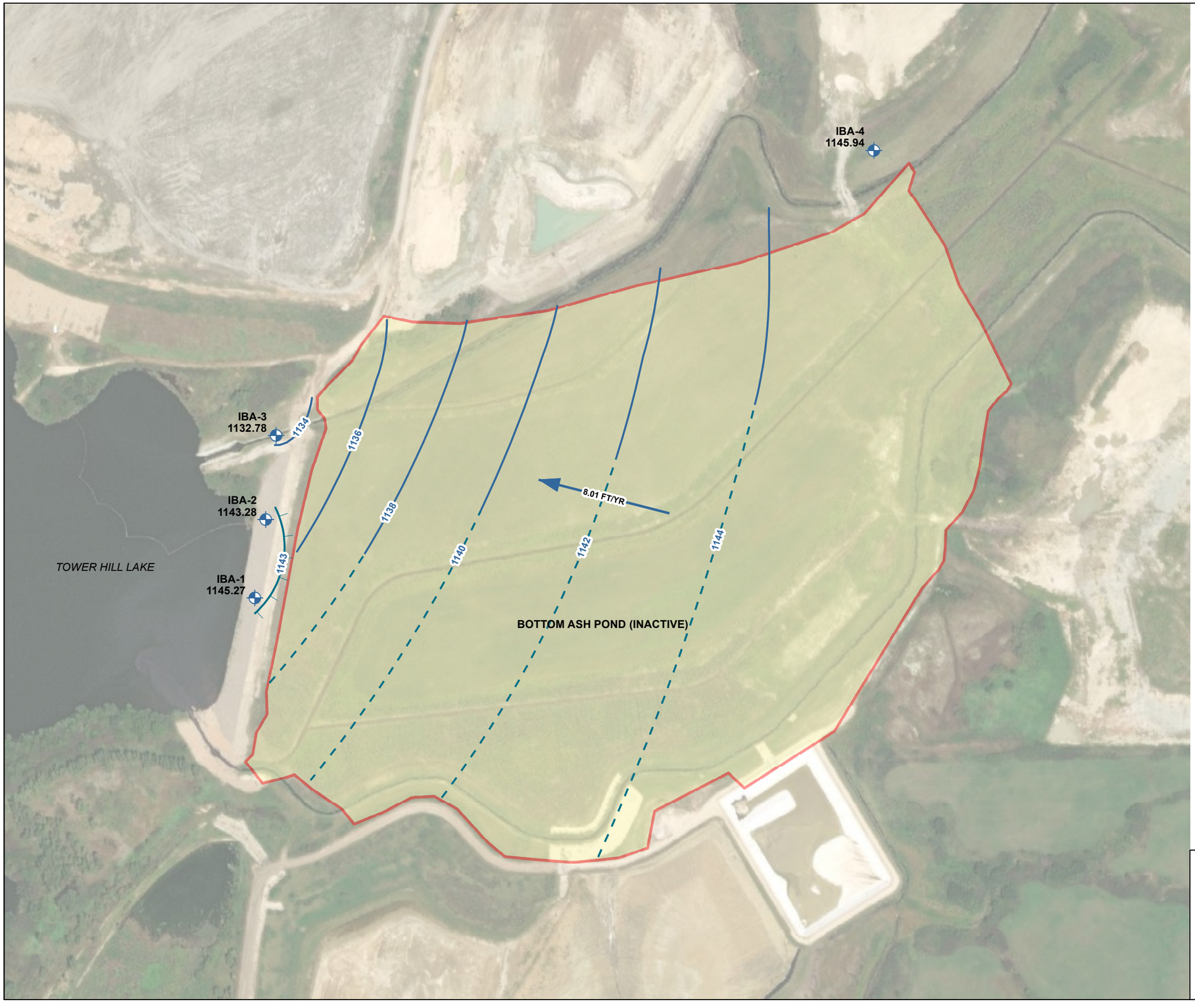
EVERGY KANSAS CENTRAL, INC.
JEFFREY ENERGY CENTER
ST. MARY'S, KANSAS

BOTTOM ASH POND (INACTIVE) GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR MAP OCTOBER 2, 2018

evergy

NOVEMBER 2022

FIGURE 6



LEGEND

IBA-3
1133.73 WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), NOVEMBER 2018

MONITORING WELL

PIEZOMETER OBSERVATION ONLY

ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 2-FT INTERVAL (AMSL), DASHED WHERE INFERRED

GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)

BOTTOM ASH POND (INACTIVE)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 21 NOVEMBER 2018.

3. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETIRIC ELEVATIONS MEASURED 21 NOVEMBER 2018 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.

4. AERIAL IMAGERY SOURCE: ESRI, 3 SEPTEMBER 2019

N

0 300 600
SCALE IN FEET

HALEY ALDRICH

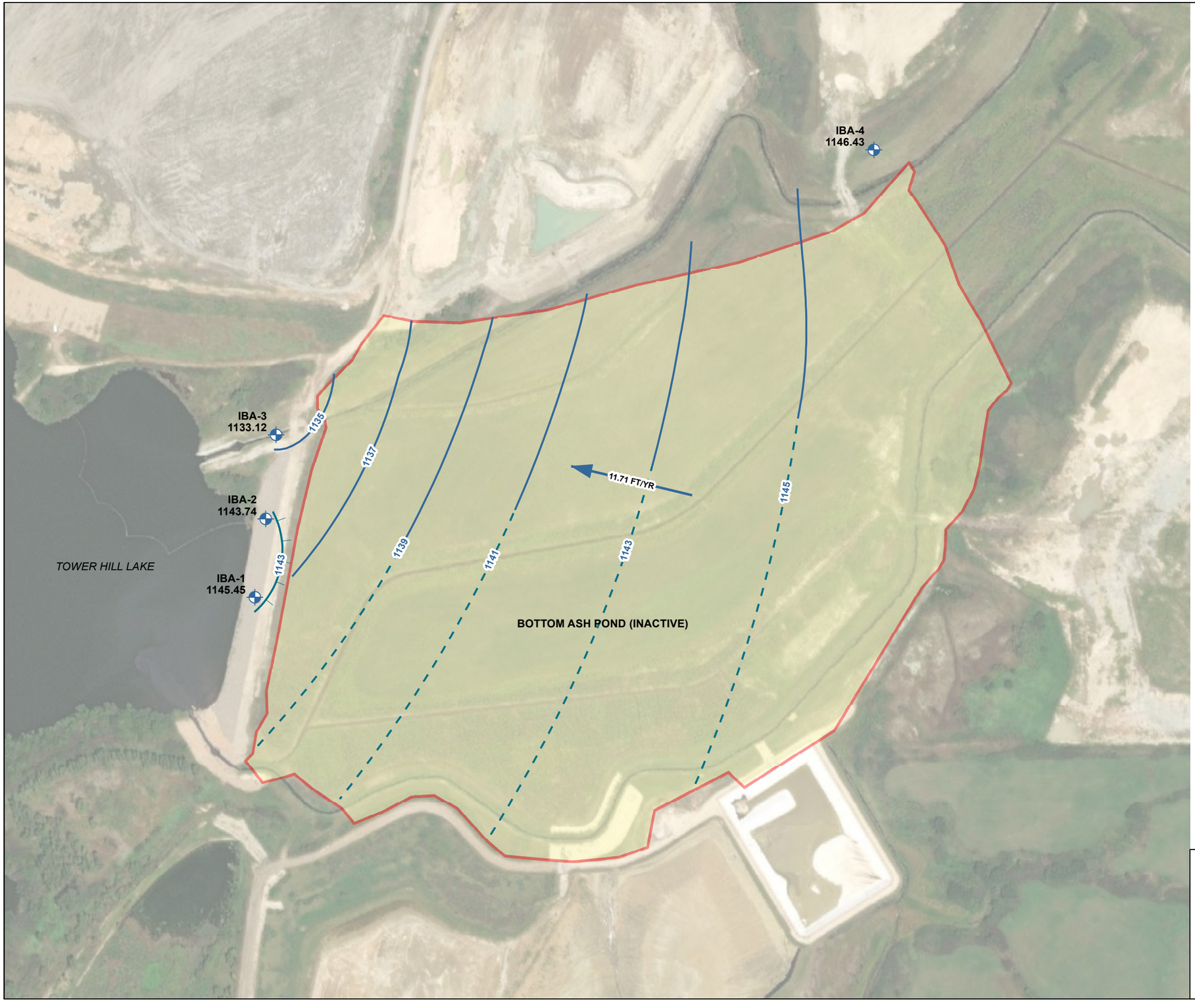
EVERGY KANSAS CENTRAL, INC.
JEFFREY ENERGY CENTER
ST. MARY'S, KANSAS

BOTTOM ASH POND (INACTIVE) GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR MAP NOVEMBER 21, 2018

evergy

NOVEMBER 2022

FIGURE 7



LEGEND

- **IBA-3 1133.73** — WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), JANUARY 2019
- MONITORING WELL
- PIEZOMETER OBSERVATION ONLY
- ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 2-FT INTERVAL (AMSL), DASHED WHERE INFERRED
- GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
- BOTTOM ASH POND (INACTIVE)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 10 JANUARY 2019.

3. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETIRIC ELEVATIONS MEASURED 10 JANUARY 2019 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.

4. AERIAL IMAGERY SOURCE: ESRI, 3 SEPTEMBER 2019

N

0 300 600
SCALE IN FEET

HALEY ALDRICH

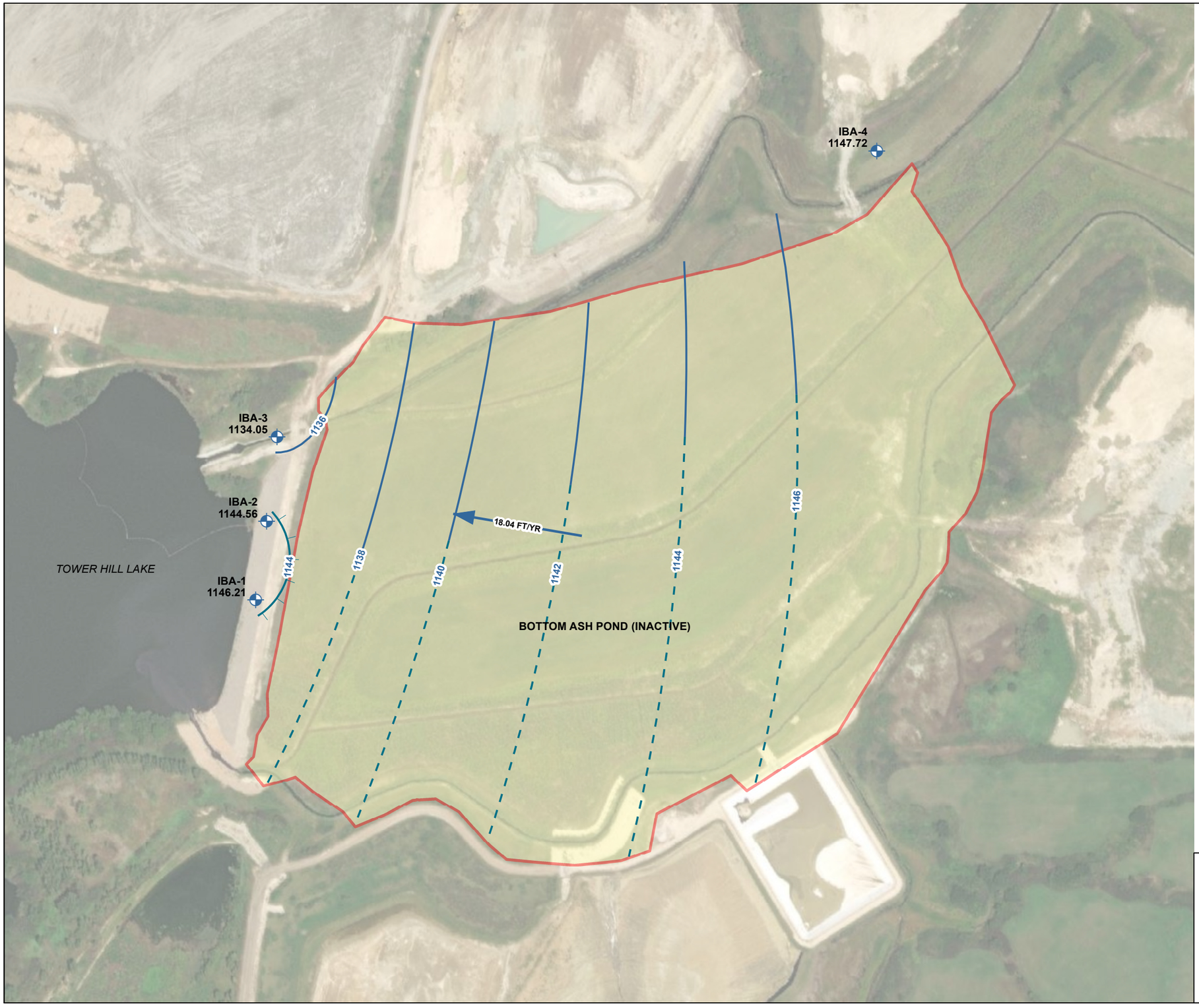
EVERGY KANSAS CENTRAL, INC.
JEFFREY ENERGY CENTER
ST. MARY'S, KANSAS

BOTTOM ASH POND (INACTIVE) GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR MAP JANUARY 10, 2019

evergy

NOVEMBER 2022

FIGURE 8



LEGEND

IBA-3 1133.73	WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), MARCH 2019
	MONITORING WELL
	PIEZOMETER OBSERVATION ONLY
	ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 2-FT INTERVAL (AMSL), DASHED WHERE INFERRED
	GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
	BOTTOM ASH POND (INACTIVE)

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 28 MARCH 2019.

3. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETIRIC ELEVATIONS MEASURED 28 MARCH 2019 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.

4. AERIAL IMAGERY SOURCE: ESRI, 3 SEPTEMBER 2019

N

0 300 600

SCALE IN FEET

HALEY ALDRICH

EVERGY KANSAS CENTRAL, INC.
JEFFREY ENERGY CENTER
ST. MARY'S, KANSAS

BOTTOM ASH POND (INACTIVE) GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR MAP MARCH 28, 2019

evergy

NOVEMBER 2022

FIGURE 9