

# 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** 

# **Table of Contents**

			Page
1.	Intro	oduction	1
2.	40 C	FR § 257.90 Applicability	2
	2.1	40 CFR § 257.90(A)	2
	2.2	40 CFR § 257.90(E) – SUMMARY	2
		2.2.1 Status of the Groundwater Monitoring Program	2
		2.2.2 Key Actions Completed	3
		2.2.3 Problems Encountered	3
		2.2.4 Actions to Resolve Problems	3
		2.2.5 Project Key Activities for Upcoming Year	3
	2.3	40 CFR § 257.90(E) – INFORMATION	3
		2.3.1 40 CFR § 257.90(e)(1) – CCR Unit and Monitoring Well Network	3
		2.3.2 40 CFR § 257.90(e)(2) – Monitoring System Changes	3
		2.3.3 40 CFR § 257.90(e)(3) – Summary of Sampling Events	3
		2.3.4 40 CFR § 257.90(e)(4) – Monitoring Transition Narrative	4
		2.3.5 40 CFR § 257.90(e)(5) – Other Requirements	4

Revision No.	Date	Notes

**Public** 

# **List of Tables**

Table No. Title

I Summary of Analytical Results

# **List of Figures**

Figure No. Title

1 Bottom Ash Pond Monitoring Well Location Map



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 Digitally signed by

Mark Nicholls Digitally signed by Mark Nicholls Date: 2019.07.26 12:32:01 -07'00'



# 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.



**Public** 

# 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

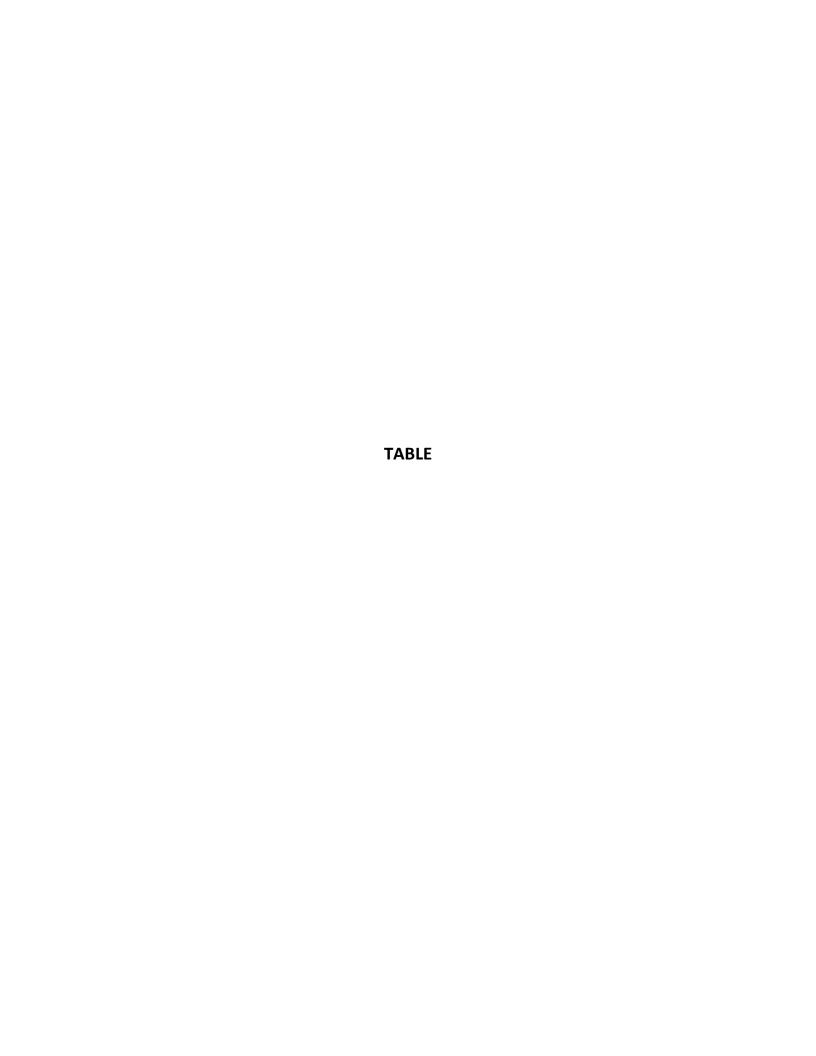
Detection monitoring was conducted in accordance with § 257.94(b), and no transition between monitoring programs occurred for the BAP in calendar year 2018 or prior to July 2019.

#### 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 I SUMMARY OF ANALYTICAL RESULTS

BOTTOM ASH POND WESTAR JEFFREY ENERGY CENTER ST. MARYS, KANSAS

	ocation	Measure Point	Sample Name	Sample Date	Event	Depth to Water	Groundwater Elevation		Field Parame	eters			Detection M	onitoring - US	SEPA Appendi	x III Constitu	ents (mg/L)				Assessme	nt Monitoring -	USEPA Appendi	x IV Constituen	ts (mg/L)		
		Elevation (TOC)	Jan po name	oumple said		(btoc)	(ft AMSL)	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
			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
ŧ			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
adie	IBA-4	1201.86	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
ö	IDA-4	1201.00	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
ᆿ			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
			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	1171.65	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
	15712	11/1.05	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-2-031418	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
<u>ie</u>			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
jr ac	IBA-2	1171.66	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
ρό			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-3-031418	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	1164.95	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



DRAFT for Review Purposes Only

July 2019

Page 2 of 2

BOTTOM ASH POND WESTAR JEFFREY ENERGY CENTER ST. MARYS, KANSAS

le	ocation	Measure Point	Sample Name	Sample Date	Event	Depth to Water	Groundwater Elevation	Assessme	ent Monitorin	g - USEPA Append	lix IV Constitue	ents (mg/L)	Assessment Monitoring - USEPA Appendix IV Constituents (pCi/L)
_		Elevation (TOC)		oumpie zute		(btoc)	(ft AMSL)	Lithium, Total	Mercury, Total	Molybdenum, Total	Selenium, Total	Thallium, Total	Radium-226 & 228 Combined
			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
Ę			IBA-4-070518	7/2/2018	Round 3	57.41	1144.45	0.031	<0.00020	0.0019	<0.0010	<0.0010	1.26
Up Gradient	IBA-4	1201.86	IBA-4-081518	8/15/2018	Round 4	56.50	1145.36	0.035	<0.00020	0.0019	<0.0010	<0.0010	1.26
ອັ	IDA-4	1201.00	IBA-4-100218	10/2/2018	Round 5	56.42	1145.44	0.032	<0.00020	0.0018	<0.0010	<0.0010	1.00
ᆿ			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
			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	1171.65	IBA-1-081518	8/15/2018	Round 4	26.09	1145.56	0.015	<0.00020	0.0069	<0.0010	<0.0010	0.397
	15/(1	1171.03	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-2-031418	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
ie.			IBA-2-070518	7/5/2018	Round 3	28.12	1143.54	0.019	<0.00020	0.0022	<0.0010	<0.0010	0.187
jrac	IBA-2	1171.66	IBA-2-081518	8/15/2018	Round 4	28.09	1143.57	0.020	<0.00020	0.0022	<0.0010	<0.0010	0.691
Down Gradient	15712	2272.00	IBA-2-100218	10/2/2018	Round 5	28.90	1142.76	0.020	<0.00020	0.0022	<0.0010	<0.0010	0.445
ő			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-3-031418	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	1164.95	IBA-3-081518	8/15/2018	Round 4	32.50	1132.45	0.019	<0.00020	0.0021	<0.0010	<0.0010	1.05
		22055	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

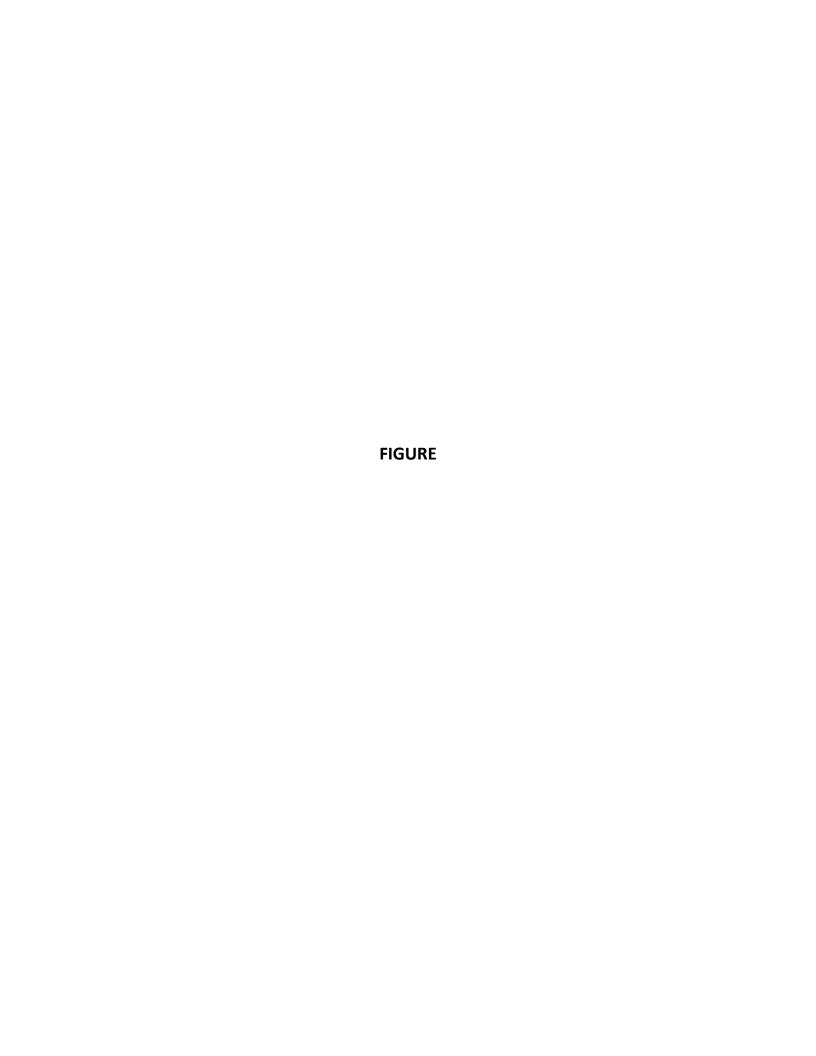
su: standard units

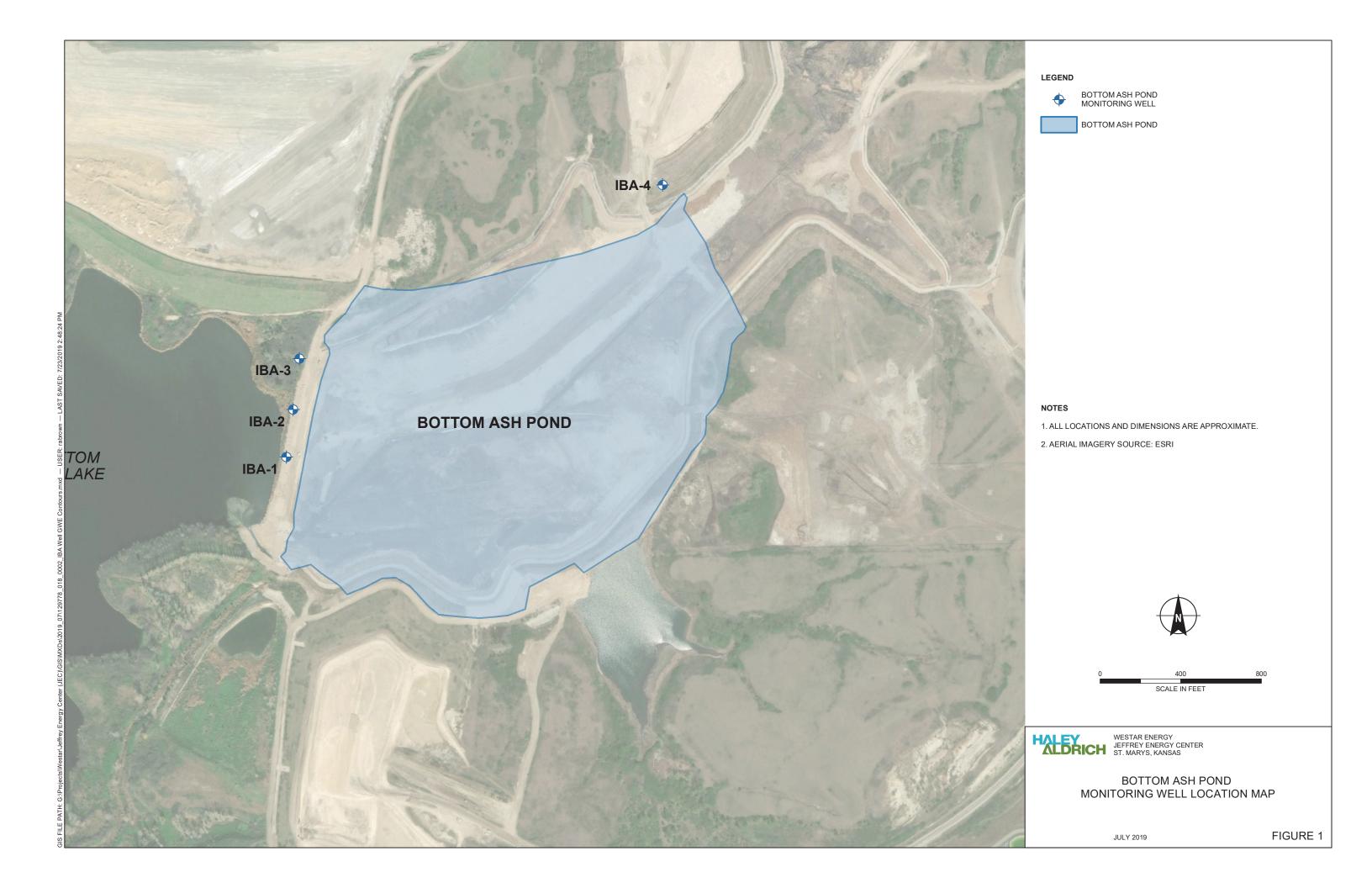
USEPA: United States Environmental Protection Agency



DRAFT for Review Purposes Only

July 2019







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

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

Evergy Kansas Central, Inc. November 10, 2022 Page 2

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



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,

Dearton M. Wilson

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







#### **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



# **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	



# **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

(913)599-5665



# **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



#### **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.



#### **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.

(913)599-5665



#### **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.



#### **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.

(913)599-5665



#### **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:**

(913)599-5665



#### **PROJECT NARRATIVE**

Project: JEC IBA CCR
Pace Project No.: 60266067

Method:Total Radium CalculationDescription:Total Radium 228+226Client:WESTAR ENERGYDate: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:**



#### **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

(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.

(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.



Project: JEC IBA CCR
Pace Project No.: 60266067

Date: 04/10/2018 04:50 PM

Sample: IBA-4-031318	Lab ID: 602	266067001	Collected: 03/13/1	8 16:37	Received: 03	3/16/18 06:20 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	).7 Preparation Met	hod: EP	A 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	3 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	3 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 Me	thod: EPA 200	0.8 Preparation Met	hod: EP	A 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 Me	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Me	thod: SM 254	oc oc					
Total Dissolved Solids	599	mg/L	5.0	1		03/17/18 12:17	•	
4500H+ pH, Electrometric	Analytical Me	thod: SM 450	O-H+B					
oH at 25 Degrees C	7.3	Std. Units	0.10	1		03/21/18 10:28	3	H6
300.0 IC Anions 28 Days	Analytical Me	thod: EPA 300	0.0					
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	



Project: JEC IBA CCR
Pace Project No.: 60266067

Date: 04/10/2018 04:50 PM

Sample: IBA-3-031418	Lab ID: 60	266067002	Collected: 03/14/1	8 10:02	Received: 03	3/16/18 06:20 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	.7 Preparation Met	hod: EP	A 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		04/05/18 17:36		
Calcium, Total Recoverable	246	mg/L	0.20	1		04/05/18 17:36		
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		04/05/18 17:36		
_ithium	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 Me	thod: EPA 200	.8 Preparation Met	hod: EP	A 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 Me	thod: EPA 245	.1 Preparation Met	hod: EP	A 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 Me	thod: SM 2540	C					
Total Dissolved Solids	1490	mg/L	5.0	1		03/20/18 13:17		
4500H+ pH, Electrometric	Analytical Me	thod: 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 Me	thod: 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	14808-70-8	



Project: JEC IBA CCR
Pace Project No.: 60266067

Date: 04/10/2018 04:50 PM

Sample: IBA-2-031418	Lab ID: 602	266067003	Collected: 03/14/1	8 11:22	Received: 03	/16/18 06:20 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Met	hod: EPA 200	).7 Preparation Met	hod: EF	PA 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	
_ithium	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 Met	hod: EPA 200	0.8 Preparation Met	hod: EF	PA 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 Met	hod: EPA 245	5.1 Preparation Met	hod: EF	PA 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 Met	hod: SM 2540	OC					
Total Dissolved Solids	1220	mg/L	5.0	1		03/20/18 13:17		
1500H+ pH, Electrometric	Analytical Met	hod: SM 4500	0-H+B					
oH at 25 Degrees C	7.1	Std. Units	0.10	1		03/30/18 12:03		H6
300.0 IC Anions 28 Days	Analytical Met	hod: EPA 300	0.0					
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	



Project: JEC IBA CCR
Pace Project No.: 60266067

Date: 04/10/2018 04:50 PM

Sample: IBA-1-031418	Lab ID: 602	266067004	Collected: 03/14/1	8 13:30	Received: 03	/16/18 06:20 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	.7 Preparation Met	hod: EP	A 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	
∟ead, Total Recoverable	<0.010	mg/L	0.010	1	04/03/18 10:15	04/05/18 17:42	7439-92-1	
ithium	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 Me	thod: EPA 200	.8 Preparation Met	hod: EP	A 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	
45.1 Mercury	Analytical Me	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Me	thod: SM 2540	OC					
Total Dissolved Solids	1740	mg/L	5.0	1		03/20/18 13:18	;	
1500H+ pH, Electrometric	Analytical Me	thod: SM 4500	)-H+B					
oH at 25 Degrees C	7.2	Std. Units	0.10	1		03/30/18 12:07	•	H6
800.0 IC Anions 28 Days	Analytical Me	thod: EPA 300	0.0					
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		



Project: JEC IBA CCR
Pace Project No.: 60266067

Date: 04/10/2018 04:50 PM

Sample: DUP-031418	Lab ID: 602	266067005	Collected: 03/14/1	8 06:00	Received: 03	8/16/18 06:20 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	0.7 Preparation Met	hod: EP	A 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	
_ithium	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 Me	thod: EPA 200	0.8 Preparation Met	hod: EP	A 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 Me	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Me	thod: SM 2540	oc					
Total Dissolved Solids	1220	mg/L	5.0	1		03/20/18 13:18		
1500H+ pH, Electrometric	Analytical Me	thod: SM 4500	D-H+B					
oH at 25 Degrees C	7.1	Std. Units	0.10	1		03/21/18 10:29		H6
300.0 IC Anions 28 Days	Analytical Me	thod: EPA 300	0.0					
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	



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

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Mercury mg/L <0.00020 0.00020 03/23/18 10:12

LABORATORY CONTROL SAMPLE: 2122378

Date: 04/10/2018 04:50 PM

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2122379 2122380

MS MSD 60265852001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual ND 0.0054 70-130 2 20 Mercury mg/L .005 .005 0.0053 106 109

MATRIX SPIKE SAMPLE: 2122381

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

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.



Project: JEC IBA CCR
Pace Project No.: 60266067

Date: 04/10/2018 04:50 PM

 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	Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Barium	mg/L		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	
ead	mg/L	1	1.0	104	85-115	
ithium	mg/L	1	1.0	102	85-115	

MATRIX SPIKE & MATRIX SPI	IKE DUPLICA	ATE: 21291	41		2129142							
			MS	MSD								
	6	0266067001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	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.



Project: JEC IBA CCR
Pace Project No.: 60266067

Date: 04/10/2018 04:50 PM

 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	ma/L	< 0.0010	0.0010	03/30/18 19:00	

LABORATORY CONTROL SAMPLE:	2125939					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% 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 S	PIKE DUPLIC	ATE: 21259	40		2125941							
			MS	MSD								
	6	0266743001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	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	

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.



Matrix: Water

Project: JEC IBA CCR
Pace Project No.: 60266067

QC Batch: 518013

QC Batch Method: SM 2540C

Associated Lab Samples:

60266067001

Analysis Method: SM 2540C Analysis Description: 2540C Tota

2540C Total Dissolved Solids

METHOD BLANK: 2120266

Associated Lab Samples: 60266067001

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L <5.0 5.0 03/17/18 12:10

LABORATORY CONTROL SAMPLE: 2120267

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

SAMPLE DUPLICATE: 2120268

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

SAMPLE DUPLICATE: 2120269

Date: 04/10/2018 04:50 PM

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



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

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L <5.0 5.0 03/20/18 13:12

LABORATORY CONTROL SAMPLE: 2121683

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

SAMPLE DUPLICATE: 2121684

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

SAMPLE DUPLICATE: 2121685

Date: 04/10/2018 04:50 PM

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



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

Date: 04/10/2018 04:50 PM

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

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.



SM 4500-H+B

4500H+B pH

Project: JEC IBA CCR
Pace Project No.: 60266067

0020007

QC Batch: 518868 Analysis Method:
QC Batch Method: SM 4500-H+B Analysis Description:

Associated Lab Samples: 60266067002

SAMPLE DUPLICATE: 2123717

Date: 04/10/2018 04:50 PM

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

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.



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

Date: 04/10/2018 04:50 PM

 Parameter
 Units
 60266067003 Result
 Dup Result
 Max RPD
 Max RPD
 Qualifiers

 pH at 25 Degrees C
 Std. Units
 7.1
 7.2
 1
 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.



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

Blank Reporting

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

LABORATORY CONTROL SAMPLE: 2129600

Date: 04/10/2018 04:50 PM

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chloride 5 4.5 91 90-110 mg/L Fluoride 2.5 2.4 97 90-110 mg/L

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2129601 2129602

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

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

Qualifiers



#### **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

Blank Reporting
Parameter Units Result Limit Analyzed

 Chloride
 mg/L
 <1.0</th>
 1.0
 04/04/18 20:03

 Sulfate
 mg/L
 <1.0</td>
 1.0
 04/04/18 20:03

LABORATORY CONTROL SAMPLE: 2130428

Date: 04/10/2018 04:50 PM

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2130429 2130430

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



Project: JEC IBA CCR
Pace Project No.: 60266067

<b>Sample: IBA-4-031318</b> PWS:	<b>Lab ID:</b> 602660676 Site ID:	OO1 Collected: 03/13/18 16:37 Sample Type:	Received:	03/16/18 06:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.356 ± 0.542 (0.934) C:NA T:80%	pCi/L	04/04/18 11:14	13982-63-3	
Radium-228		0.451 ± 0.410 (0.837) C:67% T:86%	pCi/L	04/03/18 10:57	7 15262-20-1	
Total Radium	Total Radium Calculation	0.807 ± 0.952 (1.77)	pCi/L	04/10/18 13:59	9 7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60266067

<b>Sample: IBA-3-031418</b> PWS:	<b>Lab ID:</b> 602660 Site ID:	67002	Collected: 03/14/18 10:02 Sample Type:	Received:	03/16/18 06:20	Matrix: Water	
Parameters	Method	Ac	et ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1		2 ± 0.449 (0.863) 3 T:88%	pCi/L	04/04/18 11:28	13982-63-3	
Radium-228	EPA 904.0		3 ± 0.377 (0.826) % T:82%	pCi/L	04/03/18 10:5	7 15262-20-1	
Total Radium	Total Radium Calculation	0.325	5 ± 0.826 (1.69)	pCi/L	04/10/18 13:59	9 7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60266067

<b>Sample: IBA-2-031418</b> PWS:	<b>Lab ID</b> : <b>60266067</b> Site ID:	003 Collected: 03/14/18 11:22 Sample Type:	Received:	03/16/18 06:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.188 ± 0.475 (0.882) C:NA T:95%	pCi/L	04/04/18 11:14	13982-63-3	
Radium-228		0.729 ± 0.429 (0.791) C:70% T:80%	pCi/L	04/03/18 10:5	7 15262-20-1	
Total Radium	Total Radium Calculation	0.917 ± 0.904 (1.67)	pCi/L	04/10/18 13:5	9 7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60266067

<b>Sample: IBA-1-031418</b> PWS:	<b>Lab ID:</b> 60266067 Site ID:	<b>Collected:</b> 03/14/18 13:30 Sample Type:	Received:	03/16/18 06:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.187 ± 0.405 (0.747) C:NA T:86%	pCi/L	04/04/18 11:14	13982-63-3	
Radium-228		2.93 ± 0.808 (0.972) C:69% T:85%	pCi/L	04/03/18 10:57	7 15262-20-1	
Total Radium	Total Radium Calculation	3.12 ± 1.21 (1.72)	pCi/L	04/10/18 13:59	9 7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60266067

Sample: DUP-031418 PWS:	<b>Lab ID: 60266067</b> Site ID:	7005 Collected: 03/14/18 06:00 Sample Type:	Received:	03/16/18 06:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.261 ± 0.479 (0.855) C:NA T:85%	pCi/L	04/04/18 11:14	13982-63-3	
Radium-228		1.20 ± 0.471 (0.719) C:72% T:89%	pCi/L	04/03/18 10:5	7 15262-20-1	
Total Radium	Total Radium Calculation	1.46 ± 0.950 (1.57)	pCi/L	04/10/18 13:5	9 7440-14-4	



#### **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  $\pm$  0.483 (0.678) C:NA T:90% pCi/L 04/04/18 11:14

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.



#### **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

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.



#### **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**

Date: 04/10/2018 04:50 PM

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.



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: JEC IBA CCR
Pace Project No.: 60266067

Date: 04/10/2018 04:50 PM

60266067001 60266067002 60266067003 60266067004 60266067001 60266067002 60266067004 60266067004 60266067001 60266067002 60266067001 60266067004 60266067005 60266067001 60266067001 60266067001 60266067002 60266067003 60266067003 60266067003 60266067003	IBA-4-031318	QC Batch Method	QC Batch	<b>Analytical Method</b>	Analytica Batch
60266067003 60266067004 60266067005 60266067001 60266067003 60266067004 60266067005 60266067001 60266067004 60266067004 60266067004 60266067005 60266067001 60266067001 60266067002 60266067003 60266067004	ID A 2 024 449	EPA 200.7	520220	EPA 200.7	520274
60266067004 60266067001 60266067002 60266067003 60266067004 60266067001 60266067002 60266067003 60266067004 60266067004 60266067005 60266067001 60266067002 60266067002 60266067003 60266067004	IBA-3-031418	EPA 200.7	520220	EPA 200.7	520274
0266067005 0266067001 0266067002 0266067004 0266067005 0266067001 0266067002 0266067004 0266067004 0266067005 0266067001 0266067001 0266067002 0266067002 0266067003 0266067003	IBA-2-031418	EPA 200.7	520220	EPA 200.7	520274
0266067001 0266067002 0266067003 0266067004 0266067005 0266067001 0266067002 0266067004 0266067005 0266067001 0266067001 0266067002 0266067002 0266067003 0266067003	IBA-1-031418	EPA 200.7	520220	EPA 200.7	520274
0266067002 0266067003 0266067004 0266067005 0266067001 0266067002 0266067004 0266067005 0266067001 0266067002 0266067002 0266067003 0266067004	DUP-031418	EPA 200.7	520220	EPA 200.7	520274
60266067003 60266067004 60266067005 60266067001 60266067002 60266067004 60266067005 60266067001 60266067002 60266067003 60266067004	IBA-4-031318	EPA 200.8	519351	EPA 200.8	519373
0266067004 0266067005 0266067001 0266067002 0266067004 0266067005 0266067001 0266067002 0266067003 0266067004	IBA-3-031418	EPA 200.8	519351	EPA 200.8	519373
0266067005 0266067001 0266067002 0266067003 0266067004 0266067005 0266067001 0266067002 0266067003 0266067004	IBA-2-031418	EPA 200.8	519351	EPA 200.8	519373
0266067001 0266067002 0266067003 0266067004 0266067005 0266067001 0266067002 0266067003 0266067004	IBA-1-031418	EPA 200.8	519351	EPA 200.8	519373
0266067002 0266067003 0266067004 0266067005 0266067001 0266067002 0266067003 0266067004	DUP-031418	EPA 200.8	519351	EPA 200.8	519373
0266067003 0266067004 0266067005 0266067001 0266067002 0266067003 0266067004	IBA-4-031318	EPA 245.1	518498	EPA 245.1	518777
0266067004 0266067005 0266067001 0266067002 0266067003 0266067004	IBA-3-031418	EPA 245.1	518498	EPA 245.1	518777
0266067005 0266067001 0266067002 0266067003 0266067004	IBA-2-031418	EPA 245.1	518498	EPA 245.1	518777
0266067001 0266067002 0266067003 0266067004	IBA-1-031418	EPA 245.1	518498	EPA 245.1	518777
60266067002 60266067003 60266067004	DUP-031418	EPA 245.1	518498	EPA 245.1	518777
0266067003 0266067004	IBA-4-031318	EPA 903.1	292073		
0266067004	IBA-3-031418	EPA 903.1	292073		
	IBA-2-031418	EPA 903.1	292073		
0266067005	IBA-1-031418	EPA 903.1	292073		
0200001000	DUP-031418	EPA 903.1	292073		
0266067001	IBA-4-031318	EPA 904.0	292079		
0266067002	IBA-3-031418	EPA 904.0	292079		
0266067003	IBA-2-031418	EPA 904.0	292079		
0266067004	IBA-1-031418	EPA 904.0	292079		
0266067005	DUP-031418	EPA 904.0	292079		
0266067001	IBA-4-031318	Total Radium Calculation	294162		
0266067002	IBA-3-031418	Total Radium Calculation	294162		
0266067003	IBA-2-031418	Total Radium Calculation	294162		
0266067004	IBA-1-031418	Total Radium Calculation	294162		
0266067005	DUP-031418	Total Radium Calculation	294162		
0266067001	IBA-4-031318	SM 2540C	518013		
0266067002	IBA-3-031418	SM 2540C	518303		
0266067003	IBA-2-031418	SM 2540C	518303		
0266067004	IBA-1-031418	SM 2540C	518303		
0266067005	DUP-031418	SM 2540C	518303		
60266067001	IBA-4-031318	SM 4500-H+B	518470		
0266067002	IBA-3-031418	SM 4500-H+B	518868		
60266067003		SM 4500-H+B	519635		
60266067004	IBA-2-031418	SM 4500-H+B	519635		
60266067005	IBA-2-031418 IBA-1-031418	OIVI TOUG TITE			
60266067001		SM 4500-H+B	518470		
0266067001	IBA-1-031418				

# **REPORT OF LABORATORY ANALYSIS**

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



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: JEC IBA CCR
Pace Project No.: 60266067

Date: 04/10/2018 04:50 PM

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		



# Sample Condition Upon Receipt



Client Name: Wester Energy		
Courier: FedEx   UPS   VIA Clay	PEX D ECI D	Pace ☐ Xroads ☐ Client ☐ Other ☐
Tracking #:	Pace Shipping Label Use	d? Yes □ No
Custody Seal on Cooler/Box Present: Yes No	□ Seals intact: Yes	<b>♂</b> No □
Packing Material: Bubble Wrap ☐ Bubble B	Bags □ Foam □	None  Other  Zolc
Thermometer Used:	ype of Ice: Wet Blue No	one
Cooler Temperature (°C): As-read 4.5 Corr	Factor 10.2 Correct	eted 4.7 Date and initials of person examining contents: 3/14/18
Temperature should be above freezing to 6°C		
Chain of Custody present:	<del>Yo</del> s □No □N/A	
Chain of Custody relinquished:	₩es □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 □N/A	1
Sufficient volume:	✓ Yes □No □N/A	
Correct containers used:	Yes No No/A	
Pace containers used:	√Yes □No □N/A	
Containers intact:	Yes ONo ON/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs	s? □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?	Yes ONo ON/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
(HNO <sub>3</sub> , H₂SO <sub>4</sub> , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)		date/time added.
Cyanide water sample checks:		1
Lead acetate strip turns dark? (Record only)	□Yes □No	
Potassium iodide test strip turns blue/purple? (Preserve	Yes No	2
Trip Blank present:	□Yes □No □N/A	
Headspace in VOA vials ( >6mm):	□Yes □No □N/A	
Samples from USDA Regulated Area: State:	□Yes □No ÆN/A	
Additional labels attached to 5035A / TX1005 vials in the	e 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:	-	
.07 .001		
Project Manager Review:	Da	te: 3/10/18



# **CHAIN-OF-CUSTODY / Analytical Request Document**

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

Section A Required Client Information:	Section B Required Project Information:			Section C	mation:			Page:	of
Company: WESTAR ENERGY	Report To: Brandon Griffin			Attention:			7		
Address, 818 Kansas Ave	Copy To: Jared Morrison			Company Na	ime;		REGULATORY A	GENCY	and the state of
Topeka, KS 66612				Address:			NPDES T	GROUND WATE	ER DRINKING WATER
Email To: <u>brandon.l.griffin@westarenergy.co</u> ı	m Purchase Order No.:			Pace Quote Reference:			T UST T	RCRA	OTHER
Phone 785-575-8135 Fax:	Project Name: JEC IBA C	CR		Pace Project Manager:	Jenalee Converse	913-563-1401	Site Location		
Requested Due Date/TAT: 7 day	Project Number:	_		Pace Profile #	9657		STATE:	KS	
				1		Requested	Analysis Filtered	Y/N)	
Section D Valid Matrix Required Client Information MATRIX DENVING M2	9 월 일	COLLECTED			Preservatives	z >			
WATER WASTE WAT PRODUCT SOULSOUD		MPOSITE COME START END	POSITE OD AND AND AND AND AND AND AND AND AND AN			***		(Y/N)	
SAMPLE ID WIPE ARE OTHER Sample IDs MUST BE UNIQUE TISSUE	ATRIX CODE		AMPLE TEMP AT	ontainer	HNO <sub>3</sub> HCI NaOH NaS <sub>2</sub> O <sub>3</sub> Methanol Other	#Analysis Test# 200.7 Total Metals* 200.8 Total Metals* 245.1 Total Hg	2540C TDS 4500 H+B Ra226/ Ra228	Residual Chlorine (Y/N)	Collock 7
T D A 11 001010	Z Ø DATE	TIME DATE		5 [	4	Belu.	2 BP, N 2 BP		Pace Project No./ Lab I.D.
1 IBA-4-03(3(8) 2 IBA-3-03/4/8	w7 G	3/14	1002	51	4	Dria,	20110, 201	,20	as
3 IBA - 2 -031418	wT G	3/14	1/22	51	9				us
4 IBA-1-031418	WTG	3/14		51	4				N
5									
6									
7									
8									
9									
10 Oup-031418	WT 6	3/14	0600	51	4	BPILL 2	BPIN 2BP31	1	45
11									
12									
ADDITIONAL COMMENTS 200.7 Total Metals*: B, Ca, Ba, Be, Cr, Pb, Li	RELINQUISHED B		DATE	TIME		D BY / AFFILIATION		TIME	SAMPLE CONDITIONS
200.8 Total Metals**: Sb, As, Cd, Co, Mo, Se, TI	15/1/ / W	restar	3/14/18	1600	EBrac los	+ 1 Pasi	3 16 06	20 4.5	4 4 4
D									
Ğ e		SAMPLER NAME	AND SIGNATU	RE				Į.	on (1)
Page 41 of 43			me of SAMPLER	KA PIECE	lon Griff	DATE Signed	د / ر	Temp in °C	Received on Ice (Y/N) Custody Sealed Cooler (Y/N) Samples Intact (Y/N)
43		SIGNATI	RE of SAMPLER	13	YY	(MM/DD/YY):	03/14/18	1	Sag Curs

	Samples were sent directly to the Subcontracting Laboratory.							State Of Origin:			KS			Pac	e Analytica		
Workorder: 60266067 Workorder Name: JEC IBA CCR Report To Subcontract To						1000000	Owner Received Date:			3/16/2018	Resul	Results Requested By		/: 4/10/2018			
Pac 960 Len	)8 Loiret iexa, KS	tical Kansas		1638 Suites Greer	Analytical Pittsl Roseytown Roa 5 2,3, & 4 nsburg, PA 156 € (724)850-560	ad 0					ładium 226	Radium 228	Requeste  WO#:  30246760	30 <u>2</u>	467	'60	
tem	Sampl	e ID	Sample Type	Collect Date/Time	Lab ID	Matrix	HNO3	served Co	ntainei	'S.	_			7,2,2,2,3	777		
1	IBA-4-03	1318	PS	3/13/2018 16:37	60266067001	Water	2				$\overline{}$	<del>-, </del> -					LAB USE ONLY
2	IBA-3-03	1418	PS	3/14/2018 10:02	60266067002	Water	2				X	X					001
3	IBA-2-03	1418	PS	3/14/2018 11:22	60266067003	Water	2				X	X					002
	IBA-1-03	1418	PS	3/14/2018 13:30	60266067004	Water	2		-		X	X					003
5	DUP-031	418	PS	3/14/2018 06:00	60266067005	Water	2				X	X					004
1400	# Control of the					T VUICI			SESS SEE(2.00087	7,631,665,0	<u> </u>	X	N/IEE/ANDSGESSACTORS				
Tran	sfers	Released By		Date/Time	Received E	Ву	***************************************	nter rate nimen sin.	Date	/Time				Co	omments	No Color (S)	
2		EBROCKETT	183;	Sinlis i	sso Johle	ghun	IPac	0				010					
	oler Ter	l nperature on Re	ceipt 14	°C Cus		-											
				location/name	tody Seal / Y	<u>or</u> N		Rec	eived	on l	cel	Υ )οι	r N	C-		-44 X-	for 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:		Ĺ	ace	į KS	Project # 30 2 4 6 7 6
Courier: Fed Ex UPS USPS Clie Tracking #: 4122 4945 0327	nt [	Lomi	mercia	Pace Other	Label ())
Custody Seal on Cooler/Box Present:		nn	Se	als intact: 🗓 yes	no
Thermometer Used			· ·	let Blue None	
Cooler Temperature Observed Temp	U	° C	<b>\</b>	rrection Factor: 10	) (°) °C Final Temp: 1.4 °C
Temp should be above freezing to 6°C	<u> </u>	_		Toda Trade I	7 marremp. 1.
•				pH paper Lot#	Date and Initials of person examining
Comments:	Yes	s N	o N/.	a 100107 L	contents: 17 11 370 18
Chain of Custody Present:	一人			1,	
Chain of Custody Filled Out:	<u> </u>	.		2.	
Chain of Custody Relinquished:	1>			3.	
Sampler Name & Signature on COC:		X		4.	
Sample Labels match COC;	X			5.	
-Includes date/time/ID Matrix:	WI	_			
Samples Arrived within Hold Time:				6.	
Short Hold Time Analysis (<72hr remaining):		X		7.	
Rush Turn Around Time Requested:		X	,	8.	
Sufficient Volume:	X			9.	
Correct Containers Used:	X		1	10.	
-Pace Containers Used:	X				
Containers Intact:	X		Ι.	11.	
Orthophosphate field filtered			X	12.	
Hex Cr Aqueous Compliance/NPDES sample field filtered			X	13.	
Organic Samples checked for dechlorination:			15	14.	
Filtered volume received for Dissolved tests			<b>X</b>	15,	
All containers have been checked for preservation.	X			16. OHI 2	
All containers needing preservation are found to be in compliance with EPA recommendation.	$\nearrow$			PILC	
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when A-M	Date/time of
				Completed // / Lot # of added	preservation
	<del></del>			preservative	
feadspace in VOA Vials ( >6mm):		_,	7	17.	
rip Blank Present:	$-\!$	X		18.	
rip Blank Custody Seals Present			X		
ad Aqueous Samples Screened > 0.5 mrem/hr	_	X		Initial when completed; AM	Date: 3-20-18
lient Notification/ Resolution:			<u>-</u> -	name and a second secon	A STATE OF THE STA
Person Contacted:			Date/Ti	me:	Contacted By:
Comments/ Resolution:					
-					
A check in this box indicates that addition	nnal in	form	ation	has been stored in	a erenorts

Note: Measurather in a discussion of the black of the bla

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

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

ATTACHMENT 1-2
May 2018 Sampling Event
Laboratory Analytical Report



June 15, 2018

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

RE: Project: 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,

Danson Wilson

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







#### **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



# **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



# **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



#### **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



#### **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.



#### **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.



#### **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.



#### **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.



#### PROJECT NARRATIVE

Project: JEC IBA CCR
Pace Project No.: 60270293

Method:Total Radium CalculationDescription:Total Radium 228+226Client:WESTAR ENERGYDate: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.



#### **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.



#### **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.



#### **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.



Project: JEC IBA CCR
Pace Project No.: 60270293

Date: 06/15/2018 02:09 PM

Sample: IBA-4-051118	Lab ID: 602	270293001	Collected: 05/11/1	8 14:42	Received: 05	5/12/18 08:40 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	).7 Preparation Met	hod: EP	A 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	
_ithium	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 Me	thod: EPA 200	0.8 Preparation Met	hod: EP	A 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 Me	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Me	thod: SM 254	OC					
Total Dissolved Solids	592	mg/L	5.0	1		05/17/18 15:27		
1500H+ pH, Electrometric	Analytical Me	thod: SM 450	O-H+B					
oH at 25 Degrees C	7.3	Std. Units	0.10	1		05/15/18 09:32		H6
300.0 IC Anions 28 Days	Analytical Me	thod: EPA 300	0.0					
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



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 Result Limit Analyzed Qualifiers

Mercury mg/L <0.00020 0.00020 06/06/18 09:31

LABORATORY CONTROL SAMPLE: 2165764

Date: 06/15/2018 02:09 PM

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2165765 2165766

MS MSD 60270293001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 0.0049 70-130 3 20 Mercury mg/L < 0.00020 .005 .005 0.0050 100 97

 MATRIX SPIKE SAMPLE:
 2165767

 60271119002
 Spike
 MS
 MS
 % Rec

 Parameter
 Units
 Result
 Conc.
 Result
 % Rec
 Limits
 Qualifiers

Mercury mg/L ND .005 0.0048 95 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.



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

Date: 06/15/2018 02:09 PM

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					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Barium	mg/L		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 S	PIKE DUPLICA	ATE: 21529:	37		2152938						
Parameter	6 Units	0270177002 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						
		60270179036	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	

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.



Project: JEC IBA CCR
Pace Project No.: 60270293

Date: 06/15/2018 02:09 PM

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	

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.



Project: JEC IBA CCR
Pace Project No.: 60270293

Date: 06/15/2018 02:09 PM

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

		Blank	Reporting		
Parameter	Units	Result	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					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% 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 S	SPIKE DUPLICA	ATE: 215836	60		2158361							
Parameter	6 Units	0270477001 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		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						
		60270478001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	

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.



Project: JEC IBA CCR
Pace Project No.: 60270293

Date: 06/15/2018 02:09 PM

MATRIX SPIKE SAMPLE:	2158362						
Daramatar	Lloito	60270478001	Spike	MS	MS % Bas	% Rec Limits	Ouglifiers
Parameter	Units	Result	Conc.	Result	% 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	

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.



Project: JEC IBA CCR
Pace Project No.: 60270293

QC Batch: 526135

QC Batch Method: SM 2540C

Analysis Method: SM 25 Analysis Description: 25400

SM 2540C 2540C Total Dissolved Solids

Associated Lab Samples: 60270293001

METHOD BLANK: 2154376 Matrix: Water

Associated Lab Samples: 60270293001

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L 9.0 5.0 05/17/18 15:27

LABORATORY CONTROL SAMPLE: 2154377

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

SAMPLE DUPLICATE: 2154378

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

SAMPLE DUPLICATE: 2154379

Date: 06/15/2018 02:09 PM

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



Project:

JEC IBA CCR

Pace Project No.:

60270293

QC Batch:

525810

SM 4500-H+B

Analysis Method: Analysis Description: SM 4500-H+B

QC Batch Method:

4500H+B pH

Associated Lab Samples:

60270293001

SAMPLE DUPLICATE: 2153115

Date: 06/15/2018 02:09 PM

60270276002 Result

Dup Result

**RPD** 

Max RPD

Qualifiers

Parameter pH at 25 Degrees C

Units Std. Units

7.3

7.2

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.



Project: JEC IBA CCR
Pace Project No.: 60270293

QC Batch: 528657

QC Batch Method: EPA 300.0

Associated Lab Samples: 60270293001

Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions

METHOD BLANK: 2165647 Matrix: Water

Associated Lab Samples: 60270293001

Date: 06/15/2018 02:09 PM

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					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L		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 SPI	KE DUPLICA	ATE: 21656	49		2165650							
			MS	MSD								
	6	0270293001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	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						
		60271564001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Sulfate	mg/L	8.2	5	13.5	106	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.



# **ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: JEC IBA CCR
Pace Project No.: 60270293

<b>Sample: IBA-4-051118</b> PWS:	<b>Lab ID: 60270293</b> Site ID:	001 Collected: 05/11/18 14:42 Sample Type:	Received:	05/12/18 08:40	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.682 ± 0.445 (0.456) C:NA T:89%	pCi/L	06/04/18 19:52	13982-63-3	
Radium-228		0.584 ± 0.382 (0.723) C:80% T:75%	pCi/L	06/04/18 15:18	3 15262-20-1	
Total Radium	Total Radium Calculation	1.27 ± 0.827 (1.18)	pCi/L	06/05/18 14:09	7440-14-4	



#### **QUALITY CONTROL - RADIOCHEMISTRY**

Project: JEC IBA CCR

Pace Project No.: 60270293

QC Batch: 299196

Analysis Method:

EPA 903.1

QC Batch Method:

EPA 903.1

Analysis Description:

903.1 Radium-226

Associated Lab Samples: 6
METHOD BLANK: 1464853

60270293001

Matrix: Water

Associated Lab Samples:

60270293001

Parameter

Act ± Unc (MDC) Carr Trac

Units pCi/L Analyzed

Qualifiers

Radium-226

0.197 ± 0.301 (0.484) C:NA T:90%

06/04/18 19:23

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.



#### **QUALITY CONTROL - RADIOCHEMISTRY**

Project: JEC I

JEC IBA CCR

Pace Project No.:

60270293

QC Batch:

299175

Analysis Method:

EPA 904.0

QC Batch Method: EF

EPA 904.0

Analysis Description:

904.0 Radium 228

Associated Lab Samples:

60270293001

Matrix: Water

Associated Lab Samples:

METHOD BLANK: 1464830

60270293001

Parameter

Act ± Unc (MDC) Carr Trac

Units pCi/L Analyzed

Qualifiers

Radium-228

0.546 ± 0.373 (0.712) C:85% T:77%

06/04/18 11:56

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.



#### **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**

Date: 06/15/2018 02:09 PM

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.



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: JEC IBA CCR
Pace Project No.: 60270293

Date: 06/15/2018 02:09 PM

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		



# Sample Condition Upon Receipt



Client Name: WESTAIR			
Courier: FedEx □ UPS □ VIA 🗗 Clay □ P	EX 🗆 ECI 🗆	Pace □ Xroads □	Client □ Other □
Tracking #: Pace	Shipping Label Used	i? Yes □ No 🖳	-
Custody Seal on Cooler/Box Present: Yes ☑ No □	Seals intact: Yes	No 🗆	
Packing Material: Bubble Wrap □ Bubble Bags □	Foam □	None □ Othe	er e Esc
Thermometer Used:  Type of	Ice: Wet Blue No	ne	HW
Cooler Temperature (°C): As-read 1, O Corr. Facto	r +1,2 Correct	ed 2.2	Date and initials of person examining contents: 5-12-1
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:	Wes □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:	TYes ONO ON/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	ØYes □No □N/A		
Samples contain multiple phases? Matrix: WT	□Yes □No □N/A		
Containers requiring pH preservation in compliance?	☑Yes □No □N/A		s, lot #'s of preservative and the
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCI<2; NaOH>9 Sulfide, NaOH>10 Cyanide)		date/time added.	
(Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)  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		Field Data Required?	Y / N
Person Contacted: Date/Ti	me:	<u> </u>	
Comments/ Resolution:			
1/1011		0.11/2	:
Project Manager Review:	Dat	e: 2/14/16	



# **CHAIN-OF-CUSTODY / Analytical Request Document**

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

Section A Required Client information:		Section B Required Proj	ect infor	mation:						tion C		on:													Page:		of	
Company: WESTAR ENERGY		Report To: Br	andon	Griffin		ě			Atten	tion:																		``
Address: 818 Kansas Ave		Copy To: Ja	red Mo	orrison					Com	рапу М	Vame:								F	REG	ULAT	ORY	AGE	NCY				
Topeka, KS 66612									Addre	ess:										1	NPDE:	s f	- GF	ROUND	WAT	ER [	DRINKIN	G WATER
Email To: <u>brandon.l.griffin@we</u>	starenergy.com	Purchase Orde	r No.:	10JEC-0	0000033	150			Pace Refer	Quote									7	_	JST		RC	CRA		Ę	OTHER	
Phone: 785-575-8135 Fax:		Project Name:	JEC	IBA CC	R				-8	Project	· }	eath	er W	ilson	913	-563-	1407		7	Site	Locat	tion						
Requested Due Date/TAT: 7 day		Project Numbe	r:							Profile	#: 9	657.	1						-		STA	TE:	-	KS	_			
				_					1		_	_			1	7 3	Real	uest	ed A	nalv	-	-	d (Y/I	V)	VII			
Section D Required Client Information	Valid Matrix Co	odes GODE	MP)		COLL	ECTED					Pi	esen	vativ	es		N /				T			Ì					
SAMPLE ID  (A-Z, 0-9 /) Sample IDs MUST BE UNIQ	WATER WASTE WATER PRODUCT SOIL/SOLID OIL WIPE AIR OTHER	CODE  CODE  DW  WY  WW  SIL  SIL  OL  WP  AR  OT  TS	1 2	COMP STA	OSITE RT	COMPC END/G	OSITE RAS	TEMP AT COLLECTION	AINERS	pa						s Test 4	Total Metals**		SO4	S	26 & 228				Residual Chlorine (Y/N)	697	2792	43
ITEM #		MATRIX CC	_	DATE	TIME	DATE	TIME	SAMPLE	# OF CONTAINERS	Unpreserved	HNO.	HCI	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol	Other	# Analysis	200.8 Total	245.1 Total Hg	300: CI, F,	2540C TD	Radium-226				_		Project	No./ Lab I.D.
1 IBA-4-05	1118	W	16			5/11	1446	\	14	1				Ш	Ц	-				4		131	PIN	(3)	, 3	MU		1001
2								1						_	Ц	-				4			_	H	_			
3									_	Ш		$\perp$		$\perp$	Ш	-	1	Ш						$\vdash$	$\perp$			
4			-				-	-	<u> </u>	$\perp$	-	-	-	-	Н	-	-		-	4		$\perp$	_		$\perp$	-		
5			-		-		-	-	_	H	4	+		-	Н	-	-		4	+		$\vdash$	-	++	+			
6			-		-	-	-	+	_	+	_	-		+	Н	-		H	-	-	+	$\vdash$	+	-	+			
7			+	-		+	-	$\vdash$	-	+	-	+	+	+	Н	ŀ	-	H		+			+	++-	+			
8			+-		-	1	-	+	$\vdash$	+	+		$\dashv$	+	Н	-	+		$\dashv$	-	+	+	+	+	+			
10									1	$\forall$	+		T	+	H	-		H	$\vdash$	+	$\dagger$		+		+			
11			+-				1	1	$\vdash$	$\Box$	7				П	ŀ		T	$\vdash$	+		$\exists$	+	$\vdash$	$\top$			
12										П				$\top$														
ADDITIONAL COMMI	ENTS	RE	LINQU	ISHED BY	AFFILIAT	TON	DAT	E	18	TIME			-	ACCEF	TED	BY / A	FFILV	ATIO	V		DATI		TIM	E		SAMF	PLE CONDIT	TIONS
200,7 Total Metals*: B, Ca, Ba, Be, Cr, Pb	, Li	13	21	//	ues	61	5/11	1/10	11	SOC	)	-	7		_	-		V	1/1	2	-17	10	CASI	10 2		Ч	V	V
200.8 Total Metals**: Sb, As, Cd, Co, Mo,	Se, TI		-				0/											7.			164	(0)			od_			/
P																				1			;				ō	
Page 29 of 3					SAMPL	ER NAME				0					4	7						- 5			Temp in °C	Received on Ice (Y/N)	Cooler (Y/N)	Samples Inlact (YN)
9 of					-	PRINT Nar	_	_		204	100	2	1	500		N	DATE	Cino	art	_	, ,			_	dua	ice (Y	tody	nples (Y/I)
<u> </u>						SIGNATUI	RE of SAMI	PLER	//	Y	/						MMI	ODIY	m C	5/	11/1	8		- [	F :	- A	Sign	Sall

Chain	of Custody	4000 Table Children and Control of Control								Marit Property				
	Samples were sent di	rectly to the	e Subcontract	ing Laborator	y		State	of Or	igin:		KS		Pace	Analytical www.pacelebs.com
ALLEGO AND	r: 60270293 <b>Wo</b> r	korder Na	me:JEC IBA				Own	er Rec	eived	Dat	e: 5/12/2018	Results Requ	uested By:	5/23/2018
Report To			Subcontrac	t To							Requeste	d Analysis		
9608 Loiret Lenexa, KS	tical Kansas Blvd.		1638 R Suites Greens	Analytical Pittsb Roseytown Roa 2,3, & 4 sburg, PA 1560 (724)850-5600	d )1	ale:Pr	eserved Cor	tainers.	-226 & Total Radium	Radium-228	WO#:3	025303 	31	
Item Samp		Sample C Type D	ollect ate/Time	Lab ID	Matrix	HN03	200 mm m m m m m m m m m m m m m m m m m		Radium-226	The state of the s				LAB USE ONLY
1 IBA-4-05	1118	PS 5/	/11/2018 14:42	60270293001	Water	2			X	Х				001
3				<del></del>					_	ļ		200 C		
4												Parameter Control of C		
5										-				
								ugajiya (aja	Navio A			Comment	s said naise na a	
Transfers	Released By	7	Date/Time	Received B	у			Date/T	ime					
1	MI		₹ liq (>4	o Sahar	Jefogo.	NI	-	5157	18 N	74	5			
2			<b>.</b>	No.	1				······································	-				
3				2744					***************************************	-				
Cooler Te	mperature on Receipt	: °°(	C Cus	tody Seal Y	or 🐧	D	Rec	eived o	on Ice	Y	or 🕦	Samples	Intact /Y	or N

<sup>\*\*\*</sup>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 Con-	dition	Upc	n F	Receipt	Granda
Face Analytical Client Name:	1	Dac	el	45	30 2 5 3 0 3 Project #
Courier: Fed Ex UPS USPS Uclie	ent [	Domm	егсіа	I Pace Other	Label (SX)
Tracking #:					LIMS Login WY
Custody Seal on Cooler/Box Present:		no	Se	als intact:  yes	□ no
Thermometer Used	4.		: W	et Blue Node	_
Cooler Temperature Observed Temp		c		rrection Factor:	°C Final Temp: °C
Temp should be above freezing to 6°C	~2	_			
				pH paper Lot#	Date and Initials of person examining, contents:
Comments:	Yes	No	N/A	A 1017/471	contents. 12 17 19
Chain of Custody Present:			<u> </u>	1.	
Chain of Custody Filled Out:	- Annual Control			2.	
Chain of Custody Relinquished:	· James de la company		<u> </u>	3.	
Sampler Name & Signature on COC:		- Company		4.	
Sample Labels match COC:	-			5.	
-Includes date/time/ID Matrix:	بلر	上			
Samples Arrived within Hold Time:				6.	
Short Hold Time Analysis (<72hr remaining):			,	7.	
Rush Turn Around Time Requested:		A STATE OF THE PARTY OF THE PAR		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			A STATE OF THE PARTY OF THE PAR	13.	
Organic Samples checked for dechlorination:		4		14.	
Filtered volume received for Dissolved tests			· ·	15.	
All containers have been checked for preservation.				16. ph 22	
All containers needing preservation are found to be in		į		p.12	ļ
compliance with EPA recommendation.	<u> </u>			Initial when h	Date/time of
exceptions: VOA, coliform, TOC, O&G, Phenolics				completed //	preservation
				Lot # of added preservative	
leadspace in VOA Vials ( >6mm):			1	17.	
rip Blank Present:				18.	
rip Blank Custody Seals Present		-	-		1
ad Aqueous Samples Screened > 0.5 mrem/hr	مرا	1		nitial when ompleted:	Date: <~1518
lient Notification/ Resolution:	<u> </u>	<u> </u>		Simpletod. []	7 (///
Person Contacted:		Da	te/Tir	ne:	Contacted By:
Comments/ Resolution:				Water III	

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.



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,

Starton M. Wilson

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



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



# **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



# **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



#### **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



#### **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.



#### **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.



#### **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.



#### **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.



#### **PROJECT NARRATIVE**

Project: JEC IBA CCR
Pace Project No.: 60270434

Method:Total Radium CalculationDescription:Total Radium 228+226Client:WESTAR ENERGYDate: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:**



#### **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



#### **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.



#### **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.



Project: JEC IBA CCR
Pace Project No.: 60270434

Date: 06/15/2018 01:20 PM

Sample: IBA-3-051418	Lab ID: 602	270434001	Collected: 05/14/1	8 10:30	Received: 05	5/15/18 16:35 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Met	thod: EPA 200	.7 Preparation Met	hod: EP	A 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	
_ithium	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 Met	thod: EPA 200	.8 Preparation Met	hod: EP	A 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 Met	thod: EPA 245	.1 Preparation Met	hod: EP	A 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 Met	thod: SM 2540	OC					
Total Dissolved Solids	1580	mg/L	5.0	1		05/17/18 15:27		
1500H+ pH, Electrometric	Analytical Met	thod: 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 Met	thod: EPA 300	0.0					
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	



Project: JEC IBA CCR
Pace Project No.: 60270434

Date: 06/15/2018 01:20 PM

Sample: IBA-2-051418	Lab ID: 60270434002		Collected: 05/14/18 11:52		Received: 05	5/15/18 16:35 I	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua			
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	3 7440-41-7				
Boron, Total Recoverable	0.18	mg/L	0.10	1	05/16/18 11:05						
Calcium, Total Recoverable	184	mg/L	0.20	1	05/16/18 11:05	05/17/18 14:03	3 7440-70-2				
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	05/16/18 11:05	05/17/18 14:03	3 7440-47-3				
Lead, Total Recoverable	<0.010	mg/L	0.010	1	05/16/18 11:05						
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 Met	thod: EPA 200	0.8 Preparation Met	hod: EP	A 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 Met	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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	•				
1500H+ pH, Electrometric	Analytical Method: SM 4500-H+B										
oH at 25 Degrees C	7.3	Std. Units	0.10	1		05/21/18 13:18	3	H6			
800.0 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				



Project: JEC IBA CCR
Pace Project No.: 60270434

Date: 06/15/2018 01:20 PM

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.	Qua			
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						
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						
_ithium	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 Me	thod: EPA 200	.8 Preparation Met	hod: EP	A 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 Me	thod: EPA 245	.1 Preparation Met	hod: EP	A 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				



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

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Mercury mg/L <0.00020 0.00020 06/06/18 09:31

LABORATORY CONTROL SAMPLE: 2165764

Date: 06/15/2018 01:20 PM

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2165765 2165766

MS MSD 60270293001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 0.0049 70-130 3 20 Mercury mg/L < 0.00020 .005 .005 0.0050 100 97

MATRIX SPIKE SAMPLE: 2165767 60271119002 Spike MS MS % Rec % Rec Parameter Units Result Conc. Result Limits Qualifiers ND 70-130 Mercury mg/L .005 0.0048 95

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.



Project: JEC IBA CCR
Pace Project No.: 60270434

Date: 06/15/2018 01:20 PM

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

Danamatan	11-26-	Blank	Reporting	A a alternation	0
Parameter	Units	Result	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					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% 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 SF	PIKE DUPLICA	ATE: 21540		MOD	2154034							
	6	0270353020	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	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						
		60270353029	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	

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.



Project: JEC IBA CCR
Pace Project No.: 60270434

Date: 06/15/2018 01:20 PM

MATRIX SPIKE SAMPLE:	2154035	60270353029	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	

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.



Project: JEC IBA CCR
Pace Project No.: 60270434

Date: 06/15/2018 01:20 PM

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					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% 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 S			MS	MSD	2158853	MCD	MC	MCD	0/ Das		Mari	
Parameter	Units	80270591002 Result	Spike Conc.	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		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						
		60270592004	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	

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.



Project: JEC IBA CCR
Pace Project No.: 60270434

Date: 06/15/2018 01:20 PM

MATRIX SPIKE SAMPLE:	2158854	00070500004	Calles	MC	MC	0/ Dag	
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	

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.



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

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L <5.0 5.0 05/17/18 15:27

LABORATORY CONTROL SAMPLE: 2154381

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

SAMPLE DUPLICATE: 2154382

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

SAMPLE DUPLICATE: 2154383

Date: 06/15/2018 01:20 PM

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

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.



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

Date: 06/15/2018 01:20 PM

 Parameter
 Units
 60270313004 Result
 Dup Result
 Max RPD
 Max RPD
 Qualifiers

 pH at 25 Degrees C
 Std. Units
 7.7
 7.7
 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.



Project: JEC IBA CCR
Pace Project No.: 60270434

Date: 06/15/2018 01:20 PM

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
				Allalyzou	————
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	ma/L	<1.0	1.0	06/02/18 12:15	

LABORATORY CONTROL SAMPLE:	2164020					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L		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 SPIK	E DUPLIC	ATE: 216402	21		2164022							
			MS	MSD								
		60271146006	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	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 N	11

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.



# **ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: JEC IBA CCR
Pace Project No.: 60270434

<b>Sample: IBA-3-051418</b> PWS:	<b>Lab ID: 60270434</b> Site ID:	<b>001</b> Collected: 05/14/18 10:30 Sample Type:	Received:	05/15/18 16:35	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.265 ± 0.605 (0.359) C:NA T:94%	pCi/L	06/06/18 11:12	13982-63-3	
Radium-228		0.0842 ± 0.316 (0.718) C:77% T:86%	pCi/L	06/06/18 11:38	3 15262-20-1	
Total Radium	Total Radium Calculation	0.349 ± 0.921 (1.08)	pCi/L	06/07/18 15:28	3 7440-14-4	



# **ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: JEC IBA CCR
Pace Project No.: 60270434

<b>Sample: IBA-2-051418</b> PWS:	<b>Lab ID: 60270434</b> Site ID:	<b>002</b> Collected: 05/14/18 11:52 Sample Type:	Received:	05/15/18 16:35	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.469 ± 0.716 (0.424) C:NA T:90%	pCi/L	06/06/18 11:12	13982-63-3	
Radium-228		0.601 ± 0.446 (0.871) C:81% T:82%	pCi/L	06/06/18 11:38	3 15262-20-1	
Total Radium	Total Radium Calculation	1.07 ± 1.16 (1.30)	pCi/L	06/07/18 15:28	3 7440-14-4	



# **ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: JEC IBA CCR
Pace Project No.: 60270434

<b>Sample: IBA-1-051418</b> PWS:	<b>Lab ID: 6027043</b> Site ID:	<b>4003</b> Collected: 05/14/18 13:18 Sample Type:	Received:	05/15/18 16:35	Matrix: Water	
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	3 15262-20-1	
Total Radium	Total Radium Calculation	1.66 ± 1.27 (1.09)	pCi/L	06/07/18 15:28	3 7440-14-4	



#### **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.



#### **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.



#### **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**

Date: 06/15/2018 01:20 PM

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.



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: JEC IBA CCR
Pace Project No.: 60270434

Date: 06/15/2018 01:20 PM

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		



# Sample Condition Upon Receipt



Client Name: Wester Energy				
Courier: FedEx □ UPS □ VIA □ Clay □ PEX	C ECI 🗆	Pace Z Xroads D	Client □ Other □	
Tracking #: Pace SI	hipping Label Used	? Yes□ No□		
Custody Seal on Cooler/Box Present: Yes ✓ No □ S	Seals intact: Yes	No □		
Packing Material: Bubble Wrap ☐ Bubble Bags ☐	Foam 🗆	None □ Othe	er 🗆	
Thermometer Used: T-298 Type of Ice	: Wet Blue Non	ne	5	1
Cooler Temperature (°C): As-read <u>0-8</u> Corr. Factor_	+1.1 Correcte	ed / · 9	Date and initials of person examining contents:	
Temperature should be above freezing to 6°C			15/18/18	
Chain of Custody present:	ZYes □No □N/A		•	
Chain of Custody relinquished:	ØYes □No □N/A			
Samples arrived within holding time:	Yes ONO ON/A			
	ŹYes □No □N/A	PH	S 9 1	
Rush Turn Around Time requested:	□Yes ØNo □N/A			
Sufficient volume:	Yes □No □N/A			
Correct containers used:	Yes □No □N/A			
Pace containers used:	Yes □No □N/A			
Containers intact:	ŽYes □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:	□Yes ØNo □N/A			
,	☑Yes □No □N/A	List sample IDs, volume date/time added.	es, lot #'s of preservative and the	
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide)		date/time added.		
(Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)  Cyanide water sample checks:				
	□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 ØN/A			H
Client Notification/ Resolution: Copy COC to Cl	-	Field Data Required?	Y / N	
Person Contacted: Date/Time	e:			
Comments/ Resolution:			1	
Amus		Aud b		
Project Manager Review:	Date	= 2114/10		



# **CHAIN-OF-CUSTODY / Analytical Request Document**

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

Section A Required Client information:	Section B Required Project Informa	ation:		ln	ection voice Inf		on:													Pa	age:		of 1		
Company: WESTAR ENERGY	Report To: Brandon G				ttention:									-		_	_		-		_				
Address 818 Kansas Ave	Copy To: Jared Morr	rison			ompany	Name:								-			_	Y AGI		_					
Topeka, KS 66612					ddress:											NPDE	S	ſ G	ROU	ND M	VATE		DRINKING	WATE	ર
Email To: <u>brandon_l.griffin@westarenergy.com</u>	Purchase Order No.: 1	0JEC-00000331	50		ace Quote eference:										<u></u>	UST		R	CRA				OTHER		*******
Phone: 785-575-8135 Fax:	Project Name: JEC II	BA CCR			ace Projei anager:	ct  -	leath	er W	ilson !	913-	563-1	407			Site	Loca	ition		KS	;					
Requested Due Date/TAT: 7 day	Project Number:			Pa	sce Profile	e#: C	657.	1								STA	TE:	_			- 18				
												Req	uest	ed A	naly	sis F	ilter	ed (Y	/N)						
Section D Valid Matrix	Codes (2) (2)	COLL	ECTED			P	reser	vativ	es		→ N S														
Required Client Information MATRIX DEHINING WATER WASTE WASTE WASTE WASTE WASTE PRODUCT SOIL/SOLID OIL WIPE AIR AIR	1996 valid code	COMPOSITE START	COMPOSITE END/SRAB	AT COLLECTION	ZERS							Total Metals**	-Tg	SO4		& 228					orine (Y/N)				
(A-Z, 0-9 / -) OTHER Sample IDs MUST BE UNIQUE TISSUE	a 4 分 MATRIX CODE SAMPLE TYPE	DATE TIME	DATE TIME		# OF CONTAINERS Unpreserved	-	HCI	NaOH	Methanol	Other	# Analysis Test #	200.8 Total N	245.1 Total Hg	ഥ	2540C TDS	Radium-226					Residual Chlorine (Y/N)	Pace	704.	o./ Lat	
1 TRA-3-051418	WT 6		5/14 1030		41	-	3											Ш			Н	BPM	2B.PIN		<b>,</b> ठ्य
2 IBA-2-051418	INT G		5/14 1152		41	-	3								_						Ц		+		Our
1 TBA-3-051418 2 IBA-2-051418 3 IBA-1-051418	WT G		5/14 1318		41		2		_	Ш					4	-	-	4	-	$\vdash$	$\dashv$	+	2BPIN		ouz
4							4	Ш	-		-	-	-	$\vdash$	+	+	-		+	$\vdash$	$\vdash$				
5					_	Н	_	1	+	Н	-		₩	H	-	+	-		-	$\vdash$	$\vdash$				_
6					_	Н	-	H	_	Н	-	-	-	Н	+	+	-		-		$\vdash$			_	
7						1	+	4	+	Н	-	+		H	+	+	+	$\vdash$	+	H	$\vdash$				
8				-	-	+		H	+	Н	-	+	-	H	-	+	+	H	+	+	H				
9				+	-	H			+	Н		+		H	1	+	+		+	+	Н				
10				$\vdash$	-	$\forall$	+	H	+	Н		+	+	Н		1	1				H				
11						$\forall$				П	-							Ħ			П				
12 ADDITIONAL COMMENTS	RELINQUIS	SHED BY / AFFILIAT	ION DATE		TIME	E			ACCE	PTED	BY / /	AFFILI	ATIO	N	1	DA	TE	Т	ME	Г		SAM	PLE CONDI	ONS	
200 7 Total Metals*: B, Ca, Ba, Be, Cr, Pb, Li	1550		5/2/ 05/19	1/18	081	5		1	1	v	n	_	<i>A</i> 5			5/1	5	16	35	1.	.9	Y	Y	y	
200 8 Total Metals**: Sb, As, Cd, Co, Mo, Se, Tl	001							V																1	
P <sub>a</sub>		CAUDI	ER NAME AND SIGNA	ATURE									0.01		1						0	5	Pel 7	f	act
Page 33 of		SAMPL	PRINT Name of SAMP		-	671	don	(	50	H	0						,	_			Temp in 'C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)		Samples Intact (Y/N)
of 35			SIGNATURE of SAMP	LER:	1	3	2	20		1		DATE (MM/	Sign DD/Y	ned Y); (	35/	15	/1	8			E,	& 호 고	Cust	,	Sa

	Samples were sent	directly to	the Subcontrac	ting Laborato	ry.		Sta	te Of O	rigin:		KS	P	ace Analytica www.pacelabs.com
700177420201500	rkorder: 60270434 V	/orkorder	Name:JEC IBA Subcontra				Ow	ner Red	ceived	Date			<b>i By</b> : 6/7/2018
Hea Pac 960 Len	ather Wilson the Analytical Kansas 8 Loiret Blvd. exa, KS 66219 one 1(913)563-1407	ormalisment are and a graphic debase and a series were	Pace. 1638 Suites Greer	Analytical Pittsi Roseytown Ros 5 2,3, & 4 Insburg, PA 156 6 (724)850-560	ad 01	THE PARTY OF THE P	ATRI PER ESTABLE		26 & Total Radium	Radium-228	WO#::	30253224	
Item	Sample ID	Туре	Collect Date/Time	Lab ID	Matrix	Pres 80NH	served Co	ontainers		Ra			LAB USE ONLY
2	IBA-2-051418	PS PS	5/14/2018 10:30 5/14/2018 11:52	60270434001	Water	1			X	X	A CALLOCATION AND A CALLOCATIO		001
3	BA-1-051418	PS	5/14/2018 13:18	60270434002 60270434003	Water Water	1 1			X	X			00.2 00.3
5			Vite (52) (44) (53)					990 000 948 70				Comments	
Trar 1 2 3	nsfers Released By	- Special Control of the Control of	Date/Time	Received I		Bu	DJ4 C	Date/					

\*\*\*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 Condit	ion l	Jpon	ı Re	ceipt
Face Analytical Client Name:	-			
Client Name:		<u> </u>	C Y	5 Floject #
Courier: Fed Ex UPS USPS Client	厂	ommoi	reial	Pace Other Label
Tracking #: 4368 1215 22		v.	Ciai	LIMS Login 1771
Custody Seal on Cooler/Box Present:	n	o	Seals	intact:  yes no
Thermometer Used	Type	of Ice:	Wet	) Blue None MRITER
Cooler Temperature Observed Temp	4	°C	Corre	ection Factor: O. I °C Final Temp: 1.8 °C
Temp should be above freezing to 6°C				pH paper Lot# Date and Initials of person examining
		Na	N/A	1003671 contents: 517118 CTB
Comments:	Yes	No	IN/A	
Chain of Custody Present:				1.
Chain of Custody Filled Out:	and the same of th			2.
Chain of Custody Relinquished:				3.
Sampler Name & Signature on COC:		para de la constante de la con		4.
Sample Labels match COC:	(c)	7		5.
-Includes date/time/ID Matrix:	V			
Samples Arrived within Hold Time:				6.
Short Hold Time Analysis (<72hr remaining):				7.
Rush Turn Around Time Requested:	<del>                                     </del>			8.
Sufficient Volume:				9.
Correct Containers Used:				[10.
-Pace Containers Used:	A PARTY OF THE PAR	-		
Containers Intact:	/_			11.
Orthophosphate field filtered			AND STANON	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			part of the second	13.
Organic Samples checked for dechlorination:				14.
Filtered volume received for Dissolved tests All containers have been checked for preservation.				15.
<i>'</i>				$^{16.}$ 04/2
All containers needing preservation are found to be in compliance with EPA recommendation.				
	·			Initial when Date/time of preservation
exceptions: VOA, coliform, TOC, O&G, Phenolics				completed O preservation
				preservative
Headspace in VOA Vials ( >6mm):			_	17.
Trip Blank Present:			<del></del> ,	18.
Trip Blank Custody Seals Present			and the same of th	Lilledupton C C I I I C
Rad Aqueous Samples Screened > 0.5 mrem/hr		/ ]		Initial when Completed: Date: 5 17 18
Client Notification/ Resolution:				
Person Contacted:			Date/	Fime: Contacted By:
Comments/ Resolution:				

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

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

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

ATTACHMENT 1-3
July 2018 Sampling Event
Laboratory Analytical Report



July 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,

Danson Wilson

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







# **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



# **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



# **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		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



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

(913)599-5665



#### **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.



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.



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.



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.



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.



Project: JEC IBA CCR
Pace Project No.: 60274227

Date: 07/17/2018 08:30 AM

Sample: IBA-4-070518	Lab ID: 602	274227001	Collected: 07/05/1	8 09:27	Received: 07	7/06/18 06:30 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	0.7 Preparation Met	hod: EP	A 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	
_ead, 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 Me	thod: EPA 200	0.8 Preparation Met	hod: EP	A 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	
Гhallium, 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 Me	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Me	thod: SM 2540	OC					
Total Dissolved Solids	629	mg/L	5.0	1		07/10/18 13:07		
1500H+ pH, Electrometric	Analytical Me	thod: SM 4500	D-H+B					
oH at 25 Degrees C	7.4	Std. Units	0.10	1		07/11/18 11:04		H6
800.0 IC Anions 28 Days	Analytical Me	thod: EPA 300	0.0					
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		



Project: JEC IBA CCR
Pace Project No.: 60274227

Date: 07/17/2018 08:30 AM

Sample: IBA-3-070518	Lab ID: 602	274227002	Collected: 07/05/1	8 10:42	Received: 07	7/06/18 06:30 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	.7 Preparation Met	hod: EP	A 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 Me	thod: EPA 200	.8 Preparation Met	hod: EP	A 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 Me	thod: EPA 245	.1 Preparation Met	hod: EP	A 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 Me	thod: SM 2540	OC					
Total Dissolved Solids	1590	mg/L	5.0	1		07/10/18 13:07		
4500H+ pH, Electrometric	Analytical Me	thod: SM 4500	)-H+B					
oH at 25 Degrees C	7.2	Std. Units	0.10	1		07/11/18 11:07		H6
300.0 IC Anions 28 Days	Analytical Me	thod: EPA 300	0.0					
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	



Project: JEC IBA CCR
Pace Project No.: 60274227

Date: 07/17/2018 08:30 AM

Sample: IBA-2-070518	Lab ID: 602	274227003	Collected: 07/05/1	8 12:00	Received: 07	7/06/18 06:30 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	0.7 Preparation Met	hod: EP	A 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		07/16/18 12:52		
Calcium, Total Recoverable	204	mg/L	0.20	1		07/16/18 12:52		M1
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1		07/16/18 12:52		
Lead, Total Recoverable	<0.010	mg/L	0.010	1		07/16/18 12:52		
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 Me	thod: EPA 200	0.8 Preparation Met	hod: EP	A 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 Me	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Me	thod: SM 2540	oc					
Total Dissolved Solids	1310	mg/L	5.0	1		07/10/18 13:07		
4500H+ pH, Electrometric	Analytical Me	thod: 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 Me	thod: EPA 300	0.0					
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	



Project: JEC IBA CCR
Pace Project No.: 60274227

Date: 07/17/2018 08:30 AM

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.	Qua
200.7 Metals, Total	Analytical Met	hod: EPA 200	0.7 Preparation Met	hod: EP	A 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	
_ithium	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 Met	hod: EPA 200	0.8 Preparation Met	hod: EP	A 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 Met	hod: EPA 24	5.1 Preparation Met	hod: EP	A 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 Met	hod: SM 254	OC					
Total Dissolved Solids	1770	mg/L	5.0	1		07/10/18 13:07		
1500H+ pH, Electrometric	Analytical Met	hod: SM 450	0-H+B					
oH at 25 Degrees C	7.2	Std. Units	0.10	1		07/11/18 11:13		H6
300.0 IC Anions 28 Days	Analytical Met	hod: EPA 300	0.0					
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	



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

60274227001, 60274227002, 60274227003, 60274227004 Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Mercury mg/L <0.00020 0.00020 07/16/18 16:20

LABORATORY CONTROL SAMPLE: 2189251

Date: 07/17/2018 08:30 AM

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2189252 2189253

MS MSD 60273843001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual ND 0.0050 70-130 0 20 Mercury mg/L .005 .005 0.0050 101 101

MATRIX SPIKE SAMPLE: 2189254 60274221001 Spike MS MS % Rec % Rec Parameter Units Result Conc. Result Limits Qualifiers ND 70-130 Mercury mg/L .005 0.0049 98

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.



Project: JEC IBA CCR
Pace Project No.: 60274227

Date: 07/17/2018 08:30 AM

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

		Blank	Reporting		
Parameter	Units	Result	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					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% 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 S	SPIKE DUPLICA	TE: 21839	38		2183989							
	6	0274227003	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	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						
		60274227004	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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.



Project: JEC IBA CCR
Pace Project No.: 60274227

Date: 07/17/2018 08:30 AM

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	1
Lead	mg/L	< 0.010	1	0.96	96	70-130	1
Lithium	mg/L	0.015	1	1.1	104	70-130	1

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.



Project: JEC IBA CCR
Pace Project No.: 60274227

Date: 07/17/2018 08:30 AM

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

		Blank	Reporting		
Parameter	Units	Result	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					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% 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 S			MS	MSD	2185210							
ъ.		0274263001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	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						
		60274372007	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	

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.



Project: JEC IBA CCR
Pace Project No.: 60274227

Date: 07/17/2018 08:30 AM

MATRIX SPIKE SAMPLE:	2185211	60274372007	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	

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.



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

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L <5.0 5.0 07/10/18 13:07

LABORATORY CONTROL SAMPLE: 2185373

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

SAMPLE DUPLICATE: 2185374

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

SAMPLE DUPLICATE: 2185375

Date: 07/17/2018 08:30 AM

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



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

Date: 07/17/2018 08:30 AM

60274353001 Dup Max Parameter Units Result Result **RPD** RPD Qualifiers 6.9 pH at 25 Degrees C 5 H6 Std. Units 6.9 0

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.



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

mg/L

60274227001, 60274227002, 60274227003, 60274227004 Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

 Chloride
 mg/L
 <1.0</th>
 1.0
 07/14/18 08:50

 Fluoride
 mg/L
 <0.20</td>
 0.20
 07/14/18 08:50

88.7

LABORATORY CONTROL SAMPLE: 2188754

Fluoride

Date: 07/17/2018 08:30 AM

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chloride 5 4.9 97 90-110 mg/L mg/L Fluoride 2.5 2.5 100 90-110

500

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2188755 2188756 MSD MS 60274281001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual Chloride mg/L 1560 1000 1000 2520 2600 96 104 90-110 3 15

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.



JEC IBA CCR Project: Pace Project No.: 60274227

Sulfate

Date: 07/17/2018 08:30 AM

QC Batch: 534436 Analysis Method: EPA 300.0 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

60274227001, 60274227002, 60274227003, 60274227004 Associated Lab Samples:

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

Blank Reporting

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

LABORATORY CONTROL SAMPLE: 2189076

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2189077 2189078

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

MATRIX SPIKE SAMPLE: 2189079 60274190001 MS MS Spike % Rec Parameter % Rec Qualifiers Units Result Conc. Result Limits 2070 Chloride 1000 100 90-110 mg/L 3080 Sulfate 1920 1000 2890 97 mg/L 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.

(913)599-5665



#### **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

#### ANALYTE QUALIFIERS

Date: 07/17/2018 08:30 AM

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.



## **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: JEC IBA CCR
Pace Project No.: 60274227

Date: 07/17/2018 08:30 AM

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		



# Sample Condition Upon Receipt



Client Name: NSTAR		
Courier: FedEx □ UPS □ VIA ✓ Clay □ F	PEX 🗆 ECI 🗆	Pace ☐ Xroads ☐ Client ☐ Other ☐
Tracking #: Pace	e 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: 7298 Type of	Ice Wet Blue No	
Cooler Temperature (°C): As-read	or_ <del>*/.\</del> Correct	ed 9.7 Date and initials of person 4.60 examining contents: 7.3
Temperature should be above freezing to 6°C		The last of the la
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:	ØYes □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	ØYes □No □N/A	
Samples contain multiple phases? Matrix: u)T	□Yes ☑No □N/A	
Containers requiring pH preservation in compliance?	ØYes □No □N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide)		date/illife added.
(Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)  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 ØN/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		Field Data Required? Y / N
Person Contacted: Brandon Griffin Date/	Time: 7-6-18	
Comments/Resolution: Per client- analy	ze even to	rough out of temp sout
Project Manager Review: MJW for HMW	Dat	e;7/6/18



# **CHAIN-OF-CUSTODY / Analytical Request Document**

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

Section Require	d Client Information:			Project In	nformation:				Ir		Inform	ation:								_					Page	e:	l	of	1	
Compan	y: WESTAR EN	ERGY	Report To	Brand	on Griffin				A	ttentio	n:																		l	
Address	818 Kansas A	lve	Сору То:	Jared	Morrison				C	Compa	пу Мап	ne:								RE	GULA	ATOR	Y AG	ENC	1	Œ				
	Topeka, KS 6	66612							A	ddres	s:									厅	NPD	ES	Г	ROU	ND WA	TER	Г	RINKING	WATER	
mail To	brandon.l.grif	fin@westarenergy.	com Purchase	Order No	: 10JEC	C-0000033	150			ace Qu Reference										1	UST		□ R	CRA			ГО	THER		- 1
hone:	785-575-8135	Fax:	Project Na	ame: J	EC IBA C	CR			P	ace Pro	oject	Hea	ther V	Vilso	n 91:	3-563	-140	)7		Si	te Loc	ation				11/				
Reques	ted Due Date/TAT:	7 day	Project Nu	ımber.								9657	7, 1						_	3	ST	ATE:		KS	<del></del>					
_				_					_								Re	eque	sted	Ana	lysis	Filter	red (Y	/N)	1					
	Section D Required Client Information		Matrix Codes	to left)	OMP)	COLL	ECTED		T			Pres	ervati	ives		N /A														
ITEM#	SAMPL (A-Z, 0-9 Sample IDs MUST	WATER WASTE I PRODUCT SOIL/SOI OIL WIPE AIR OTHER	T P	CODE (see valid		DMPOSITE START	COMPC END/G		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved H₂SO₄	HNO3	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	I Analysis Test↓	200.7 Total Metals*	200.8 Total Metals**	245.1 Lotal Hg 300: CL F. SO4		4500 H+B				Residual Chlorine (Y/N)		*	7427	o./ Lab I.	.D.
1	TRA-4-	070518		_	6		>15	0927	寸	2	t	1					Ť	1	1 1	Ť	Ì	1	3-1	4/	Brin					
2		670518		WT (			7/5	1042	T	2	1	1	T	$\Box$		1		T	Ш			7	F	Ti					0	אר או
3		070518		WTO			7/5	1200	1	2	I	11					71	T	П					П	П					133
4	TRA-1	070518		WI			7/5	1307	7	2	1			П		1		1	1					V	1					904
5	1	- , , , ,					1	1	T					$\Box$										*		1				
6				11					1																					
7									T			П																		
8									1						T		П			П					П	T				
9																														
10	İ								T																					
11									T			П					П	П		Т			П	Т	П					
12									T																					
	ADDITIONA	AL COMMENTS		RELIN	IQUISHED E	BY / AFFILIAT	пои	DATE		TI	ME	3	Th	ACC	EPTE	D BY	AFF	ILIAT	ION	1 6	DA	ATE	TI	ME			SAMPL	E CONDITI	ONS	
	otal Metals*: B, Ca, Ba, lotal Metals**: Sb, As, Co		13	Y	7/	wash	EV	7/5/1	8	140	7O	I	Z	2		<del>-</del>	,	FA	Œ	,	7-1	648	Ole	30	9,7	. \	1	Ŋ	7	
	Ps																				7									
	Page 27					SAMPL		AND SIGNAT	_	0	970	Cara Cara		2.6	HA.	γ.				IĘ.	ıć j				Temp in °C	00	Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact	(N)
	of 27							RE of SAMPLE		B	2)	1	/	PV /	IF		DA (M	TE S	igned /YY):	67	105	118	7		Tem	000	90	Custod Coole	Samply	5



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,

Danie M. Wilson

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



9608 Loiret Blvd. Lenexa, KS 66219 (913)599-5665



#### **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 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

Missouri Certification #: 235

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



## **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	



## **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

(913)599-5665



#### **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:**



#### **PROJECT NARRATIVE**

Project: JEC IBA CCR
Pace Project No.: 60274380

Method: EPA 904.0

Description:904.0 Radium 228Client:WESTAR ENERGYDate: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:**

(913)599-5665



#### **PROJECT NARRATIVE**

Project: JEC IBA CCR Pace Project No.: 60274380

Method:Total Radium CalculationDescription:Total Radium 228+226Client:WESTAR ENERGYDate: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.



Project: JEC IBA CCR
Pace Project No.: 60274380

<b>Sample: IBA-4-070518</b> PWS:	<b>Lab ID: 60274380</b> Site ID:	O01 Collected: 07/02/18 09:27 Sample Type:	Received:	07/09/18 09:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.631 ± 0.715 (1.11) C:NA T:82%	pCi/L	07/20/18 10:53	3 13982-63-3	
Radium-228		0.632 ± 0.408 (0.760) C:73% T:72%	pCi/L	07/26/18 14:27	7 15262-20-1	
Total Radium	Total Radium Calculation	1.26 ± 1.12 (1.87)	pCi/L	07/27/18 14:56	6 7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60274380

<b>Sample: IBA-3-070518</b> PWS:	<b>Lab ID: 60274380</b> Site ID:	O002 Collected: 07/02/18 10:42 Sample Type:	Received:	07/09/18 09:30	Matrix: Water	
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	7 13982-63-3	
Radium-228	EPA 904.0	0.214 ± 0.302 (0.646) C:71% T:89%	pCi/L	07/26/18 14:2	7 15262-20-1	
Total Radium	Total Radium Calculation	0.283 ± 0.812 (1.62)	pCi/L	07/27/18 14:50	6 7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60274380

<b>Sample: IBA-2-070518</b> PWS:	<b>Lab ID: 6027438</b> ( Site ID:	O003 Collected: 07/02/18 12:00 Sample Type:	Received:	07/09/18 09:30	Matrix: Water	
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	7 15262-20-1	
Total Radium	Total Radium Calculation	0.187 ± 0.693 (1.57)	pCi/L	07/27/18 14:56	6 7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60274380

<b>Sample: IBA-1-070518</b> PWS:	<b>Lab ID: 60274</b> : Site ID:	Sample Type:	02/18 13:07	Received:	07/09/18 09:30	Matrix: Water	
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 (0.670 C:72% T:83%	6)	pCi/L	07/26/18 14:27	7 15262-20-1	
Total Radium	Total Radium Calculation	0.306 ± 0.853 (1.72)		pCi/L	07/27/18 14:56	7440-14-4	



#### **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.



#### **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.



#### **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**

Date: 07/30/2018 04:05 PM

PASI-PA Pace Analytical Services - Greensburg



## **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: JEC IBA CCR
Pace Project No.: 60274380

Date: 07/30/2018 04:05 PM

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		



## CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:	Section B Required Project Information:		Section C Invoice Information:		Pa	ge: { of	1
Company WESTAR ENERGY	Report To: Brandon Griffin		Attention:				
Address: 818 Kansas Ave	Copy To: Jared Morrison		Company Name:	REGULAT	TORY AGENCY		
Topeka, KS 66612			Address:	T NPDE	S F GROUND W	ATER T DRINE	KING WATER
Email To: brandon.l.griffin@westarenergy.com	Purchase Order No : 10JEC-	0000033150	Pace Quote Reference:	☐ UST	☐ RCRA	F OTHE	R
Prone 785-575-8135 Fax:	Project Name: JEC IBA CC	R	Pace Project Heather Wilson 913	-563-1407 Site Loca	tion		
Requested Due Date/TAT: 15 day	Project Number.		Pace Profile #: 9657, 1	STA	TE: KS	- /////////////////////////////////////	
<u></u>				Requested Analysis F	iltered (Y/N)		
Section D Valid Matrix	Codes 2 0			T N IA			
Required Client information MATRIX  ORINKING WATER	Codes	COLLECTED	Preservatives	8			
SAMPLE ID WIPE			RS	est[		(N/X)	<b>E S</b>
SAMPLE ID  AR  (A-Z, 0-91,-)  Sample IOS MUST BE UNIQUE  TISSUE	MATRIX CODE SAMPLE TYPE (6	TIME DATE TIME	sample temp at cc # OF CONTAINERS Unpreserved H2SO4 HNO3 HCI NaOH Na2S2O3 Methanol Other	Analysis Ter Radium-226 Radium-228 Total Radium		Residual Chlorine (Y/N)	#: <b>6</b> 0
1 IBA-4-670518	W/G	7/2.0927	2 2				
2 IBA-3-070518	247 G	7/2 1042	2 2				N -
13 IBA-2-070518	wr G	7/2 1200	2 2				4
4 IBA-1-070518	w7 6	2/2 1307	2 2				
5							ω
6							0
7.							0
8							
9				AND THE STATE OF T			
10							
11							
12							
ADDITIONAL COMMENTS	RELINQUISHED BY	/ AFFILIATION DATE	TIME ACCEPTE	D BY / AFFILIATION DAT	turo de madeina	SAMPLE CO	NDITIONS
	BYY	NG/88 7/5/1	8 1500 Junto A	18-PALO 719	18 0930 17	2 4 1	7 7
	0 1		1	1 ' '			
			V				
		SAMPLER NAME AND SIGNA	TURE OF LOVE TO A CONTROL OF THE			aled on	lact (j)
Page		PRINT Name of SAMPL	ER: Brandon Griffin	AND THE RESERVE OF THE PROPERTY OF THE PARTY	S. u ower	(Y/N	er (Y)
ge 16		SIGNATURE of SAMPL		DATE Signed (MM/DD/YY): 07/05/	/18	Received on Ica (Y/N)	Cooler (Y/N) Samples Inlact (Y/N)

C	hain of	Custo	dy —		THE RESERVE OF THE PERSON NAMED OF THE PERSON	**************************************										
	X Sam	ples were s	sent directly to	the Subcontra	cting Laborato	ory.		State	e Of Orig	in:		KS		1		nalytical
	rkorder: 60	274380	Workorder	Name:JEC IBA				Own	er Recei	ved	Date:		Results	Requeste		<i>w.pacelebs.com</i> 7/31/2018
Head Pac 960 Ler	ather Wilson te Analytical K 8 Loiret Blvd. exa, KS 6621 one 1(913)563	9		Pace 1638 Suite Gree	Analytical Pittsi Roseytown Ros s 2,3, & 4 nsburg, PA 156 e (724)850-560	ad 601				Combined Radium	лт 226/ 228	10.675.686.666	#:30	  258	 	
Item	Sample ID		Sample Type	Collect Date/Time	Lab ID	Matrix	Pres	served Con	tainers	Сош	Radium					
1	IBA-4-070518		PS	7/2/2018 09:27	60274380001	Water	2			X						3 USE ONLY
2	IBA-3-070518		PS	7/2/2018 10:42	60274380002	Water	2			<u>^</u>	X					
3	IBA-2-070518		PS	7/2/2018 12:00	60274380003	Water	2			X	X				$\bigcirc$	
4 5	IBA-1-070518	December 25	PS	7/2/2018 13:07	60274380004	Water	2			X	X					)3 34
Trar	sfers Relea	sed By		Date/Time	Beceived E				Date/Time				Com	ments		
2 3						1.A.C.		945	7/9/18	رق	32	02	Jon			
	ler Tempera		eceipt ===		stody Seal Y	or/N		Rece	l eived on l	lce/	Y) o	Jus 1/10		ples Inta		137/10/19

\*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 2 5 8 5 8 2 \_\_\_\_\_

	_																										
Sectio Require	n A ed Client Information:	Section B Required Pr		rmation:					tion C													Р	age:	1	of	d .	
Compar	y: WESTAR ENERGY	Report To:					٠	_	ce Info	mation								ı						**			
Address	818 Kansas Ave	Сору То:	Jared M	lorrison				Com	pany N	ame:																	
	Topeka, KS 66612							Addr										REGI	JLATO	RYA	GENC	4850	<u> 41.9</u>	<u> </u>			21000 21000
Email To		Purchase Or	rder No -	10,150,0	20000000	150			Quote									Ĺν	NPDES		GROL	IND V	VATE!	R	DRINKING	WATER	
Phone:	785-575-8135 Fax:	Project Nam				150		Refe	rence;									Γ (	JST	F	RCRA			Γ"	OTHER		
	ted Due Date/TAT: 15 day			C IBA CCI	K			Pace Mana	Project ger:	He	ather	Wilso	on 91	3-563	3-14(	)7		Site	Locatio	эπ		_					////
Reques	ned Due Date/TAT. 15 day	Project Num	iber.					Pace	Profile #	# 96!	7, 1								STATE	E:	K	5	_ [				
														lenj.	R	eques	sted	Analys	sis Filt	ered	(Y/N)	and an					
	Section D Valid Matrix C Required Client Information MATRIX DRINKING WATER	odes CODE DW	codes to left) C=COMP)		COLL	.ECTED				Pre	serva	tives		¥/ N ■													
	WATER	WT WW P SL		COMP	OSITE IRT	COMPO END/G	COLLECTION																(Ž				
	SAMPLE ID OIL WIPE	OL WP	19		1		AT COL	ERS						est1			***************************************						Residual Chlorine (Y/N)				
	(A-Z, 0-9 / ,-) OTHER Sample IDs MUST BE UNIQUE TISSUE	OT TS	CODE				TEMP /	TAIN	Ved				_	sis To	526								Chlor				
ITEM#			MATRIX SAMPLE 1				AMIT SAMPLE T	# OF CONTAINERS	Unpreserved	H2SU4		Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol Other	2	Radium-226	Radium-228 Total Radium							dual				
				DATE	TIME	DATE		#	5	HNO,	모임	S.	Metha	1 A	Rac	Tag La							Res	Pace	Project N	o./ Lah L	ь
1	IBA-4-6705/8		W/ (2			7/2	0927	2		and,						į \								******			-
2	IBA-3-070518	- 1	w7] G	<u>-                                     </u>		7/2	1042	2		2					. i										***************************************		
3	IBA-2-070518		WT (A	ļ		7/1	1200	2	1	2					Da(yy)												
4	IBA-1-070518		wt 6	<u> </u>		7 / homen	1307	12		2					in.	V)dressee											
5								_	$\perp$							*   '											
6			.		-	***************************************		<u> </u>	1_1																		
7			_		ļ			_	11																	***************************************	
8 9								_	11																		
10				1		<u> </u>		╂	11			11	$\perp$				ļ										
11			···	1	-			╄			_								11	<u> </u>							**
12	·			<del> </del>		<del> </del>		╀	+-+			11								<u> </u>							
	ADDITIONAL COMMENTS		PE(INO	JISHED BY A	/ AEEU IAT	101		-				Ш				Щ.,									***		
			RELINUX	<u> </u>	· · · · ·	2000 British 200	DATE	7 (SOM )	TIME		ikitair.	ACC	EPTE	DBY	/ AFF	LIATIC	(2.22)	äälun	DATE	8 39	TIME			SAMP	LE CONDITI	ONS	·
*****		<u> </u>		<u>/ v</u>	105/T	<u> </u>	7/5/18	15	do		M	<u> </u>	) <u>} /</u>	12	34.	-P)	W	5 17	19/18	10	رووا	16	72	7		4	
										$\perp \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \!$	<u> </u>	-			****				7 /							****	
										\ \ \ \ \ \													T				
	·		****				<u> </u>														*****					MM SQUIIII -	
	Page	•			SAMPL		AND SIGNATU		115							-1-13	:·						ပ့်	ng (c	S ()	lact	
	18				-1170		e of SAMPLER	2,500	^4/\s	kr.	61	ift	n,		DA	TE Sig	ined						Temp in '	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact	
	of 12					JOHATON	- OI GAMPLER		1	1	·				(M	M/DD/	(Y): (	7/4	25/1	8		<u> </u>		~ ~	် လို	Sar	

Client Name:    Face Analytical   Client Name:   Client   Commercial	Pittsburgh Lab Sample Condition	n U	pon	Rec	eipt	gran to the
Date and initials of person examining contents:	Face Analytical Client Name:	Ne	sto	us I	onery	Project #_ 3635858d
acking #:	CAS TUPS TUSPS TClient	□∘	ттег	dal l	ace Other	Label
Justicity Seat on Cooler/Back Propent: Type of Ice: Web Blue None Web Bl	ourier: 418 7276 9542	BAR.				Company process and a second
Type of Ice: Wes Blue None Welfer (Correction Factor, V.C.) Correction Factor, V.C. Correction Factor,	racking #:	17 no		Seals i	ntact: 🗌 yes 🔏	Źno ,
contents:  Ves No N/A  Date and initials of person examining contents:  Wes No N/A  Date and initials of person examining contents:  Wes No N/A  Date and initials of person examining contents:  Wes No N/A  Date and initials of person examining contents:  Wes No N/A  Date and initials of person examining contents:  Wes No N/A  Date and initials of person examining contents:  Wes No N/A  Date and initials of person examining contents:  Wes No N/A  I.  Ham of Custody Present:  All Custody Relinquished:  Janual Frame & Signature on COC:  Jampler Name & Signature on CoC:  Jampler Na	ustody Seal on Cooler/Box Flesent.	7 Tyne o	f Ice:/	(Wet	Blue None VV	elled 177 :
mp should be above freezing to 6°C  moments:  Yes No N/A  Date and Initials of person examining contents:    PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   PH paper Lot#   Date and Initials of person examining contents:   PH paper Lot#   PH	''' '''' '''	(	°C (	Corre	ction Factor <u>: **O.</u> _	C Final Temp: 1.
omments:  Yes No N/A  Custody Present: hain of Custody Filled Out: hain of Custody Relinquished: ampler Name & Signature on COC: ample Name & Signature on COC: handles Matrix: hain of Custody Relinquished: hain of Custody Relinquished: hain of Custody Relinquished: hain of Custody Filled Out: hain of Custody	Octor Tomperson	<u>`</u>				Pote and initials of person examining
All containers used:  Containers Index  Organic Samples Checked for Dissolved tests  All containers have been checked for preservation.  All containers have been checked for Dissolved tests  Headspace in VOA Vials (>8mm):  Trip Blank Custody Seals Present	emp should be above freezing to 6 C			I	1 6 4	
hain of Custody Present:  hain of Custody Filled Out:  hain of Custody Relinquished:  hain of		Yes	No	N/A	1003611	
hain of Custody Filled Out:  thain of Custody Relinquished:  thain of Custody Relinquished:  tampler Name & Signature on COC:  tample Labels match COC:  thoused sate/filme/ID  Matrix:  thoused sate/filme/ID  Matrix:  thoused sate/filme/ID  Matrix:  thoused sate/filme/ID  Matrix:  thouse samples Arrived within Hold Time:  Somrt Hold Time Analysis (<72hr remaining):  Rush Turn Around Time Requested:  Sufficient Volume:  Correct Containers Used:  thouse containers Used:  thouse containers Used:  the Containers Itsed:  Containers Intact:  11.  Containers Intact:  12.  Onthophosphate field filtered  13.  14.  Organic Samples checked for dechlorination:  14.  Organic Samples checked for Dissalved tests  All containers have been checked for preservation.  All containers have been checked for preservation.  All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  exceptions: VOA, coliform, TOC, Q&G, Phenolics  Initial when the completed initial when completed initial					1	
hain of Custody Relinquished:  sampler Name & Signature on COC;  sample Labels match COC;  -Includes date/lime/ID  Matrix:  -Includes date/lime/ID  Matrix:  -Includes date/lime/ID  Matrix:  -Includes date/lime/ID  Samples Arrived within Hold Time:  -Includes date/lime/ID  Samples Arrived within Hold Time:  -Includes date/lime/ID  -Includes date/Ime/ID  -Includes date/Ime/Includes date/Ime/Includes date/Includes date/Ime/Includes date/Ime/Includes date/Includes date/					2	
ampler Name & Signature on COC:    Includes date/time/ID   Matrix:   5.     Includes date/time/ID   Matrix:   7.     Samples Arrived within Hold Time:   6.     Samples Arrived within Hold Time:   6.     Samples Arrived within Hold Time:   7.     Short Hold Time Analysis (<72hr remaining):   8.     Rush Turn Around Time Requested:   9.     Sufficient Volume:   9.     Correct Containers Used:   9.     Correct Containers Used:   11.     Correct Containers Used:   12.     Onthophosphate field filtered   13.     Heave of Aqueeus Compliance/NPDES sample field fillered   14.     Hex of Aqueeus Compliance/NPDES sample field fillered   14.     Hex of Aqueeus Compliance/NPDES sample field fillered   14.     Heave of Containers have been checked for dechlorination:   14.     Initial when					3	
Sample Labels match COC:  -Includes date/time/ID  Matrix:  Samples Arrived within Hold Time:  Short Hold Time Analysis (<72hr remaining):  Rush Turn Around Time Requested:  Sufficient Volume:  Correct Containers Used:  -Pace Containers Used:  -Pa		A ROOM OF THE PARTY OF THE PART			4	
-Includes date/time/ID Matrix: W1 6. Samples Arrived within Hold Time: 7. Short Hold Time Analysis (<72hr remaining): 8. Short Hold Time Analysis (<72hr remaining): 9. Sufficient Volume: 10					5.	
Samples Arrived within Hold Time:  Samples Arrived within Hold Time:  Short Hold Time Analysis (<72hr remaining):  Rush Turn Around Time Requested:  Sufficient Volume:  Correct Containers Used:  -Pace Containers Used:  -Pace Containers Used:  Containers Intact:  Orthophosphate field filtered  Hax Cr Aqueous Compliance/NPDES sample field filtered  Hax Cr Aqueous Comples checked for dechlorination:  Filtered volume received for Dissolved tests  All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  exceptions: VOA, coliform, TOC, O&G, Phenolics  Headspace in VOA Vials (>6.  7.  10.  11.  12.  13.  14.  15.  16.  Hittal when		WT				
Short Hold Time Analysis (<72hr remaining):  Rush Turn Around Time Requested:  Sufficient Volume:  Correct Containers Used:  -Pace Containers Used:  -Pace Containers Used:  Orthophosphate field filtered  Hex Cr Aqueous Compliance/NPDES sample field filtered  Hex Cr Aqueous Compliance/NPDES sample field filtered  Hex Cr Aqueous Compliance/NPDES sample field filtered  113.  Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests  All containers have been checked for preservation.  All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  exceptions: VOA, coliform, TOC, O&G, Phenolics  Headspace in VOA Vials (>6mm):  17.  18.  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Aqueous Samples Screened > 0.5 mrem/hr  Client Notification/ Resolution:  Date/Time:	-Includes date/time/ID	Ť		ĵ	6.	
Rush Turn Around Time Requested:  Sufficient Volume:  Correct Containers Used:  -Pace Containers Used:  -Pace Containers Used:  -Pace Containers Intact:  Orthophosphate field filtered  Hex Cr Aqueous Compliance/NPDES sample field filtered  Hex Cr Aqueous Compliance/NPDES sample field filtered  Hax Cr Aqueous Compliance/NPDES sample field f				1	7.	
Sufficient Volume:  Correct Containers Used:  -Pace Containers Used:  -Pace Containers Used:  Orthophosphate field filtered  Hex Cr Aqueous Compliance/INPDES sample field filtered  Hex Cr Aqueous Compliance/INPDES sample field filtered  Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  exceptions: VOA, coliform, TOC, O&G, Phenolics  Headspace in VOA Vials (>6mm):  Trip Blank Custody Seals Present  Trip Blank Custody Seals Present  Rad Aqueous Samples Screened > 0.5 mrem/hr  Client Notification/ Resolution:  Person Contacted:  Date/Time:  Contacted By:  Comments/ Resolution:				1	8.	
Sufficient Volume:  Correct Containers Used: -Pace Containers Used:  11.  Containers Intact:  Orthophosphate field filtered  Hex Cr Aqueous Compliance/INPDES sample field filtered  Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  exceptions: VOA, coliform, TOC, O&G, Phenolics  Headspace in VOA Vials ( >6mm):  Trip Blank Custody Seals Present  Trip Blank Custody Seals Present  Rad Aqueous Samples Screened > 0.5 mrem/hr  Client Notification/ Resolution:  Person Contacted:  Date/Time:  Contacted By:  Comments/ Resolution:	Rush Turn Around Time Requested:		<del>                                     </del>			
Correct Containers Used: -Pace Containers Used: -Pace Containers Intact:  Orthophosphate field filtered  Hex Cr Aqueous Compliance/NPDES sample field filtered  Hex Cr Aqueous Compliance/NPDES sample field filtered  13.  Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests  All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  exceptions: VOA, coliform, TOC, O&G, Phenolics  Headspace in VOA Vials (>6mm):  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Aqueous Samples Screened > 0.5 mrem/hr  Client Notification/ Resolution:  Person Contacted:  Date/Time:  Contacted By:  Comments/ Resolution:	Sufficient Volume:	-	-	1		
Containers Intact:  Orthophosphate field filtered  12.  Orthophosphate field filtered  13.  Hex Cr Aqueous Compliance/NPDES sample field filtered  13.  Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests  All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  exceptions: VOA, coliform, TOC, O&G, Phenolics  Headspace in VOA Vials (>6mm):  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Aqueous Samples Screened > 0.5 mrem/hr  Client Notification/ Resolution:  Person Contacted:  Date/Time:  Contacted By:  Comments/ Resolution:	Correct Containers Used:		-	1-	1	
Containers Intact: Orthophosphate field filtered Hex Cr Aqueous Compliance/NPDES sample field filtered Organic Samples checked for dechlorination: Filtered volume received for Dissolved tests All containers have been checked for preservation. All containers needing preservation are found to be in compliance with EPA recommendation.  exceptions: VOA, coliform, TOC, O&G, Phenolics  Headspace in VOA Vials (>6mm):  Trip Blank Present: Trip Blank Custody Seals Present Rad Aqueous Samples Screened > 0.5 mrem/hr  Client Notification/ Resolution:  Person Contacted:  Date/Time:  Comments/ Resolution:  Date/Time:  Contacted By:	-Pace Containers Used:			├	111	
Orthophosphate field filtered  Hex Cr Aqueous Compliance/NPDES sample field filtered  Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests  All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  exceptions: VOA, coliform, TOC, O&G, Phenolics  Initial when	Containers Intact:	-	-	+-		
Hex Cr Aqueous Compliance/NPDES sample field filtered  Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  exceptions: VOA, coliform, TOC, O&G, Phenolics  Headspace in VOA Vials (>6mm):  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Aqueous Samples Screened > 0.5 mrem/hr  Client Notification/ Resolution:  Person Contacted:  Date/Time:	Orthophosphate field filtered	┼─	┼			
Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  exceptions: VOA, coliform, TOC, O&G, Phenolics  Headspace in VOA Vials (>6mm):  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Aqueous Samples Screened > 0.5 mrem/hr  Client Notification/ Resolution:  Person Contacted:  Person Contacted:  Date/Time:  Comments/ Resolution:  Date/Time:  Contacted By:  Comments/ Resolution:	Hex Cr Aqueous Compliance/NPDES sample field filtered	<del> </del>	┼			
Filtered volume received for Dissolved tests All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  exceptions: VOA, coliform, TOC, O&G, Phenolics  Headspace in VOA Vials (>6mm):  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Aqueous Samples Screened > 0.5 mrem/hr  Client Notification/ Resolution:  Person Contacted:  Person Contacted:  Date/Time:  Comments/ Resolution:	Organic Samples checked for dechlorination:	├	┼─-	1		
All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  exceptions: VOA, coliform, TOC, O&G, Phenolics  Headspace in VOA Vials (>6mm):  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Aqueous Samples Screened > 0.5 mrem/hr  Client Notification/ Resolution:  Person Contacted:  Date/Time:  Date/Time:  Comments/ Resolution:	Filtered volume received for Dissolved tests	+	<del> </del>	<del> </del>		
All containers needing preservation are found to be in compliance with EPA recommendation.  exceptions: VOA, coliform, TOC, O&G, Phenolics    Initial when completed	All containers have been checked for preservation.		<del> </del>		To phi	
exceptions: VOA, coliform, TOC, O&G, Phenolics    Initial when completed	All containers needing preservation are found to be in					
exceptions: VOA, coliform, TOC, O&G, Prientolics  Lot # of added preservative  17.  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Aqueous Samples Screened > 0.5 mrem/hr  Client Notification/ Resolution:  Person Contacted:  Date/Time:  Contacted By:  Comments/ Resolution:	compliance with EPA recommendation.	1 <u>6</u>	ار			
Headspace in VOA Vials (>6mm):  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Aqueous Samples Screened > 0.5 mrem/hr  Client Notification/ Resolution:  Person Contacted:  Date/Time:  Comments/ Resolution:	exceptions: VOA, coliform, TOC, O&G, Phenolics					
Headspace in VOA Vials (>6mm):  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Aqueous Samples Screened > 0.5 mrem/hr  Client Notification/ Resolution:  Person Contacted:  Date/Time:  Comments/ Resolution:						
Trip Blank Present:  Trip Blank Custody Seals Present  Rad Aqueous Samples Screened > 0.5 mrem/hr  Client Notification/ Resolution:  Person Contacted:  Date/Time:  Date/Time:  Comments/ Resolution:	in VOA Viale / >6mm):			-	17	
Trip Blank Custody Seals Present Rad Aqueous Samples Screened > 0.5 mrem/hr  Client Notification/ Resolution:  Person Contacted:  Date/Time:  Comments/ Resolution:	<del></del>		and the same		18.	
Rad Aqueous Samples Screened > 0.5 in remini						al alul
Person Contracted	Rad Aqueous Samples Screened > 0.5 mrem/h		/	1		3 Date: 1 110
Person Contracted	Client Notification/ Resolution:					Contacted By:
Comments/ Resolution:	Person Contacted:					
	Comments/ Resolution:					
			<del></del>			

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

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR

Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers) \*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

ATTACHMENT 1-4
August 2018 Sampling Event
Laboratory Analytical Report



August 27, 2018

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

RE: Project: 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,

Danson Wilson

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







#### **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



## **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



## **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
0277958003	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
0277958004	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
0277958005	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	НММ	1	PASI-K
		EPA 300.0	OL	3	PASI-K



#### **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:**



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:**



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:**

(913)599-5665



#### **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:**



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:



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.



Project: JEC IBA CCR
Pace Project No.: 60277958

Date: 08/27/2018 05:14 PM

Sample: IBA-4-081518	Lab ID: 602	277958001	Collected: 08/15/1	8 08:35	Received: 08	3/16/18 16:00 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	).7 Preparation Met	hod: EP	A 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			
_ithium	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 Me	thod: EPA 200	0.8 Preparation Met	hod: EP	A 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 Me	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Me	thod: SM 2540	OC					
Total Dissolved Solids	626	mg/L	5.0	1		08/21/18 12:08	;	
4500H+ pH, Electrometric	Analytical Me	thod: SM 4500	0-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 Me	thod: EPA 300	0.0					
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	



Project: JEC IBA CCR
Pace Project No.: 60277958

Date: 08/27/2018 05:14 PM

Sample: IBA-3-081518	Lab ID: 602	277958002	Collected: 08/15/1	8 09:57	Received: 08	3/16/18 16:00	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Met	thod: EPA 200	).7 Preparation Met	hod: EP	A 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			
_ithium	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 Met	thod: EPA 200	0.8 Preparation Met	hod: EP	A 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 Met	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Met	thod: SM 2540	OC					
Total Dissolved Solids	1630	mg/L	5.0	1		08/21/18 12:08	3	
4500H+ pH, Electrometric	Analytical Met	thod: SM 4500	0-H+B					
oH at 25 Degrees C	7.2	Std. Units	0.10	1		08/18/18 15:13	3	H6
300.0 IC Anions 28 Days	Analytical Met	thod: EPA 300	0.0					
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	



Project: JEC IBA CCR
Pace Project No.: 60277958

Date: 08/27/2018 05:14 PM

Sample: IBA-2-081518	Lab ID: 602	277958003	Collected: 08/15/1	8 12:04	Received: 08	/16/18 16:00 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Met	thod: EPA 200	0.7 Preparation Met	hod: EP	A 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	
_ead, Total Recoverable	<0.010	mg/L	0.010	1	08/20/18 09:10			
ithium	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 Met	thod: EPA 200	0.8 Preparation Met	hod: EP	A 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	
Γhallium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:49	7440-28-0	
45.1 Mercury	Analytical Met	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Met	thod: SM 2540	OC					
Total Dissolved Solids	1330	mg/L	5.0	1		08/21/18 12:08		
1500H+ pH, Electrometric	Analytical Met	thod: SM 4500	D-H+B					
oH at 25 Degrees C	7.2	Std. Units	0.10	1		08/18/18 15:24		H6
800.0 IC Anions 28 Days	Analytical Met	thod: EPA 300	0.0					
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		



Project: JEC IBA CCR
Pace Project No.: 60277958

Date: 08/27/2018 05:14 PM

Sample: IBA-1-081518	Lab ID: 602	277958004	Collected: 08/15/1	8 13:10	Received: 08	3/16/18 16:00	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Met	hod: EPA 200	0.7 Preparation Met	hod: EP	A 200.7			
Barium, Total Recoverable	0.034	mg/L	0.0050	1	08/20/18 09:10	08/24/18 17:15	5 7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 17:15	5 7440-41-7	
Boron, Total Recoverable	0.37	mg/L	0.10	1	08/20/18 09:10	08/24/18 17:15	5 7440-42-8	
Calcium, Total Recoverable	310	mg/L	0.20	1	08/20/18 09:10	08/24/18 17:15	5 7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	08/20/18 09:10	08/24/18 17:15	5 7440-47-3	
Lead, Total Recoverable	<0.010	mg/L	0.010	1	08/20/18 09:10			
_ithium	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 Met	hod: EPA 200	0.8 Preparation Met	hod: EP	A 200.8			
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:53	3 7440-36-0	
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:53	3 7440-38-2	
Cadmium, Total Recoverable	0.00053	mg/L	0.00050	1	08/20/18 09:10	08/24/18 12:53	3 7440-43-9	
Cobalt, Total Recoverable	0.0025	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:53	3 7440-48-4	
Molybdenum, Total Recoverable	0.0069	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:53	3 7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:53	3 7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/20/18 09:10	08/24/18 12:53	3 7440-28-0	
245.1 Mercury	Analytical Met	hod: EPA 245	5.1 Preparation Met	hod: EP	A 245.1			
Mercury	<0.00020	mg/L	0.00020	1	08/22/18 11:50	08/22/18 17:04	4 7439-97-6	
2540C Total Dissolved Solids	Analytical Met	hod: SM 2540	OC					
Total Dissolved Solids	1680	mg/L	5.0	1		08/21/18 12:08	3	
4500H+ pH, Electrometric	Analytical Met	hod: SM 4500	O-H+B					
pH at 25 Degrees C	7.1	Std. Units	0.10	1		08/18/18 15:25	5	H6
300.0 IC Anions 28 Days	Analytical Met	hod: EPA 300	0.0					
Chloride	122	mg/L	10.0	10		08/26/18 16:07	7 16887-00-6	
Fluoride	0.35	mg/L	0.20	1		08/25/18 20:37	7 16984-48-8	
Sulfate	877	mg/L	100	100		08/26/18 16:2	1 14808-79-8	



Project: JEC IBA CCR
Pace Project No.: 60277958

Date: 08/27/2018 05:14 PM

Sample: DUP-081518	Lab ID: 602	277958005	Collected: 08/15/1	8 06:00	Received: 08	/16/18 16:00 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Met	hod: EPA 200	).7 Preparation Met	hod: EP	A 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		08/24/18 17:18		
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 Met	hod: EPA 200	0.8 Preparation Met	hod: EP	A 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	
Гhallium, 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 Met	hod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Met	hod: SM 254	0C					
Total Dissolved Solids	1710	mg/L	5.0	1		08/21/18 12:08		
1500H+ pH, Electrometric	Analytical Met	hod: SM 450	0-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 Met	hod: EPA 300	0.0					
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	



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

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Mercury mg/L <0.00020 0.00020 08/22/18 15:53

LABORATORY CONTROL SAMPLE: 2215571

Date: 08/27/2018 05:14 PM

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2215572 2215573

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

MATRIX SPIKE SAMPLE: 2215574

60277950001 Spike MS MS % Rec

ParameterUnitsResultConc.Result% RecLimitsQualifiersMercurymg/LND.0050.00458970-130

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.



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

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Mercury mg/L <0.00020 0.00020 08/22/18 16:57

LABORATORY CONTROL SAMPLE: 2215598

Date: 08/27/2018 05:14 PM

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2215599 2215600

MS MSD 60277973001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual ND 0.0032 70-130 20 M1 Mercury mg/L .005 .005 0.0034 68 64

MATRIX SPIKE SAMPLE: 2215601 60277408002 Spike MS MS % R

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

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.



Project: JEC IBA CCR
Pace Project No.: 60277958

Date: 08/27/2018 05:14 PM

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

		Blank	Reporting		
Parameter	Units	Result	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	

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Barium	mg/L		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 S	SPIKE DUPLICA	ATE: 221378	37		2213788							
Parameter	6 Units	0277882001 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						
		60277958005	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	

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.



Project: JEC IBA CCR
Pace Project No.: 60277958

Date: 08/27/2018 05:14 PM

MATRIX SPIKE SAMPLE:	2213789						
		60277958005	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	)

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.



Project: JEC IBA CCR
Pace Project No.: 60277958

Date: 08/27/2018 05:14 PM

 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	ma/L	< 0.0010	0.0010	08/24/18 11:59	

LABORATORY CONTROL SAMPLE:	2213822					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% 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 S	SPIKE DUPLICA	TE: 221382	23 MS	MSD	2213824							
Parameter	6 Units	0277598001 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Faiametei	Units			COIIC.			70 KeC	% Kec		KFD	MPD	uai
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						
		60277599001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	

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.



Project: JEC IBA CCR
Pace Project No.: 60277958

Date: 08/27/2018 05:14 PM

MATRIX SPIKE SAMPLE:	2213825	00077500004	0 11	140	140	0/ D	
Parameter	Units	60277599001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
							Qualificity
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	

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.



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

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L <5.0 5.0 08/21/18 12:08

LABORATORY CONTROL SAMPLE: 2214825

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

SAMPLE DUPLICATE: 2214826

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

SAMPLE DUPLICATE: 2214827

Date: 08/27/2018 05:14 PM

Parameter Units 60277958004 Dup Result RPD AND Qualifiers

Total Dissolved Solids mg/L 1680 1700 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.



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

60277549003 Result

Dup Result

**RPD** 

Max RPD

Qualifiers

Parameter pH at 25 Degrees C

Date: 08/27/2018 05:14 PM

Units Std. Units

7.0

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.



Project: JEC IBA CCR

Pace Project No.: 60277958

QC Batch: 540188
QC Batch Method: SM 4500-H+B

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

Associated Lab Samples: 60277958001, 60277958002, 60277958003, 60277958004

SAMPLE DUPLICATE: 2213529

Date: 08/27/2018 05:14 PM

 Parameter
 Units
 Result
 Result
 RPD
 Max

 pH at 25 Degrees C
 Std. Units
 6.6
 6.7
 1
 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.



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

> Blank Reporting

Parameter Limit Qualifiers Units Result Analyzed <1.0 08/25/18 14:41 mg/L 1.0

Chloride Fluoride mg/L < 0.20 0.20 08/25/18 14:41

LABORATORY CONTROL SAMPLE: 2218729

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chloride mg/L 4.7 94 90-110 Fluoride mg/L 2.5 2.6 104 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2218730 2218731

		60277531001	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	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

Date: 08/27/2018 05:14 PM

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	

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.



Project: JEC IBA CCR Pace Project No.: 60277958

Chloride

Sulfate

Sulfate

Date: 08/27/2018 05:14 PM

 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

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

LABORATORY CONTROL SAMPLE: 2219134

Spike LCS LCS % Rec
Parameter Units Conc. Result % 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

mg/L

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

 MATRIX SPIKE SAMPLE:
 2219137

 60277542001
 Spike
 MS
 MS
 % Rec

 Parameter
 Units
 Result
 Conc.
 Result
 % Rec
 Limits
 Qualifiers

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.



#### **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**

Date: 08/27/2018 05:14 PM

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.



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: JEC IBA CCR
Pace Project No.: 60277958

Date: 08/27/2018 05:14 PM

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		



# **Sample Condition Upon Receipt**



PEX 🗆 ECI 🗀	Pace ☑ Xroads ☐ Client ☐ Other ☐
Pace Shipping Label Used	d? Yes   No □
Seals intact: Yes	□ No □
gs □ Foam □	None ☐ Other ☐
of Ice We Blue No	
actor <u>+1.1</u> Correc	Date and initials of person examining contents: 5-17
	ı .
Yes No N/A	
ØYes □No □N/A	
Yes No N/A	
ØYes □No □N/A	PH
□Yes ☑No □N/A	•
Yes No N/A	
☐Yes □No □N/A	
Tyes No N/A	
ØYes □No □N/A	
□Yes □No MN/A	
□Yes □No ☑N/A	
Yes ONO ON/A	
□Yes □No □N/A	
□Yes □No □N/A	List sample IDs, volumes, lot #'s of preservative and the
	date/time added.
□Yes □No	
□Yes □No	
□Yes □No ☑NA	
□Yes □No •N/A	
□Yes □No 📶N/A	
eld? 🗆 Yes 🗀 No 🗀 N/A	
	Field Data Required? Y / N
te/Time:	
	Seals intact: Yes of Seals of Seals intact: Yes of Seals of Sea





# **CHAIN-OF-CUSTODY / Analytical Request Document**

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

_	d Client Information:	IFROY.	Section B Required Pro								tion (		ion:								,						Page:		( of	1	
Compan			Report To: Copy To: J						_	-	pany I	Name	·	-	_				_		DF.	0111	4.70	27/	051	101/				911	
rtudicoo			Сору го.	areu iv	0113011					Addr					12					-		_	ATOF	-	_				DDIA II (II		
Casil Te	Topeka, KS 6		Purchase Ord	or No :	10 150 0	20000224	50				Quote					-				_	- 1		DES -				TAW C	ER [	DRINKIN	IG WA	EK
Email To		fin@westarenergy.com			10JEC-0		150			Refer			1 41	14	E1	- 042		4.40	7	-		_	_	-	RCI	RA		V//////	OTHER	,,,,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	785-575-8135	Fax:	Project Name		C IBA CCI	K				Mana	iger:				/IISOI	n 913	-263	-140	<i>'</i>		Si		cation			KS					
Reques	ted Due Date/TAT:	7 day	Project Numb	er.						Pace	Profile	= #.   (	9657,	g <sup>1</sup>			_				3		TATE.	_			W77	<u>//////</u>			
					1				r	_	r		_				=	Re	que	stec	Ana	lysis	Filte	red	(Y/N	)	-(//				
	Section D Required Client Informati	Valid Matrix C	CODE	MP)		COLL	ECTED					F	Prese.	rvativ	/es		N/A							1							
	SAMPL	DRINKING WATER WATER WASTE WATER PRODUCT SOIL/SOLID OIL WIPE	P SL OL WP	(S=GRAB C=COMP)	COMP	POSITE	COMPC END/G	OSITÉ RAB	AT COLLECTION	ERS							Test	Metals*	etals""	p 2							rine (Y/N)	6	1279	58	
ITEM #	(A-Z, 0-9 Sample IDs MUST	AIR (,-) OTHER	AR OT TS	SAMPLE TYPE	DATE	TIME	DATE	TIME	SAMPLE TEMP A	# OF CONTAINERS	Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HCI HCI	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	lysis	200.7 Total M	200.8 Total Metals	245.1 Total Hg	) (၇	4500 H+B					Residual Chlorine (Y/N)	Pac	e Project	No./ L	ab I.D.
1	IBA-4-	081518		or G			8/15	0835		2			1										BP	Vu	R	731	7				OOL
2	IBA-3-	081518		T G				0957		2			1						$\perp$			Ш			B	71/	<b>U</b>				OR
3	TBA-2	081518		T 6				1204		2	1		1												13	731	الا				013
4	IAA-1-	-081518	^	T G	c .		6/15	1310		2	1		1		_	_			1				V	_		1	_				024
5												Ш			_	$\perp$		_	+	1	1			+			_				
6				1				500	-	_	-	Ш	_		+	+		_	4	+	+	Н	_	+	-	_	+				
7				-		-	-		⊢	┡			-		+	+		-	+	+	+	$\vdash$	+	+		$\dashv$	+	-			
8						-	-	-	$\vdash$	⊢	+	$\vdash$	+	$\vdash$	+	+		-	+	+	+	Н	-	-	+	-	+	-			
9	DUP-0815	10	- 1	1		-	8/15	0600	+	2	1	$\vdash$	+	$\vdash$		+	2 4	+	+		-	Н	371		Z	-31	+	<del> </del>			/195
10	001 0013	0		+			0/13	5000	1	1-			+	+	+	+		+	+	+	+		9	1	101	04	+				0.5
11										T		T				$\top$					T			Ī			$\top$				
	ADDITIONA	L COMMENTS	F	ELINQ	JISHED BY	/ AFFILIAT	ION	DAT	E	F	TIME	5	LPE	10	ACCI	EPTE	BY /	AFFI	LIAT	ION	3		AJE		TIME			SAI	IPLE COND	ITIONS	
200.7 To	otal Metals*: B, Ca, Ba,	Be, Cr, Pb, Li	ME	27	1/1	west	< V	8/16/	110	08	830	0	T	1			=	_	F	2	4		7-19	8	60	5 ,	2.6	Y	N		¥
200 8 To	otal Metals**: Sb, As, Co	I, Co, Mo, Se, TI	10	-	-	, ,		1.4							-				_		DI	Eig.	17-18								(
												$\dashv$		_							_	,	*1-10	-		$\neg$	_		1		
									-	1		+							_	_		-	_	+		$\dashv$		<del>                                     </del>	+	+-	
ء ا	0					CAMPI	ED MANE	AND SICH	ATI	DE					145	-								_		$\dashv$		+	) o	+	ਹੁ
g d						SAMPL	ER NAME	_	_	_	2 -		7		1	-	· ·			- /			-			-	in °C	9d of (N)	Seal (Y/N		s Inta N)
9000							SIGNATUR	RE of SAMP	_		13	1	Jan )	-	61	rit	אל	DAT (MI	TE S	igned	08	/1	5/	18			Temp in	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)		Samples Intact (Y/N)



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,

diator m. Wilson

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



9608 Loiret Blvd. Lenexa, KS 66219 (913)599-5665



#### **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



# **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



# **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



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:**



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:**



Project: JEC IBA CCR Pace Project No.: 60278245

Method:Total Radium CalculationDescription:Total Radium 228+226Client:WESTAR ENERGYDate: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.



Project: JEC IBA CCR
Pace Project No.: 60278245

<b>Sample: IBA-4-081518</b> PWS:	<b>Lab ID: 60278245</b> Site ID:	Collected: 08/15/18 08:35 Sample Type:	Received:	08/20/18 09:50	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		1.25 ± 0.868 (1.17) C:NA T:82%	pCi/L	08/31/18 20:22	13982-63-3	
Radium-228		0.00800 ± 0.358 (0.832) C:71% T:78%	pCi/L	08/31/18 14:1	5 15262-20-1	
Total Radium	Total Radium Calculation	1.26 ± 1.23 (2.00)	pCi/L	09/04/18 16:10	7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60278245

<b>Sample: IBA-3-081518</b> PWS:	<b>Lab ID: 60278</b> 2 Site ID:	245002	Collected: 08/15/18 09:57 Sample Type:	Received:	08/20/18 09:50	Matrix: Water	
Parameters	Method	Ad	et ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1		3 ± 0.734 (1.24) A T:68%	pCi/L	08/31/18 20:22	13982-63-3	
Radium-228	EPA 904.0		3 ± 0.363 (0.689) % T:80%	pCi/L	08/31/18 14:1	5 15262-20-1	
Total Radium	Total Radium Calculation	1.05	± 1.10 (1.93)	pCi/L	09/04/18 16:10	7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60278245

<b>Sample: IBA-2-081518</b> PWS:	<b>Lab ID: 60278245</b> Site ID:	OO3 Collected: 08/15/18 12:04 Sample Type:	Received:	08/20/18 09:50	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.402 ± 0.370 (0.218) C:NA T:85%	pCi/L	08/31/18 20:22	13982-63-3	
Radium-228		0.289 ± 0.364 (0.772) C:69% T:83%	pCi/L	08/31/18 14:1	5 15262-20-1	
Total Radium	Total Radium Calculation	0.691 ± 0.734 (0.990)	pCi/L	09/04/18 16:10	7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60278245

<b>Sample: IBA-1-081518</b> PWS:	<b>Lab ID</b> : <b>602782</b> Site ID:	45004 Collected: 08/15/18 13:10 Sample Type:	Received:	08/20/18 09:50	Matrix: Water	
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 14:1	5 15262-20-1	
Total Radium	Total Radium Calculation	$0.397 \pm 0.869  (1.76)$	pCi/L	09/04/18 16:10	7440-14-4	



# **ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: JEC IBA CCR
Pace Project No.: 60278245

Sample: DUP-081518 PWS:	<b>Lab ID: 6027824</b> Site ID:	Sample Type:	Received:	08/20/18 09:50	Matrix: Water	
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 14:1	5 15262-20-1	
Total Radium	Total Radium Calculation	0.650 ± 0.993 (1.87)	pCi/L	09/04/18 16:10	7440-14-4	



## **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.



## **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.



## **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**

Date: 09/05/2018 12:19 PM

PASI-PA Pace Analytical Services - Greensburg



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: JEC IBA CCR
Pace Project No.: 60278245

Date: 09/05/2018 12:19 PM

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		



# CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Regulred Client Information:		Section B Required Proje	ganget passet personne	*************	***************************************	************************************	TOTAL TO	]	AND DESCRIPTION OF THE PARTY OF	e Inforn	nation:	***************************************		**********	*****		pija nie nie orie arie	opy optical accounts	4	-				P;	age:		of		
Company: WESTAR ENE		Report To: Br							Attenti								.,		-	innikatezake.	aisittesan	NICES CONTROL		**********		STREET,	homentorantzanara N	EMPSEZINEZH	
Address: 818 Kansas Av	re	Сору То: Ја	red Mo	orrison				ĺ	Comp	any Nar	me:		,,,						RE	GULA	TOR	Y AG	ENC'	Y					
Topeka, KS 66	612	enting the contract of the con						ľ	Addres	98:									=	NPD	ES	Γ G	ROU	IND V	NATE	R C	DRINKIN	G WA	TER
Email To: <u>brandon.l.gríffi</u> r	n@westarenergy.com	Purchase Orde	r No.:	10JEC-0	0000331	50			Pace O Refere											UST		□ R	CRA			-	OTHER		
Phone: 785-575-8135	Fax:	Project Name:	JEC	IBA CCF	}	***************************************	· · · · · · · · · · · · · · · · · · ·		Pace P Manage		Hea	ther	Vilso	n 91:	3-563	3-140	)7		Sit	e Loc	ation		1	•	V				
Requested Due Date/TAT:	15 day	Project Numbe	<b>'</b> :							rofile #:	965	7, 1								ST	ATE:		KS	5	- E				
				homerie de de la	······································		THE STATE OF THE S		THE REAL PROPERTY.	*******			344554732463		1	Re	que	sted	Anal	ysis	Filter	ed (Y	N)						
Section D Required Client Information	Valid Matrix C MATRIX	ordes (2	(P)		COLL	ECTED	THE PERSONNEL PROPERTY.				Pres	ervat	ives		Y.N.														
SAMPLE (A-Z, 0-9 / , Sample IDs MUST BE	DRINKING WATER WASTE WASTE WASTE WASTE PRODUCT SCILISOLID OR WIPE AIR OTHER		(G=GRAB	COMPC STAR	SITÉ	DOMPO END/G	ESTE A	TEMP AT COLLECTION	CONTAINERS	Wed		and I simultandumber to the gradient control of the	en er en	_	is Test	226	III-228					en de la company			Residual Chlotine (YM)	ladiatenkakakakaka	rekolicitatialiakukeeka		alai ila dimika kantai kantai k
*	SOMETIN SEASONING OF FEIGHT BANKS CHINISTS AT A ANTIBLAS OF STEAS AND AN ARTHUR.	MATRIX MATRIX	SAMPLE	DATE	TIME	DATE	TIME	SAMPLET	# OF	Unpreserved H-SO,	HNOS	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Other	Analysis	Radium-	Radium-228	10617	o de la constante de la consta		Q.				Residua	Pace	Project	No./ L	ab I.D.
	81518	1.08	1 60			8/15	0835	одоривания	2		[2]			-		$\Box$	4				-		-	1	-	······································			
	81518		12			6/19	0957	-	À.		2	_ _	<u></u>		colomeros	4	Ш.	William Co.			ar i e e e e e e e e e e e e e e e e e e	_							
	V61518	V	6			8/15	1204		2		2														<b> </b>				
4 164-1-	08:1518	w.	6			8/15	1310		2_	-	2					1	Щ		$\vdash$		-		-	-	$\vdash \vdash$				
10 <b>5</b> 0											$+\!+\!$			-		-	-	-	++		-		-	-					
(i), <b>6</b> (i);												_		-	cocchictories			_	-		,,,,		-		$\vdash \vdash$				
98 <b>7</b> 58			-	ĺ		<u> </u>	<del> </del>	-		_		- -		-	Marine Services			-	+	-			-	-			<del>,</del>		
8			<del>-   ·</del>								11		alana da	+					+	_	+-	-	+-	+	$\vdash$				
10 DUP- 08151	<u> </u>	la "	G	elaker e		8/19	cha		フ	$\dashv$	12		et e				X	_		-			-						
	(2		13	0,000		7				$\dashv$				╁	overseed/over			7	+	+			+		m				
·····································			_				1				11	_		<u> </u>			$\top$	+					$\top$		H				
ADDITIONAL	COMMENTS	RE	LINQU	SHED BY /	AFFILIATI	ON	DATE		T	ME	*******	Hamilto Silvania	ACC	EPTE	D BY	AFF	LIATI	ON	-	DA	TE	Tir	ΛĒ	İ	årararaikar	SAMP	LE CONDI	TIONS	***********
		135	2)		vest	· /	8/14/	N	08	30	IC	In	w.J	ئى كىر	4	1	~	D	Œ	8/2	1/18	09	50	18	.71	٦	N	IV	TEAN SAITS) HANGON ASSESSED
		100					<del>  ** -                                 </del>			3-4	17		1	207				# #	-	-	7			1	7			17	
								1		***********	+₩													1	$\top$			İ	
											1				·····			·							十				
Page 1						*************	AND SIGNA ne of SAMPL	TATALANA A		319	77	Cv1			14	4	CONTRACTOR OF THE STATE OF THE	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		**************************************				, , , , , , , , , , , , , , , , , , ,	Temp in "C	Received antice (Y.N.)	Custody Sealed Cooler (Y/N)		Samples Intect (Y/N)
17 of 2						SIGNATUF	RE of SAMPL	ER;	18	2	1	The state of the s				DA (Mi	TE SI	gned YY):	08,	/15	6/1	8			Ē	Rece · Ice	Custoc		Samp

## Pittsburgh Lab Sample Condition Upon Receipt р Face Analytical Wester Energy Project # Client Name: Courier: Fed Ex UPS USPS Client Commercial Pace Other Label Tracking #: 7823 8322 7885 LIMS Login yes no Seals intact: Type of Ice: Wet Blue None Welter Thermometer Used Correction Factor: Cooler Temperature Temp should be above freezing to 6°C pH paper Lot# Date and Initials of person examining contents: Yes No Comments: Chain of Custody Present: Chain of Custody Filled Out: Chain of Custody Relinquished: 3. Sampler Name & Signature on COC: Sample Labels match COC: 5. -Includes date/time/ID Matrix: Samples Arrived within Hold Time: Short Hold Time Analysis (<72hr remaining): Rush Turn Around Time Requested: 8. Sufficient Volume: 9. Correct Containers Used: 10. -Pace Containers Used: Containers Intact: 11. 12. Orthophosphate field filtered 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, PHLZ All containers needing preservation are found to be in compliance with EPA recommendation. Date/time of exceptions: VOA, coliform, TOC, O&G, Phenolics completed 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 Client Notification/ Resolution: Person Contacted: Contacted By: Date/Time: Comments/ Resolution:

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)

3:53 cm/ 8/21/18 hat additional information has been stored in ereports.

\*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,

0278245 <b>W</b> o	rkorder l	dom IEO io i					State	Of Orig	gin:		KS	/		e Analytica
		vame:JEC IBA Subcontra					Owne	r Rece	ived	l Date		Results Re	equested By	
Kansas 119 3-1407		Pace / 1638   Suites Green	Analytical Pittst Roseytown Ros 2,3, & 4 sburg, PA 156	ad					226 & Total Radium	adium-228				
	Sample Type	Collect Date/Time	Lab ID	Matrix	Other	reserve	d Cont	ainers	Radium-					
	PS	8/15/2018 08:35	60278245001	Water	1				Y	V				LAB USE ONL
	PS	8/15/2018 09:57	60278245002	Water	1					<del></del>	1100 Maria (1100 M			001
	PS	8/15/2018 12:04	60278245003	Water	1					<del></del>		200		002
	PS	8/15/2018 13:10	60278245004	Water	1									003
	PS	8/15/2018 06:00	60278245005	Water	1					-}				004
		Operation of the second										Comme	ente Communication	<u> 006 </u>
eased By		Date/Time	Received F	<b>≩</b> у				Date/Tim	ie				16.00 (1000) (16.00 (16	
14704-0-11			- Bh	kip_						<b>5</b> 6	BJH 8/2	e118		
	3-1407	Sample Type PS PS PS PS PS PS PS PS	Sample Collect Type Date/Time PS 8/15/2018 08:35 PS 8/15/2018 12:04 PS 8/15/2018 13:10 PS 8/15/2018 06:00  Passed By Date/Time	Sample   Collect   Lab   ID	Sample   Collect   Lab ID   Matrix	Sample   Collect   Lab ID   Matrix	Greensburg, PA 15601 Phone (724)850-5600    Preserve	Greensburg, PA 15601 Phone (724)850-5600    Sample   Collect   Type   Date/Time   Lab ID   Matrix   Sample   Ps   8/15/2018 08:35   60278245001   Water   1   Ps   8/15/2018 12:04   60278245002   Water   1   Ps   8/15/2018 13:10   60278245004   Water   1   Ps   8/15/2018 13:10   60278245005   Water   1   Ps   8/15/2018 06:00   60278245005   Water   1   Ps   Branch   Ps   Branch   Ps   Branch   Ps   Branch   Ps   Branch   Ps   Branch   Bra	Greensburg, PA 15601 Phone (724)850-5600  Preserved Containers    Sample   Collect   Date/Time   Lab ID   Matrix	Sample   Collect   Type   Date/Time   Lab ID   Matrix   Matrix   PS   8/15/2018 08:35   60278245001   Water   1	Sample   Collect   Type   Date/Time   Lab ID   Matrix   Sample   Preserved Containers   Sample   Collect   Type   Date/Time   Lab ID   Matrix   Sample   Collect   Sample   Sample   Collect   Coll	Sample   Collect   Type   Date/Time   Lab ID   Matrix   February   Sample   Collect   Type   Date/Time   Lab ID   Matrix   Mater   1	Sample   Collect   Type   Date/Time   Lab   D   Matrix   PS   8/15/2018 08:05   60278245001   Water   1   X   X   X   PS   8/15/2018 13:10   60278245004   Water   1   X   X   X   PS   8/15/2018 13:10   60278245004   Water   1   X   X   X   PS   8/15/2018 13:10   60278245004   Water   1   X   X   X   PS   8/15/2018 13:10   60278245004   Water   1   X   X   X   PS   8/15/2018 06:00   60278245005   Water   1   X   X   X   PS   8/15/2018 06:00   60278245005   Water   1   X   X   X   PS   8/15/2018 06:00   60278245005   Water   1   X   X   X   PS   8/15/2018 06:00   60278245005   Water   1   X   X   X   PS   8/15/2018 06:00   60278245005   Water   1   X   X   X   PS   8/15/2018 06:00   60278245005   Water   1   X   X   X   PS   8/15/2018 06:00   60278245005   Water   1   X   X   X   PS   8/15/2018 06:00   60278245005   Water   1   X   X   X   X   PS   8/15/2018 06:00   60278245005   Water   1   X   X   X   X   PS   8/15/2018 06:00   60278245005   Water   1   X   X   X   X   X   PS   8/15/2018 06:00   60278245005   Water   1   X   X   X   X   X   X   X   X   X	

<sup>\*\*\*</sup>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.

Sectio Requir	n A ed Client Information;		-	Section Required		at Infor	matian:						ion C													Consequence	Page:			of	· · · · · · · · · · · · · · · · · · ·	-72.W
Compa	ry: WESTAR EI	VERGY		Report To				**************************************	***************************************	***************************************	<del></del>	Invoid Atten	*****	mation:	Wards was	************	******		***********	***************************************	-	Personal Property of the Personal Property of				accepta.		***********	ļ	»»»»»»		
Addres	s: 818 Kansas	Ave		Copy To:					····			Comp	any Na	ame;				·····							100 m		MARKATINES	·		**************************************	CONTRACTOR AND ADDRESS OF THE ADDRES	97411711717777
	Topeka, KS	66612										Addre	95:									-	ULATO		ATTECNATION	Si de Constante	otoni mani		Contract of the Contract of th	DEFENDENCE AND	THE STATE OF THE S	
Email T	a: <u>brandon.l.grí</u>	ffin@westarer	nergy.com	Purchase	Order	No.:	10.JEC-0	10000331	150			Pace				···············							VPDES				D WAT	ER -	" DRI	NKING V	NATER	A CONTRACTOR OF THE CONTRACTOR
Phone:	785-575-8135	Faxc		Project Na			BA CCI					Refere		lina	- 4 h. a.a	1801-		10.00				1	JST		RC	RA		CIII (SECONDO AND AND AND AND AND AND AND AND AND AND	OTH	ER		
Reques	Sted Due Date/TAT:	15 day		Project Nu			- 10/100	1				Manag				VVIIS	on A	13-56	3-14	107		Site	Locati	on		KS						
***************************************	***************************************	THE REAL PROPERTY OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED			***************************************			-			<del>Villianze</del> n	Luca I	-Tottle #	965	7, 1	**********	<del></del>	PROTECTION OF THE PROTECTION O					STAT	ε:								
	0	Contract Con	*****************	······································	1			Marin Statile Comme	<del></del>	*27717211111111111111111111111111111111	- ANNE ANNE	e commence de la comm	Name and Address of the London	·	*********	<del></del>				eque	ested	Analy	sis Fil	tered	TYN	()						
	Section D Required Client Informat	tlon	Valid Matrix C MATRIX	CODE	(o left)	MP)		COLL	ECTED			niozonatazene		Pres	erva	tives		Y N						THE PERSON NAMED IN COLUMN								
			WATER	WT WW F	alid codes to left)	AB C=COMP)	COMP STA		COMPO END/G	SITE RAG	COLLECTION											***************************************			***************************************		9		hairelandsalinda	Salas Salas Salas Salas Salas Salas Salas Salas Salas Salas Salas Salas Salas Salas Salas Salas Salas Salas S	heilaslaslaslaslaslaslaslas	
	SAMPL	E ID	OIL WIPE	SL OL WP AR	(see valid	(G=GRAB		1		<u> </u>		RS						Test	TANKS TANKS TANKS				-				ıe (Υ/					College Control of Con
	(A-Z, 0-9 Sample IDs MUST			OT TŞ	CODE	TYPE					TEMP AT	NTAIN	swed				_	S)	-226	.228			30	2	6	2	Chlori	55				Partie November 1 (1975)
TEM #					MATRIX	SAMPLE	DATE	TIME	DATE	TIME	SAMPLE	# OF CONTAINERS	Unpreserved	HNOs	NaOH NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Analysis	Radium-226	Radium-228	rotal Radium						Residual Chlorine (Y/N)	NA CONTRACTOR CONTRACT				DESCRIPTION OF THE PERSON OF T
; :1	INA- 4-	081518	CONTRACTOR OF THE PARTY OF THE	274-274-27	WI	6			8/15	0835		2		2			«E		Tr.									Pa	ce Pro	ect No.	./ Lab (.)	D
- 2	IBA-3-	081518		***************************************	NJ				8/19	0957	s .	12	TT	2	_			7	1	and College	1		+	$\dashv$	+	-	100			-		and a second
3	IRA-2.	-081518			W	6			8/15	1204	1	1		2	1	$\dashv \dashv$		-	-		<del>                                     </del>		+									
£	IA4-1-	- 081518	5		M	6			8719	1310		12	T	2	$\top$			_		All may			++	_	-			1				
5		· ·			- Common of the					<u></u>		1 /2100	$\sqcap$		十	11		-		-					+			-			····	100000000000000000000000000000000000000
6	-				Salara Line						<b></b>	Ì	$\Box$		_		$\dashv$	7			+	1-1-	+									
7										<u> </u>								7	-		_	++	+	$\dashv$	1		255					
8					Name of the least							Occurrence of the latest of th						<b>-</b>			┪		$\dagger \dagger$	_	+		- Paradoni	1				
. 9					and the second						Т										_		+		-			1		····		
:10	DUP-1815	18			MT	G			8/19	ChW		7		12					×	X	\ \  \  \  \		+		$\top$			ļ				
11										<u> </u>					~~~		T	1			$\top$		11		$\dagger$							
12		**************************************	··																		┪		11		1-				·			
******	ADDITION	AL COMMENTS			REL	INQUI	SHED BY	AFFILIAT	ION	DAT	E	1	IME			AC	CEPTI	ED BY	JAF	FILIAT	ION	-	DATE		TIME		įi.	SA	MPLEC	ONDITION	NS	
				1/3	= 1	<i>)</i>	rance for the	vest	K V	8/15	/18/	()	330		11	-	1	1	1)		m	U 8	doub	10	995	~	18.7			11	7	
						1	<del></del>	1	*	1307( 1 )	<u></u>	1 ***	e me	17		M	1		10			ا سا	W	10 (	510		10.	7	-	2+	<del>-</del>	
							· · · · · · · · · · · · · · · · · · ·	····				-		1																		
	***************************************											<b> </b>												+		_						
Lage zo oi								SAMPL	ER NAME I			***************************************		*************				**************************************			***********						ပ္	fi c	10 a	<del>2</del>	itact	
7	, , ,								PRINT Nan			<u>_</u>	<u>51.</u>	mod	on	(	366	77									Tenpin "C	Received an Ice (Y/N)	\ \frac{1}{2}	Cooler (Y/IN)	Samples Intect (Y/N)	
<u> </u>	5								SIGNATUR	E of SAM	PLER:		<i>[</i> ]		and the same				D/ (%)	ate s /m/de	igned VYY):	08/	19	118	Be <sup>a</sup>		Ē	Rec	1 2	000	Samf	

Pittsburgh Lab Sample Conc	lition	Upo	n R	eceipt
FaceAnalytical Client Name:	W	este	W	Energy Project # 3026293
Courier: Fed Ex UPS USPS Clie	nt 🗀			Pace Other Label
		<del></del>		LIMS Login 1877
Custody Seal on Cooler/Box Present: Syes	J∠l r	10	Sea	ls intact: ☐ yes ☐ no
Thermometer Used	Type			et Blue None Welter
Cooler Temperature Observed Temp  Temp should be above freezing to 6°C	4,8	°C	Cor	
Comments:	Yes	No	N/A	1/18/13/17/ contents: 0/7/1/0 to a
Chain of Custody Present:	James and State of the State of			1.
Chain of Custody Filled Out:	and the same of			2.
Chain of Custody Relinquished:				3.
Sampler Name & Signature on COC:	Fed Ex			
Sample Labels match COC:	- I			5.
-Includes date/time/ID Matrix:	WT			
Samples Arrived within Hold Time:				6.
Short Hold Time Analysis (<72hr remaining):				7.
Rush Turn Around Time Requested:		A CONTRACTOR OF THE PARTY OF TH		8.
Sufficient Volume:				9.
Correct Containers Used:				10.
-Pace Containers Used:				
Containers Intact:				11.
Orthophosphate field filtered			and the same of th	
Hex Cr Aqueous Compliance/NPDES sample field filtered		Ţ,	A CONTRACTOR OF THE PARTY OF TH	13.
Organic Samples checked for dechlorination:				14.
Filtered volume received for Dissolved tests			A STATE OF THE PARTY OF THE PAR	
All containers have been checked for preservation.				
All containers needing preservation are found to be in compliance with EPA recommendation.				PHICE
exceptions: VOA, coliform, TOC, O&G, Phenolics				completed JVD preservation
	<del></del>	<del>- ,</del>	_	preservative
Headspace in VOA Vials ( >6mm):		/		17.
Trip Blank Present:			<i>_</i>	18.
Trip Blank Custody Seals Present				mitial when a company of the company
Rad Aqueous Samples Screened > 0.5 mrem/nr				711.45   511.322.11.8
Client Notification/ Resolution:				
Person Contacted:		م	ate/Ti	ime:Contacted By:
Comments/ Resolution:				
MANAGEMENT AND AND AND AND AND AND AND AND AND AND				

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

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

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

ATTACHMENT 1-5 October 2018 Sampling Event Laboratory Analytical Report



October 22, 2018

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

RE: Project: 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,

Danson Wilson

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







## **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

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



# **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	



# **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
0282725002	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
0282725003	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
0282725005	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



## **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

(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.

(913)599-5665



## **PROJECT NARRATIVE**

Project: JEC IBA CCR Pace Project No.: 60282725

Method:EPA 245.1Description:245.1 MercuryClient:WESTAR ENERGYDate: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.

(913)599-5665



## **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.



## **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.



## **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.



Project: JEC IBA CCR
Pace Project No.: 60282725

Date: 10/22/2018 03:49 PM

Sample: IBA-4-100218	Lab ID: 602	82725001	Collected: 10/02/1	8 10:21	Received: 10	)/04/18 16:35	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Met	hod: EPA 200	).7 Preparation Met	hod: EP	A 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	3 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	3 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	
ithium	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 Met	hod: EPA 200	0.8 Preparation Met	hod: EP	A 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 Met	hod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Met	hod: SM 254	OC .					
Total Dissolved Solids	632	mg/L	5.0	1		10/08/18 10:35	5	
1500H+ pH, Electrometric	Analytical Met	hod: SM 450	O-H+B					
oH at 25 Degrees C	7.2	Std. Units	0.10	1		10/05/18 12:10	)	H6
800.0 IC Anions 28 Days	Analytical Met	hod: EPA 300	0.0					
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



Project: JEC IBA CCR
Pace Project No.: 60282725

Date: 10/22/2018 03:49 PM

Sample: IBA-3-100218	Lab ID: 602	282725002	Collected: 10/02/1	8 12:11	Received: 10	)/04/18 16:35 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	0.7 Preparation Met	hod: EP	A 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	
_ithium	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 Me	thod: EPA 200	0.8 Preparation Met	hod: EP	A 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 Me	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Me	thod: SM 254	0C					
Total Dissolved Solids	1510	mg/L	5.0	1		10/08/18 10:35		
4500H+ pH, Electrometric	Analytical Me	thod: SM 450	0-H+B					
oH at 25 Degrees C	7.2	Std. Units	0.10	1		10/05/18 12:11		H6
300.0 IC Anions 28 Days	Analytical Me	thod: EPA 300	0.0					
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	14808-70-8	



Project: JEC IBA CCR
Pace Project No.: 60282725

Date: 10/22/2018 03:49 PM

Sample: IBA-2-100218	Lab ID: 602	282725003	Collected: 10/02/1	8 13:58	Received: 10	/04/18 16:35 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	.7 Preparation Met	hod: EP	A 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	
_ead, Total Recoverable	<0.010	mg/L	0.010	1	10/09/18 16:24	10/13/18 18:41	7439-92-1	
ithium	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 Me	thod: EPA 200	.8 Preparation Met	hod: EP	A 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	
Γhallium, Total Recoverable	<0.0010	mg/L	0.0010	1	10/09/18 16:24	10/11/18 17:00	7440-28-0	
45.1 Mercury	Analytical Me	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Me	thod: SM 2540	OC					
Total Dissolved Solids	1300	mg/L	5.0	1		10/08/18 10:35	i	
1500H+ pH, Electrometric	Analytical Me	thod: SM 4500	)-H+B					
oH at 25 Degrees C	7.1	Std. Units	0.10	1		10/05/18 12:13	<b>;</b>	H6
800.0 IC Anions 28 Days	Analytical Me	thod: EPA 300	0.0					
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	



Project: JEC IBA CCR
Pace Project No.: 60282725

Date: 10/22/2018 03:49 PM

Sample: IBA-1-100218	Lab ID: 602	282725004	Collected: 10/02/1	8 15:05	Received: 10	/04/18 16:35 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	.7 Preparation Met	hod: EP	A 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	
_ead, Total Recoverable	<0.010	mg/L	0.010	1	10/09/18 16:24	10/13/18 18:44	7439-92-1	
ithium	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 Me	thod: EPA 200	.8 Preparation Met	hod: EP	A 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	
Гhallium, 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 Me	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Me	thod: SM 2540	OC					
Total Dissolved Solids	1820	mg/L	5.0	1		10/08/18 10:35	i	
1500H+ pH, Electrometric	Analytical Me	thod: SM 4500	)-H+B					
oH at 25 Degrees C	7.1	Std. Units	0.10	1		10/05/18 12:14	ı	H6
800.0 IC Anions 28 Days	Analytical Me	thod: EPA 300	0.0					
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	



Project: JEC IBA CCR
Pace Project No.: 60282725

Date: 10/22/2018 03:49 PM

Sample: DUP-100218	Lab ID: 602	282725005	Collected: 10/02/1	8 06:00	Received: 10	)/04/18 16:35 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Met	hod: EPA 200	).7 Preparation Met	hod: EP	A 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 Met	hod: EPA 200	0.8 Preparation Met	hod: EP	A 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 Met	hod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Met	hod: SM 254	OC .					
Total Dissolved Solids	626	mg/L	5.0	1		10/08/18 10:35		
4500H+ pH, Electrometric	Analytical Met	hod: SM 450	0-H+B					
oH at 25 Degrees C	7.1	Std. Units	0.10	1		10/05/18 12:07		H6
800.0 IC Anions 28 Days	Analytical Met	hod: EPA 300	0.0					
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	



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

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Mercury mg/L <0.00020 0.00020 10/11/18 16:12

LABORATORY CONTROL SAMPLE: 2251089

Date: 10/22/2018 03:49 PM

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2251090 2251091

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

MATRIX SPIKE SAMPLE: 2251092

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

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.



Project: JEC IBA CCR
Pace Project No.: 60282725

Date: 10/22/2018 03:49 PM

 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	

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Barium	mg/L		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 S	PIKE DUPLICA	ATE: 224958	32		2249583							
Parameter	6 Units	0282725001 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						
		60282726006	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	

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.



Project: JEC IBA CCR
Pace Project No.: 60282725

Date: 10/22/2018 03:49 PM

MATRIX SPIKE SAMPLE:	2249584						
_		60282726006	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	)

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.



Project: JEC IBA CCR
Pace Project No.: 60282725

Date: 10/22/2018 03:49 PM

 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					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% 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 S	SPIKE DUPLICA	ATE: 224958	87		2249588							
			MS	MSD								
	6	0282725005	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	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						
		60282726007	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	

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.



Project: JEC IBA CCR
Pace Project No.: 60282725

Date: 10/22/2018 03:49 PM

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	

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.



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

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L <5.0 5.0 10/08/18 10:35

LABORATORY CONTROL SAMPLE: 2247661

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Total Dissolved Solids** mg/L 1000 1010 101 80-120

SAMPLE DUPLICATE: 2247662

60282451002 Dup Max **RPD RPD** Parameter Units Result Result Qualifiers 1430 0 **Total Dissolved Solids** 1440 10 mg/L

SAMPLE DUPLICATE: 2247663

Date: 10/22/2018 03:49 PM

ParameterUnits60282553014 ResultDup ResultRPDMax RPDQualifiersTotal Dissolved Solidsmg/L732736110

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.



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

Date: 10/22/2018 03:49 PM

 Parameter
 Units
 60282725005 Result
 Dup Result
 Max RPD
 Max RPD
 Qualifiers

 pH at 25 Degrees C
 Std. Units
 7.1
 7.2
 1
 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.



Project: JEC IBA CCR
Pace Project No.: 60282725

Date: 10/22/2018 03:49 PM

 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

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

LABORATORY CONTROL SAMPLE: 2251781 Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chloride mg/L 5 5.1 101 90-110 Fluoride 2.5 2.5 102 90-110 mg/L Sulfate mg/L 5 5.2 104 90-110

MATRIX SPIKE SAMPLE:	2251784	60282726005	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Fluoride	mg/L	3.2	2.5	6.2	120	90-110	M1

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



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

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Sulfate mg/L <1.0 1.0 10/16/18 09:24

LABORATORY CONTROL SAMPLE: 2254737

Date: 10/22/2018 03:49 PM

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2254738 2254739

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

MATRIX SPIKE SAMPLE: 2254740 60282726007 Spike MS MS % Rec

ParameterUnitsResultConc.Result% RecLimitsQualifiersSulfatemg/L21801000343012590-110M1

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.



## **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**

Date: 10/22/2018 03:49 PM

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.



## **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: JEC IBA CCR
Pace Project No.: 60282725

Date: 10/22/2018 03:49 PM

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		
	DUP-100218	EPA 300.0	549179		



# Sample Condition Upon Receipt



Client Name: VCI far		
Courier: FedEx  UPS VIA Clay	PEX □ ECI □	Pace Z Xroads □ Client □ Other □
Tracking #: Pa	ace Shipping Label Used	d? 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: <u>T-298</u> Type	of Ice: (Vet) Blue No	
Cooler Temperature (°C): As-read OY Corr. Fa	ctor <u>0-0</u> Correct	Date and initials of person examining contents:
Temperature should be above freezing to 6°C		10/4/18 PV10/5
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): $\mathcal{P}$ /0/5	Yes ★No □N/A	PH
Rush Turn Around Time requested:	□Yes ØNo □N/A	
Sufficient volume:	✓Yes □No □N/A	
Correct containers used:	Yes □No □N/A	
Pace containers used:	✓Yes □No □N/A	
Containers intact:	Mes □No □N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	□Yes □No ☑N/A	
Filtered volume received for dissolved tests?	□Yes □No ZN/A	
Sample labels match COC: Date / time / ID / analyses	ØYes □No □N/A	
Samples contain multiple phases? Matrix:	□Yes ☑No □N/A	
Containers requiring pH preservation in compliance? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , 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:	Dv. Dv.	
Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
	□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		
Client Notification/ Resolution: Copy COC		Field Data Required? Y / N
	e/Time:	
Comments/ Resolution:		
Project Manager Review: REVIEWED	Date	ox <sub>=</sub> :

By hwilson at 10:44 am, 10/5/18

F-KS-C-003-Rev.11, February 28, 2018



# **CHAIN-OF-CUSTODY / Analytical Request Document**

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

Sectio Require	n A ed Client Information:		Section B Required Proj	ect Info	mation:						tion (	C formati	ion:														Page:	1	of	1		
Compar	y: WESTAR E	NERGY	Report To: Bi	andor	Griffin					Atter	ntion:										٦					-						_
Address	818 Kansas	Ave	Copy To: Ja	red M	orrison	-				Com	pany l	Name:	:								RI	EGU	LATO	DRY	AGEN	CY	6.4	115	100			
	Topeka, KS	66612								Addr	ess:										T	- N	PDES	Г	GRO	DUN	D WAT	ER [	DRINKIN	IG WA	TER	٦
Email T	brandon.l.gr	iffin@westarenergy.com	Purchase Orde	r No.:	10JEC-0	0000033	150				Quote				-	_	_	_		-	1,	- u	ST		RCF				OTHER	_		
Phone:	785-575-8135	Fax:	Project Name:	JE(	C IBA CC	R					Projec	t F	leath	ner W	/ilso	n 913	3-563	-140	7	-	5	Site t	ocatio	_				V///////		/////		77
Reques	ted Due Date/TAT:	7 day	Project Number	r:		_				Mana Pace	ger: Profile	#: <u>C</u>	9657	1	-	_		_					STATI	-11		KS						
					-		-			_	-	-	_	_	_	-		Re	que	stec	I An				(Y/N)		VII	<u> </u>				H
	Section D Required Client Informa		CODE	C=COMP)		COLL	ECTED.					P	rese	rvativ	/es		TN/A															
	SAMPL	DRINKING WATER WATER WASTE WATER PRODUCT SOIL/SOLID OIL WIPE	DW WT WW P SL OL WP	(G=GRAB C=CC	COMP	POSITE	COMPC END/G	DSITE RAB	COLLECTION	RS							st.	tals*	tals""								(N/Y) ar	602	12725			
ITEM#	(A-Z, 0-9 Sample IDs MUS	OTHER	AR OT TS	YPE (	DATE	TIME	DATE	TIME	SAMPLE TEMP AT	# OF CONTAINERS	Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HCI	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Other	Analysis Test	200.7 Total Metals	200.8 Total Metals	245.1 Total Hg	C TDS	4500 H+B					Residual Chlorine (Y/N)	Pace	Project	No./ I	Lab I.D.,	
1	IBA-4-	100218	W	16	i i	-	10/2	1021	T	2	T			П	$\top$	T		1		Ì	1 [			7	$\Box$	7			RP3A		09	)(
2	IBA-3-	100218	4	76			10/2	121/		2	i		1	П		T		T				11						1	1		09	
3	IBA-2-	100218		76			10/2		-	2	1		i	П			11					11									09	
4		100218	V	56			10/2	1505	П	2	N	П	1	П			14	1		l l	П	1		T	11	7		+	1		g#	П
5								_						П	T	T					1											
6			+ 1						П		П	П		П			1-1			T				1	$\Box$	$\neg$						$\neg$
7																	1 1															
8			2 1											П																		
9						T E																										
10	DUP-100	218	W	TG			16/2	0600		2	1		$\Box$					X	11	1	14	14						1	+		045	
11																																
12											Ш									1												
	ADDITION	AL COMMENTS	RE	LINQU	ISHED BY	AFFILIAT	ION	DAT	E		TIME				ACCI	EPTEC	BY /	AFFI	ITAL	ON			DATE		TIME		8	SAME	LE CONDI	TIONS		
200 7 Te	otal Metals*: B, Ca, Ba,	Be, Cr, Pb, Li	132	27	//	wes	tar	10/4	118	OC	190			1	71	10	W.	22	_	_		10	4/19	1 /	6 35	-	0.4	Y	7	7	1	
200 8 Te	otal Metals**: Sb, As, C	d, Co, Mo, Se, Tl			1								= /	P			1					1	10							1		
												_	-									1	_	-		+						$\exists$
_				_								$\dashv$									_	+				+				1		$\dashv$
aye	<u> </u>					SAMPL	ER NAME	AND SIGN	ATUF	RE	16											1					O	5	pele (7	$\vdash$	act	$\dashv$
7	် သ						PRINT Nan	ne of SAMF	LER:	1	300	n	en	6	11	Fai	2			_		_		_		-	Temp In °C	yed (V/V)	y Seg		es Int /N)	
	of Sp						SIGNATUR	RE of SAME	LER:		3	2	2	_				DA <sup>*</sup>	E Sig	gned (YY):	10)	10	2/	18			Tem	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)		Samples Intact (Y/N)	



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,

Starton M. Wilson

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



9608 Loiret Blvd. Lenexa, KS 66219 (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

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

Ohio EPA Rad Approval: #41249

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



## **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	



## **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



#### **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:**

(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:**



#### **PROJECT NARRATIVE**

Project: JEC IBA CCR Pace Project No.: 60283097

Method:Total Radium CalculationDescription:Total Radium 228+226Client:WESTAR ENERGYDate: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.



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	



Project: JEC IBA CCR
Pace Project No.: 60283097

<b>Sample: IBA-3-100218</b> PWS:	<b>Lab ID: 6028309</b> Site ID:	<b>P7002</b> Collected: 10/02/18 12:11 Sample Type:	Received:	10/05/18 10:00	Matrix: Water	
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	2 15262-20-1	
Total Radium	Total Radium Calculation	$0.427 \pm 0.885  (1.72)$	pCi/L	10/22/18 12:23	3 7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60283097

<b>Sample: IBA-2-100218</b> PWS:	<b>Lab ID: 602830</b> Site ID:	97003 Collected: 10/02/18 13:5 Sample Type:	8 Received:	10/05/18 10:00	Matrix: Water	
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	3 15262-20-1	
Total Radium	Total Radium Calculation	0.445 ± 0.695 (1.25)	pCi/L	10/22/18 12:23	3 7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60283097

<b>Sample: IBA-1-100218</b> PWS:	<b>Lab ID: 6028309</b> Site ID:	7004 Collected: 10/02/18 15:05 Sample Type:	Received:	10/05/18 10:00	Matrix: Water	
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	3 15262-20-1	
Total Radium	Total Radium Calculation	0.730 ± 0.863 (1.53)	pCi/L	10/22/18 12:23	3 7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60283097

Sample: DUP-100218 PWS:	<b>Lab ID:</b> 60283097 Site ID:	O05 Collected: 10/02/18 06:00 Sample Type:	Received:	10/05/18 10:00	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.695 ± 0.615 (0.911) C:NA T:72%	pCi/L	10/19/18 18:12	13982-63-3	
Radium-228		0.321 ± 0.370 (0.778) C:78% T:81%	pCi/L	10/18/18 11:43	3 15262-20-1	
Total Radium	Total Radium Calculation	1.02 ± 0.985 (1.69)	pCi/L	10/22/18 12:23	3 7440-14-4	



#### **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.



#### **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.



#### **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**

Date: 10/22/2018 03:22 PM

PASI-PA Pace Analytical Services - Greensburg



## **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: JEC IBA CCR
Pace Project No.: 60283097

Date: 10/22/2018 03:22 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytica 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 Cond	ition I	Upor	ı Re	eceipt	
FaceAnalytical Client Name:	W	e5+	CVL	Energy	Project # 602 8309
Courier: Fed Ex UPS USPS Uclier Tracking #: 25 4 2 2 782 9	1t D 357	comme	ercial	Pace Other	LabelLiMS Login
Custody Seal on Cooler/Box Present: Jyes	r			-	no
Thermometer Used	Туре	of Ice:	(We	t Blue None	
Cooler Temperature Observed Temp 18	.4	* C	Corr	ection Factor:	°C Final Temp: 18.3 °C
Temp should be above freezing to 6°C		-			
				pH paper Lot#	Date and Initials of person examining contents: ET 10.8-18
Comments:	Yes	No	N/A	10Pdr 11	
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:		/	Ĺ	5. Sample 00	I dosent have a time
-Includes date/time/ID Matrix:	wit		-	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:				10.	
-Pace Containers Used;		3			
Containers Intact:	1			11.	
Orthophosphate field filtered	1			12.	
Hex Cr Aqueous Compliance/NPDES sample field filtered		<del></del>		13.	SHE WAS TO DESCRIPTION OF THE PERSON OF THE
Organic Samples checked for dechlorination:		1		14.	
Filtered volume received for Dissolved tests		-		15.	France VIII
All containers have been checked for preservation.				16.	
All containers needing preservation are found to be in compliance with EPA recommendation.		,		PHL	_
exceptions: VOA, coliform, TOC, O&G, Phenolics	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			Initial when completed Lot # of added preservative	Date/time of preservation
Headspace in VOA Vlals ( >6mm);				17.	
Trip Blank Present:				18.	*******
Trip Blank Custody Seals Present				-	
Rad Aqueous Samples Screened > 0.5 mrem/hr				Initial when completed:	Date: 10-8-18
Client Notification/ Resolution:					
Person Contacted:			Date/T	ime:	Contacted By:
Comments/ Resolution:				10042	
				(* 	<del></del>
			_	3811	Value 20 100 1 445,000 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
					1300
A check in this box indicates that addi	tional i	nform	ation	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.

J:\QAQC\Master\Document Management\Sample Mgt\Sample Condition Upon Receipt Pittsburgh (C056-7 16Feb2018)



# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT, All relevant fields must be completed accurately.

Section Require	n A d Client Information:			Section I		Inform	nation;						tion C	) ormatio	n;												Pa	age:		of	/
Company	WESTAR E	VERGY		Report To:	Brar	ndon	Griffin					Atten	tion:										1				_				
Address:	818 Kansas	Ave		Сору То:	Jare	d Mo	rrison					Comp	pany N	Vame:									RÉG	ULAT	ORY	AGEN	ĊY	1		- 3	5 1016
	Topeka, KS	66612	- 1111									Addre	ess:										[	NPDES	s r	GRO	UND V	VATE	R Г	DRINKING	3 WATER
Email To	<u>brandon.l.gr</u>	ffin@westarer	nergy.com	Purchase (	Order N	No.:	10JEC-0	0000331	150			Pace Refer	Quote										1	UST	Г	RCR	A			OTHER	
Phone:	785-575-8135	Fax:		Project Na	me:	JEC	IBA CCF	₹					Project	1 H	eath	er W	ilsor	n 913	3-563	3-140	)7	-	Site	Locat	ion			E			
Request	led Due Date/TAT:	15 day		Project Nu	mber:									# 96	557,	1							uli <sub>n</sub>	STAT	re:		KS	- 1			
					_															R	eque	sted	Analy	sis Fi	ltered	(Y/N)	12				
	Section D Required Client Informa		Valid Matrix C MATRIX DRINKING WATER	CODE	cades to left)	C=COMP)		COLL	ECTED					Pr	eser	vativ	es	_	A/ N												
	WATER WASTE WATER PRODUCT SOIL/SOLID OIL			WT WW P SL	(see valid cade	(G=GRAB C=C	COMP		COMPO END/G	POSITE GRAB																(X/N)		- 0:	2001		
ITEM#	SAMPL (A-Z, 0-9 Sample IDs MUS	9 / ,-)	OIL WIPE AIR OTHER TISSUE	OL WP AR OT TS	MATRIX CODE (se	SAMPLE TYPE (G=0					SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Jupreserved	H <sub>2</sub> SO <sub>4</sub>	HCI	NaOH	Va <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Other	څ∣	Radium-226	Radium-228	otal Radium				81		Residual Chlorine (Y/N)			3097
_	IBA-4-	100 10			Z ZT	6	DATE	TIME	10/2	TIME	S	2	121	2		121	2 2	2 0	1	Ψ.	2		++	1	+	++	$\dashv$	-	Pace	Project N	No./ Lab I.D.
2	TR4-2 ~	100218			WT				10/2	1211	+	2	H	2		H		t	1	H	+	+	+	1	+	++	+	$\vdash$			
3	TRA-2~	100218		V 117	4	6			10/2	1358		2		2					1	H	$\mathbf{H}$	Ì									
4		100218			60	6			10/2	1505	T	2	П	1		Ħ	T	Т	1	$\Box$	T										
5																															
6																Ш															
7																Ш															
8										-	$\perp$	_	$\perp$		-	H	4			Ш								Н			
9					1	ļ.,			ļ.,	-	$\perp$	1	$\vdash$	Η,	$\perp$	Н	_		1	H		1				1		$\perp$			
10	DUP-100	1218			WT	G			10/2	0600	-	12	_	1	4	H	+	+		X	X	<u> </u>				44		$\vdash$			
11	<b>-</b>			-	+	-		-	<del> </del>	+	+	-	+		+	Н	+	+	100	Н	-		++	-	-		+	H			
12	ADDITION	IAL COMMENTS		18	REL	INQUI	SHED BY	AFFILIAT	TON	DAT	rE	-	TIME		da:	<u>. П</u>	ACCI	EPTE	D BY	/ AFF	ILIAT	ION	9	DATE		TIME	3		SAMP	LE CONDIT	TONS
				13	V	7	/ W	105+9	1	10/4	18	00	100	) (	211	m	IJ	1 9	丈/	2~		_	l	0-5:	-18	2001	18	5.3	V	V	N
			7	0	+1	1	/			107	10	Т		7			U	1		F	T 19	5-5	-18			1000			_		
																								-			$\top$				
								_																							
TI								SAMPL	ER NAME	AND SIG	ND SIGNATURE										9	٥	го <u>(</u>	saled /N)	llact						
Page 18									PRINT Na	me of SAM	PLER	BI	Tan	den	-(-	5/1/	Fi	n										remp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Inlact (Y/N)
18									SIGNATU	RE of SAM	PLER	2 /	130	V	1	1				DA (M	ATE S	igned D/YY):	10/	021	18	7	1	le.	Rec	Custo	Sami

C	nain	of Custo	dy —					·				***************************************						,		フ	
	x S	Samples were s	sent directly to t	he Subcontracti	ng Laboratory	<i>'</i> .				Of Or Need	-	KS	Yes	x	No			/-	P	ace	Analytical www.pacelabs.com
Wo	rkorde	r: 60283097	Workorder I	Name: JEC IBA	CCR					er Rec		d Da		10/5/2		Res	ults	Requ	iestec	d By:	10/26/2018
Rep	ort To			Subcontra	ct To	50.00	(A)	(i) (i)		30 00 30		1907.189	(63)(13)(1)	Red	uestec	Analy	/sis		V/8107729444		
Pac 960 Len	B Loiret ∋xa, KS	tical Kansas Blvd.	Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3, & 4 Greensburg, PA 15601 Phone (724)850-5600						rved Con	tainers	n-226 & Total Radium	Radiun									
200					10 10 10 10 0 0	1 (2 % A)			П	T	Radium										
Item	Sample	eID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other				Ra										LAB USE ONLY
1	IBA-4-10	10218	PS	10/2/2018 10:21	60283097001	Water	1				Х	X									100
2	IBA-3-10	0218	PS	10/2/2018 12:11	60283097002	Water	1				Х	Х									002
3	IBA-2-10	0218	PS	10/2/2018 13:58	60283097003	Water	1				Х	X									003
4	iBA-1-10	0218	PS	10/2/2018 15:05	60283097004	Water	1				Х	X									004
5	DUP-100	218	PS	10/2/2018 06:00	60283097005	Water	1				Х	X									005
//jiiiis9	40.60.000	1		•			300ga		8 9 9 9						(0) (Shi)		Соп	iments	0.000 0.00		
Tran	sfers	Released By		Date/Time	Received I	<del></del>				Date/T											
1					m	- 20th	)	,		10-5	18	<u>ν</u> φ(	20 L	2 CN	10-	7-1 {	Ò				
2										<u> </u>		4									
3			~		<u> </u>					<u> </u>											
Coc	iler Ter	mperature on F	Receipt 137.7	5°C Cus	tody Seal(`	V or N		- 1	Rece	havie	n le	~~	N or	N	- 1		San	nnlae	Intac	٠+ ( ٧×	Sor M

<sup>\*\*\*</sup>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.

iection tequired	A d Client Information:	Required Project Information:								Section C Invoice Information:													Pa	ige:	l	of			
Company	WESTAR ENERGY	Report To: ]	Bran	don	Griffin			,		Attenti	ion:									1									
ddress:	818 Kansas Ave	Copy To: ,	Jare	d Mo	rrison					Comp	any Na	me:						***************************************		REG	ULAT	OR	/ AGI	NCY	<i>f</i>				
	Topeka, KS 66612									Addre	SS:								***************************************	г	NPDE	s	Г G	ROU	ND W	/ATEF	₹ [	DRINKING	WATER
mail To	brandon.l.griffin@westarenergy.com	Purchase Or	rder N	lo.:	10JEC-0	0000331	50			Pace C Refere			• • •						***************************************	1_	UST		m R	CRA			_	OTHER	
hone:	785-575-8135 Fax:	Project Nam	ie:	JEC	IBA CCR	₹				Pace P Manag	roject	Hea	ther '	Wilso	on 91	3-56	3-140	)7		Site	Loca	tion				P			
Request	ed Due Date/TAT: 15 day	Project Num	ber;								er. Profile #:	965	7, 1								STA			KS		- [			
			1	- 1					1							┶		eque	sted	Analy	rsis F	ilter	ed (Y)	N)	_				
	Section D Valid Matrix C Required Client Information MATRIX DRINKING WATER WATER	Odes CODE DW WT	des to left)	C=COMP)		COLL	ECTED		NO NO			Pres	servat	ives		N / A					+								
	WASTE WATER PRODUCT SOIL/SOLID OIL	WW P SL OL	(see valid codes to left)	(G=GRAB C	COMPC STAF		COMPOS END/GF	SITE	COLLECTION	S						<b>₽</b>										e (Y/N)			i
	SAMPLE ID WIPE ARE OTHER Sample IDs MUST BE UNIQUE TISSUE	MP AR OT TS	- 1						TEMP AT	# OF CONTAINERS	rved				-	sis Test	ဖွ	-228								Residual Chlorine (Y/N)			
ITEM #			MATRIX CODE	SAMPLETYPE	DATE	TIME	DATE	TIME	SAMPLE	# OF CO	Unpreserved	HNO3	HCI NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Analysis	Radium-226	Radium-228	otal Nadluin							Residua	Pace	Project N	o./ Lab I.D.
1	IBA-4-100218	1	~~ <u>~</u> ~	6			10/2	1021		2		2	1			Т		1					1			T			
2	IRA-3 - 100218	1	wŢ	6			10/2	1211		2		2				1	П	Charleson			$\top$			1					
3	TRA-2-100218		VT	6			10/2	1358		2		12				7	П												
4	IAA-1-1002-18	į	W				19/2	1505		2		2					П								П			***************************************	
5																													
6											Il																		
7																													
8																													
9	_															_	Ш												
10	DUP-100218		wr	6			10/2	0600		2		12				]	M	XZ	4	Ш.	$\bot$		$\perp$	ļ	Ш		***************************************		
11	<u>.</u>								_	<u> </u>				$\perp$		1				11					Ш	$\bot$			
12						<u> </u>	_		<u> </u>	<u> </u>	<u>                                     </u>					2						<u> </u>				丄			
	ADDITIONAL COMMENTS		RELI	NQUI	SHED BY /		1	DAT	E	T	IME .			AC	CEPTE	D BY	/ AFF	ILIAT	ON	11, 111	DAT	E	Til	NE			SAMP	LE CONDIT	ONS
		189	)	1	/ W	C519	V	10/4	18	09	00)	9	m	rl	4	J.	<u> </u>		_	1	0-2	-18	100	Ó	18	,.3	1	N	7
		0	N A	*	•	·						Τ		ĺ	T	-	E	7 70	Z-c	-19									•
																		<u></u>		, , ,									
	Page	•				SAMPL	ER NAME A	··				4	<i>y</i> .	·,···,								-			ů	<u>, T</u>	g ou	Sealed Y/N)	Intact )
	<sup>9</sup> age 20 of 21						PRINT Nam				and R	<u>  ( )</u>	<u>6n</u>	4	in			ATE SI	gned	10/	02	11	7		Temp in °C	7.11.7	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	21									- 1	1									V	4 1 1						1	<u> </u>	· · · · · · · · · · · · · · · · · · ·

Pittsburgh Lab Sample Condi	tion	Upo	n Re	eceipt
Face Analytical Client Name:	M	1627	tour	# 302676
Courier: Fed Ex UPS USPS Client Tracking #: 25 4 2 2 78 2 9 3	t ロ 35	Comme ]	ercial	Deace Other Label M5
Custody Seal on Cooler/Box Present: Jyes		no		ş intact: yes no
Thermometer Used	Type	of Ice	::( We	t Blue None
Cooler Temperature Observed Temp 18.	4	. C	Corr	ection Factor: O.V °C Final Temp: 18.3 °C
Temp should be above freezing to 6°C		<del></del>		
				pH paper Lot# Date and Initials of person examining contents: ET 10-8-18
Comments:	Yes	No	N/A	100 410 11 contents 0 1 10 3 13
Chain of Custody Present:			_	1.
Chain of Custody Filled Out:	$\vdash$	ļ	1	2.
Chain of Custody Relinquished:		<u> </u>	ļ	3.
Sampler Name & Signature on COC:		<u> </u>	<u> </u>	4.
Sample Labels match COC:	L		1	5. Sample out dosent have a time
-Includes date/time/ID Matrix:	W.		<del></del>	on bottle
Samples Arrived within Hold Time:		<u> </u>	<u> </u>	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	1			12.
Hex Cr Aqueous Compliance/NPDES sample field filtered				13.
Organic Samples checked for dechlorination:				14.
Filtered volume received for Dissolved tests				15.
All containers have been checked for preservation.				16.
All containers needing preservation are found to be in compliance with EPA recommendation.				PHZ
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when Completed Date/time of preservation
exceptions: Yes q community (e.g., each, the restore				Lot # of added
	<u>г т</u>		T	preservative
Headspace in VOA Vials ( >6mm):				17.
Trip Blank Present:				18.
Trip Blank Custody Seals Present  Rad Aqueous Samples Screened > 0.5 mrem/hr	<del> </del>			Initial when
Rad Aqueous Samples Screened > 0.5 mcmm		_		completed: Date: 10-8-18
Client Notification/ Resolution:				
Person Contacted:			Date/1	ime: Contacted By:
Comments/ Resolution:				1

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)

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

ATTACHMENT 1-6
November 2018 Sampling Event
Laboratory Analytical Report



December 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,

Danson Wilson

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







#### **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



## **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



## **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

(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:**



#### **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:**



#### **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:**

(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:**

(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:**



#### **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.



## **ANALYTICAL RESULTS**

Project: JEC IBA CCR
Pace Project No.: 60287645

Date: 12/05/2018 11:14 PM

Sample: IBA-4-112118	Lab ID: 602	287645001	Collected: 11/21/1	8 08:35	Received: 11	/26/18 15:40 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	).7 Preparation Met	hod: EP	A 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		12/04/18 16:56		
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		12/04/18 16:56		
Lead, Total Recoverable	<0.010	mg/L	0.010	1		12/04/18 16:56		
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 Me	thod: EPA 200	0.8 Preparation Met	hod: EP	A 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	
Nolybdenum, 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	
hallium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:52	7440-28-0	
45.1 Mercury	Analytical Me	thod: EPA 245	5.1 Preparation Met	hod: EP	A 245.1			
Mercury	<0.00020	mg/L	0.00020	1	12/01/18 12:10	12/03/18 12:45	7439-97-6	
00.0 IC Anions 28 Days	Analytical Me	thod: EPA 300	0.0					
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	
540C Total Dissolved Solids	Analytical Me	thod: SM 2540	OC .					
otal Dissolved Solids	627	mg/L	5.0	1		11/28/18 10:58		
500H+ pH, Electrometric	Analytical Me	thod: SM 4500	0-H+B					
H at 25 Degrees C	7.3	Std. Units	0.10	1		11/28/18 12:06		H6
=								



Project: JEC IBA CCR
Pace Project No.: 60287645

Date: 12/05/2018 11:14 PM

Sample: IBA-3-112118	Lab ID: 602	287645002	Collected: 11/21/1	8 10:06	Received: 11	/26/18 15:40 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Me	thod: EPA 20	00.7 Preparation Met	thod: EF	PA 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		12/04/18 17:03		
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 Me	thod: EPA 20	00.8 Preparation Met	thod: EF	PA 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	
hallium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:54	7440-28-0	
45.1 Mercury	Analytical Me	thod: EPA 24	15.1 Preparation Met	thod: EF	PA 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 Me	thod: EPA 30	0.00					
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	
540C Total Dissolved Solids	Analytical Me	thod: SM 25	40C					
otal Dissolved Solids	3170	mg/L	5.0	1		11/28/18 10:58		
500H+ pH, Electrometric	Analytical Me	thod: SM 45	00-H+B					
H at 25 Degrees C	7.4	Std. Units	0.10	1		11/28/18 12:09		H6



Project: JEC IBA CCR
Pace Project No.: 60287645

Date: 12/05/2018 11:14 PM

Sample: IBA-2-112118	Lab ID: 602	287645003	Collected: 11/21/1	8 11:22	Received: 11	/26/18 15:40 N	Natrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 20	0.7 Preparation Met	thod: EF	PA 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	
_ithium	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 Me	thod: EPA 20	0.8 Preparation Met	thod: EF	PA 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	
45.1 Mercury	Analytical Me	thod: EPA 24	5.1 Preparation Met	thod: EF	PA 245.1			
Mercury	<0.00020	mg/L	0.00020	1	12/01/18 12:10	12/03/18 12:54	7439-97-6	
800.0 IC Anions 28 Days	Analytical Me	thod: EPA 30	0.00					
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	
540C Total Dissolved Solids	Analytical Me	thod: SM 254	40C					
Total Dissolved Solids	1310	mg/L	5.0	1		11/28/18 10:58		
I500H+ pH, Electrometric	Analytical Me	thod: SM 450	00-H+B					
oH at 25 Degrees C	7.2	Std. Units	0.10	1		11/29/18 08:09		H6
=								



Project: JEC IBA CCR
Pace Project No.: 60287645

Date: 12/05/2018 11:14 PM

Sample: IBA-1-112118	Lab ID: 602	287645004	Collected: 11/21/1	8 13:37	Received: 11	/26/18 15:40 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Met	thod: EPA 20	0.7 Preparation Met	thod: EF	PA 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		12/04/18 17:08		
Calcium, Total Recoverable	298	mg/L	0.20	1		12/04/18 17:08		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1		12/04/18 17:08		
_ead, Total Recoverable	<0.010	mg/L	0.010	1		12/04/18 17:08		
ithium	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 Met	thod: EPA 20	0.8 Preparation Met	thod: EF	PA 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	
rsenic, 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	
Nolybdenum, 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	
hallium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/03/18 12:24	12/04/18 10:58	7440-28-0	
45.1 Mercury	Analytical Met	thod: EPA 24	5.1 Preparation Met	thod: EF	PA 245.1			
Mercury	<0.00020	mg/L	0.00020	1	12/01/18 12:10	12/03/18 12:56	7439-97-6	
00.0 IC Anions 28 Days	Analytical Met	thod: EPA 30	0.0					
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	
ulfate	880	mg/L	50.0	50		12/05/18 15:49	14808-79-8	
540C Total Dissolved Solids	Analytical Met	thod: SM 254	10C					
otal Dissolved Solids	612	mg/L	5.0	1		11/28/18 11:00		
500H+ pH, Electrometric	Analytical Met	thod: SM 450	00-H+B					
H at 25 Degrees C	7.3	Std. Units	0.10	1		11/29/18 08:14		H6
- 3			2110			<del>-</del>		-



Project: JEC IBA CCR
Pace Project No.: 60287645

Date: 12/05/2018 11:14 PM

Sample: DUP-112118	Lab ID: 602	287645005	Collected: 11/21/1	8 06:00	Received: 11	/26/18 15:40 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Me	thod: EPA 20	0.7 Preparation Met	thod: EP	A 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		12/04/18 17:10		
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		12/04/18 17:10		
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 Me	thod: EPA 20	0.8 Preparation Met	thod: EP	A 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	
Nolybdenum, 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	
Γhallium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/03/18 12:24	12/04/18 11:00	7440-28-0	
45.1 Mercury	Analytical Me	thod: EPA 24	5.1 Preparation Met	thod: EP	A 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 Me	thod: EPA 30	0.0					
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	
540C Total Dissolved Solids	Analytical Me	thod: SM 254	10C					
otal Dissolved Solids	1270	mg/L	5.0	1		11/28/18 11:00		
1500H+ pH, Electrometric	Analytical Me	thod: SM 450	00-H+B					
oH at 25 Degrees C	7.3	Std. Units	0.10	1		11/28/18 12:04		H6
- 3			211.0					-



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

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Mercury mg/L <0.00020 0.00020 12/03/18 12:42

LABORATORY CONTROL SAMPLE: 2289014

Date: 12/05/2018 11:14 PM

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Mercury mg/L .005 0.0050 101 85-115

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2289015

MS MSD

60287645001 Spike Spike MS MSD MS MSD % Rec Max

Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD

Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 0.0050 70-130 2 20 Mercury mg/L < 0.00020 .005 .005 0.0049 98 100

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.



Project: JEC IBA CCR
Pace Project No.: 60287645

Date: 12/05/2018 11:14 PM

 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	

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Barium	mg/L		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 SP	IKE DUPLICA	ATE: 228949	93 MS	MSD	2289494							
	6	0287156001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	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						
		60287156002	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	

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.



Project: JEC IBA CCR
Pace Project No.: 60287645

Date: 12/05/2018 11:14 PM

MATRIX SPIKE SAMPLE:	2289495					_	
Parameter	Units	60287156002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron mg/L		293 ug/L		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	



Project: JEC IBA CCR
Pace Project No.: 60287645

Date: 12/05/2018 11:14 PM

 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

		Blank	Reporting		
Parameter	Units	Result	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	

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
mony	mg/L	.04	0.040	100	85-115	
enic	mg/L	.04	0.040	100	85-115	
nium	mg/L	.04	0.040	100	85-115	
alt	mg/L	.04	0.040	100	85-115	
odenum	mg/L	.04	0.041	102	85-115	
nium	mg/L	.04	0.039	97	85-115	
ium	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	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	

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.



Project: JEC IBA CCR Pace Project No.: 60287645

Date: 12/05/2018 11:14 PM

 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

Blank Reporting Parameter Result Limit Qualifiers Units Analyzed Chloride <1.0 12/05/18 11:54 mg/L 1.0 Fluoride mg/L ND 0.20 12/05/18 11:54 Sulfate 12/05/18 11:54 mg/L <1.0 1.0

LABORATORY CONTROL SAMPLE: 2290853 Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chloride mg/L 4 3.8 95 90-110 Fluoride 2 1.8 92 90-110 mg/L Sulfate mg/L 8 7.9 99 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2290854 2290855 MS MSD 60287645001 MS MSD MS MSD % Rec Spike Spike Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec RPD RPD Qual Limits Chloride mg/L 18.5 20 20 37.1 36.3 93 89 90-110 2 20 M1 Fluoride 0.51 2 2 2.4 2.3 92 89 90-110 3 20 M1 mg/L Sulfate 90-110 3 20 mg/L 159 160 160 316 306 98 92

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.



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

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L <5.0 5.0 11/28/18 10:56

LABORATORY CONTROL SAMPLE: 2286175

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

SAMPLE DUPLICATE: 2286176

Date: 12/05/2018 11:14 PM

60287645001 Dup Max **RPD RPD** Parameter Units Result Result Qualifiers **Total Dissolved Solids** 627 623 1 10 mg/L



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

Date: 12/05/2018 11:14 PM

60287529002 Dup Max Parameter Units Result Result **RPD** RPD Qualifiers 10.7 pH at 25 Degrees C 5 H6 Std. Units 10.8 0



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

Date: 12/05/2018 11:14 PM

60287645003 Dup Max Parameter Units Result Result **RPD** RPD Qualifiers 7.2 pH at 25 Degrees C 7.2 5 H6 Std. Units 0



#### **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**

Date: 12/05/2018 11:14 PM

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.



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: JEC IBA CCR
Pace Project No.: 60287645

Date: 12/05/2018 11:14 PM

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
0287645005	DUP-112118	EPA 200.7	558026	EPA 200.7	558094
0287645001	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
0287645003	IBA-2-112118	EPA 245.1	557920	EPA 245.1	558012
0287645004	IBA-1-112118	EPA 245.1	557920	EPA 245.1	558012
0287645005	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		
0287645005	DUP-112118	EPA 300.0	558394		
60287645001	IBA-4-112118	SM 2540C	557258		
0287645002	IBA-3-112118	SM 2540C	557258		
0287645003	IBA-2-112118	SM 2540C	557258		
0287645004	IBA-1-112118	SM 2540C	557258		
0287645005	DUP-112118	SM 2540C	557258		
0287645001	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		



# Sample Condition Upon Receipt



Client Name: West ar		
Courier: FedEx UPS VIA Clay I	PEX 🗆 ECI 🗆	Pace
Tracking #: Pac	e Shipping Label Use	d? Yes □ No □
Custody Seal on Cooler/Box Present: Yes □ No □	Seals intact: Yes [	□ No /□
Packing Material: Bubble Wrap □ Bubble Bags □	☐ Foam ☐	None □ Other DAPIC
Thermometer Used: T-299 Type of	fice: Wet Blue No	ne / '
Cooler Temperature (°C): As-read 2,7 Corr. Fact	or 1011 Correc	ted 2.8 Date and initials of person examining contents: 11-24-18 AF
Temperature should be above freezing to 6°C		
Chain of Custody present:	Yes No N/A	
Chain of Custody relinquished:	ØYes □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 ZNo □N/A	
Sufficient volume:	Yes No N/A	
Correct containers used:	Yes ONO ON/A	
Pace containers used:	Yes ONO ON/A	
Containers intact:	Yes DNo DN/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	ØYes □No □N/A	
Samples contain multiple phases? Matrix: WIT	□Yes ØNo □N/A	
Containers requiring pH preservation in compliance?	ØYes □No □N/A	List sample IDs, volumes, lot #'s of preservative and the
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide)	/	date/time added.
(Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Cyanide water sample checks:		
Lead acetate strip tums dark? (Record only)	□Yes □No	
Potassium iodide test strip turns blue/purple? (Preserve)	□Yes □No	
Trip Blank present:	□Yes INo □N/A	
Headspace in VOA vials ( >6mm):	□Yes □No ØN/A	
Samples from USDA Regulated Area: State:	□Yes □No □N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	? DYes DNo N/A	Hv
Client Notification/ Resolution: Copy COC to		Field Data Required? Y / N
Person Contacted: Date/T	ime:	
Comments/ Resolution:		
900		
Project Manager Review	Dat	e <sup>t</sup>

Project Manager Review



Date! \_\_\_\_\_



# **CHAIN-OF-CUSTODY / Analytical Request Document**

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

ection A equired Client Information:	Section B Required Proj	ect Inform	nation:					Section nvoice	Inform	nation								_						Page:		of	Ł
ompany: WESTAR ENERGY	Report To: B	andon	Griffin				1	Attentio	on:																		
ddress: 818 Kansas Ave	Copy To: Ja	ared Mo	rrison					Compa	any Na	me:								RI	EGU	LATO	RY A	GEN	ICY	1 1			7 · T
Topeka, KS 66612							7	Addres	ss:									T	N	PDES	Г	GR	OUNE	WATE	R 🗆	DRINKING	WATER
mail To: brandon.l.griffin@westarenergy.com	Purchase Ord	er No.:	10JEC-0	0000331	50			Pace Q										1	U	ST		RCF	RA		F	OTHER	
Phone: 785-575-8135 Fax:	Project Name	JEC	IBA CCF	2			-	Referen Pace Pr	roject	He	ather	Wils	son 91	13-56	3-14	07		5	Site L	ocatio	n						
Requested Due Date/TAT: 7 day	Project Number							Manage Pace Pr		96	57, 1	-	_					$\dashv$		STATE			KS	[			
requested Due Date/TAT.	i rojece rearras	5] 1					_	-	-		_	-			F	Segu	este	d An		is Filt		(Y/N	)	VIII			
							П			_				1=		l l		T	1	T	T			7///			
Section D Valid Matrix C Required Client Information MATRIX	odes CODE	MP)		COLL	ECTED					Pre	serv	ative	s	2 %													
SAMPLE ID  (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE  Sample IDs MUST BE UNIQUE  SRINKING WATER WASTE WATER PRODUCT SOIL/SOLID OIL WIPE AIR OTHER TISSUE	OL WP	MATRIX CODE (see valid codes to left) SAMPLE TYPE (G=GRAB C=COMP)	COMP( STAI	रा	COMPO END/GI	RAB	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	HNO <sub>3</sub>	HCI	NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other		200.8 Total Metals**	245.1 Total Hg	300: CI, F, SO4	기뿌					Residual Chlorine (Y/N)		<b>\$ 76</b> Y	
	$\rightarrow$	_	DATE	TIME	DATE	TIME	S	_	7	-  -	+	4	121	-	121	12	2	213	1 4		211	0	SPI				00/
1 IBA-4-112118		IT G			11/21	1006	$\vdash$	2	1	+	+	+	+	-	1	H	H	1	H	4	14	1	7	4			02
2 IBA-3-112118		_	-	-		1122	H	2	H	1	H	+	+	+	1	H	H	H	++	+	+		1	$\top$			org
3 IBA-2-112118		9			11/21	1337		2		+	H	+	+	-	It	+t	Н	+	,	1	1		N	$\top$			oay
4 IBA-1-112118		T 6	_	-	11/21	133/	$\vdash$	2	++	+	$\vdash$	+	+	1	H	ť	H		V   1		+	T	<b>*</b>				
5		4	-	-	-		$\vdash$		$\forall$	+	$\forall$	+	$\forall$		H	$\vdash$	$\Box$							$\top$			
6		+	-	-			$\vdash$		H	+	$\forall$	-	+	1	H	T	H	+	+		T	Т					
7		-	-	-		-			$\vdash$	+	H	+	+	1		T	H	1	$\top$	$\top$	1	$\top$	Ħ				
8		+	-	-		-	+		$\forall$	+	H	+	+	1		T		$\top$		$\Box$		$\top$	П				
9		+	1			+	+		+	+	$\forall$	$\top$	+	$\exists$		1		Т	1		T	1.	П				
11 OUP-112118		M 6	-		11/21	0600	+	2	1	1	$\vdash$			$\exists$	X	1×	X	X	KK	B	DI	J	B	)			005
		1 6			11/21	0000	+	-		+	Ħ	T	$\top$	1		+			1	14				Ť			
12 ADDITIONAL COMMENTS		RELINOL	JISHED BY	/ AFFILIAT	TON	DAT	E	18	TIME			Α	CCEP	TED E	Y/A	FILL	ATION	3		DATE	5 1	ПМП	E		SAMI	LE CONDITI	ONS
200.7 Total Metals*: B, Ca, Ba, Be, Cr, Pb, Li	MI	7		west		11/21	1/10	CI	730	7	1.0		生			2	cl	20	110	10.18	1	54	n	2.8	1	4.1	V
200.8 Total Metals**: Sb, As, Cd, Co, Mo, Se, Tl	117	P	//	West	7	11/2	5/ Y	U	250	1	10-0	4	70	w	u į	u	21		LIFA	<i>II</i> 10	- It	ΥÇ	U	A) I O	Y	N	7
P age				CAMPI	ER NAME	AND SICA	LATA!	DE												77 3.5		lia.		0	E .	pela (2	act
e 27				SAMPI			_	-7		T		_	26	4				-					_	် ပ	ved o	y Sec	as Int
7 of 27						me of SAM RE of SAM	_		1/an	2	1):	9	20	[7		DATE (MM/	Sign DD/YY	ed (): {	1/2	21/l	8			Temp In	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)



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,

Dearton M. Wilson

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







#### **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 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

Missouri Certification #: 235

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



# **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



# **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



#### **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:**



#### **PROJECT NARRATIVE**

Project: JEC IBA CCR
Pace Project No.: 60287914

Method: EPA 904.0

Description:904.0 Radium 228Client:WESTAR ENERGYDate: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:**



#### **PROJECT NARRATIVE**

Project: JEC IBA CCR Pace Project No.: 60287914

Method:Total Radium CalculationDescription:Total Radium 228+226Client:WESTAR ENERGYDate: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.



Project: JEC IBA CCR
Pace Project No.: 60287914

<b>Sample: IBA-4-112118</b> PWS:	<b>Lab ID: 602879</b> Site ID:	14001 Collected: 11/21/18 08:35 Sample Type:	Received:	11/27/18 11:30	Matrix: Water	
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 22:10	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	5 15262-20-1	
Total Radium	Total Radium Calculation	0.944 ± 1.06 (1.85)	pCi/L	12/17/18 13:49	7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60287914

<b>Sample: IBA-3-112118</b> PWS:	<b>Lab ID: 60287914</b> Site ID:	Collected: 11/21/18 10:06 Sample Type:	Received:	11/27/18 11:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		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	7 15262-20-1	
Total Radium	Total Radium Calculation	0.940 ± 0.958 (1.16)	pCi/L	12/17/18 13:55	5 7440-14-4	



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	



Project: JEC IBA CCR
Pace Project No.: 60287914

<b>Sample: IBA-1-112118</b> PWS:	<b>Lab ID: 60287914</b> Site ID:	OO4 Collected: 11/21/18 13:37 Sample Type:	Received:	11/27/18 11:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.948 ± 0.571 (0.233) C:NA T:88%	pCi/L	12/14/18 22:2	7 13982-63-3	
Radium-228		0.452 ± 0.473 (0.989) C:70% T:85%	pCi/L	12/14/18 11:07	7 15262-20-1	
Total Radium	Total Radium Calculation	1.40 ± 1.04 (1.22)	pCi/L	12/17/18 13:5	5 7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60287914

<b>Sample: DUP-112118</b> PWS:	<b>Lab ID:</b> 60287914 Site ID:	O05 Collected: 11/21/18 06:00 Sample Type:	Received:	11/27/18 11:30	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.298 ± 0.415 (0.693) C:NA T:89%	pCi/L	12/14/18 22:27	7 13982-63-3	
Radium-228		0.817 ± 0.434 (0.776) C:73% T:90%	pCi/L	12/14/18 11:07	7 15262-20-1	
Total Radium	Total Radium Calculation	1.12 ± 0.849 (1.47)	pCi/L	12/17/18 13:5	5 7440-14-4	



#### **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.



#### **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.



#### **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**

Date: 12/17/2018 03:31 PM

PASI-PA Pace Analytical Services - Greensburg



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: JEC IBA CCR
Pace Project No.: 60287914

Date: 12/17/2018 03:31 PM

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		



# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section	A Client Information:	Section E Required F		Inform	nation:					Sectio	n C Inform	ations													Pa	age:	Name of the last	of	
ompany		Report To:							_	Attentio		auon.								7					<u> </u>				
ddress;	818 Kansas Ave	Сору То:	Jare	d Mo	rrison				C	Compa	ny Nan	ne:								REG	SULA	ATOR	Y A	SENC	Υ		an estat		
	Topeka, KS 66612							·····	A	Addres	5:						-			+	NPD					VATER	<u>г</u> г	ORINKING	: \A/ATER
mail To:	brandon.l.griffin@westarenergy.com	Purchase C	order N	lo.:	10JEC-0	0000331	50		P	ace Qu	uote										UST			RCRA		17 t 7 tui 1		THER	, <b>44</b> , (1 L) (
hone:	785-575-8135  Fax:	Project Nar	ne:	JEC	IBA CCR	<u> </u>			P	Referen	oject	Hea	ther \	Vilso	n 913	3-563	-140	17		-		ation	_		1	V///		777777	
	ed Due Date/TAT: 15 day	Project Nur				•				Aanage. Pace Pn	r: ofile #:	965								- Sitt		- 3	1	K	s				
		1,										300	', '									ATE:	<u> </u>	V/AD					
				. 1				<u> </u>	_	1.						<b>→</b>	K	eque	stea	Anal	ysis	Flite	rea (	Y/N)					
	Section D Valid Matrix C Required Client Information MATRIX	CODE CODE	o teft)	MP)		COLL	ECTED			ľ		Pres	ervat	ives		Y/ N.													
ITEM#	DRINKING WATER WASTE WAS		MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COMPC STAR	OSITE	COMPOS END/GR	TIME	L Mark	# OF CONTAINERS	Unpreserved H <sub>2</sub> SO <sub>4</sub>				Methanol Other	rest L	Radium-226	Radium-228	olat Nauluiii		A A A A A A A A A A A A A A A A A A A					Residual Chlorine (Y/N)	Paco I	Project A	lo./ Lab I.D.
	IBA-4-112-118		VI	6	DATE	HVIE	11/21	0835	+	2	<del>-   +</del>			-	20	-	1	i F	1	++	+	+	$\vdash$	-	+		racei	-roject N	io./ Lab i.b.
2	IBA-3-112118		WT	6				1006	Ť	2	-	12		+			++	+	H	+		+	$\forall$		+				
3	IRA - 2 - 112(18		WT	Ğ				1122		2	_	2	$\top$	H	_		+	H	H		$\top$		+-						
4	1RA - 1 -112118		WT	<del></del>	-		11/24	1337	-	2		12	+	H	$\top$	1		/ $/$	+	+	$\top$		$\dagger \dagger$		+				
<del></del>	77374		H	0		<u> </u>	/ 1/	13.07	T	-2-	_			╁┈╁					┪	_		_	T	$\dashv$	1				
6			<b> </b>						+		_							$\dashv$	$\top$		$\top$	1	$\dagger \dagger$		+				······
7	***************************************								1				$\top$	$\Box$					$\top$	11		_	1.1						
8									T			$\Box$	$\top$						$\top$	11	1				+-1				
9			t						+	-		T	_	1	$\neg$			$\top$	$\top$	1	十		11		_				
10								l	1			T		$\Box$			П	1	╅		1								
11	DUP-112118		Wi	G			11/21	0600		2		12					X	$\lambda$	7										
12							······································		7		-	11		П		1		Ť	$\top$		$\top$	T		7					
	ADDITIONAL COMMENTS	est je .	REL	INQUI	SHED BY /	AFFILIATI	ON	DATE		Τì	ME			ACC	CEPTE	D BY	AFF	ILIATI	ON		D/	ATE		TIME			SAMPL	E CONDIT	IONS
		1		い	//v	resta		11/26/18	7	OZ.	30	6	:1/	Λ ./	$\sqrt{\lambda}$	VL.	S	<b>∀</b> ~		L	11-2	7-18	3 117	30	ų,	- JY	Y	N	Ч
		1	<i>j</i>			1	<u>.                                    </u>							<u> </u>		Ű		1			11.4					E 18-1	3	<del></del>	
<del></del>	· · · · · · · · · · · · · · · · · · ·								1																	190	$\neg \dagger$		
									$\dashv$			†				-							<u> </u>	***********	_		$\dashv$		
	P	1				SAMPLI	ER NAME A	AND SIGNAT	URI	E		e ja	1955	i Sage	1.50								100		١,	ء د		B =	act
	e 17 of						PRINT Nam	ne of SAMPLE	R:	- //	rano	lon	6	77	Fig		n.	TE Si	anad			2.00				o ni dime i	Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	f 18						SIGNATUR	E of SAMPLE	R:	/	12	1	2				(M	M/DD	/YY):	u/	<u>کل</u>	112	8		F	g	_		Sar

Pittsburgh Lab Sample Condition Upon Receipt				
Face Analytical Client Name:		Po	zce	KS Project #
Courier: Fed Ex UPS USPS UClient		omme	ercial	Pace Other Label
Tracking #: 457 2786	1511	٠.		LIMS Login
Custody Seal on Cooler/Box Present:				
Thermometer Used Type of ice: (We) Blue None				
Cooler Temperature Observed Temp 4.60 °C Correction Factor: O 1 °C Final Temp: 4.5 °C				
Temp should be above freezing to 6°C		•		
				pH paper Lot# Date and Initials of person examining contents: ET 1)-28-18
Comments:	Yes	Νo	N/A	10D2C181 contents: E111-28-10
Chain of Custody Present:				1.
Chain of Custody Filled Out:			<u> </u>	2.
Chain of Custody Relinquished:				3.
Sampler Name & Signature on COC:				4.
Sample Labels match COC:	L		1	5. Sample 003 has notime on
-Includes date/time/ID Matrix:	W	T	······	bottle
Samples Arrived within Hold Time:		•		6.
Short Hold Time Analysis (<72hr remaining):	]		1	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. DH LZ
All containers needing preservation are found to be in		_		Puc
compliance with EPA recommendation.	<b>/</b>			Control of the state of the sta
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when Date/time of completed preservation
·				Lot # of added
	1			preservative
Headspace in VOA Vials ( >6mm):				17.
Trip Blank Present:	<u></u>			18. 
Trip Blank Custody Seals Present  Rad Aqueous Samples Screened > 0.5 mrem/hr			<del>//</del>	Initial when 11 79-18
Nad Addedus Statiples Co. Co. 12				Initial when completed: ET   Date: 11-28-18
Client Notification/ Resolution:				
Person Contacted:			Date/	Fime: Contacted By:
Comments/ Resolution:				

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)

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

\*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



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,

diator m. Wilson

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







### **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



# **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



# **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



### **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:**



### **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.



### **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.



### **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.



### **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.



### **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.



Project: JEC IBA CCR
Pace Project No.: 60291850

Date: 01/22/2019 01:55 PM

Sample: IBA-4-011019	Lab ID: 602	291850001	Collected: 01/10/1	9 10:22	Received: 01	/14/19 15:40 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	0.7 Preparation Met	hod: EP	A 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	
_ithium	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 Me	thod: EPA 200	0.8 Preparation Met	hod: EP	A 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 Me	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Me	thod: SM 2540	oc					
Total Dissolved Solids	643	mg/L	5.0	1		01/16/19 09:45		
1500H+ pH, Electrometric	Analytical Me	thod: SM 4500	)-H+B					
oH at 25 Degrees C	7.2	Std. Units	0.10	1		01/18/19 11:42		H6
300.0 IC Anions 28 Days	Analytical Me	thod: EPA 300	0.0					
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	



Project: JEC IBA CCR
Pace Project No.: 60291850

Date: 01/22/2019 01:55 PM

Sample: IBA-3-011019	Lab ID: 60	291850002	Collected: 01/10/1	9 12:10	Received: 01	/14/19 15:40 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	.7 Preparation Met	hod: EP	A 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			
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 Me	thod: EPA 200	.8 Preparation Met	hod: EP	A 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 Me	thod: EPA 245	.1 Preparation Met	hod: EP	A 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 Me	thod: SM 2540	OC					
Total Dissolved Solids	1480	mg/L	5.0	1		01/16/19 09:45		
4500H+ pH, Electrometric	Analytical Me	thod: 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 Me	thod: EPA 300	0.0					
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	



Project: JEC IBA CCR
Pace Project No.: 60291850

Date: 01/22/2019 01:55 PM

Sample: IBA-2-011019	Lab ID: 602	291850003	Collected: 01/10/1	9 12:54	Received: 01	/14/19 15:40 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	.7 Preparation Met	hod: EF	A 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 Me	thod: EPA 200	.8 Preparation Met	hod: EF	A 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 Me	thod: EPA 245	5.1 Preparation Met	hod: EF	A 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 Me	thod: SM 2540	OC					
Total Dissolved Solids	1470	mg/L	5.0	1		01/16/19 09:45		
4500H+ pH, Electrometric	Analytical Me	thod: SM 4500	)-H+B					
oH at 25 Degrees C	7.3	Std. Units	0.10	1		01/18/19 11:47		H6
300.0 IC Anions 28 Days	Analytical Me	thod: EPA 300	0.0					
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	



Project: JEC IBA CCR
Pace Project No.: 60291850

Date: 01/22/2019 01:55 PM

Sample: IBA-1-011019	Lab ID: 602	291850004	Collected: 01/10/1	9 15:13	Received: 01	/14/19 15:40	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Met	thod: EPA 200	).7 Preparation Met	hod: EP	A 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			
ithium	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 Met	thod: EPA 200	0.8 Preparation Met	hod: EP	A 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 Met	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Met	thod: SM 2540	OC					
Total Dissolved Solids	1720	mg/L	5.0	1		01/16/19 09:45	5	
1500H+ pH, Electrometric	Analytical Met	thod: SM 4500	O-H+B					
oH at 25 Degrees C	7.3	Std. Units	0.10	1		01/18/19 11:48	3	H6
800.0 IC Anions 28 Days	Analytical Met	thod: EPA 300	0.0					
Chloride	128	mg/L	10.0	10		01/18/19 21:03	3 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	7 14808-79-8	



Project: JEC IBA CCR
Pace Project No.: 60291850

Date: 01/22/2019 01:55 PM

Sample: DUP-011019	Lab ID: 602	291850005	Collected: 01/10/1	9 06:00	Received: 01	/14/19 15:40	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Met	thod: EPA 200	).7 Preparation Met	hod: EP	A 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			
ithium	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 Met	thod: EPA 200	).8 Preparation Met	hod: EP	A 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	
Гhallium, Total Recoverable	<0.0010	mg/L	0.0010	1	01/16/19 09:40	01/17/19 10:53	3 7440-28-0	
245.1 Mercury	Analytical Met	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Met	thod: SM 2540	OC					
Total Dissolved Solids	1770	mg/L	5.0	1		01/16/19 09:45	;	
1500H+ pH, Electrometric	Analytical Met	thod: SM 4500	0-H+B					
oH at 25 Degrees C	7.3	Std. Units	0.10	1		01/18/19 11:49	1	H6
800.0 IC Anions 28 Days	Analytical Met	thod: EPA 300	0.0					
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	



Project: JEC IBA CCR
Pace Project No.: 60291850

LABORATORY CONTROL SAMPLE:

Date: 01/22/2019 01:55 PM

 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

Blank Reporting

 Parameter
 Units
 Result
 Limit
 Analyzed
 Qualifiers

 Mercury
 mg/L
 <0.00020</td>
 0.00020
 01/22/19 10:07

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Mercury mg/L 0.005 0.0050 99 85-115

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2318582 2318583

2318581

MS MSD 60291923001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 0.005 0.0050 70-130 20 Mercury mg/L ND 0.005 0.0049 98 99

MATRIX SPIKE SAMPLE: 2318612

60291851005 Spike MS MS % Rec % Rec Parameter Units Result Conc. Result Limits Qualifiers < 0.00020 70-130 Mercury mg/L 0.005 0.0046 92

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.



Project: JEC IBA CCR
Pace Project No.: 60291850

Date: 01/22/2019 01:55 PM

 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					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Barium	mg/L		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 S	PIKE DUPLICA	ATE: 23176	18		2317619							
Parameter	6 Units	0291850002 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						
		60291851005	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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.



Project: JEC IBA CCR
Pace Project No.: 60291850

Date: 01/22/2019 01:55 PM

MATRIX SPIKE SAMPLE:	2317620						
Parameter	Units	60291851005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
						Limito	
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.



Project: JEC IBA CCR
Pace Project No.: 60291850

Date: 01/22/2019 01:55 PM

 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

		Blank	Reporting		
Parameter	Units	Result	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					
Dansastan	I I a Ya	Spike	LCS	LCS	% Rec	0
Parameter	Units	Conc.	Result	% 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 DUPLIC	ATE: 23176	05		2317606							
			MS	MSD								
	6	0291893001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	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	

Antimony	mg/L	<0.0010	0.04	0.040	101	70-130	
Parameter	Units	60291851002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
MATRIX SPIKE SAMPLE:	2317607						

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.



Project: JEC IBA CCR
Pace Project No.: 60291850

Date: 01/22/2019 01:55 PM

MATRIX SPIKE SAMPLE:	2317607						
		60291851002	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	

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.



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

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L <5.0 5.0 01/16/19 09:45

LABORATORY CONTROL SAMPLE: 2317750

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Total Dissolved Solids** mg/L 1000 1010 101 80-120

SAMPLE DUPLICATE: 2317751

60291692001 Dup Max **RPD RPD** Parameter Units Result Result Qualifiers 892 10 **Total Dissolved Solids** 901 1 mg/L

SAMPLE DUPLICATE: 2317753

Date: 01/22/2019 01:55 PM

60291850003 Dup Max RPD RPD Parameter Units Result Result Qualifiers 1470 **Total Dissolved Solids** mg/L 1330 10 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.



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

Date: 01/22/2019 01:55 PM

60291832001 Dup Max Parameter Units Result Result **RPD** RPD Qualifiers 7.1 pH at 25 Degrees C 7.0 5 H6 Std. Units 0

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.



Project: JEC IBA CCR
Pace Project No.: 60291850

Date: 01/22/2019 01:55 PM

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

Blank Reporting Parameter Result Limit Qualifiers Units Analyzed Chloride <1.0 1.0 01/17/19 10:04 mg/L Fluoride mg/L < 0.20 0.20 01/17/19 10:04 Sulfate <1.0 01/17/19 10:04 mg/L 1.0

LABORATORY CONTROL SAMPLE: 2318674 Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chloride mg/L 5 4.8 95 90-110 Fluoride 2.5 2.5 100 90-110 mg/L Sulfate mg/L 5 4.9 98 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2318675 2318676 MS MSD 60291832007 Spike MS MSD MS MSD % Rec Max Spike Parameter Units Result Conc. Conc. Result % Rec % Rec RPD RPD Qual Result Limits Chloride mg/L 3.7 5 5 8.9 8.9 104 104 90-110 0 15 Fluoride ND 2.5 2.5 2.7 2.7 108 108 90-110 15 mg/L 1 Sulfate 105 90-110 mg/L 1.9 5 5 7.1 7.0 103 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.



Project: JEC IBA CCR
Pace Project No.: 60291850

Date: 01/22/2019 01:55 PM

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

		Blank	Reporting		
Parameter	Units	Result	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	ma/L	<1.0	1.0	01/18/19 09:43	

LABORATORY CONTROL SAMPLE:	2319401					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L		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 SPIR	KE DUPLICA	ATE: 23194	02		2319403							
			MS	MSD								
	6	60292185001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	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	60292229009	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	476	250	713	95	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.



### **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**

Date: 01/22/2019 01:55 PM

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.



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: JEC IBA CCR
Pace Project No.: 60291850

Date: 01/22/2019 01:55 PM

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					



# Sample Condition Upon Receipt



Client Name: Westow Energy				
10 mm 1 mm 1 mm 1 mm 1 mm 1 mm 1 mm 1 m	PEX 🗆 ECI 🗅	Pace Xroads	Client □ Other □	
Tracking #: Pace	e Shipping Label Used	d? Yes□ No/□	15	
Custody Seal on Cooler/Box Present: Yes ∠ No □	Seals intact: Yes	No □	, ,	
Packing Material: Bubble Wrap □ Bubble Bags □	□ Foam 🗓	None 🗀 Oth	ner 🗆	
Thermometer Used: <u>T-298</u> Type of	Ice: (Wet) Blue No	ne	j†	
Cooler Temperature (°C): As-read \-3 Corr. Factor	or <u>0 · O</u> Correct	ted / 3	Date and initials of person examining contents:	
Temperature should be above freezing to 6°C		-	0-1/14/19	
Chain of Custody present:	ŹYes □No □N/A			
Chain of Custody relinquished:	ZYes □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 ØNo □N/A			
Sufficient volume:	Øyes □No □N/A		2 2	
	//			
Correct containers used:	/ .			
Pace containers used:	` □Yres □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 \( \text{No} \( \text{N/A} \)			
Samples contain multiple phases? Matrix:	□Yes ☑No □N/A			
Containers requiring pH preservation in compliance?	ZYes □No □N/A		es, lot #'s of preservative and the	
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide)	/	date/time added.		
(Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)  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			Hn
Client Notification/ Resolution: Copy COC to	Client? Y / N	Field Data Required	? Y / N	
Person Contacted: Date/T	ime:	<del></del>		
Comments/ Resolution:				_==
· · · · · · · · · · · · · · · · · · ·				
Desiret Manages Deview	Dat		-	;
Project Manager Review: DEV/JEM/ED	Date	J		

By hwilson at 4:58 pm, 1/15/19



# **CHAIN-OF-CUSTODY / Analytical Request Document**

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

Jeolion A	Section B Required Project	t Inform	ation:					Section Invoice	e Infor		í.							_					Page:			of	
Company: WESTAR ENERGY	Report To: Bra	ndon (	Griffin					Attentio										L									
Address: 818 Kansas Ave	Copy To: Jar	ed Mo	rrison					Compa	any Na	ame:								RI	GU	LATORY	AGEN	CY			11	1/5	
Topeka, KS 66612								Addres	ss:									NPDES GROUND WATER DRINKING WATER							NATER		
Email To: brandon.l.griffin@westarenergy.com	Purchase Order	No :	10JEC-00	00003315	50			Pace Quote Reference:						□ UST □ RCRA □ OTHER													
Phone: 785-575-8135 Fax:	Project Name:	JEC	IBA CCR					Pace P Manage	roject	He	athe	r Wils	son 9	13-56	33-14	107		5	Site L	ocation		KS					
Requested Due Date/TAT: 7 day	Project Number							Pace P		#: 96	57, 1								-	STATE:		, (0	_				
romer som																Requ	este	d An	alys	is Filter	ed (Y/N	)	1//				
Section D Valid Matrix C	odes 🛱	<u>(đ</u>		COLL	CTED					Pre	esen	ative	s	N/A													
Required Client Information  MATRIX DRINKING WATER WASTE WATER WASTE WATER PRODUCT SOIL/SOLID OIL WIPE AIR OTHER TISSUE  1 TBA-Y-01(019 2 TBA-3-01(019 3 TBA-2-01(019	Odes CODE DW WT WW P SL OL WPP AR OT TS   WATA	SAMPLE TYPE (G=GRAB	COMPC STAF	SITE	DATE    Output   Outp	TIME 1022 1210 1359	SAMPLE TEMP AT COLLECTION	2 2 # OF CONTAINERS	Unpreserved	H2O4	IQI.	HOBN NaOH		Other Other	Metals*	200.8 Total Metals**	Tota	300: CI, F, SO4	4500 H+B				Residual Chlorine (Y/N)		e Pro	850 gject No BPIA	o./ Lab I.D.
4 IBA-1-011019		6			1/10	1513	-	12	+	$\dashv$				-	-	1	1	•						*		7	009
5 6 7 OVP~ OLIO19 8 9 10	W	r G			1/10	0600		2		1					\ <u>\</u>	X	Χ	X	2	X				1		ţ	005
12				l				-			_	Ш	CCTC	TED	27.74	EEU 14	LIO:		2 0	DATE	TIMI			SA	MPLF	CONDITIO	ONS
ADDITIONAL COMMENTS	R	LINQU	ISHED BY			DAT			TIME			Al.	CCEP	h	KIA	FFILI	TION			1 .	200		13	JA	1	V T	V
200.7 Total Metals*: B, Ca, Ba, Be, Cr, Pb, Li 200.8 Total Metals**: Sb, As, Cd, Co, Mo, Se, Tl	13	V	//	neste	<√	1/14	/19	104	1 5		1	VIC			7	_			1	14/19	154	U	1 >	7		У	/
П																											
Page 28 of 28				SAMPL		AND SIGN me of SAM RE of SAM	PLEF	: B	14	nd	2	Ç	ri	FF	'n	DATE (MM/	Sign	ned Y): O	1/	11/1	9		Temp in °C	Received on Ice (Y/N)		Cooler (Y/N)	Samples Intact (Y/N)



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,

Dearton M. Wilson

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



9608 Loiret Blvd. 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 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

Missouri Certification #: 235

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



# **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	



# **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



### **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.



### **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.



### **PROJECT NARRATIVE**

Project: JEC IBA CCR Pace Project No.: 60292064

Method:Total Radium CalculationDescription:Total Radium 228+226Client:WESTAR ENERGYDate: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.



# **ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: JEC IBA CCR
Pace Project No.: 60292064

<b>Sample: IBA-4-011019</b> PWS:	<b>Lab ID: 6029206</b> 4 Site ID:	Collected: 01/10/19 10:22 Sample Type:	Received:	01/15/19 10:00	Matrix: Water	
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 19:5	1 13982-63-3	
Radium-228	EPA 904.0	0.630 ± 0.359 (0.654) C:77% T:85%	pCi/L	01/24/19 12:3	1 15262-20-1	
Total Radium	Total Radium Calculation	0.923 ± 0.774 (1.36)	pCi/L	01/30/19 13:4	1 7440-14-4	



# **ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: JEC IBA CCR
Pace Project No.: 60292064

<b>Sample: IBA-3-011019</b> PWS:	<b>Lab ID: 6029206</b> Site ID:	4002 Collected: 01/10/19 12:10 Sample Type:	Received:	01/15/19 10:00	Matrix: Water	
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 19:5	1 13982-63-3	
Radium-228	EPA 904.0	0.484 ± 0.379 (0.754) C:78% T:82%	pCi/L	01/24/19 12:3	1 15262-20-1	
Total Radium	Total Radium Calculation	0.484 ± 0.837 (1.69)	pCi/L	01/30/19 13:4	1 7440-14-4	



# **ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: JEC IBA CCR
Pace Project No.: 60292064

<b>Sample: IBA-2-011019</b> PWS:	<b>Lab ID: 602920</b> Site ID:	64003 Collecte Sample	d: 01/10/19 13:54 Type:	Received:	01/15/19 10:00	Matrix: Water	
Parameters	Method	Act ± Unc (N	MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.197 ± 0.531 C:NA T:76%	(0.986)	pCi/L	01/29/19 19:5	1 13982-63-3	
Radium-228	EPA 904.0	0.340 ± 0.331 C:77% T:88%	(0.677)	pCi/L	01/24/19 12:3	1 15262-20-1	
Total Radium	Total Radium Calculation	0.537 ± 0.862	(1.66)	pCi/L	01/30/19 13:4	1 7440-14-4	



# **ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: JEC IBA CCR
Pace Project No.: 60292064

<b>Sample: IBA-1-011019</b> PWS:	<b>Lab ID:</b> 60292064 Site ID:	OO4 Collected: 01/10/19 15:13 Sample Type:	Received:	01/15/19 10:00	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.560 ± 0.647 (1.05) C:NA T:77%	pCi/L	01/29/19 19:5	1 13982-63-3	
Radium-228		0.464 ± 0.366 (0.728) C:77% T:82%	pCi/L	01/24/19 12:3	1 15262-20-1	
Total Radium	Total Radium Calculation	1.02 ± 1.01 (1.78)	pCi/L	01/30/19 13:4	1 7440-14-4	



# **ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: JEC IBA CCR
Pace Project No.: 60292064

Sample: DUP-011019 PWS:	<b>Lab ID:</b> 60292064 Site ID:	O05 Collected: 01/10/19 06:00 Sample Type:	Received:	01/15/19 10:00	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.417 ± 0.511 (0.840) C:NA T:89%	pCi/L	01/29/19 20:0	13982-63-3	
Radium-228		-0.116 ± 0.314 (0.762) C:76% T:80%	pCi/L	01/24/19 12:3	1 15262-20-1	
Total Radium	Total Radium Calculation	0.417 ± 0.825 (1.60)	pCi/L	01/30/19 13:4	1 7440-14-4	



#### **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.



#### **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.



#### **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**

Date: 01/30/2019 02:19 PM

PASI-PA Pace Analytical Services - Greensburg



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: JEC IBA CCR
Pace Project No.: 60292064

Date: 01/30/2019 02:19 PM

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		



# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

ection equired	A I Client Information:	Section B Required Pr	oject In	formation	1:				tion C ice Informa	ition:							_					Page:	l		of		
ompany	: WESTAR ENERGY	Report To:	Brando	on Griffi	în			Atter	ntion:								1										
ddress;	818 Kansas Ave	Сору То:	Jared	Morriso	on		MANAGEMENT OF THE STATE OF THE	Com	pany Nam	e:							REG	ULA	TORY	AGE	NCY			-27348			
	Topeka, KS 66612							Addr	ess:								Γ	NPDE	ES I	GF	ROUNI	O WATE	ER 「	DR	INKING	WATER	
mail To:	brandon.l.griffin@westarenergy.com	Purchase Or	der No.	: 10JE	EC-00000331	50			Quote rence:									UST	1	RC	RA		Γ"	ОТІ	HER		
hone:	785-575-8135 Fax:	Project Name	e: J	EC IBA	CCR			Pace Mana	Project ager;	Heath	er Wi	lson 9	13-56	3-140	07		Site	e Loca	ation		KS						$\mathbb{Z}$
equest	ed Due Date/TAT: 15 day	Project Numi	ber.					Pace	Profile #:	9657,	1								TE:								
													I.		eque	sted	Anal	ysis l	iltere	d (Y/I	1)						
	Section D Valid Matrix C Required Client Information MATRIX	CODE	to left)	C=COMP)	COLL	ECTED				Presei	vative	∍s	ŤN /A							-							
	WATER WASTE WATER PRODUCT SOIL/SOLID OIL SAMPLE ID AIR	DW WT WW P SL OL WP AR OT	(see valid	(G=GRAB	COMPOSITE START	COMPO END/GI	RAB L	NERS	t the same				Test			E .	LATERTINE					lorine (Y/N)					
ITEM#	(A-Z, 0-9 / ,-) OTHER Sample IDs MUST BE UNIQUE TISSUE	OT TS	MATRIX CODE	SAMPLE TYPE	ATE TIME	DATE	TIME	# OF CONTAINERS			NaOH	Methanol	Uther Analysis	Radium-226	Radium-228	Total Radium	· · · · · · · · · · · · · · · · · · ·					Residual Chlorine (Y/N)	Pa	ce Pr	oject N	o./ Lab I.D.	
1	IBA-4-011019		74	G		1/10	1022	2		2	Ш	11	_	11	Ш		$\perp$		ļl		11						_
2	IBA- 3-011019		WT (			1/10	1210	2		2	<u> </u>		_	Ш	$\prod$	Ш.	1-1		-			11	ļ				
3	1BA- 2-011019			9		1/10	1354	2		کر م	-		4	$\coprod$		4	11	-		$\perp$	₩						$\dashv$
4	IBA-1-011019		VT (	<u> </u>		1/10	1513	2	-	2	$\sqcup$	+	-	H		+	++	-	+		$\perp$		<u> </u>	······································			
-5								+	<u> </u>	$\vdash$	$\vdash \vdash$			$\vdash$	$\vdash$	+	-		_								
6	1000-011019		WT 1	G		1/10	0600	1 9		5	$\vdash$	+		۷	X	X	+						}				$\dashv$
	01.31		1 {	<u> </u>		U W	000	+	`		H	11	-	H	171	+	╁┈╁	1		$\neg$			<u> </u>				一
8 9								$\top$							$\Box$				1		111				*************		一
10										T f			7														
11																											
12																	Щ										
	ADDITIONAL COMMENTS	at yanuj	RELIN	IQUISHE	D BY / AFFILIATI		DATE		TIME		3. 1 P	ACCEP"	LED B/	//AF	FILIA	ION		DA		TIN	200		SA	MPLE	CONDIT	ONS	4
		19	X	Y 1	westav.		01/14/1	9 (	75 15	1	2	<u>S</u>	حـ					1-15	74	200	Š	1.9	4		4	<u> </u>	
									···											···········		······································		+			$\dashv$
								+				*******												-			$\dashv$
	<u>n</u>				SAMPL	ER NAME	AND SIGNAT	URE		<u> </u>											: : :::	O	<u> </u>		D 2	act	$\overline{}$
	age 17 of 2				<u> </u>	PRINT Na	me of SAMPL	ER:	grand By	on 13	60	Ffin		D	ATE S	Signed	01	/11	/10	7		Temp in °C	Received on		Custody Sealed Cooler (Y/N)	Samples intact (Y/N)	ļ
	2				L				00	/						•		• •		, -q				•			

#### Pittsburgh Lab Sample Condition Upon Receipt Pace Analytical Client Name: Pace Kansas Project # Courier: Fed Ex UPS USPS Client Commercial Pace Other Label 746873960an LIMS Login Custody Seal on Cooler/Box Present: Type of Ice:( Wet Blue None Thermometer Used Correction Factor: 70. ( °C Final Temp: 1. Cooler Temperature **Observed Temp** Temp should be above freezing to 6°C pH paper Lot# 1828(M Yes No N/A Comments: Chain of Custody Present: Chain of Custody Filled Out: Chain of Custody Relinquished: Sampler Name & Signature on COC: 5. Sample Labels match COC: -Includes date/time/ID Matrix: Samples Arrived within Hold Time: Short Hold Time Analysis (<72hr remaining): 8. Rush Turn Around Time Requested: 9. Sufficient Volume: 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. 15. Filtered volume received for Dissolved tests All containers have been checked for preservation. All containers needing preservation are found to be in compliance with EPA recommendation. Initial when Date/time of exceptions: VOA, coliform, TOC, O&G, Phenolics completed preservation Lot # of added preservative Headspace in VOA Vials ( >6mm): 18. Trip Blank Present: Trip Blank Custody Seals Present Rad Aqueous Samples Screened > 0.5 mrem/hr Initial when -1579 Date: completed: M Client Notification/ Resolution: Person Contacted: Date/Time: Contacted By: Comments/ Resolution:

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)

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

\*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.

CI	hain of C	ustody							,							- ,		•
	X Samples	s were sent dire	ectly to th	ne Subcontracti	ng Laboratory					Of Or Neede		ks X <b>Y</b> e	ae	No		-	Pac	Ce Analytical S
	rkorder: 6029	2064 <b>W</b> orl	korder N	lame: JEC IBA	CCR					er Rec			***********		Result	s Reau	ested E	Bv: 2/5/2019
Rep	ort To			Subcontra	ct To	0.000 (2) (6010)						GE (57/99)			Analysis		21 (100 (100)	recollection (COV)
Pac 960 Len	ather Wilson te Analytical Kan 18 Loiret Blvd. nexa, KS 66219 one 1(913)563-14			1638 Suites Greer	Analytical Pittsb Roseytown Roa 5 2,3, & 4 Isburg, PA 1566 6 (724)850-5600	ad					Radium-226 & Total Radium	Radium-228					 	 7226     -
0.70000			e programičnih sa				\$30.5 <b>6</b>	reserve	a con	tainers	<b>- </b> <u> </u>	$1^{-}1$						j
Item	Sample ID		Sample Type	Collect Date/Time	Lab ID	Matrix	Other				Radi							LAB USE ONLY
1	IBA-4-011019		PS	1/10/2019 10:22	60292064001	Water	1				X	X						1001
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				Τx	1x1		1				004
5	DUP-011019		PS	1/10/2019 06:00	60292064005	Water	1				X	X						005
2	nsfers Release			Date/Time	Received E	JB.		ρευ	É	Date/Ti O(\(\lambda\)	ime 19	01/v/h	1		Co	pmments		<u> </u>
Cod	oler Temperati	ure on Receipt	1.9	°C Cus	tody Seal Y	or N			Rece	eived o	n Ice	(Y)	or N		Sa	mples	Intagt	Y)or N

<sup>\*\*\*</sup>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.

#\_30277226

Section A Required Client Information:	Section B Required Project Information:		Section C		Page: of
Company: WESTAR ENERGY	Report To: Brandon Griffin		Attention:		
Address: 818 Kansas Ave	Copy To: Jared Morrison		Company Name:	REGULATORY AGENC	CY LL CARRENT CONTRACT
Topeka, KS 66612		A CONTRACTOR OF THE CONTRACTOR	Address:	□ NPDES □ GRO	DUND WATER TO DRINKING WATER
Email To: brandon.l.griffin@westarenergy.com	Purchase Order No.: 10JEC-0	000033150	Pace Quote	T UST T RCRA	A COTHER
Phone: 785-575-8135 Fax:	Project Name: JEC IBA CCF	₹	Reference: Pace Project Heather Wilson 913-563-1407	Site Location	
Requested Due Date/TAT: 15 day	Project Number:		Manager: Pace Profile #: 9657, 1	STATE: K	KS ////////////////////////////////////
				sted Analysis Filtered (Y/N)	
Section D Valid Matrix ( Required Client Information MATRIX DRINKING WATER WATER WASTE WATER PRODUCT	DW S D D COMPO	COLLECTED  OSITE COMPOSITE END/GRAB	Preservatives >		(NJ)
SOLUSOLID OIL SAMPLE ID WIPE AIR (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE TISSUE	MATRIX CODE (see valid SAMPLE TYPE (G=GRAB	OSITE COMPOSITE RT END/GRAB HOLD TO LA GENERAL LA GENER	# OF CONTAINERS Unpreserved H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCI NaOH NaOH Na2S <sub>2</sub> O <sub>3</sub> Methanol Other Cother Radium-226 Radium-228	Total Kadlum	Residual Chlorine (Y/N)  Pace Project No. Lab I.D.
1 IBA-4-011019	WT G	1/10 /02-2	2 2 1 1 1 1		
2 PAK- 3-011019	WT G	1/10/210	2 2 1		
3 IBA- 2-011019	WT 6	1/10/354	2   \(\lambda\)		
4 IBA-1-011019	VT 6	1/10 1513	2   2	1	
5					
6					
7 1009-011019	46	1/10 0600	2 2 + 7	<u> </u>	
8					
· ġː					
Ú10 ··					
11111					
12	RELINQUISHED BY	/ AFFILIATION DATE	TIME ACCEPTED BY / AFFILIA	TION DATE TIME	SAMPLE CONDITIONS
ADDITIONAL COMMENTS	TOTAL CONTRACTOR OF THE PARTY O	1.00000 0.00000			
	1137 / W	lestar 01/14/1	9 0915 My Su	1-15-19 2008	
§					
Pag		SAMPLER NAME AND SIGNAT	URE	. Seese Just 1914 Aug	aled (2)
Page 20		PRINT Name of SAMPLE	0		Temp in *C Received on Ice (Y/IN) Custody Sealed Cooler (Y/IN)
of 2		SIGNATURE of SAMPLE		Signed 01/11/19	Tet Cusk Coo

ILIOH I	poor	1 Ke	eceipt	
	Pac	el	Kansas_	Projec## 302772
	-		,	Labei
			<u> </u>	no
Type				1 (G
0	°C	Con	rection Factor: 70	C Final Temp: 1. 7 °C
			pH paper Lot#	Date and Initials of person examining
l Voc	No	Ν/Δ		contents: <u> </u>
1100	110	14//		
1/		<del> </del>		
1/		<del> </del>		
+		-		
+				
- A	,	Ì	]5. ]	
1		<u> </u>	C	
<del> </del>				
<del>  /</del>	/			
+			-	
			110.	
//				
		/		man malana takala
+				
1 1		<u>/</u>		44-44-44-44-44-44-44-44-44-44-44-44-44-
-			1	
/			16. PHLZ	
			Initial when completed Lot # of added	Date/time of preservation
· 1	1			
-+		-		
		/	18.	
		_	Initial when completed: M 25	Date: 1-1579
	[	,		Contacted By:
	nt 🗆	Yes No	Pace Int Commercial Ino Seal Type of Ice: We S °C Corr  Yes No N/A	Type of Ice: Wet Blue None  Correction Factor: 70.  PH paper Lot#  Yes No N/A 60358  1.  2.  3.  4.  5.  7.  8.  9.  10.  11.  12.  13.  14.  15.  16.  17.  18.  Initial when completed: M25.

 $\ \square$  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



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,

Danson Wilson

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







#### **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

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



# **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



# **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
0298392002	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
0298392003	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
0298392004	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
0298392005	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



#### **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.



#### **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.

(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.

(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.



#### **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.

(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.



Project: JEC IBA CCR
Pace Project No.: 60298392

Date: 04/09/2019 09:15 AM

Sample: IBA-4-032819	Lab ID: 602	298392001	Collected: 03/28/1	9 09:02	Received: 03	3/29/19 15:00 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	).7 Preparation Met	hod: EP	A 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	
ithium	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 Me	thod: EPA 200	0.8 Preparation Met	hod: EP	A 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 Me	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Me	thod: SM 2540	OC					
Total Dissolved Solids	614	mg/L	5.0	1		04/02/19 11:50		
1500H+ pH, Electrometric	Analytical Me	thod: SM 4500	0-H+B					
oH at 25 Degrees C	7.3	Std. Units	0.10	1		04/05/19 11:24		H6
800.0 IC Anions 28 Days	Analytical Me	thod: EPA 300	0.0					
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	



Project: JEC IBA CCR
Pace Project No.: 60298392

Date: 04/09/2019 09:15 AM

Sample: IBA-3-032819	Lab ID: 602	298392002	Collected: 03/28/1	9 11:40	Received: 03	/29/19 15:00	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Met	thod: EPA 200	).7 Preparation Met	hod: EP	A 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	2 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	2 7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	04/04/19 13:05	04/05/19 10:52	2 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	
_ithium	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 Met	thod: EPA 200	0.8 Preparation Met	hod: EP	A 200.8			
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:03	3 7440-36-0	
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:03	3 7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	04/04/19 13:05	04/05/19 15:03	3 7440-43-9	
Cobalt, Total Recoverable	0.0011	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:03	3 7440-48-4	
Molybdenum, Total Recoverable	0.0022	mg/L	0.0010	1	04/04/19 13:05	04/05/19 15:03	3 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	3 7440-28-0	
245.1 Mercury	Analytical Met	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Met	thod: SM 254	oc oc					
Total Dissolved Solids	1590	mg/L	5.0	1		04/02/19 11:50	)	
4500H+ pH, Electrometric	Analytical Met	thod: SM 450	0-H+B					
pH at 25 Degrees C	7.3	Std. Units	0.10	1		04/05/19 14:47	7	H6
300.0 IC Anions 28 Days	Analytical Met	thod: EPA 300	0.0					
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	



Project: JEC IBA CCR
Pace Project No.: 60298392

Date: 04/09/2019 09:15 AM

Sample: IBA-2-032819	Lab ID: 602	98392003	Collected: 03/28/1	9 13:10	Received: 03	/29/19 15:00 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Met	hod: EPA 200	).7 Preparation Met	hod: EP	A 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 Met	hod: EPA 200	0.8 Preparation Met	hod: EP	A 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			
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 Met	hod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Met	hod: SM 254	OC .					
Total Dissolved Solids	1320	mg/L	5.0	1		04/02/19 11:50		
4500H+ pH, Electrometric	Analytical Met	hod: SM 450	0-H+B					
pH at 25 Degrees C	7.3	Std. Units	0.10	1		04/05/19 14:52		H6
800.0 IC Anions 28 Days	Analytical Met	hod: EPA 300	0.0					
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		
Sulfate	582	mg/L	50.0	50		04/06/19 23:22	14808-79-8	



Project: JEC IBA CCR
Pace Project No.: 60298392

Date: 04/09/2019 09:15 AM

Sample: IBA-1-032819	Lab ID: 602	98392004	Collected: 03/28/1	9 14:15	Received: 03	8/29/19 15:00 N	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Met	hod: EPA 200	.7 Preparation Met	hod: EP	A 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	
_ead, Total Recoverable	<0.010	mg/L	0.010	1	04/04/19 13:05	04/05/19 10:56	7439-92-1	
ithium	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 Met	hod: EPA 200	.8 Preparation Met	hod: EP	A 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		04/05/19 15:11		
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	
Гhallium, 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 Met	hod: EPA 245	.1 Preparation Met	hod: EP	A 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 Met	hod: SM 2540	OC					
Total Dissolved Solids	1750	mg/L	5.0	1		04/02/19 11:50		
1500H+ pH, Electrometric	Analytical Met	hod: SM 4500	)-H+B					
oH at 25 Degrees C	7.1	Std. Units	0.10	1		04/05/19 14:57		H6
800.0 IC Anions 28 Days	Analytical Met	hod: 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	



Project: JEC IBA CCR
Pace Project No.: 60298392

Date: 04/09/2019 09:15 AM

Sample: DUP-032819	Lab ID: 602	298392005	Collected: 03/28/1	9 06:00	Received: 03	3/29/19 15:00 I	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
200.7 Metals, Total	Analytical Me	thod: EPA 200	).7 Preparation Met	hod: EP	A 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			
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	
_ithium	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 Me	thod: EPA 200	0.8 Preparation Met	hod: EP	A 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 Me	thod: EPA 245	5.1 Preparation Met	hod: EP	A 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 Me	thod: SM 254	OC					
Total Dissolved Solids	621	mg/L	5.0	1		04/03/19 11:17		
4500H+ pH, Electrometric	Analytical Me	thod: SM 450	0-H+B					
oH at 25 Degrees C	7.2	Std. Units	0.10	1		04/05/19 11:19		H6
300.0 IC Anions 28 Days	Analytical Me	thod: EPA 300	0.0					
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	



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

Blank Reporting

 Parameter
 Units
 Result
 Limit
 Analyzed
 Qualifiers

 Mercury
 mg/L
 <0.00020</td>
 0.00020
 04/05/19 09:35

LABORATORY CONTROL SAMPLE: 2368554

Date: 04/09/2019 09:15 AM

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Mercury mg/L 0.005 0.0051 102 85-115

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2368555 2368556

MS MSD 60298429002 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual < 0.066 0.005 0.005 0.0047 70-130 0 20 Mercury mg/L 0.0047 94 95 ug/L

MATRIX SPIKE SAMPLE: 2368557 60298392001 Spike MS MS % Rec Parameter Units Result Conc. Result % Rec Limits Qualifiers < 0.00020 Mercury mg/L 0.005 0.0050 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.



Project: JEC IBA CCR
Pace Project No.: 60298392

Date: 04/09/2019 09:15 AM

 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

Danier at an	I I a Yea	Blank	Reporting	A a alternati	0
Parameter	Units	Result	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	

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Barium	mg/L		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 S	SPIKE DUPLICA	ATE: 23683	30		2368381							
Parameter	6 Units	0298184001 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						
		60298203001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	

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.



Project: JEC IBA CCR
Pace Project No.: 60298392

Date: 04/09/2019 09:15 AM

MATRIX SPIKE SAMPLE:	2368382	60298203001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	

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.



Project: JEC IBA CCR
Pace Project No.: 60298392

Date: 04/09/2019 09:15 AM

 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					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% 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 S	SPIKE DUPLICA	ATE: 23681	. •		2368141							
Parameter	6 Units	0298392004 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						
		60298103001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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	

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.



Project: JEC IBA CCR
Pace Project No.: 60298392

Date: 04/09/2019 09:15 AM

MATRIX SPIKE SAMPLE:	2368142	60298103001	Cailco	MS	MS	% Rec	
Parameter	Units	Result	Spike Conc.	Result	% 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	

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.



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

Blank Reporting

Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L <5.0 5.0 04/02/19 11:50

LABORATORY CONTROL SAMPLE: 2366800

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Total Dissolved Solids** mg/L 1000 985 98 80-120

SAMPLE DUPLICATE: 2366801

60298378002 Dup Max **RPD RPD** Parameter Units Result Result Qualifiers 106 4 **Total Dissolved Solids** 110 10 mg/L

SAMPLE DUPLICATE: 2366802

Date: 04/09/2019 09:15 AM

		60298258002	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Total Dissolved Solids	mg/L	583	571	2	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.



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

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Total Dissolved Solids mg/L <5.0 5.0 04/03/19 11:17

LABORATORY CONTROL SAMPLE: 2367538

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Total Dissolved Solids** mg/L 1000 979 98 80-120

SAMPLE DUPLICATE: 2367539

60298560001 Dup Max **RPD RPD** Parameter Units Result Result Qualifiers 14800 3 10 **Total Dissolved Solids** 14300 mg/L

SAMPLE DUPLICATE: 2367540

Date: 04/09/2019 09:15 AM

60298508005 Dup Max RPD RPD Parameter Units Result Result Qualifiers 201 **Total Dissolved Solids** mg/L 202 0 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.



Project: JEC IBA CCR
Pace Project No.: 60298392

QC Batch: 577337 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60298392001, 60298392005

SAMPLE DUPLICATE: 2368911

Date: 04/09/2019 09:15 AM

60297940002 Dup Max Parameter Units Result Result **RPD** RPD Qualifiers 7.5 pH at 25 Degrees C 7.5 5 H6 Std. Units 0

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.



#### **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

Date: 04/09/2019 09:15 AM

60298339002 Dup Max Parameter Units Result Result **RPD** RPD Qualifiers pH at 25 Degrees C 8.1 5 H6 Std. Units 8.1 0

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.



#### **QUALITY CONTROL DATA**

Project: JEC IBA CCR
Pace Project No.: 60298392

Date: 04/09/2019 09:15 AM

 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

Blank Reporting Qualifiers Parameter Units Result Limit Analyzed 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 04/06/19 10:54 mg/L <1.0 1.0

LABORATORY CONTROL SAMPLE: 2370151 Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chloride mg/L 5 4.8 96 90-110 Fluoride 2.5 2.4 97 90-110 mg/L Sulfate mg/L 5 5.0 101 90-110

MATRIX SPIKE SAMPLE:	2370154						
		60298271007	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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.



#### **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**

Date: 04/09/2019 09:15 AM

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



## **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: JEC IBA CCR
Pace Project No.: 60298392

Date: 04/09/2019 09:15 AM

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
0298392005	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		
0298392004	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		



# Sample Condition Upon Receipt



Client Name: Westaw Energy		
Courier: FedEx □ UPS □ VIA □ Clay □ PE	EX 🗆 ECI 🗆	Pace
Tracking #: Pace	Shipping Label Used	i? Yes □ No □
Custody Seal on Cooler/Box Present: Yes Д . No □	Seals intact: Yes	No 🗆
Packing Material: Bubble Wrap ☐ Bubble Bags ☐	Foam 🗆	None □ Other □
Thermometer Used: <u>T-296</u> Type of le	ce: (Wet) Blue Nor	
Cooler Temperature (°C): As-read 2./ Corr. Factor	r ·O_ Correct	ed _/·/ Date and initials of person examining contents:
Temperature should be above freezing to 6°C		N3/29/19
Chain of Custody present:	ZYes □No □N/A	
Chain of Custody relinquished:	ZiYes □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 ZNo □N/A	
Sufficient volume:	Yes No N/A	
Correct containers used:	Yes ONO ON/A	
Pace containers used:	Yes No N/A	
Containers intact:	Yes ONO ON/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 <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , 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/Ti	me:	
Comments/ Resolution:		
Project Manager Review:	Dat	e:



# **CHAIN-OF-CUSTODY / Analytical Request Document**

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

Section A Required Client Information:		l Project In						Section Invoice	ė Infor		n:							_						P	Page:	1	lo	1	
Company: WESTAR ENERGY			on Griffin					Compa		amo.				_				4									-		
Address 818 Kansas Ave	Copy 10:	Jared	Morrison							aitie.								-	_	-	ATOR	_	_	_			ii auh		
Topeka, KS 66612								Addres										_	Г				GROL		WATE		DRINKII	NG W	ATER
Email To: <u>brandon.l.griffin@westare</u>	nergy.com Purchase	Order No.			83			Pace C Refere	nce:									_		UST			RCRA		_	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	OTHER	7777	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Phone: 785-575-8135 Fax:	Project N	ame; J	EC IBA CCI	R				Pace P Manag	jėΓ:				son 9	913-5	563-1	1407		_	Site	e Lo	cation		K	s	-				
Requested Due Date/TAT: 7 day	Project N	umber:						Pace P	Profile #	#: 9E	57, 1									_	TATE:	L			_				
							_		_							Req	uest	ted A	anal	ysis	Filte	red (	(/N)						
Section D Required Client Information	Valid Matrix Codes MATRIX CODE	(i) left)	Č.	COLL	ECTED					Pre	eserv	ative	s	3	2 ()														
SAMPLE ID	DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL CL WIPE WP		COMP STA		COMPO END/GI	SITE RAB	COLLECTION	RS							St 4	stals**		4							ine (Y/N)				
(A-Z, 0-9 /) Sample IDs MUST BE UNIQUE	AIR AR OTHER OT TISSUE TS	CODE	DATE	TIME	DATE	TIME	SAMPLE TEMP AT	# OF CONTAINERS	Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HCI	NaOH Na.S.O.	Methanol		# Analysis lest	200.8 Total Metals*	245.1 Total Hg	300: CI, F, SO4	2540C TDS	4500 H+B					Residual Chlorine (Y/N)	602 Pace			Lab I.D.
1 FBA-4-032819		WT (			3/28	0902		1	T		$\sqcap$					115	1		1	1					П	BP3 B			
2 IBA-3-032810	7	wT/			3/28	1140		2	T	1	П												pv 7	1291		30.11	Ī	1	002
3 TAA-2-032819		WT L			3/28	1310		2	1	1									1				·						003
4 TBA-1-632819		WY 6			3/28	1415		2	n l	1						1 1	I		1	$I \downarrow$							4	1	004
5																													
6													Ш					Ш			1							-	
7											Ц			_		_					1			1	$\sqcup$				
8							_		Ш	_	$\sqcup$	_	$\perp$	_	-	_	_	$\sqcup$			_		_		Н				
9			,			-/	-			-		4	$\perp$				-				-	$\square$	4	-	Н				
10 10-132819		WT	6		3/28	0600	-	1	Н	-	H	+	$\perp$	4	ľ	XX	X	X	X	4	-	$\vdash$	-	+	H		<b>5</b> 7	*	005
11				-	ļ	-	-	L	$\vdash$	+	$\vdash$	+	+	-	1	+	-	H	-	-	+	Н	-	+	Н				
12		051111	OUIOUEO DV	/ 4554 147	1011	DATI	_		TIME			-	CCEP	TED	BY / A	SEE!! I	ATIO	N		D	ATE		IME	+		SAME	LE CONI	DITION	
ADDITIONAL COMMENTS		RELIN	QUISHED BY		ION	-	_		-	-	-18	h	1	IEU	M	4	AIIO				_		_	1		3AMI	LE CON	JIION	
200.7 Total Metals*: B, Ca, Ba, Be, Cr, Pb, Li 200.8 Total Metals**: Sb, As, Cd, Co, Mo, Se,	<b>D</b>	TY	/we	estev		3/20	1_	08:	30	+	1		in	y	101	2	-	* 1	-	3/	29	15	C	1	1	X_		+	У
									_	+							_		-		-			+				+	
D. D.																													
<u>з</u>				SAMPL	ER NAME	AND SIGN	IATUI	RE	NO.		30		Ex.	10			L S			I.					ပ်	e (	aled (N		lact
Page 29 of 30					PRINT Nar	ne of SAMI	PLER	1	3/9.	ndo	n	6,	NA	74		B.4.				,	Large N	1			Temp in °	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)		Samples Intact (Y/N)
30					SIGNATUI	RE of SAME	PLER	/	16/	Y	1/					(MM/	Sign DD/Y	red Y):	03	10	8/	19			Te	δ. Z	Cust		Sam

## Pace Container Order #468035

Order	By:	Ship T	o:	Retur	n 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
in	fo				
Project	Name JEC IBA CCR- App III & IV	Due Date	02/27/2019 <b>Profile</b> 96	57	Quote
P	Project Wilson, Heather	Return	Carrier Mo	ost Economical	Locatio KS
– Trip B	lanks —————		Bottle —		100 m 100 m
[ ] Ir	nclude Trip Blanks		Blank    Pre-Printed No Sample IDs		Boxed Cases
			Pre-Printed With Sample ID	1 1 1	Individually Wrapped Grouped By Sample
- Retur	rn Shipping ————			1 1 1	
COC	rn Shipping No Shipper Vith Shipper  Options  Jumber of Blanks		Pre-Printed With Sample IE	1 1 1	
— COC	No Shipper Vith Shipper  Options  Jumber of Blanks  Pre-Printed  1		Pre-Printed With Sample ID  Misc Sampling Instructions X Custody Seal X Temp. Blanks X Coolers Syringes	Os Dis	Extra Bubble Wrap Short Hold/Rush DI Liter(s) USDA Regulated Soils
— COC	No Shipper Vith Shipper Options  Jumber of Blanks	Containe 1-1L plastic	Pre-Printed With Sample ID  Misc Sampling Instructions X Custody Seal X Temp. Blanks X Coolers Syringes Total # of	Os Dis	Grouped By Sample  Extra Bubble Wrap Short Hold/Rush D! Liter(s)

## **Hazard Shipping Placard In Place**: NO

Sample	Ship Date :	02/28/2019
PP COC (1), PP labels w/o sample IDs Lenexa return Scott to take on 2/28/19	Prepared Verified By:	robin
Page 1	of 1	Page 30 of 30

<sup>\*</sup>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.

<sup>\*</sup>Pace Analytical reserves the right to return hazardous, toxic, or radioactive samples to you.

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

<sup>\*</sup>Payment term are net 30 days.

<sup>\*</sup>Please include the proposal number on the chain of custody to insure proper billing.



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,

Danson Wilson

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







#### **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 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

Missouri Certification #: 235

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



## **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



## **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



#### **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:**

(913)599-5665



#### **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:**

(913)599-5665



#### **PROJECT NARRATIVE**

Project: JEC IBA CCR
Pace Project No.: 60298488

Method:Total Radium CalculationDescription:Total Radium 228+226Client:WESTAR ENERGYDate: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.



Project: JEC IBA CCR
Pace Project No.: 60298488

<b>Sample: IBA-4-032819</b> PWS:	<b>Lab ID:</b> 602984880 Site ID:	O01 Collected: 03/28/19 09:02 Sample Type:	Received:	03/29/19 09:45	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.509 ± 0.590 (0.952) C:NA T:89%	pCi/L	04/08/19 22:26	13982-63-3	
Radium-228		0.563 ± 0.446 (0.895) C:74% T:82%	pCi/L	04/08/19 15:28	3 15262-20-1	
Total Radium	Total Radium Calculation	1.07 ± 1.04 (1.85)	pCi/L	04/09/19 12:30	7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60298488

<b>Sample: IBA-3-032819</b> PWS:	<b>Lab ID: 60298488</b> Site ID:	3002 Collected: 03/28/19 11:40 Sample Type:	Received:	03/29/19 09:45	Matrix: Water	
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	3 15262-20-1	
Total Radium	Total Radium Calculation	0.256 ± 0.847 (1.73)	pCi/L	04/09/19 12:30	7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60298488

<b>Sample: IBA-2-032819</b> PWS:	<b>Lab ID: 6029848</b> Site ID:	8003 Collected: 03/28/19 13:10 Sample Type:	Received:	03/29/19 09:45	Matrix: Water	
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	3 15262-20-1	
Total Radium	Total Radium Calculation	0.321 ± 0.825 (1.60)	pCi/L	04/09/19 12:30	7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60298488

<b>Sample: IBA-1-032819</b> PWS:	<b>Lab ID: 6029848</b> Site ID:	88004 Collected: 03/28/19 14:15 Sample Type:	Received:	03/29/19 09:45	Matrix: Water	
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	3 15262-20-1	
Total Radium	Total Radium Calculation	0.182 ± 0.850 (1.72)	pCi/L	04/09/19 12:30	7440-14-4	



Project: JEC IBA CCR
Pace Project No.: 60298488

Sample: DUP-032819 PWS:	<b>Lab ID:</b> 602984 Site ID:	88005	Collected: 03/28/19 06:00 Sample Type:	Received:	03/29/19 09:45	Matrix: Water	
Parameters	Method	Ac	et ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1		0 ± 0.443 (0.740) A T:84%	pCi/L	04/08/19 22:26	13982-63-3	
Radium-228	EPA 904.0		0 ± 0.462 (1.01) % T:85%	pCi/L	04/08/19 15:20	0 15262-20-1	
Total Radium	Total Radium Calculation	0.578	3 ± 0.905 (1.75)	pCi/L	04/09/19 12:30	7440-14-4	



#### **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  $-0.0745 \pm 0.340 \quad (0.802) \text{ C:NA T:91\%}$  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.



#### **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.



#### **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.



#### **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**

Date: 04/09/2019 02:51 PM

PASI-PA Pace Analytical Services - Greensburg



## **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: JEC IBA CCR
Pace Project No.: 60298488

Date: 04/09/2019 02:51 PM

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				

C	hain	of Custo	dy ——											- 💉	<i>/</i>
	X s	Samples were s	ent directly to th	ne Subcontracti	ng Laboratory	<i>'</i> .			e Of C	rigin:	KS X	Yes No		Pa	CE Analytical
		r: 60298488	Workorder N	lame: JEC IBA	CCR					ceived	$\overline{}$	h		s Requested	By: 4/11/2019
Rep	ort To			Subcontra	ct To			energe ger	000100011001		WWW.	Request	ed Analysis		
Pac 960 Len	8 Loiret exa, KS	ical Kansas Blvd.		1638   Suites Green	Analytical Pittsk Roseytown Roa 3 2,3, & 4 Isburg, PA 156 e (724)850-560	ad <sup>*</sup> 01	Pre	eserved Co	ntainers	т-226 & Total Radium	Radium-228	WO#:		 87081   <b> </b>	
Item	Sampli	e ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other			Radium					LAB USE ONLY
1	IBA-4-03	2819	PS	3/28/2019 09:02	60298488001	Water	1			X	X				GO1
2	IBA-3-03	2819	PS	3/28/2019 11:40	60298488002	Water	1			Х	Х				002
3	IBA-2-03:	2819	PS	3/28/2019 13:10	60298488003	Water	1		$\Box$	Х	X				©3
4	IBA-1-03;	2819	PS	3/28/2019 14:15	60298488004	Water	1			Х	Х				60 Y
5	DUP-032	819	PS	3/28/2019 06:00	60298488005	Water	1	<u>LL</u>		X	X				605
1 2 3	nsfers	Released By		Date/Time	Received I	TY HA	(1) ú/ (1) 19. 4/2	2/19	Date/	Time 1//9 9	1.45		Ç.	omments	
Coc	oler Ter	nperature on l	Receipt 1.2	°C Cus	stody Seal	Y/or N	V	Rec	eived	on Ice	Y	or N	Sa	amples Intact	Y or N

Cooler Temperature on Receipt 1.2 °C Custody Seal, Y or N Received on Ice, Y or N Samples Intact Y \*\*\*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.

30287081

Section A Required Client Information:	Section E Required F		t Infon	mation:						tion ice Int	<b>C</b> formatio	on:						_	-			B.		Pa	age:		of	/	
Company: WESTAR ENERGY	Report To:	Brar	ndon	Griffin					Atte	ntion:		·							7										
Address: 818 Kansas Ave	Сору То:	Jare	d Mo	orrison					Com	рапу	Name:								RE	GUL	ATO	RY AC	SENCY	<b>/</b>			ia está		
Topeka, KS 66612	***************************************								Addı	ress:									T	NP	DES	<u> </u>	GROU	ND V	VATEF	<b>?</b> [-	DRINKIN	NG W/	TER
Email To: <u>brandon.l.griffin@westarenergy.com</u>	Purchase C	Order I	No.:	10JEC-0	0000400	383				Quote									$\dashv_{\vdash}$				RCRA			,	OTHER		
Phone: 785-575-8135 Fax:	Project Nan	me;	JEC	IBA CCF	₹				Pace	Projec		leath	er W	/ilson	913	-563-	1407		-		ocatio			<del></del>	<b>V</b>	<i>111111</i>	7/////		
Requested Due Date/TAT: 46-day 4/12/19	Project Nun	mber:							Mana Pace		6#: 9i								_		TATE		KS	<i>i</i>	- 🛭				
										***********						ĠŴ.	Req	ueste	d Ana	lysi	s Filte	ered (	Y/N)	- F	7///				
Section D Valid Matrix of Required Client Information MATRIX	Codes CODE	o left)	MP)		COLL	EÇTED.		miemoseanem			Pr	esen	vatív	es/	and the same of th	N /	] "							$\prod$					
DENING WATER WATER WATER WASTE WATER WASTE WATER PRODUCT SOIL/SOILD OIL WIPE AIR (A-Z, 0-9 f, -) Sample IDs MUST BE UNIQUE  ** BU L	DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COMPC STAI		COMPC END/S	SITE	SAMPLE TEMP AT COLLECTION	里	Unpreserved	H₂SO₄ HNO.	HC	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol	000 telli del l'accombra de l'accombra de l'accombra de l'accombra de l'accombra de l'accombra de l'accombra d	lest.↓	Radium-226	Total Radium							Residual Chlorine (Y/N)	Pace	Project	: No./	Lab I.D.
1 IBA-4-032819		wr	6			3/28	0902	┞	2	<u> </u>	1			+	-		<u></u> ( )	1	$\top$			1	_	H	_	- 1000	T TOJC DE	140.5	<u> </u>
2 IBA-3-072819		wt	6		<del>                                     </del>	3/28	1140	1	2			2		$\top$	- Consider		11/	1/	$\top$										
3 TAA-2- 032819		wŢ	6			3/28		<b>†</b>	12	_				$\top$	П		H	Ιt	_		$\top$			П					
* IBA-1-032819		WT	6			3/28	1415	1	2		1	2	_		П							+ 1	$\top$	П	1	-			
5 7								1-	Ť				T	$\top$				1	1			1-1	_						
## <b>\$</b>								╁		$\top$			十		П		_						_	H	_		,		
<b>687.48</b>	-						<u> </u>	<del> </del>	T				$\dashv$	_	H			1 +	_							,			
8						<del> </del>		+	$\vdash$	+		1	+		$\Box$		╁	++		$\vdash$			_		-				
					<del> </del>		1	+-	╁	╅		+	+	$\dashv$	Н		-	1		L	_	+	-	H					
10 NUP-032819		w	7		<u></u>	3/28	016	┼	2	+	1 7		$\dashv$	_	-	١,	7	拉						┢					
					<u> </u>	7/80	0000	+-	obla	+	160	-	$\dashv$		$\vdash$		T	173	+		+	-		┢	+				
12								+	╁	+			+	+-	$\vdash \vdash$	ŀ	+	+	+		-	+		$\vdash \vdash$	_				***************************************
ADDITIONAL COMMENTS	is gales distant	DEL	NO.	SHED BY J	ACCULAT	lou man	DAT	l Historia	1 101	TIME	0.255	ا نشأم ورتون	i de inte			700		ÁTION	i vete esi	10902	الم	1	ilian da d						
ADDITIONAL COMMENTS	7				yy in yarar y	ery la valable es	200			20000	مإسب			ACCE	7160	B1 //	2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	end project		2.75	ATE	3- 49.4% <sub>3</sub>	IME		<del>_</del>	SAMP	LE CONDI	TIONS	
	BIL	10	\$ A	<u> </u>	wes!	GV.	3/28/	119	15	30	<u> </u>		<i>\#</i>	V /	10	<u>_</u>	1/	116	7	03/2	44	1 0º	45	1.2	<u>'_</u> '	1	\$		4
				-								7	•				•			•	, ,	İ					Y		
											P											1				0	3/24	191	
_							<b></b>				$\dashv$											<del>                                     </del>			+	$\rightarrow$	324	₹—	
Page 19					SAMPL	ER NAME	AND SIGN	ATU	RE.	(174)		75 de 1	J. File					อเหลือ							+			-	
ω 						PRINT Nan	e of SAM	LER	: 1	BV.	$\sim J_{c}$	%n	for	17	60	,		and registration	April		gyver et likel	, er en fijeli.	erina di Mari	Temp in °C		Ved C	/ Sea راز۲/۱		ss Int
) of 2						SIGNATUR	E of SAME	LER			7	The state of the s			- " [	$\overline{}$	DATE (MM/	Signed	o?	1/2	8/1	4		Tem		Received on Ice (Y/N)	Cooler (Y/N)		Samples Intact (Y/N)

Tracking #: 47 M & 8 4	
Tracking #:	28708
Type of Ice: Wet Blue None Cooler Temperature Observed Tomp C Correction Factor: C Final Temp: Temp should be above freezing to 6°C  Comments: PH paper Lofff Contents: Date and Initials of precontents: Date and	abel ET
Thermometer Used	
Cooler Temperature Observed Temp C C Correction Factor: 6 Final Temp: Temp should be above freezing to 6°C    PH paper Lot#	
Comments:  Chain of Custody Present: Chain of Custody Filled Out: Chain of Custody Filled Out: Chain of Custody Filled Out: Chain of Custody Relinquished: Sampler Name & Signature on COC: -Includes date/time/ID Matrix: Sample Labels match COC: -Includes date/time/ID Matrix: Samples Arrived within Hold Time: Short Hold Time Analysis (<72hr remaining): Rush Turn Around Time Requested: Sufficient Volume:  Correct Containers Used: -Pace Containers Used: Containers Intact: Orthophosphate field filtered Hex Cr Aqueous Compliance/NPDES sample field filtered Hex Cr Aqueous Compliance/NPDES sample field filtered 113. Organic Samples checked for dechlorination: Filtered volume received for Dissolved tests All containers have been checked for preservation. All containers have been checked for preservation. All containers have been checked for preservation. All containers have been checked for Dissolved tests All containers have been checked for preservation.  Initial when Date/Time of preservation bate:  Initial when Date/Time of preservation bate:  Initial when Date/Time of preservation bate:  Initial when Date/Time of preservation bate:  Initial when Date/Time of preservation bate:  Initial when Date/Time of preservation bate:  Initial when Date/Time of preservation bate:  Initial when Date/Time of completed:  Initial when Date/Time of preservation bate:  Initial when Date/Time of preservation bate:  Initial when Date/Time of completed:  Initial when Date/Time of preservation bate:  Initial when Date/Time of preservation bate:  Initial when Date/Time of completed:  Initial when Date/Time of preservation bate:  Initial when Date/Time of preservation bate:  Initial when Date/Time of completed:  Initial when Date/Time of bate/Time of completed:  Initial when Date/Time of b	1.2 .0
Comments:  Chain of Custody Present:  Chain of Custody Filled Out:  Chain of Custody Filled Out:  Chain of Custody Relinquished:  Sampler Name & Signature on COC:  Sample Labels match COC:  Includes date/time/ID  Matrix:  Samples Arrived within Hold Time:  Short Hold Time Analysis (<72hr remaining):  Rush Turn Around Time Requested:  Sufficient Volume:  Correct Containers Used:  Pace Containers Used:  Orthophosphate field filtered  Hex Cr Aqueous Compliance/NPDES sample field filtered  Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests  All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  Pexceptions: VOA, coliform, TOC, O&G, Phenolics  Initial when Date in thill when Completed:  Initial when Custody Seals Present  Rad Samples Screened < 0.5 mrem/hr  Initial when Custody Date:  Initial when Custody Date:  Initial when Custody Date:  Initial when Completed:  Initial when Complete	
Comments:  Chain of Custody Present:  Chain of Custody Filled Out:  Chain of Custody Relinquished:  Sampler Name & Signature on COC:  Sample Labels match COC:  -Includes date/filme/ID  Matrix:  Samples Arrived within Hold Time:  Short Hold Time Analysis (<72hr remaining):  Rush Turn Around Time Requested:  Sufficient Volume:  Correct Containers Used:  -Pace Containers Used:  -Pace Containers Used:  Cortainers Intact:  Orthophosphate field fillered  Hex Cr Aqueous Compliance/NPDES sample field filtered  12.  Hex Cr Aqueous Compliance/NPDES sample field filtered  13.  Organic Samples checked for dechlorination:  Intil and containers have been checked for preservation.  All containers have been checked for preservation.  All containers have been checked for preservation.  All containers have been checked for preservation.  All containers have been checked for preservation.  All containers have been checked for preservation.  All containers have been checked for preservation.  All containers have been checked for preservation.  All containers have been checked for preservation.  Initial when    Initial when   Initial when   Initial when   Initial when   Initial when   Initial when   Initial when   Initial when   Initial	person examining
Chain of Custody Relinquished:  Chain of Custody Relinquished:  Sampler Name & Signature on COC:  Sample Labels match COC:  Includes date/time/ID  Matrix:  Short Hold Time Analysis (<72hr remaining):  Rush Turn Around Time Requested:  Sufficient Volume:  Correct Containers Used:  -Pace Containers Used:  -Pace Containers Used:  Orthophosphate field filtered  Hex Cr Aqueous Compliance/NPDES sample field filtered  Hex Cr Aqueous Compliance/NPDES sample field filtered  Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests  All containers have been checked for preservation.  All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  Exceptions: VOA, coliform, TOC, O&G, Phenolics  Initial when  Initial w	thing Ju
Chain of Custody Relinquished:  Sampler Name & Signature on COC:  A.  Sample Labels match COC:  Includes date/time/I/D  Matrix:  Samples Arrived within Hold Time:  Short Hold Time Analysis (<72hr remaining):  Rush Turn Around Time Requested:  Sufficient Volume:  Correct Containers Used:  -Pace Containers Used:  -Pace Containers Used:  Containers Infact:  Orthophosphate field filtered  Hex Cr Aqueous Compliance/NPDES sample field filtered  Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests  All containers nave been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  All containers needing preservation are found to be in compliance with EPA recommendation.  Initial when Date/time of preservative  Lot # of added preservative  17.  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Samples Screened < 0.5 mrem/hr  Initial when Completed:  Date: 03 24 1	•
Sample Labels match COC: -Includes date/time/ID Matrix: -Includes date/time/ID Matrix: -Short Hold Time Analysis (<72hr remaining): -Rush Turn Around Time Requested: -Sufficient Volume: -Pace Containers Used: -Pace Containers Used: -Pace Containers Intact: -Pace Containe	
Sample Labels match COC: -Includes date/time/ID Matrix:  Samples Arrived within Hold Time:  Short Hold Time Analysis (<72hr remaining):  Rush Turn Around Time Requested:  Sufficient Volume:  Correct Containers Used: -Pace Containers Used:  Containers Intact:  Orthophosphate field filtered Hex Cr Aqueous Compliance/NPDES sample field filtered Organic Samples checked for dechlorination: Filtered volume received for Dissolved tests All containers needing preservation are found to be in compliance with EPA recommendation.  All centainers needing preservation are found to be in compliance with EPA recommendation.  Initial when completed  Initial when completed  Initial when completed  Initial when completed  Initial when completed:  Initial	
-Includes date/time/ID  Samples Arrived within Hold Time:  Short Hold Time Analysis (<72hr remaining):  Rush Turn Around Time Requested:  Sufficient Volume:  Correct Containers Used:  -Pace Containers Used:  -Pace Containers Used:  Orthophosphate field filtered  Hex Cr Aqueous Compliance/NPDES sample field filtered  12.  Hex Cr Aqueous Compliance/NPDES sample field filtered  Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests  All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  Initial when Date/time of preservative in a found to be in completed.  Initial when Date/time of preservative in a found to be in completed.  Initial when Date/time of preservative in a found to be in completed.  Initial when Date/time of preservative in a found to be in completed.  Initial when Date/time of preservative in a found to be in completed.  Initial when Date/time of preservative in a found to be in completed.  Initial when Date/time of preservative in a found to be in completed.  Initial when Date/time of preservative in a found to be in completed.  Initial when Date/time of preservative in a found to be in completed.  Initial when Date/time of preservative in a found to be in completed.  Initial when Date/time of completed.  Initial when Date/time of completed.  Initial when Date/time of completed.  Initial when Date/time of completed.  Initial when Date/time of completed.  Initial when Date/time of completed.  Initial when Date/time of completed.  Initial when Date/time of completed.  Initial when Date/time of completed.  Initial when Date/time of completed.  Initial when Date/time of completed.  Initial when Date/time of completed.  Initial when Date/time of completed.  Initial when Date/time of completed.	
Samples Arrived within Hold Time:  Short Hold Time Analysis (<72hr remaining):  Rush Turn Around Time Requested:  8.  Sufficient Volume:  9.  Correct Containers Used:  -Pace Containers Used:  -Pace Containers Used:  11.  Orthophosphate field filtered  Hex Cr Aqueous Compliance/NPDES sample field filtered  12.  Hex Cr Aqueous Compliance/NPDES sample field filtered  13.  Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests  All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  Initial when  Date/time of preservation  Initial when  Date/time of preservation  Initial when  Date/time of preservation  Initial when  Date/time of preservation  Initial when  Date/time of preservation  Initial when  Date/time of preservation  Initial when  Date/time of preservation  Initial when  Date/time of preservation  Initial when  Date/time of preservation  Initial when  Date/time of preservation  Date/time of preservation  Initial when  Date/time of preservation  Initial when  Date/time of preservation	
Short Hold Time Analysis (<72hr remaining):  Rush Turn Around Time Requested:  8.  Sufficient Volume:  Correct Containers Used:  -Pace Containers Used:  -Pace Containers Intact:  Orthophosphate field filtered  Hex Cr Aqueous Compliance/NPDES sample field filtered  12.  Hex Cr Aqueous Compliance/NPDES sample field filtered  13.  Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests  All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  Pexceptions: VOA, coliform, TOC, O&G, Phenolics  Initial when Date/time of preservative  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Samples Screened < 0.5 mrem/hr  Initial when Date:  Date: 03 261	
Rush Turn Around Time Requested:  Sufficient Volume:  Correct Containers Used:  -Pace Containers Used:  -Pace Containers Intact:  Orthophosphate field filtered  Hex Cr Aqueous Compliance/NPDES sample field filtered  12.  Hex Cr Aqueous Compliance/NPDES sample field filtered  Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests  All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  Exceptions: VOA, coliform, TOC, O&G, Phenolics  Initial when Date/time of completed preservative  17.  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Samples Screened < 0.5 mrem/hr  Initial when Custody Seals Present  Initial when Custody Seals Present  Initial when Custody Seals Present  Initial when Custody Seals Present  Initial when Custody Seals Present  Initial when Custody Seals Present  Initial when Custody Seals Present  Initial when Custody Seals Present  Initial when Custody Seals Present  Initial when Custody Seals Present  Initial when Custody Seals Present	
Sufficient Volume:  Correct Containers Used:  -Pace Containers Used:  Containers Intact:  Orthophosphate field filtered  -Lex Cr Aqueous Compliance/NPDES sample field filtered  12.  -Lex Cr Aqueous Compliance/NPDES sample field filtered  13.  Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests  All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  Initial when  Date/time of completed  Date/time of preservative  Headspace in VOA Vials (>6mm):  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Samples Screened < 0.5 mrem/hr  Date:  D	
Correct Containers Used:  -Pace Containers Used:  Containers Intact:  Orthophosphate field filtered  12.  Iter Cryptophosphate field filtered  13.  Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests  It containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  Initial when  Completed   Date/time of preservative  Initial when  Completed   To graphic Samples Creened < 0.5 mrem/hr  Date:  OS 26   Date:  OS 26	
Pace Containers Used: Containers Intact: Drthophosphate field filtered  12.  13. Drganic Samples checked for dechlorination: Filtered volume received for Dissolved tests If containers have been checked for preservation.  If containers needing preservation are found to be in compliance with EPA recommendation.  Initial when Date/time of preservation between the VOA, coliform, TOC, O&G, Phenolics  Initial when Date/time of preservation between the VOA Vials (>6mm):  Initial when Date/time of preservation between the VOA Vials (>6mm):  Initial when Date/time of preservation between the VOA Vials (>6mm):  Initial when Date/time of preservation between the VOA Vials (>6mm):  Initial when Date/time of preservation between the VOA Vials (>6mm):  Initial when Date/time of preservation between the VOA Vials (>6mm):  Initial when Date:  Initial when Date:  Initial when Date:  Initial when Date:  Initial when Date:  Initial when Date:  Initial when Date:  Initial when Date:  Initial when Date:  Initial when Date:  Initial when Date:  Initial when Date:  Initial when Date:  Initial when Completed:  Initial when Comp	
Containers Intact:  Orthophosphate field filtered  12.  Itex Cr Aqueous Compliance/NPDES sample field filtered  13.  Organic Samples checked for dechlorination:  Itered volume received for Dissolved tests  Itered volume received for Dissolved tests  Itered volume received for Dissolved tests  Itered volume received for preservation.  Itered volume received for Dissolved tests  Itered volume received for Dissolved for D	
Orthophosphate field filtered  12.  13.  Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests  MI containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  Exceptions: VOA, coliform, TOC, O&G, Phenolics  Initial when	
All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  All containers: VOA, coliform, TOC, O&G, Phenolics  All containers in VOA Vials (>6mm):  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Samples Screened < 0.5 mrem/hr  13.  14.  15.  16.  16.  Date/time of completed  Date/time of preservation  Lot # of added preservative  Initial when	
Organic Samples checked for dechlorination:  Filtered volume received for Dissolved tests All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  Exceptions: VOA, coliform, TOC, O&G, Phenolics  Initial when	
Filtered volume received for Dissolved tests All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  Exceptions: VOA, coliform, TOC, O&G, Phenolics  Initial when Date/time of preservation  Lot # of added preservative  Headspace in VOA Vials ( >6mm):  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Samples Screened < 0.5 mrem/hr  Date: 03 261	
All containers have been checked for preservation.  All containers needing preservation are found to be in compliance with EPA recommendation.  Exceptions: VOA, coliform, TOC, O&G, Phenolics  Headspace in VOA Vials (>6mm):  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Samples Screened < 0.5 mrem/hr  Take the servation of preservation of preservation of preservative	
All containers needing preservation are found to be in compliance with EPA recommendation.  Initial when Date/time of preservation  Lot # of added preservative  Headspace in VOA Vials (>6mm):  Trip Blank Present:  Rad Samples Screened < 0.5 mrem/hr  Date: Date: Date:	
bexceptions: VOA, coliform, TOC, O&G, Phenolics  Initial when Date/time of preservation  Lot # of added preservative  Headspace in VOA Vials (>6mm):  Trip Blank Present:  Initial when Date/time of preservation  17.  Initial when Date/time of preservation  Lot # of added preservative  18.  Initial when Date: Dat	
exceptions: VOA, coliform, TOC, O&G, Phenolics    Completed	
Lot# of added preservative  Headspace in VOA Vials ( >6mm):  Trip Blank Present:  Trip Blank Custody Seals Present  Rad Samples Screened < 0.5 mrem/hr  Initial when completed:  Date: 03 26	
Trip Blank Present:  Trip Blank Custody Seals Present Rad Samples Screened < 0.5 mrem/hr  Initial when completed:  Date: 03 25	
Trip Blank Custody Seals Present Rad Samples Screened < 0.5 mrem/hr Initial when completed: Date: 03 26	
Rad Samples Screened < 0.5 mrem/hr Initial when completed: Date: 03 25	
completed: VVIS Date: US) VCV	
Client Notification/ Resolution:	119
	1
Person Contacted: Date/Time: Contacted By:	
Comments/ Resolution:	

 $\Box$  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**

