HALEY ALDRICH

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2018 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
BOTTOM ASH SETTLING AREA
TECUMSEH ENERGY CENTER
TECUMSEH, KANSAS

by Haley & Aldrich, Inc.
Cleveland, Ohio

for Evergy Kansas Central, Inc. (f/k/a Westar Energy, Inc.)
Topeka, Kansas

File No. 129778-041
January 2019
Revised: March 2021

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Revision No.	Date	Notes
0	January 2019	Original
1	March 2021	Revised to include groundwater potentiometric contour maps for 2018

List of Tables

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This Annual Groundwater Monitoring and Corrective Action Report documents the groundwater monitoring system for the Tecumseh Energy Center Bottom Ash Settling Area consistent with applicable sections of 257.90 through 257.98, and describes activities conducted in the prior calendar year (2018) and documents compliance with the U.S. Environmental Protection Agency Coal Combustion Residual Rule. I certify that the 2018 Annual Groundwater Monitoring and Corrective Action Report for the Bottom Ash Settling Area 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.

1. Introduction

This 2018 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) addresses the Bottom Ash Settling Area (BASA; also known as the Bottom Ash Settling Pond) at the Tecumseh Energy Center (TEC), operated by Evergy Kansas Central, Inc. (Evergy; f/k/a Westar Energy, Inc.). This Annual Report was developed in accordance with the U.S. Environmental Protection Agency Coal Combustion Residual (CCR) Rule effective October 19, 2015 (Rule), specifically Code of Federal Regulations Title 40 (40 CFR), subsection 257.90(e). The Annual Report documents the groundwater monitoring system for the BASA consistent with applicable sections of 257.90 through 257.98, and describes activities conducted in the prior calendar year (2018) and documents compliance with the Rule. The specific requirements for the Annual Report listed in § 257.90(e) of the Rule are provided in Section 2 of this Annual Report and are in bold italic font, followed by a short narrative describing how each Rule requirement has been met.

2. 40 CFR § 257.90 Applicability

2.1 40 CFR § 257.90(a)

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

Evergy has installed and certified a groundwater monitoring system at the TEC BASA. The BASA is 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) (Rule).

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).

This Annual Report describes monitoring completed and actions taken for the groundwater monitoring system at the TEC BASA as required by the Rule. 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 and § 257.95 is also provided in this report. This Annual Report documents the applicable groundwater-related activities completed in the calendar year 2018.

2.2.1 Status of the Groundwater Monitoring Program

Results of the detection monitoring statistical analyses completed in January 2018 identified statistically significant increased (SSI) concentration of Appendix III constituents in downgradient monitoring wells relative to concentrations observed in upgradient monitoring wells. No alternative source was identified. Accordingly, the groundwater monitoring program moved to and is currently implementing an assessment monitoring program.

2.2.2 Key Actions Completed

The 2017 Annual Groundwater Monitoring and Corrective Action Report was completed in January 2018. Statistical analysis was completed in January 2018 on analytical data from the initial detection monitoring sampling event. Appendix III SSIs were determined in January 2018, and Evergy pursued an alternative source demonstration, which was not successful. Sampling for the first semi-annual detection monitoring event was completed in March 2018; however, due to the determination of SSIs and transition to an assessment monitoring program, no statistical analyses were completed on this data. An assessment monitoring program was established and the initial assessment monitoring sampling event was completed in June 2018. A second assessment monitoring sampling event including detected Appendix IV constituents from the initial assessment monitoring sampling event, as well as all Appendix III constituents, was completed in September 2018. Groundwater protection standards for detected Appendix IV constituents were established. Statistical analysis of the results from the second assessment monitoring sampling event are due to be completed in January 2019 and will be reported in the next annual report.

2.2.3 Problems Encountered

No noteworthy problems (i.e., problems could include damaged wells, issues with sample collection or lack of sampling, and problems with analytical analysis) were encountered for the TEC BASA groundwater monitoring program in 2018.

2.2.4 Actions to Resolve Problems

No problems were encountered at the TEC BASA in 2018, therefore, no actions to resolve problems were required.

2.2.5 Project Key Activities for Upcoming Year

Key activities planned for 2019 include the 2018 Annual Groundwater Monitoring and Corrective Action Report, statistical analysis of assessment monitoring analytical data collected in September 2018, and semi-annual assessment monitoring and subsequent statistical analysis.

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)

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 BASA 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;

No monitoring wells were installed or decommissioned during 2018.

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;

In accordance with § 257.94(b), three independent samples (one detection monitoring sample, and two assessment monitoring samples) from each background and downgradient monitoring well were collected in 2018. Detection monitoring samples are summarized in Table I, and assessment monitoring samples are summarized in Table II. Both summary tables include the sample names, dates of sample collection, and monitoring data obtained for the groundwater monitoring program. Groundwater potentiometric elevation contour maps associated with each groundwater monitoring sampling event in 2018 are provided in Figures 2 through 4.

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

Initial detection monitoring statistical analyses were completed in January 2018 in accordance with § 257.94(b). The analyte concentrations from the downgradient wells for each of the Appendix III constituents from the 2017 detection monitoring sampling event from each location were compared to their respective prediction limit (PL). Once data is validated, a sample concentration greater than the PL is considered to represent an SSI. An SSI over background levels for one or more constituents listed in Appendix III were identified. A summary of the Appendix III SSIs identified in January 2018 is provided in Table III.

A successful demonstration that a source other than the CCR unit caused the SSI over background levels was not completed within 90 days of the SSI determination in accordance with 40 CFR §257.94(e)(2), and the assessment monitoring program was established by July 2018. The assessment monitoring program has been established to meet the requirements of 40 CFR §257.95.

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 Annual Report documents activities conducted to comply with § 257.90 through § 257.95 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. The following requirements include relevant and required information in the Annual Report for activities completed in calendar year 2018.

2.3.5.1 40 CFR § 257.94(d)(3) – Demonstration for Alternative Detection Monitoring Frequency

The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration for an alternative groundwater sampling and analysis frequency meets the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority in the annual groundwater monitoring and corrective action report required by § 257.90(e).

An alternative groundwater detection monitoring sampling and analysis frequency has not been established for this unit, therefore, no demonstration or certification is applicable.

2.3.5.2 40 CFR § 257.94(e)(2) – Detection Monitoring Alternate Source Demonstration

The owner or operator may demonstrate that a source other than the CCR unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels to include obtaining a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority verifying the accuracy of the information in the report. If a successful demonstration is completed within the 90-day period, the owner or operator of the CCR unit may continue with a detection monitoring program under this section. If a successful demonstration is not completed within the 90-day period, the owner or operator of the CCR unit must initiate an assessment monitoring program as required under § 257.95. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

An alternative source demonstration for detection monitoring SSIs was not successfully completed within 90 days for this unit, therefore, no demonstration or certification is applicable.

2.3.5.3 40 CFR § 257.95(c)(3) – Demonstration for Alternative Assessment Monitoring Frequency

The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration for an alternative groundwater sampling and analysis frequency meets the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority in the annual groundwater monitoring and corrective action report required by § 257.90(e).

An alternative groundwater assessment monitoring sampling and analysis frequency has not been established for this unit, therefore, no demonstration or certification is applicable.

2.3.5.4 40 CFR § 257.95(d)(3) – Assessment Monitoring Concentrations and Groundwater Protection Standards

Include the recorded concentrations required by paragraph (d)(1) of this section, identify the background concentrations established under § 257.94(b), and identify the groundwater protection standards established under paragraph (d)(2) of this section in the annual groundwater monitoring and corrective action report required by § 257.90(e).

An assessment monitoring program is currently being implemented at the CCR unit. Two rounds of assessment monitoring sampling were completed in 2018. Analytical results for both downgradient and upgradient wells are provided in Table II. The groundwater protection standards established for the TEC BASA are included in Table IV.

2.3.5.5 40 CFR § 257.95(g)(3)(ii) – Assessment Monitoring Alternate Source Demonstration

Demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Any such demonstration must be supported by a report that includes the factual or evidentiary basis for any conclusions and must be certified to be accurate by a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority. If a successful demonstration is made, the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to this section, and may return to detection monitoring if the constituents in appendices III and IV to this part are at or below background as specified in paragraph (e) of this section. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

Assessment monitoring statistical analyses were not completed in 2018. Therefore, this criterion is not applicable.

2.3.5.6 40 CFR § 257.96(a) – Demonstration for Additional Time for Assessment of Corrective Measures

Within 90 days of finding that any constituent listed in appendix IV to this part has been detected at a statistically significant level exceeding the groundwater protection standard defined under § 257.95(h), or immediately upon detection of a release from a CCR unit, the owner or operator must initiate an assessment of corrective measures to prevent further releases, to remediate any releases and to restore affected area to original conditions. The assessment of corrective measures must be completed within 90 days, unless the owner or operator demonstrates the need for additional time to complete the assessment of corrective measures due to site-specific conditions or circumstances. The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority attesting that the demonstration is accurate. The 90-day deadline to complete the assessment of corrective measures may be extended for no longer than 60 days. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

Assessment monitoring statistical analyses were not completed in 2018. Therefore, this criterion is not applicable.

TABLES

TABLE I
SUMMARY OF ANALYTICAL RESULTS - DETECTION MONITORING
EVERGY KANSAS CENTRAL, INC.
TECUMSEH ENERGY CENTER
BOTTOM ASH SETTLING AREA
TECUMSEH, KANSAS

Location	Upgradient	Downgradient		
	MW-7	MW-8	MW-9	MW-10
Measure Point (TOC)	878.28	888.01	886.98	887.08
Sample Name	MW-7-030918	MW-8-030918	MW-9-030918	MW-10-030918
Sample Date	3/9/2018	3/9/2018	3/9/2018	3/9/2018
Lab Data Reviewed and Accepted	4/16/2018	4/16/2018	4/16/2018	4/16/2018
Depth to Water (ft btoc)	23.44	29.11	33.58	33.75
Temperature (Deg C)	56.2	63.2	56.1	55.7
Conductivity (µS/cm)	1613	1858	1866	1894
Turbidity (NTU)	2.10	0.96	14.19	2.75
Boron, Total (mg/L)	**0.77**	**1.5**	**0.13**	**0.25**
Calcium, Total (mg/L)	**165**	**233**	**259**	**176**
Chloride (mg/L)	**193**	**233**	**188**	**227**
Fluoride (mg/L)	**0.37**	**0.33**	**0.38**	**0.55**
Sulfate (mg/L)	**547**	**846**	**26.1**	**136**
pH (su)	**7.0**	**6.8**	**6.7**	**6.8**
TDS (mg/L)	**1190**	**1390**	**1090**	**1120**

Abbreviations and Notes:

This detection monitoring sample was collected prior to the establishment of an assessment monitoring program. The program subsequently transitioned into assessment monitoring, and consequently statistical analyses were not conducted on these data.

µ*S/cm = micro Siemens per centimeter*

Deg C = degrees Celsius

ft btoc = feet below top of casing

mg/L = milligrams per liter

NTU = Nephelometric Turbidity Unit

su = standard unit

TDS = total dissolved solids

TOC = top of casing

Bold value: Detection above laboratory reporting limit

TABLE II

SUMMARY OF ANALYTICAL RESULTS - ASSESSMENT MONITORING

EVERGY KANSAS CENTRAL, INC.

TECUMSEH ENERGY CENTER

BOTTOM ASH SETTLING AREA

TECUMSEH, KANSAS

Location	Upgradient		Downgradient					
	MW-7		MW-8		MW-9		MW-10	
Measure Point (TOC)	878.28		888.01		886.98		887.08	
Sample Name	MW-7-061118	MW-7-090618	MW-8-061118	MW-8-090618	MW-9-061118	MW-9-090618	MW-10-061118	MW-10-090618
Sample Date	6/11/2018	9/6/2018	6/11/2018	9/6/2018	6/11/2018	9/6/2018	6/11/2018	9/6/2018
Lab Data Reviewed and Accepted	7/16/2018	10/15/2018	7/16/2018	10/15/2018	7/16/2018	10/15/2018	7/16/2018	10/15/2018
Depth to Water (ft btoc)	23.45	23.57	26.53	22.80	33.56	34.61	33.65	33.95
Temperature (Deg C)	18.19	17.77	23.92	22.35	22.38	19.83	20.10	18.62
Conductivity (µS/cm)	1690	1730	1940	1940	1920	1940	1930	1940
Turbidity (NTU)	0.77	2.04	1.36	0.72	4.21	5.14	2.31	2.21
Boron, Total (mg/L)	--	**0.73**	--	**1.3**	--	<0.10	--	**0.23**
Calcium, Total (mg/L)	--	**167**	--	**222**	--	**250**	--	**173**
Chloride (mg/L)	--	**212**	--	**256**	--	**201**	--	**231**
Fluoride (mg/L)	--	**0.33**	--	**0.31**	--	**0.51**	--	**0.51**
Sulfate (mg/L)	--	**569**	--	**738**	--	**87**	--	**110**
pH (su)	--	**6.8**	--	**6.8**	--	**6.6**	--	**6.6**
TDS (mg/L)	--	**1290**	--	**1560**	--	**1320**	--	**1200**
Antimony, Total (mg/L)	<0.0010	--	<0.0010	--	<0.0010	--	<0.0010	--
Arsenic, Total (mg/L)	**0.0016**	**0.0015**	**0.0041**	**0.0028**	**0.097**	**0.099**	**0.041**	**0.040**
Barium, Total (mg/L)	**0.069**	**0.079**	**0.060**	**0.057**	**0.85**	**0.91**	**0.33**	**0.35**
Beryllium, Total (mg/L)	<0.0010	--	<0.0010	--	<0.0010	--	<0.0010	--
Cadmium, Total (mg/L)	<0.00050	--	<0.00050	--	<0.00050	--	<0.00050	--
Chromium, Total (mg/L)	<0.0050	--	<0.0050	--	<0.0050	--	<0.0050	--
Cobalt, Total (mg/L)	**0.0010**	**0.0010**	**0.0015**	**0.0014**	**0.014**	**0.011**	<0.0010	<0.0010
Lead, Total (mg/L)	<0.010	--	<0.010	--	<0.010	--	<0.010	--
Lithium, Total (mg/L)	**0.025**	**0.029**	**0.021**	**0.022**	**0.011**	**0.012**	<0.010	<0.010
Molybdenum, Total (mg/L)	**0.0082**	**0.0082**	**0.035**	**0.037**	**0.0018**	<0.0010	**0.0019**	**0.0027**
Selenium, Total (mg/L)	<0.0010	--	<0.0010	--	<0.0010	--	<0.0010	--
Thallium, Total	<0.0010	--	<0.0010	--	<0.0010	--	<0.0010	--
Mercury, Total (mg/L)	<0.00020	--	<0.00020	--	<0.00020	--	<0.00020	--
Fluoride (mg/L)	**0.33**	**0.33**	**0.26**	**0.31**	**0.50**	**0.51**	**0.48**	**0.51**
Radium-226 & 228 Combined (pCi/L)	**1.54**	**0.398**	**1.59**	**1.29**	**3.36**	**2.53**	**2.09**	**3.58**

Abbreviations and Notes:

The June sampling event was for Appendix IV constituents only. The September sampling event included Appendix IV constituents detected in the June sampling event, and all of the Appendix III constituents.

µS/cm = micro Siemens per centimeter

Deg C = degrees Celsius

ft btoc = feet below top of casing

mg/L= milligrams per liter

NTU = Nephelometric Turbidity Unit

pCi/L = picoCuries per liter

su = standard unit

TDS = total dissolved solids

TOC = top of casing

Bold value: Detection above laboratory reporting limit

TABLE III
SUMMARY OF APPENDIX III SSIs
EVERGY KANSAS CENTRAL, INC.
TECUMSEH ENERGY CENTER
BOTTOM ASH SETTLING AREA
TECUMSEH, KANSAS

Well ID	Statistical Analysis Completed	Constituent
MW-8	January 2018	Boron
	January 2018	Calcium
	January 2018	Sulfate
	January 2018	TDS
MW-9	January 2018	Calcium
	January 2018	Fluoride
	January 2018	TDS
MW-10	January 2018	Calcium
	January 2018	Chloride
	January 2018	Fluoride

Abbreviations and Notes:

SSIs = statistically significant increases

TDS = total dissolved solids

TABLE IV
GROUNDWATER PROTECTION STANDARDS
EVERGY KANSAS CENTRAL, INC.
TECUMSEH ENERGY CENTER
BOTTOM ASH SETTLING AREA
TECUMSEH, KANSAS

Constituent	Groundwater Protection Standard (mg/L)
Arsenic	0.010*
Barium	2*
Cobalt	0.006**
Fluoride	4.0*
Lithium	0.040**
Molybdenum	0.100**
Radium 226 & 228	5.9 pCi/L***

Abbreviations and Notes:

** Value set equal to the maximum contaminant level.*

*** Value set based on regional screening levels.*

**** Value set based on background level.*

mg/L = milligrams per liter

pCi/L = picoCuries per liter

FIGURES

LEGEND

- MONITORING WELL
- PIEZOMETRIC OBSERVATION ONLY
- BOTTOM ASH SETTLING AREA

NOTE

1. ALL LOCATIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI, NOVEMBER 7, 2015.

N

0 50 100

SCALE IN FEET

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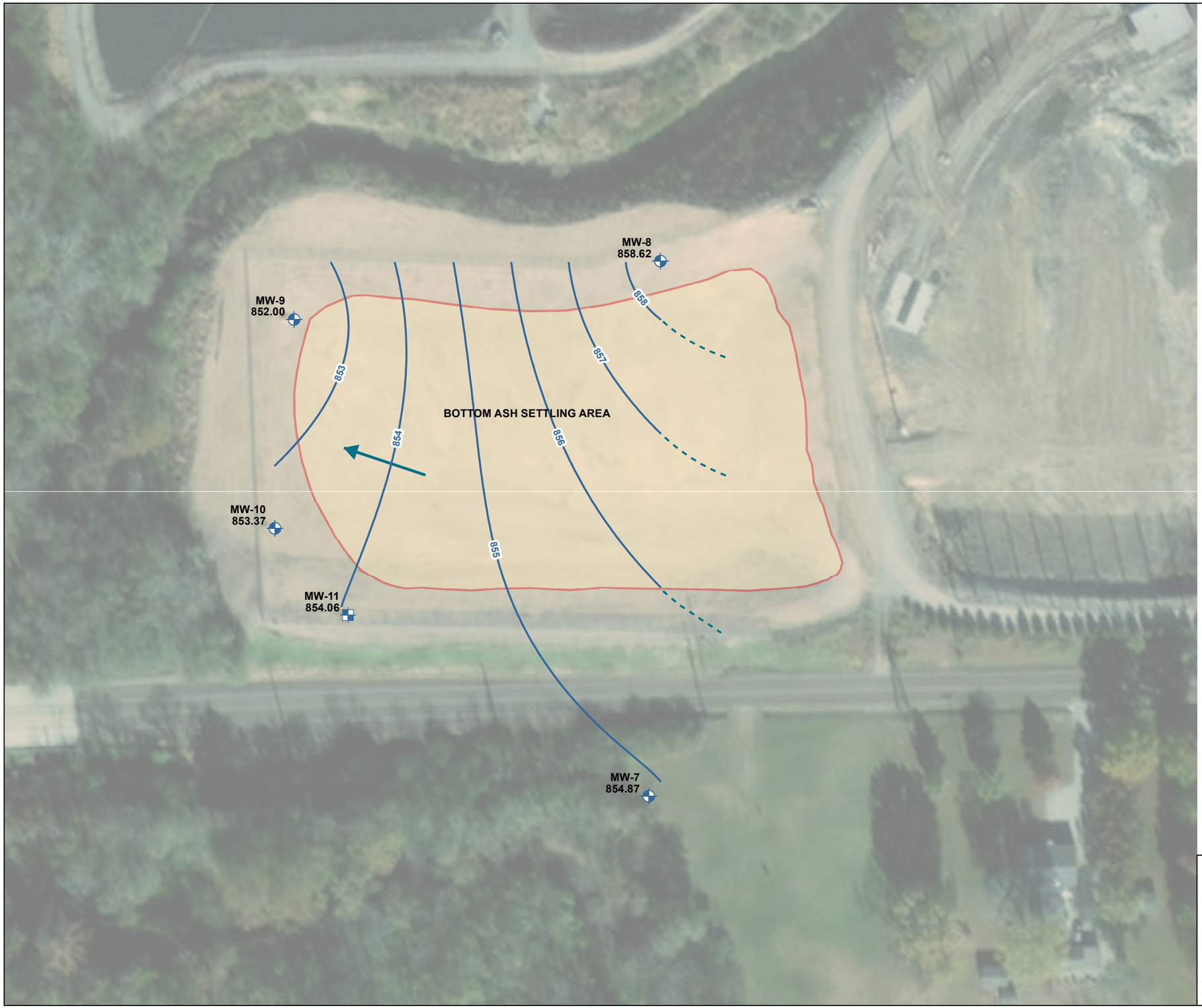
EVERGY KANSAS CENTRAL, INC.
TECUMSEH ENERGY CENTER
TECUMSEH, KANSAS

BOTTOM ASH SETTLING AREA MONITORING WELL LOCATION MAP

MARCH 2021
SCALE: AS SHOWN

FIGURE 1

GIS FILE PATH: G:\Projects\Westar\Tecumseh Energy Center (TEC)\GIS\MXDs\2018_01\TEC_BOTTOM ASH SETTLING POND_MW_LOC_map.mxd — USER: dzinsmaster — LAST SAVED: 3/16/2018 10:29:19 AM



LEGEND

- **MW-8 849.64** WELL NAME AND GROUNDWATER ELEVATION (MARCH 9, 2018)
- MONITORING WELL
- PIEZOMETER OBSERVATION ONLY
- GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 1-FT INTERVAL (AMSL)
- ESTIMATED GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- BOTTOM ASH SETTLING AREA

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 09 MARCH 2018.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, NOVEMBER 7, 2019

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0 75 150
SCALE IN FEET

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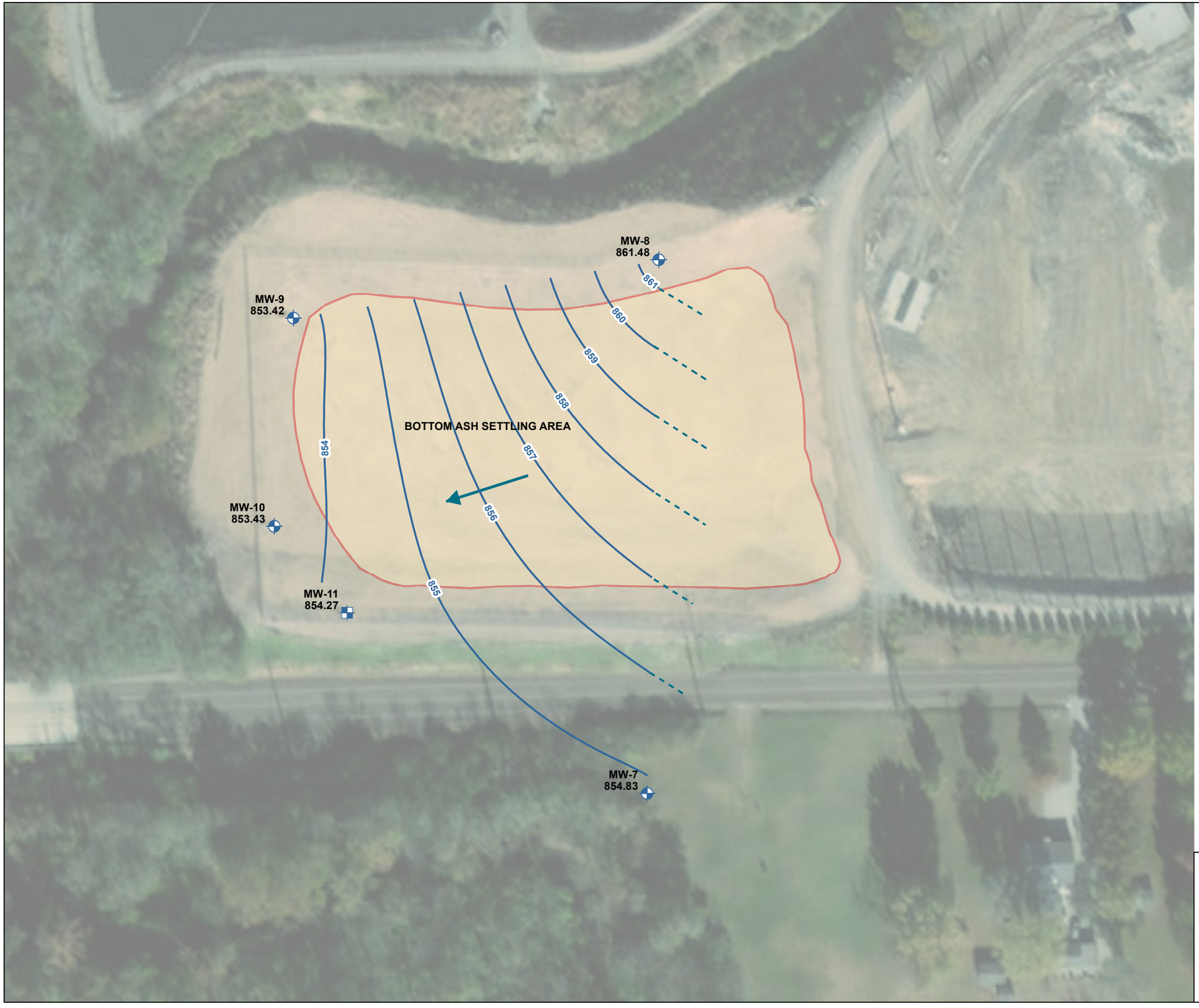
EVERGY KANSAS CENTRAL, INC.
TECUMSEH ENERGY CENTER
TECUMSEH, KANSAS

BOTTOM ASH SETTLING AREA GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR MAP MARCH 09, 2018

evergy

MARCH 2021

FIGURE 2



LEGEND

- **MW-8 849.64** — WELL NAME AND GROUNDWATER ELEVATION (JUNE 6/11, 2018)
- MONITORING WELL
- PIEZOMETER OBSERVATION ONLY
- GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 1-FT INTERVAL (AMSL)
- ESTIMATED GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- BOTTOM ASH SETTLING AREA

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 06 AND 11 JUNE 2018.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, NOVEMBER 7, 2019

N

0 75 150

SCALE IN FEET

HALEY ALDRICH

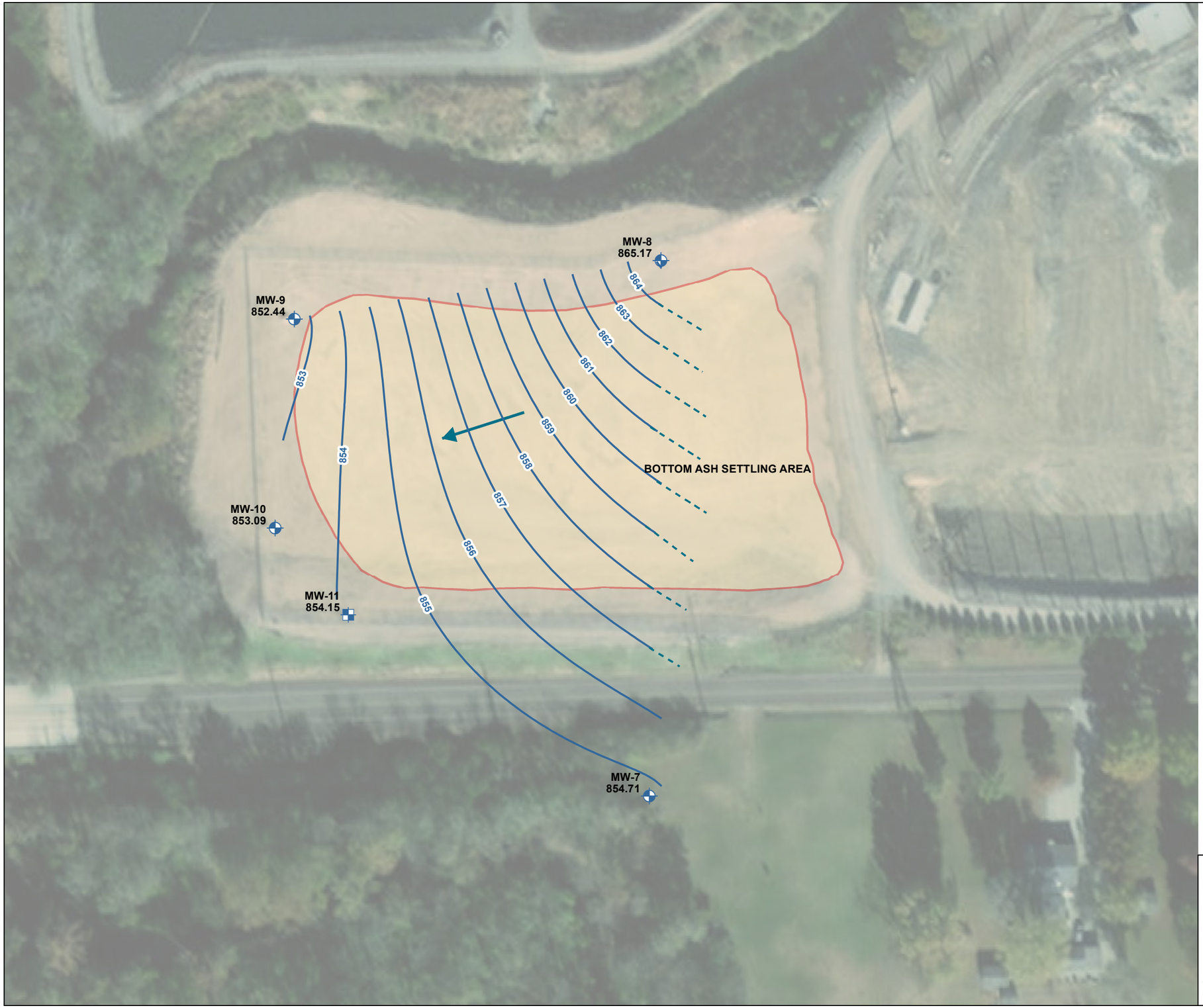
EVERGY KANSAS CENTRAL, INC.
TECUMSEH ENERGY CENTER
TECUMSEH, KANSAS

BOTTOM ASH SETTLING AREA GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR MAP JUNE 06 &11, 2018

evergy

MARCH 2021

FIGURE 3



LEGEND

MW-8 849.64 WELL NAME AND GROUNDWATER ELEVATION (SEPTEMBER 4, 2018)

MONITORING WELL

PIEZOMETER OBSERVATION ONLY

GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 1-FT INTERVAL (AMSL)

ESTIMATED GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR

GROUNDWATER FLOW DIRECTION

BOTTOM ASH SETTLING AREA

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 04 SEPTEMBER 2018.

3. AMSL = ABOVE MEAN SEA LEVEL

4. AERIAL IMAGERY SOURCE: ESRI, NOVEMBER 7, 2019

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0 75 150

SCALE IN FEET

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EVERGY KANSAS CENTRAL, INC.
TECUMSEH ENERGY CENTER
TECUMSEH, KANSAS

BOTTOM ASH SETTLING AREA GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR MAP SEPTEMBER 04, 2018

evergy

MARCH 2021

FIGURE 4

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

March 22, 2022
Project No. 0204993-000

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

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

Mark Nicholls
Digitally signed by Mark Nicholls
Date: 2022.03.22 15:33:06 -07'00'

SUBJECT: 2018 Annual Groundwater Monitoring and Corrective Action Report Addendum
Evergy Kansas Central, Inc. (Evergy)
Bottom Ash Settling Area
Tecumseh Energy Center – Tecumseh, Kansas

The Bottom Ash Settling Area (BASA) at the Evergy Tecumseh Energy Center (TEC) 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 in 2018 for the BASA was completed and placed in the facility's operating record on January 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 Reports, 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 2018 sampling events are included in Attachment 1, and a discussion of the applicable statistical analyses completed in 2018 are included in Attachment 2 of this addendum. Revision 1 of the 2018 GWMCA Report does include a "Groundwater Potentiometric Elevation Contour Map" for each of the 2018 sampling events as

Figures 2, 3, and 4. In those figures, the measured groundwater elevations for each well are listed. Those maps have been duplicated in this addendum and were modified to include the calculated groundwater flow rate and direction.

The attachments to this addendum are as follows providing the additional information.

- 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 sampling events completed in March, June, and September 2018 are provided.
- Attachment 2 – Statistical Analyses: Includes a discussion of the statistical analyses utilized along with a table summarizing the statistical outputs (e.g., frequency of detection, maximum detection, variance, standard deviation, coefficient of variance, outlier tests, trends, upper and lower confidence limits, and comparison against Groundwater Protection Standards), and supporting backup for statistical analyses completed in 2018. Statistical analyses completed in 2018 included:
  - January 2018 statistical analyses for data obtained in the August 2016 through June 2017 background sampling events; and
  - Explanation of statistical analysis related to the March 2018 sampling event.
- Attachment 3 – Revised Groundwater Potentiometric Maps: Includes the measured groundwater elevations at each well and the approximated groundwater flow direction and calculated flow rate. Maps for the sampling events completed in March, June, and September 2018 are provided.

ATTACHMENT 1

Laboratory Analytical Reports

ATTACHMENT 1-1

March 2018 Sampling Event Laboratory Analytical Report

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

March 20, 2018

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

RE: Project: TEC SI CCR
Pace Project No.: 60265654

Dear Brandon Griffin:
Enclosed are the analytical results for sample(s) received by the laboratory on March 09, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

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

Enclosures

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

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CERTIFICATIONS

Project: TEC SI CCR
Pace Project No.: 60265654

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 17-016-0
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070

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SAMPLE SUMMARY

Project: TEC SI CCR
Pace Project No.: 60265654

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60265654001	**MW-7-030918**	Water	03/09/18 08:17	03/09/18 15:10
60265654002	**MW-10-030918**	Water	03/09/18 09:17	03/09/18 15:10
60265654003	**MW-9-030918**	Water	03/09/18 10:19	03/09/18 15:10
60265654004	**MW-8-030918**	Water	03/09/18 11:32	03/09/18 15:10

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SAMPLE ANALYTE COUNT

Project: TEC SI CCR
Pace Project No.: 60265654

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60265654001	**MW-7-030918**	EPA 200.7	SMW	2	PASI-K
		SM 2540C	OL	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
60265654002	**MW-10-030918**	EPA 200.7	SMW	2	PASI-K
		SM 2540C	OL	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
60265654003	**MW-9-030918**	EPA 200.7	SMW	2	PASI-K
		SM 2540C	OL	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
60265654004	**MW-8-030918**	EPA 200.7	SMW	2	PASI-K
		SM 2540C	OL	1	PASI-K
		SM 4500-H+B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K

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PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60265654

Method: **EPA 200.7**
Description: 200.7 Metals, Total
Client: WESTAR ENERGY
Date: March 20, 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.

Additional Comments:

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PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60265654

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: WESTAR ENERGY
Date: March 20, 2018

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

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

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

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

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

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

Additional Comments:

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PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60265654

Method: **SM 4500-H+B**
Description: 4500H+ pH, Electrometric
Client: WESTAR ENERGY
Date: March 20, 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.
- MW-10-030918 (Lab ID: 60265654002)
- MW-7-030918 (Lab ID: 60265654001)
- MW-8-030918 (Lab ID: 60265654004)
- MW-9-030918 (Lab ID: 60265654003)

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

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

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

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

Additional Comments:

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PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60265654

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: WESTAR ENERGY
Date: March 20, 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.

Additional Comments:

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

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ANALYTICAL RESULTS

Project: TEC SI CCR
Pace Project No.: 60265654

Sample: MW-7-030918 **Lab ID: 60265654001** Collected: 03/09/18 08:17 Received: 03/09/18 15:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron, Total Recoverable	**0.77**	mg/L	0.10	1	03/13/18 10:15	03/13/18 18:00	7440-42-8	
Calcium, Total Recoverable	**165**	mg/L	0.20	1	03/13/18 10:15	03/13/18 18:00	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1190**	mg/L	5.0	1		03/16/18 10:11		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.0**	Std. Units	0.10	1		03/19/18 11:43		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**193**	mg/L	50.0	50		03/17/18 01:32	16887-00-6	
Fluoride	**0.37**	mg/L	0.20	1		03/16/18 09:31	16984-48-8	
Sulfate	**547**	mg/L	50.0	50		03/17/18 01:32	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: TEC SI CCR
Pace Project No.: 60265654

Sample: MW-10-030918 **Lab ID: 60265654002** Collected: 03/09/18 09:17 Received: 03/09/18 15:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron, Total Recoverable	**0.25**	mg/L	0.10	1	03/13/18 10:15	03/13/18 18:03	7440-42-8	
Calcium, Total Recoverable	**176**	mg/L	0.20	1	03/13/18 10:15	03/13/18 18:03	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1120**	mg/L	5.0	1		03/16/18 10:11		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**6.8**	Std. Units	0.10	1		03/19/18 11:46		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**227**	mg/L	25.0	25		03/17/18 02:14	16887-00-6	
Fluoride	**0.55**	mg/L	0.20	1		03/16/18 09:45	16984-48-8	
Sulfate	**136**	mg/L	25.0	25		03/17/18 02:14	14808-79-8	

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ANALYTICAL RESULTS

Project: TEC SI CCR
Pace Project No.: 60265654

Sample: MW-9-030918 **Lab ID: 60265654003** Collected: 03/09/18 10:19 Received: 03/09/18 15:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron, Total Recoverable	**0.13**	mg/L	0.10	1	03/13/18 10:15	03/13/18 18:05	7440-42-8	
Calcium, Total Recoverable	**259**	mg/L	0.20	1	03/13/18 10:15	03/13/18 18:05	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1090**	mg/L	5.0	1		03/16/18 10:12		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**6.7**	Std. Units	0.10	1		03/19/18 11:47		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**188**	mg/L	25.0	25		03/17/18 02:28	16887-00-6	
Fluoride	**0.38**	mg/L	0.20	1		03/16/18 09:59	16984-48-8	
Sulfate	**26.1**	mg/L	2.0	2		03/17/18 02:42	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: TEC SI CCR
Pace Project No.: 60265654

Sample: MW-8-030918 **Lab ID: 60265654004** Collected: 03/09/18 11:32 Received: 03/09/18 15:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron, Total Recoverable	**1.5**	mg/L	0.10	1	03/13/18 10:15	03/13/18 18:08	7440-42-8	
Calcium, Total Recoverable	**233**	mg/L	0.20	1	03/13/18 10:15	03/13/18 18:08	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1390**	mg/L	5.0	1		03/16/18 10:12		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**6.8**	Std. Units	0.10	1		03/19/18 11:48		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**233**	mg/L	25.0	25		03/17/18 02:56	16887-00-6	
Fluoride	**0.33**	mg/L	0.20	1		03/16/18 10:13	16984-48-8	
Sulfate	**846**	mg/L	100	100		03/17/18 03:09	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: TEC SI CCR
Pace Project No.: 60265654

QC Batch: 517370 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60265654001, 60265654002, 60265654003, 60265654004

METHOD BLANK: 2117482 Matrix: Water
Associated Lab Samples: 60265654001, 60265654002, 60265654003, 60265654004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	mg/L	<0.10	0.10	03/13/18 17:10	
Calcium	mg/L	<0.20	0.20	03/13/18 17:10	

LABORATORY CONTROL SAMPLE: 2117483

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	mg/L	1	0.98	98	85-115	
Calcium	mg/L	10	9.9	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2117484 2117485

Parameter	Units	60265366001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	mg/L	319 ug/L	1	1	1.3	1.3	102	101	70-130	0	20	
Calcium	mg/L	84900 ug/L	10	10	95.7	95.0	108	101	70-130	1	20	

MATRIX SPIKE SAMPLE: 2117486

Parameter	Units	60265366003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	mg/L	ND	1	1.0	100	70-130	
Calcium	mg/L	46800 ug/L	10	56.0	91	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: TEC SI CCR
Pace Project No.: 60265654

QC Batch: 517832 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60265654001, 60265654002, 60265654003, 60265654004

METHOD BLANK: 2119422 Matrix: Water
Associated Lab Samples: 60265654001, 60265654002, 60265654003, 60265654004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	03/16/18 10:08	

LABORATORY CONTROL SAMPLE: 2119423

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	986	99	80-120	

SAMPLE DUPLICATE: 2119424

Parameter	Units	60265640001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	491	501	2	10	

SAMPLE DUPLICATE: 2119425

Parameter	Units	60265640002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	840	847	1	10	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: TEC SI CCR
Pace Project No.: 60265654

QC Batch: 518078 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 60265654001, 60265654002, 60265654003, 60265654004

SAMPLE DUPLICATE: 2120629

Parameter	Units	60265654001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.0	7.0	0	5	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: TEC SI CCR
Pace Project No.: 60265654

QC Batch: 517729 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60265654001, 60265654002, 60265654003, 60265654004

METHOD BLANK: 2119018 Matrix: Water
Associated Lab Samples: 60265654001, 60265654002, 60265654003, 60265654004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.20	0.20	03/15/18 22:38	

LABORATORY CONTROL SAMPLE: 2119019

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2119020 2119021

Parameter	Units	60265623001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	1.5	2.5	2.5	3.7	3.7	91	90	80-120	1	15	

MATRIX SPIKE SAMPLE: 2119022

Parameter	Units	60265653002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	0.27	2.5	2.9	106	80-120	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: TEC SI CCR
Pace Project No.: 60265654

QC Batch: 517966 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60265654001, 60265654002, 60265654003, 60265654004

METHOD BLANK: 2119906 Matrix: Water
Associated Lab Samples: 60265654001, 60265654002, 60265654003, 60265654004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	03/16/18 18:49	
Sulfate	mg/L	<1.0	1.0	03/16/18 18:49	

LABORATORY CONTROL SAMPLE: 2119907

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	
Sulfate	mg/L	5	5.1	103	90-110	

MATRIX SPIKE SAMPLE: 2119910

Parameter	Units	60265623008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	394	1000	1390	99	80-120	
Sulfate	mg/L	1750	1000	2870	112	80-120	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: TEC SI CCR
Pace Project No.: 60265654

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.

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

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

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: TEC SI CCR
Pace Project No.: 60265654

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60265654001	**MW-7-030918**	EPA 200.7	517370	EPA 200.7	517417
60265654002	**MW-10-030918**	EPA 200.7	517370	EPA 200.7	517417
60265654003	**MW-9-030918**	EPA 200.7	517370	EPA 200.7	517417
60265654004	**MW-8-030918**	EPA 200.7	517370	EPA 200.7	517417
60265654001	**MW-7-030918**	SM 2540C	517832		
60265654002	**MW-10-030918**	SM 2540C	517832		
60265654003	**MW-9-030918**	SM 2540C	517832		
60265654004	**MW-8-030918**	SM 2540C	517832		
60265654001	**MW-7-030918**	SM 4500-H+B	518078		
60265654002	**MW-10-030918**	SM 4500-H+B	518078		
60265654003	**MW-9-030918**	SM 4500-H+B	518078		
60265654004	**MW-8-030918**	SM 4500-H+B	518078		
60265654001	**MW-7-030918**	EPA 300.0	517729		
60265654001	**MW-7-030918**	EPA 300.0	517966		
60265654002	**MW-10-030918**	EPA 300.0	517729		
60265654002	**MW-10-030918**	EPA 300.0	517966		
60265654003	**MW-9-030918**	EPA 300.0	517729		
60265654003	**MW-9-030918**	EPA 300.0	517966		
60265654004	**MW-8-030918**	EPA 300.0	517729		
60265654004	**MW-8-030918**	EPA 300.0	517966		

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Sample Condition Upon Receipt

WO# : 60265654

60265654

Client Name: Westar

Courier: FedEx ☐ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☒ 2 Xroads ☐ Client ☐ Other ☐

Tracking #: _____ Pace Shipping Label Used? Yes ☒ No ☐

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

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☐

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

Cooler Temperature (°C): **As-read** 0.8/0.0 **Corr. Factor** +0.2 **Corrected** 1.0/0.2

Temperature should be above freezing to 6°C

AM 3/9/18

Date and initials of person examining contents:

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	7 day
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? ☒Yes ☐No ☐N/A (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)		List sample IDs, volumes, lot #'s of preservative and the date/time added. MW7-(2)BP3N MW9-(2)BP3N MW10-(2)BP3N MW8-(2)BP3N
Cyanide water sample checks: Lead acetate strip turns dark? (Record only) ☐Yes ☐No Potassium iodide test strip turns blue/purple? (Preserve) ☐Yes ☐No		
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

REVIEWED
By hwilson at 1:53 pm, 3/12/18

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A — Required Client Information:

Company: WESTAR ENERGY
Address: 818 Kansas Ave
Topeka, KS 66612
Email To: brandon.l.griffin@westarenergy.com
Phone: 785-575-8135 Fax:
Requested Due Date/TAT: 7 day

Section B — Required Project Information:

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

Section C — Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager: Jenalee Converse 913-563-1401
Pace Profile #: 9656

REGULATORY AGENCY

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

Site Location STATE: KS

Section D — Required Client Information

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

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	200.7 Total Metals*	300: Cl, F SO4	2540C TDS	4500 H+B	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-7-030918	WT	G			3/9/18	0817		3	1		2						Y						60269654
2	MW-10-030918	WT	G			3/9/18	0917		3	1		2						Y						
3	MW-9-030918	WT	G			3/9/18	1019		3	1		2						Y						
4	MW-8-030918	WT	G			3/9/18	1132		3	1		2						Y						
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

Pace Project No./ Lab I.D.: SPIN (2)BP3N
01
02
03
04

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
200.7 Total Metals*: B, Ca	Westar	3/9/18	1245	PACE	3/9	1510	0.2	4	4	4

SAMPLER NAME AND SIGNATURE				
PRINT Name of SAMPLER: Brandon Griffin		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
SIGNATURE of SAMPLER:	DATE Signed (MM/DD/YY): 03/09/18				

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

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

ATTACHMENT 1-2

June 2018 Sampling Event Laboratory Analytical Report

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

June 20, 2018

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

RE: Project: TEC SI CCR
Pace Project No.: 60272330

Dear Brandon Griffin:
Enclosed are the analytical results for sample(s) received by the laboratory on June 11, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

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

Enclosures

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

Pace Analytical Services, LLC
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Lenexa, KS 66219
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CERTIFICATIONS

Project: TEC SI CCR
Pace Project No.: 60272330

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
WY STR Certification #: 2456.01
Arkansas Certification #: 17-016-0
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

Pace Analytical Services, LLC
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SAMPLE SUMMARY

Project: TEC SI CCR
Pace Project No.: 60272330

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60272330001	**MW-7-061118**	Water	06/11/18 07:42	06/11/18 15:25
60272330002	**MW-10-061118**	Water	06/11/18 09:02	06/11/18 15:25
60272330003	**MW-9-061118**	Water	06/11/18 10:33	06/11/18 15:25
60272330004	**MW-8-061118**	Water	06/11/18 12:24	06/11/18 15:25

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

SAMPLE ANALYTE COUNT

Project: TEC SI CCR
Pace Project No.: 60272330

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60272330001	**MW-7-061118**	EPA 200.7	AGO	5	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	CRN	1	PASI-K
		EPA 300.0	WNM	1	PASI-K
60272330002	**MW-10-061118**	EPA 200.7	AGO	5	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	CRN	1	PASI-K
		EPA 300.0	WNM	1	PASI-K
60272330003	**MW-9-061118**	EPA 200.7	AGO	5	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	CRN	1	PASI-K
		EPA 300.0	WNM	1	PASI-K
60272330004	**MW-8-061118**	EPA 200.7	AGO	5	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	CRN	1	PASI-K
		EPA 300.0	WNM	1	PASI-K

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PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60272330

Method: **EPA 200.7**
Description: 200.7 Metals, Total
Client: WESTAR ENERGY
Date: June 20, 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.

Additional Comments:

Pace Analytical Services, LLC
9608 Loiret Blvd.
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PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60272330

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: WESTAR ENERGY
Date: June 20, 2018

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

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

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

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

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

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

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

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

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

Additional Comments:

Pace Analytical Services, LLC
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(913)599-5665

PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60272330

Method: **EPA 245.1**
Description: 245.1 Mercury
Client: WESTAR ENERGY
Date: June 20, 2018

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

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

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

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

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

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

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

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

Additional Comments:

Pace Analytical Services, LLC
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(913)599-5665

PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60272330

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: WESTAR ENERGY
Date: June 20, 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.

Additional Comments:

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

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

ANALYTICAL RESULTS

Project: TEC SI CCR
Pace Project No.: 60272330

Sample: MW-7-061118 **Lab ID: 60272330001** Collected: 06/11/18 07:42 Received: 06/11/18 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	**0.069**	mg/L	0.0050	1	06/13/18 10:26	06/13/18 18:09	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/13/18 18:09	7440-41-7	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	06/13/18 10:26	06/13/18 18:09	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	06/13/18 10:26	06/13/18 18:09	7439-92-1	
Lithium	**0.025**	mg/L	0.010	1	06/13/18 10:26	06/13/18 18:09	7439-93-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	**<0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:31	7440-36-0	
Arsenic, Total Recoverable	**0.0016**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:31	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	06/13/18 10:26	06/19/18 13:31	7440-43-9	
Cobalt, Total Recoverable	**0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:31	7440-48-4	
Molybdenum, Total Recoverable	**0.0082**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:31	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:31	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:31	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	06/14/18 10:50	06/14/18 14:22	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Fluoride	**0.33**	mg/L	0.20	1		06/14/18 15:43	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: TEC SI CCR
Pace Project No.: 60272330

Sample: MW-10-061118 **Lab ID: 60272330002** Collected: 06/11/18 09:02 Received: 06/11/18 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	**0.33**	mg/L	0.0050	1	06/13/18 10:26	06/13/18 18:12	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/13/18 18:12	7440-41-7	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	06/13/18 10:26	06/13/18 18:12	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	06/13/18 10:26	06/13/18 18:12	7439-92-1	
Lithium	**<0.010**	mg/L	0.010	1	06/13/18 10:26	06/13/18 18:12	7439-93-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	**<0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:33	7440-36-0	
Arsenic, Total Recoverable	**0.041**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:33	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	06/13/18 10:26	06/19/18 13:33	7440-43-9	
Cobalt, Total Recoverable	**<0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:33	7440-48-4	
Molybdenum, Total Recoverable	**0.0019**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:33	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:33	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:33	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	06/14/18 10:50	06/14/18 14:24	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Fluoride	**0.48**	mg/L	0.20	1		06/14/18 15:58	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: TEC SI CCR
Pace Project No.: 60272330

Sample: MW-9-061118 **Lab ID: 60272330003** Collected: 06/11/18 10:33 Received: 06/11/18 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	**0.85**	mg/L	0.0050	1	06/13/18 10:26	06/13/18 18:15	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/13/18 18:15	7440-41-7	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	06/13/18 10:26	06/13/18 18:15	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	06/13/18 10:26	06/13/18 18:15	7439-92-1	
Lithium	**0.011**	mg/L	0.010	1	06/13/18 10:26	06/13/18 18:15	7439-93-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	**<0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/20/18 13:08	7440-36-0	
Arsenic, Total Recoverable	**0.097**	mg/L	0.0010	1	06/13/18 10:26	06/20/18 13:08	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	06/13/18 10:26	06/20/18 13:08	7440-43-9	
Cobalt, Total Recoverable	**0.014**	mg/L	0.0010	1	06/13/18 10:26	06/20/18 13:08	7440-48-4	
Molybdenum, Total Recoverable	**0.0018**	mg/L	0.0010	1	06/13/18 10:26	06/20/18 13:08	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/20/18 13:08	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/20/18 13:08	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	06/14/18 10:50	06/14/18 14:26	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Fluoride	**0.50**	mg/L	0.20	1		06/14/18 16:12	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: TEC SI CCR
Pace Project No.: 60272330

Sample: MW-8-061118 **Lab ID: 60272330004** Collected: 06/11/18 12:24 Received: 06/11/18 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	**0.060**	mg/L	0.0050	1	06/13/18 10:26	06/13/18 18:18	7440-39-3	
Beryllium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/13/18 18:18	7440-41-7	
Chromium, Total Recoverable	**<0.0050**	mg/L	0.0050	1	06/13/18 10:26	06/13/18 18:18	7440-47-3	
Lead, Total Recoverable	**<0.010**	mg/L	0.010	1	06/13/18 10:26	06/13/18 18:18	7439-92-1	
Lithium	**0.021**	mg/L	0.010	1	06/13/18 10:26	06/13/18 18:18	7439-93-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	**<0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:37	7440-36-0	
Arsenic, Total Recoverable	**0.0041**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:37	7440-38-2	
Cadmium, Total Recoverable	**<0.00050**	mg/L	0.00050	1	06/13/18 10:26	06/19/18 13:37	7440-43-9	
Cobalt, Total Recoverable	**0.0015**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:37	7440-48-4	
Molybdenum, Total Recoverable	**0.035**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:37	7439-98-7	
Selenium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:37	7782-49-2	
Thallium, Total Recoverable	**<0.0010**	mg/L	0.0010	1	06/13/18 10:26	06/19/18 13:37	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	06/14/18 10:50	06/14/18 14:33	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Fluoride	**0.26**	mg/L	0.20	1		06/14/18 16:27	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: TEC SI CCR
Pace Project No.: 60272330

QC Batch: 529996 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60272330001, 60272330002, 60272330003, 60272330004

METHOD BLANK: 2170883 Matrix: Water
Associated Lab Samples: 60272330001, 60272330002, 60272330003, 60272330004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	06/14/18 16:05	

LABORATORY CONTROL SAMPLE: 2170884

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2170885 2170886

Parameter	Units	60272489001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	<0.20 ug/L	.005	.005	0.0044	0.0045	88	91	70-130	2	20	

MATRIX SPIKE SAMPLE: 2170887

Parameter	Units	60272453001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	.005	0.0041	83	70-130	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

QUALITY CONTROL DATA

Project: TEC SI CCR
Pace Project No.: 60272330

QC Batch: 529776 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60272330001, 60272330002, 60272330003, 60272330004

METHOD BLANK: 2170093 Matrix: Water
Associated Lab Samples: 60272330001, 60272330002, 60272330003, 60272330004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	06/14/18 11:12	
Beryllium	mg/L	<0.0010	0.0010	06/14/18 11:12	
Chromium	mg/L	<0.0050	0.0050	06/13/18 17:51	
Lead	mg/L	<0.010	0.010	06/13/18 17:51	
Lithium	mg/L	<0.010	0.010	06/14/18 11:12	

LABORATORY CONTROL SAMPLE: 2170094

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	0.98	98	85-115	
Beryllium	mg/L	1	0.99	99	85-115	
Chromium	mg/L	1	0.99	99	85-115	
Lead	mg/L	1	1.0	100	85-115	
Lithium	mg/L	1	0.97	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2170095 2170096

Parameter	Units	60272422001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	mg/L	0.070	1	1	1.0	1.0	95	95	70-130	0	20	
Beryllium	mg/L	ND	1	1	0.96	0.96	96	96	70-130	0	20	
Chromium	mg/L	0.0090	1	1	0.97	0.97	96	96	70-130	0	20	
Lead	mg/L	ND	1	1	0.95	0.96	95	96	70-130	0	20	
Lithium	mg/L	ND	1	1	0.96	0.96	95	95	70-130	0	20	

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

REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: TEC SI CCR
Pace Project No.: 60272330

QC Batch: 529791 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60272330001, 60272330002, 60272330003, 60272330004

METHOD BLANK: 2170134 Matrix: Water
Associated Lab Samples: 60272330001, 60272330002, 60272330003, 60272330004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	06/19/18 13:27	
Arsenic	mg/L	<0.0010	0.0010	06/19/18 13:27	
Cadmium	mg/L	<0.00050	0.00050	06/19/18 13:27	
Cobalt	mg/L	<0.0010	0.0010	06/19/18 13:27	
Molybdenum	mg/L	<0.0010	0.0010	06/19/18 13:27	
Selenium	mg/L	<0.0010	0.0010	06/19/18 13:27	
Thallium	mg/L	<0.0010	0.0010	06/19/18 13:27	

LABORATORY CONTROL SAMPLE: 2170135

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.041	104	85-115	
Arsenic	mg/L	.04	0.041	102	85-115	
Cadmium	mg/L	.04	0.041	102	85-115	
Cobalt	mg/L	.04	0.039	98	85-115	
Molybdenum	mg/L	.04	0.040	99	85-115	
Selenium	mg/L	.04	0.042	106	85-115	
Thallium	mg/L	.04	0.039	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2170136 2170137

Parameter	Units	60272341001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/L	0.37J ug/L	.04	.04	0.043	0.043	107	106	70-130	1	20	
Arsenic	mg/L	0.80J ug/L	.04	.04	0.042	0.042	104	103	70-130	0	20	
Cadmium	mg/L	0.044J ug/L	.04	.04	0.040	0.040	100	100	70-130	0	20	
Cobalt	mg/L	0.36J ug/L	.04	.04	0.038	0.038	95	95	70-130	0	20	
Molybdenum	mg/L	4.0 ug/L	.04	.04	0.046	0.046	106	106	70-130	0	20	
Selenium	mg/L	0.39J ug/L	.04	.04	0.042	0.042	103	104	70-130	0	20	
Thallium	mg/L	<0.036 ug/L	.04	.04	0.037	0.036	93	91	70-130	2	20	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: TEC SI CCR
Pace Project No.: 60272330

QC Batch: 530054 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60272330001, 60272330002, 60272330003, 60272330004

METHOD BLANK: 2171065 Matrix: Water
Associated Lab Samples: 60272330001, 60272330002, 60272330003, 60272330004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.20	0.20	06/14/18 10:05	

LABORATORY CONTROL SAMPLE: 2171066

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.4	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2171067 2171068

Parameter	Units	60272574001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.67	2.5	2.5	3.2	3.2	100	100	90-110	1	15	

MATRIX SPIKE SAMPLE: 2171069

Parameter	Units	60272337002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	<0.13	2.5	2.6	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.

REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: TEC SI CCR
Pace Project No.: 60272330

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

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: TEC SI CCR
Pace Project No.: 60272330

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60272330001	**MW-7-061118**	EPA 200.7	529776	EPA 200.7	529832
60272330002	**MW-10-061118**	EPA 200.7	529776	EPA 200.7	529832
60272330003	**MW-9-061118**	EPA 200.7	529776	EPA 200.7	529832
60272330004	**MW-8-061118**	EPA 200.7	529776	EPA 200.7	529832
60272330001	**MW-7-061118**	EPA 200.8	529791	EPA 200.8	529833
60272330002	**MW-10-061118**	EPA 200.8	529791	EPA 200.8	529833
60272330003	**MW-9-061118**	EPA 200.8	529791	EPA 200.8	529833
60272330004	**MW-8-061118**	EPA 200.8	529791	EPA 200.8	529833
60272330001	**MW-7-061118**	EPA 245.1	529996	EPA 245.1	530027
60272330002	**MW-10-061118**	EPA 245.1	529996	EPA 245.1	530027
60272330003	**MW-9-061118**	EPA 245.1	529996	EPA 245.1	530027
60272330004	**MW-8-061118**	EPA 245.1	529996	EPA 245.1	530027
60272330001	**MW-7-061118**	EPA 300.0	530054		
60272330002	**MW-10-061118**	EPA 300.0	530054		
60272330003	**MW-9-061118**	EPA 300.0	530054		
60272330004	**MW-8-061118**	EPA 300.0	530054		

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Sample Condition Upon Receipt

WO# : 60272330

60272330

Client Name: Westar Energy

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

Tracking #: _____ Pace Shipping Label Used? Yes ☐ No ☑

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

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☑ Other ☐

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

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

Date and initials of person examining contents: PW 6/11/18

Temperature should be above freezing to 6°C

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

Hmw

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

REVIEWED
By hwilson at 5:04 pm, 6/12/18

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A — **Required** Client Information:

Company:	WESTAR ENERGY
Address:	818 Kansas Ave
	Topeka, KS 66612
Email To:	brandon.l.griffin@westarenergy.com
Phone: (785) 575-8135	Fax:
Requested Due Date/TAT:	7 DAY

Section B — **Required** Project Information:

Report To:	Brandon Griffin
Copy To:	Jared Morrison, Heath Hornya
Purchase Order No.:	10TEC-0000007599
Project Name:	TEC SI CCR
Project Number:	

Section C — Invoice Information:

Attention:	Jared Morrison
Company Name:	WESTAR ENERGY
Address:	SEE SECTION A
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson, 913-563-1407
Pace Profile #:	9656, 2

REGULATORY AGENCY

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

Site Location STATE: KS

Section D — **Required** Client Information

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

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	200.7 Total Metals*	200.8 Total Metals**	245.1 Total Mercury	300.0 Fluoride	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-7-061118	WT	G			6/11	0742		2	1		1						Y						6027230 BOTH BOTH 001
2	MW-10-061118	WT	G			6/11	0902		2	1		1						Y						002
3	MW-9-061118	WT	G			6/11	1033		2	1		1						Y						003
4	MW-8-061118	WT	G			6/11	1224		2	1		C						Y						004
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*200.7 Total Metals: Ba, Be, Cr, Pb, Li	Westar	1340	6/11/18		6/11/18	1525	1.7	Y	Y	Y
**200.8 Total Metals: Co, As, Se, Mo, Cd, Sb, Tl										

SAMPLER NAME AND SIGNATURE			Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	Brandon Griffin					
SIGNATURE of SAMPLER:		DATE Signed (MM/DD/YY): 06/11/18				

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

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

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

July 05, 2018

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

RE: Project: TEC SI CCR
Pace Project No.: 60272385

Dear Brandon Griffin:
Enclosed are the analytical results for sample(s) received by the laboratory on June 12, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

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

Enclosures

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

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

CERTIFICATIONS

Project: TEC SI CCR
Pace Project No.: 60272385

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

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

SAMPLE SUMMARY

Project: TEC SI CCR
Pace Project No.: 60272385

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60272385001	**MW-7-061118**	Water	06/11/18 07:42	06/12/18 10:00
60272385002	**MW-10-061118**	Water	06/11/18 09:02	06/12/18 10:00
60272385003	**MW-9-061118**	Water	06/11/18 10:33	06/12/18 10:00
60272385004	**MW-8-061118**	Water	06/11/18 12:24	06/12/18 10:00

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: TEC SI CCR
Pace Project No.: 60272385

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60272385001	**MW-7-061118**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60272385002	**MW-10-061118**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60272385003	**MW-9-061118**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60272385004	**MW-8-061118**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

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PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60272385

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

Pace Analytical Services, LLC
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(913)599-5665

PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60272385

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

Pace Analytical Services, LLC
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PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60272385

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

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

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

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

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

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

Additional Comments:

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

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: TEC SI CCR
Pace Project No.: 60272385

Sample: MW-7-061118 **Lab ID: 60272385001** Collected: 06/11/18 07:42 Received: 06/12/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.256 ± 0.293 (0.173) C:NA T:68%**	pCi/L	07/02/18 21:52	13982-63-3	
Radium-228	EPA 904.0	**1.28 ± 0.462 (0.648) C:83% T:83%**	pCi/L	07/02/18 17:22	15262-20-1	
Total Radium	Total Radium Calculation	**1.54 ± 0.755 (0.821)**	pCi/L	07/03/18 15:13	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: TEC SI CCR
Pace Project No.: 60272385

Sample: MW-10-061118 **Lab ID: 60272385002** Collected: 06/11/18 09:02 Received: 06/12/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.396 ± 0.371 (0.525) C:NA T:77%**	pCi/L	07/02/18 21:52	13982-63-3	
Radium-228	EPA 904.0	**1.69 ± 0.547 (0.715) C:83% T:80%**	pCi/L	07/02/18 17:22	15262-20-1	
Total Radium	Total Radium Calculation	**2.09 ± 0.918 (1.24)**	pCi/L	07/03/18 15:13	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: TEC SI CCR
Pace Project No.: 60272385

Sample: MW-9-061118 **Lab ID: 60272385003** Collected: 06/11/18 10:33 Received: 06/12/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.10 ± 0.520 (0.404) C:NA T:82%**	pCi/L	07/02/18 21:52	13982-63-3	
Radium-228	EPA 904.0	**2.26 ± 0.703 (0.923) C:83% T:72%**	pCi/L	07/02/18 17:19	15262-20-1	
Total Radium	Total Radium Calculation	**3.36 ± 1.22 (1.33)**	pCi/L	07/03/18 15:13	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: TEC SI CCR
Pace Project No.: 60272385

Sample: MW-8-061118 **Lab ID: 60272385004** Collected: 06/11/18 12:24 Received: 06/12/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.328 ± 0.307 (0.435) C:NA T:93%**	pCi/L	07/02/18 22:07	13982-63-3	
Radium-228	EPA 904.0	**1.26 ± 0.514 (0.819) C:84% T:77%**	pCi/L	07/02/18 17:19	15262-20-1	
Total Radium	Total Radium Calculation	**1.59 ± 0.821 (1.25)**	pCi/L	07/03/18 15:13	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL - RADIOCHEMISTRY

Project: TEC SI CCR
Pace Project No.: 60272385

QC Batch: 302397 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60272385001, 60272385002, 60272385003, 60272385004

METHOD BLANK: 1479701 Matrix: Water
Associated Lab Samples: 60272385001, 60272385002, 60272385003, 60272385004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	1.04 ± 0.386 (0.526) C:87% T:82%	pCi/L	07/02/18 17:21	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: TEC SI CCR
Pace Project No.: 60272385

QC Batch: 302408 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60272385001, 60272385002, 60272385003, 60272385004

METHOD BLANK: 1479727 Matrix: Water
Associated Lab Samples: 60272385001, 60272385002, 60272385003, 60272385004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.113 ± 0.257 (0.152) C:NA T:78%	pCi/L	07/02/18 21:07	

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

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: TEC SI CCR
Pace Project No.: 60272385

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: TEC SI CCR
Pace Project No.: 60272385

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60272385001	**MW-7-061118**	EPA 903.1	302408		
60272385002	**MW-10-061118**	EPA 903.1	302408		
60272385003	**MW-9-061118**	EPA 903.1	302408		
60272385004	**MW-8-061118**	EPA 903.1	302408		
60272385001	**MW-7-061118**	EPA 904.0	302397		
60272385002	**MW-10-061118**	EPA 904.0	302397		
60272385003	**MW-9-061118**	EPA 904.0	302397		
60272385004	**MW-8-061118**	EPA 904.0	302397		
60272385001	**MW-7-061118**	Total Radium Calculation	304590		
60272385002	**MW-10-061118**	Total Radium Calculation	304590		
60272385003	**MW-9-061118**	Total Radium Calculation	304590		
60272385004	**MW-8-061118**	Total Radium Calculation	304590		

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	WESTAR ENERGY	Report To:	Brandon Griffin	Attention:	Jared Morrison
Address:	818 Kansas Ave	Copy To:	Jared Morrison, Heath Hornya	Company Name:	WESTAR ENERGY
	Topeka, KS 66612			Address:	SEE SECTION A
Email To:	brandon.l.griffin@westarenergy.com	Purchase Order No.:	10TEC-0000007599	Pace Quote Reference:	
Phone:	(785) 575-8135 Fax:	Project Name:	TEC SI CCR	Pace Project Manager:	Heather Wilson, 913-563-1407
Requested Due Date/TAT:	15 Day	Project Number:		Pace Profile #:	9656, 2

REGULATORY AGENCY: ☑ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: KS

Section D Required Client Information

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

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WIPE WP; AIR AR; OTHER OT; TISSUE TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-7-061118	WT	G			6/11	0742		2			2											
2	MW-10-061118	WT	G			6/11	0902		2			2											
3	MW-9-061118	WT	G			6/11	1033		2			2											
4	MW-8-061118	WT	G			6/11	1224		2			2											
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Requested Analysis Filtered (Y/N)

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Westar	6/11/18	1400	Ben Montana	6-12-18	1000	4.34	Y	Y	Y
							BM 6-12-18			

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 06/11/18

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

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

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: PACE Kansas Project # _____

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

Label _____
LIMS Login

Tracking #: 4368 7275 7652

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

Thermometer Used 7 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 3.5 °C Correction Factor: -0.1 °C Final Temp: 3.4 °C

Temp should be above freezing to 6°C

pH paper Lot# 1003671 Date and Initials of person examining contents: BLM 6-12-18

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

Client Notification/ Resolution:

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

Comments/ Resolution: _____

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

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

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

ATTACHMENT 1-3

September 2018 Sampling Event Laboratory Analytical Report

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

September 21, 2018

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

RE: Project: TEC SI CCR
Pace Project No.: 60280001

Dear Brandon Griffin:
Enclosed are the analytical results for sample(s) received by the laboratory on September 07, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

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

Enclosures

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

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: TEC SI CCR
Pace Project No.: 60280001

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
Arkansas Drinking Water
WY STR Certification #: 2456.01
Arkansas Certification #: 18-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

Pace Analytical Services, LLC
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SAMPLE SUMMARY

Project: TEC SI CCR
Pace Project No.: 60280001

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60280001001	**MW-7-090618**	Water	09/06/18 09:52	09/07/18 17:05
60280001002	**MW-8-090618**	Water	09/06/18 14:14	09/07/18 17:05
60280001003	**MW-9-090618**	Water	09/06/18 12:36	09/07/18 17:05
60280001004	**MW-10-090618**	Water	09/06/18 11:27	09/07/18 17:05

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: TEC SI CCR
Pace Project No.: 60280001

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60280001001	**MW-7-090618**	EPA 200.7	TDS	4	PASI-K
		EPA 200.8	JGP	3	PASI-K
		EPA 245.1	CTR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60280001002	**MW-8-090618**	EPA 200.7	TDS	4	PASI-K
		EPA 200.8	JGP	3	PASI-K
		EPA 245.1	CTR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60280001003	**MW-9-090618**	EPA 200.7	TDS	4	PASI-K
		EPA 200.8	JGP	3	PASI-K
		EPA 245.1	CTR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60280001004	**MW-10-090618**	EPA 200.7	TDS	4	PASI-K
		EPA 200.8	JGP	3	PASI-K
		EPA 245.1	CTR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K

Pace Analytical Services, LLC
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PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60280001

Method: **EPA 200.7**
Description: 200.7 Metals, Total
Client: WESTAR ENERGY
Date: September 21, 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.

Additional Comments:

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

PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60280001

Method: **EPA 200.8**
Description: 200.8 MET ICPMS
Client: WESTAR ENERGY
Date: September 21, 2018

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

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

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

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

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

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

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

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

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

Additional Comments:

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PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60280001

Method: **EPA 245.1**
Description: 245.1 Mercury
Client: WESTAR ENERGY
Date: September 21, 2018

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

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

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

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

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

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

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

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

Additional Comments:

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PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60280001

Method: **SM 2540C**
Description: 2540C Total Dissolved Solids
Client: WESTAR ENERGY
Date: September 21, 2018

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

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

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

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

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

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

Additional Comments:

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PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60280001

Method: **SM 4500-H+B**
Description: 4500H+ pH, Electrometric
Client: WESTAR ENERGY
Date: September 21, 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.
- MW-10-090618 (Lab ID: 60280001004)
- MW-7-090618 (Lab ID: 60280001001)
- MW-8-090618 (Lab ID: 60280001002)
- MW-9-090618 (Lab ID: 60280001003)

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

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

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

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

Additional Comments:

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PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60280001

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: WESTAR ENERGY
Date: September 21, 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.

Additional Comments:

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

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ANALYTICAL RESULTS

Project: TEC SI CCR
Pace Project No.: 60280001

Sample: MW-7-090618 **Lab ID: 60280001001** Collected: 09/06/18 09:52 Received: 09/07/18 17:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	**0.079**	mg/L	0.0050	1	09/10/18 15:45	09/12/18 15:56	7440-39-3	
Boron, Total Recoverable	**0.73**	mg/L	0.10	1	09/10/18 15:45	09/12/18 15:56	7440-42-8	
Calcium, Total Recoverable	**167**	mg/L	0.20	1	09/10/18 15:45	09/12/18 15:56	7440-70-2	
Lithium	**0.029**	mg/L	0.010	1	09/10/18 15:45	09/12/18 15:56	7439-93-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Total Recoverable	**0.0015**	mg/L	0.0010	1	09/12/18 09:10	09/18/18 11:06	7440-38-2	
Cobalt, Total Recoverable	**0.0010**	mg/L	0.0010	1	09/12/18 09:10	09/18/18 11:06	7440-48-4	
Molybdenum, Total Recoverable	**0.0082**	mg/L	0.0010	1	09/12/18 09:10	09/18/18 11:06	7439-98-7	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	09/10/18 15:49	09/11/18 11:40	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1290**	mg/L	5.0	1		09/12/18 14:37		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**6.8**	Std. Units	0.10	1		09/10/18 14:27		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**212**	mg/L	20.0	20		09/12/18 15:18	16887-00-6	
Fluoride	**0.33**	mg/L	0.20	1		09/11/18 23:45	16984-48-8	
Sulfate	**569**	mg/L	100	100		09/12/18 00:13	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: TEC SI CCR
Pace Project No.: 60280001

Sample: MW-8-090618 **Lab ID: 60280001002** Collected: 09/06/18 14:14 Received: 09/07/18 17:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	**0.057**	mg/L	0.0050	1	09/10/18 15:45	09/12/18 15:59	7440-39-3	
Boron, Total Recoverable	**1.3**	mg/L	0.10	1	09/10/18 15:45	09/12/18 15:59	7440-42-8	
Calcium, Total Recoverable	**222**	mg/L	0.20	1	09/10/18 15:45	09/12/18 15:59	7440-70-2	
Lithium	**0.022**	mg/L	0.010	1	09/10/18 15:45	09/12/18 15:59	7439-93-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Total Recoverable	**0.0028**	mg/L	0.0010	1	09/12/18 09:10	09/18/18 11:08	7440-38-2	
Cobalt, Total Recoverable	**0.0014**	mg/L	0.0010	1	09/12/18 09:10	09/18/18 11:08	7440-48-4	
Molybdenum, Total Recoverable	**0.037**	mg/L	0.0010	1	09/12/18 09:10	09/18/18 11:08	7439-98-7	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	09/10/18 15:49	09/11/18 11:42	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1560**	mg/L	5.0	1		09/12/18 14:37		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**6.8**	Std. Units	0.10	1		09/12/18 09:53		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**256**	mg/L	20.0	20		09/12/18 15:32	16887-00-6	
Fluoride	**0.31**	mg/L	0.20	1		09/12/18 00:26	16984-48-8	
Sulfate	**738**	mg/L	100	100		09/12/18 00:54	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: TEC SI CCR
Pace Project No.: 60280001

Sample: MW-9-090618 **Lab ID: 60280001003** Collected: 09/06/18 12:36 Received: 09/07/18 17:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	**0.91**	mg/L	0.0050	1	09/10/18 15:45	09/12/18 16:01	7440-39-3	
Boron, Total Recoverable	**<0.10**	mg/L	0.10	1	09/10/18 15:45	09/12/18 16:01	7440-42-8	
Calcium, Total Recoverable	**250**	mg/L	0.20	1	09/10/18 15:45	09/12/18 16:01	7440-70-2	
Lithium	**0.012**	mg/L	0.010	1	09/10/18 15:45	09/12/18 16:01	7439-93-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Total Recoverable	**0.099**	mg/L	0.0010	1	09/12/18 09:10	09/18/18 11:10	7440-38-2	
Cobalt, Total Recoverable	**0.011**	mg/L	0.0010	1	09/12/18 09:10	09/18/18 11:10	7440-48-4	
Molybdenum, Total Recoverable	**<0.0010**	mg/L	0.0010	1	09/12/18 09:10	09/18/18 11:10	7439-98-7	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	09/10/18 15:49	09/11/18 11:45	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1320**	mg/L	5.0	1		09/12/18 14:37		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**6.6**	Std. Units	0.10	1		09/12/18 09:43		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**201**	mg/L	20.0	20		09/12/18 15:46	16887-00-6	
Fluoride	**0.51**	mg/L	0.20	1		09/12/18 01:07	16984-48-8	
Sulfate	**87.0**	mg/L	10.0	10		09/12/18 01:21	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: TEC SI CCR
Pace Project No.: 60280001

Sample: MW-10-090618 **Lab ID: 60280001004** Collected: 09/06/18 11:27 Received: 09/07/18 17:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	**0.35**	mg/L	0.0050	1	09/10/18 15:45	09/12/18 16:03	7440-39-3	
Boron, Total Recoverable	**0.23**	mg/L	0.10	1	09/10/18 15:45	09/12/18 16:03	7440-42-8	
Calcium, Total Recoverable	**173**	mg/L	0.20	1	09/10/18 15:45	09/12/18 16:03	7440-70-2	
Lithium	**<0.010**	mg/L	0.010	1	09/10/18 15:45	09/12/18 16:03	7439-93-2	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Total Recoverable	**0.040**	mg/L	0.0010	1	09/12/18 09:10	09/18/18 11:12	7440-38-2	
Cobalt, Total Recoverable	**<0.0010**	mg/L	0.0010	1	09/12/18 09:10	09/18/18 11:12	7440-48-4	
Molybdenum, Total Recoverable	**0.0027**	mg/L	0.0010	1	09/12/18 09:10	09/18/18 11:12	7439-98-7	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	**<0.00020**	mg/L	0.00020	1	09/10/18 15:49	09/11/18 11:47	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1200**	mg/L	5.0	1		09/12/18 14:37		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**6.6**	Std. Units	0.10	1		09/10/18 14:36		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**231**	mg/L	20.0	20		09/12/18 16:27	16887-00-6	
Fluoride	**0.51**	mg/L	0.20	1		09/12/18 02:16	16984-48-8	
Sulfate	**110**	mg/L	10.0	10		09/12/18 02:29	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: TEC SI CCR
Pace Project No.: 60280001

QC Batch: 543775 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60280001001, 60280001002, 60280001003, 60280001004

METHOD BLANK: 2228341 Matrix: Water
Associated Lab Samples: 60280001001, 60280001002, 60280001003, 60280001004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	09/11/18 11:10	

LABORATORY CONTROL SAMPLE: 2228342

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0048	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2228343 2228344

Parameter	Units	60279690002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	ND	.005	.005	0.0048	0.0047	95	94	70-130	0	20	

MATRIX SPIKE SAMPLE: 2228345

Parameter	Units	60279978001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	.005	0.0043	85	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: TEC SI CCR
Pace Project No.: 60280001

QC Batch: 543760 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60280001001, 60280001002, 60280001003, 60280001004

METHOD BLANK: 2228293 Matrix: Water
Associated Lab Samples: 60280001001, 60280001002, 60280001003, 60280001004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	09/12/18 15:22	
Boron	mg/L	<0.10	0.10	09/12/18 15:22	
Calcium	mg/L	<0.20	0.20	09/12/18 15:22	
Lithium	mg/L	<0.010	0.010	09/12/18 15:22	

LABORATORY CONTROL SAMPLE: 2228294

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.1	105	85-115	
Boron	mg/L	1	1.0	101	85-115	
Calcium	mg/L	10	10.5	105	85-115	
Lithium	mg/L	1	1.0	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2228295 2228296

Parameter	Units	60279599001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	mg/L	39.2 ug/L	1	1	1.1	1.1	105	103	70-130	2	20	
Boron	mg/L	ND	1	1	1.1	1.1	103	101	70-130	2	20	
Calcium	mg/L	29100 ug/L	10	10	39.5	38.6	104	94	70-130	3	20	
Lithium	mg/L	15.1 ug/L	1	1	1.0	1.0	102	99	70-130	3	20	

MATRIX SPIKE SAMPLE: 2228297

Parameter	Units	60279995001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	126 ug/L	1	1.1	101	70-130	
Boron	mg/L	175 ug/L	1	1.2	106	70-130	
Calcium	mg/L	61500 ug/L	10	71.1	96	70-130	
Lithium	mg/L	58.9 ug/L	1	1.1	107	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: TEC SI CCR
Pace Project No.: 60280001

QC Batch: 543998 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60280001001, 60280001002, 60280001003, 60280001004

METHOD BLANK: 2229057 Matrix: Water
Associated Lab Samples: 60280001001, 60280001002, 60280001003, 60280001004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/L	<0.0010	0.0010	09/18/18 11:01	
Cobalt	mg/L	<0.0010	0.0010	09/18/18 11:01	
Molybdenum	mg/L	<0.0010	0.0010	09/18/18 11:01	

LABORATORY CONTROL SAMPLE: 2229058

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	.04	0.040	101	85-115	
Cobalt	mg/L	.04	0.040	99	85-115	
Molybdenum	mg/L	.04	0.040	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2229059 2229060

Parameter	Units	60280092001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/L	ND	.04	.04	0.040	0.040	99	98	70-130	1	20	
Cobalt	mg/L	ND	.04	.04	0.038	0.037	93	92	70-130	1	20	
Molybdenum	mg/L	2.2 ug/L	.04	.04	0.042	0.042	100	101	70-130	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: TEC SI CCR
Pace Project No.: 60280001

QC Batch: 544091 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60280001001, 60280001002, 60280001003, 60280001004

METHOD BLANK: 2229368 Matrix: Water
Associated Lab Samples: 60280001001, 60280001002, 60280001003, 60280001004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	09/12/18 14:37	

LABORATORY CONTROL SAMPLE: 2229369

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

SAMPLE DUPLICATE: 2229370

Parameter	Units	60279828005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	888	895	1	10	

SAMPLE DUPLICATE: 2229371

Parameter	Units	60279996001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	8780	8580	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: TEC SI CCR
Pace Project No.: 60280001

QC Batch: 543745 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 60280001001, 60280001004

SAMPLE DUPLICATE: 2228249

Parameter	Units	60279697001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.0	7.0	0	5	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: TEC SI CCR
Pace Project No.: 60280001

QC Batch: 544084
QC Batch Method: SM 4500-H+B
Analysis Method: SM 4500-H+B
Analysis Description: 4500H+B pH
Associated Lab Samples: 60280001002, 60280001003

SAMPLE DUPLICATE: 2229332

Parameter	Units	60279939001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.0	7.0	1	5	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: TEC SI CCR
Pace Project No.: 60280001

QC Batch: 543974 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60280001001, 60280001002, 60280001003, 60280001004

METHOD BLANK: 2228958 Matrix: Water
Associated Lab Samples: 60280001001, 60280001002, 60280001003, 60280001004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.20	0.20	09/11/18 14:15	
Sulfate	mg/L	<1.0	1.0	09/11/18 14:15	

LABORATORY CONTROL SAMPLE: 2228959

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.6	103	90-110	
Sulfate	mg/L	5	4.9	99	90-110	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: TEC SI CCR
Pace Project No.: 60280001

QC Batch: 544096 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60280001001, 60280001002, 60280001003, 60280001004

METHOD BLANK: 2229377 Matrix: Water
Associated Lab Samples: 60280001001, 60280001002, 60280001003, 60280001004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	09/12/18 11:12	

LABORATORY CONTROL SAMPLE: 2229378

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

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

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: TEC SI CCR
Pace Project No.: 60280001

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

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

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: TEC SI CCR
Pace Project No.: 60280001

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60280001001	**MW-7-090618**	EPA 200.7	543760	EPA 200.7	543824
60280001002	**MW-8-090618**	EPA 200.7	543760	EPA 200.7	543824
60280001003	**MW-9-090618**	EPA 200.7	543760	EPA 200.7	543824
60280001004	**MW-10-090618**	EPA 200.7	543760	EPA 200.7	543824
60280001001	**MW-7-090618**	EPA 200.8	543998	EPA 200.8	544150
60280001002	**MW-8-090618**	EPA 200.8	543998	EPA 200.8	544150
60280001003	**MW-9-090618**	EPA 200.8	543998	EPA 200.8	544150
60280001004	**MW-10-090618**	EPA 200.8	543998	EPA 200.8	544150
60280001001	**MW-7-090618**	EPA 245.1	543775	EPA 245.1	543818
60280001002	**MW-8-090618**	EPA 245.1	543775	EPA 245.1	543818
60280001003	**MW-9-090618**	EPA 245.1	543775	EPA 245.1	543818
60280001004	**MW-10-090618**	EPA 245.1	543775	EPA 245.1	543818
60280001001	**MW-7-090618**	SM 2540C	544091		
60280001002	**MW-8-090618**	SM 2540C	544091		
60280001003	**MW-9-090618**	SM 2540C	544091		
60280001004	**MW-10-090618**	SM 2540C	544091		
60280001001	**MW-7-090618**	SM 4500-H+B	543745		
60280001002	**MW-8-090618**	SM 4500-H+B	544084		
60280001003	**MW-9-090618**	SM 4500-H+B	544084		
60280001004	**MW-10-090618**	SM 4500-H+B	543745		
60280001001	**MW-7-090618**	EPA 300.0	543974		
60280001001	**MW-7-090618**	EPA 300.0	544096		
60280001002	**MW-8-090618**	EPA 300.0	543974		
60280001002	**MW-8-090618**	EPA 300.0	544096		
60280001003	**MW-9-090618**	EPA 300.0	543974		
60280001003	**MW-9-090618**	EPA 300.0	544096		
60280001004	**MW-10-090618**	EPA 300.0	543974		
60280001004	**MW-10-090618**	EPA 300.0	544096		

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Sample Condition Upon Receipt

WO# : 60280001

60280001

Client Name: Westar Energy

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

Tracking #: _____ Pace Shipping Label Used? Yes ☐ No ☑

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

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☑ Other ☐

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

Cooler Temperature (°C): As-read 1.3 Corr. Factor 0.0 Corrected 1.3

Date and initials of person examining contents: pw 9/7/18

Temperature should be above freezing to 6°C

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

Hmw

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: REVIEWED By hwilson at 11:22 am, 9/10/18 Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A — Required Client Information:

Company:	WESTAR ENERGY
Address:	818 Kansas Ave
	Topeka, KS 66612
Email To:	brandon.l.griffin@westarenergy.com
Phone: (785) 575-8135	Fax:
Requested Due Date/TAT:	7 DAY

Section B — Required Project Information:

Report To:	Brandon Griffin
Copy To:	Jared Morrison, Bob Beck
Purchase Order No.:	10TEC-0000007599
Project Name:	TEC SI CCR
Project Number:	

Section C — Invoice Information:

Attention:	Jared Morrison
Company Name:	WESTAR ENERGY
Address:	SEE SECTION A
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson, 913-563-1407
Pace Profile #:	9656, 2

REGULATORY AGENCY

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

Site Location STATE: KS

Section D — Required Client Information

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

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	200.7 Total Metals*	300.0: chloride, fluoride	300.0: sulfate	2540C: TDS	4500: pH	200.8 Total Metals**	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 602 80001
1	MW-7-090618	WT	G			9/6 09/05/18	0952		2	1		1						x	x	x	x	x	x		RPIN BPIN
2	MW-8-090618	WT	G			9/6 09/05/18	1414		2	1		1						x	x	x	x	x	x		
3	MW-9-090618	WT	G			9/6 09/05/18	1236		2	1		1						x	x	x	x	x	x		
4	MW-10-090618	WT	G			9/6 09/05/18	1127		2	1		1						x	x	x	x	x	x		
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*200.7 Total Metals: B, Ca, Ba, Li	Westar	9/6/18	1530		9/7/18	1705	1-3	Y	Y	Y
** 200.8 Total Metals: As, Co, Mo										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 09/06/18

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

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

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

September 26, 2018

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

RE: Project: TEC SI CCR
Pace Project No.: 60280651

Dear Brandon Griffin:
Enclosed are the analytical results for sample(s) received by the laboratory on September 13, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

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

Enclosures

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

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CERTIFICATIONS

Project: TEC SI CCR
Pace Project No.: 60280651

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: TEC SI CCR
Pace Project No.: 60280651

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60280651001	**MW-7-090618**	Water	09/06/18 09:52	09/13/18 10:00
60280651002	**MW-8-090618**	Water	09/06/18 14:14	09/13/18 10:00
60280651003	**MW-9-090618**	Water	09/06/18 12:36	09/13/18 10:00
60280651004	**MW-10-090618**	Water	09/06/18 11:27	09/13/18 10:00

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SAMPLE ANALYTE COUNT

Project: TEC SI CCR
Pace Project No.: 60280651

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60280651001	**MW-7-090618**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60280651002	**MW-8-090618**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60280651003	**MW-9-090618**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60280651004	**MW-10-090618**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

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PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60280651

Method: **EPA 903.1**
Description: 903.1 Radium 226
Client: WESTAR ENERGY
Date: September 26, 2018

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

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

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

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

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

Additional Comments:

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PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60280651

Method: **EPA 904.0**
Description: 904.0 Radium 228
Client: WESTAR ENERGY
Date: September 26, 2018

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

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

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

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

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

Additional Comments:

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PROJECT NARRATIVE

Project: TEC SI CCR
Pace Project No.: 60280651

Method: **Total Radium Calculation**
Description: Total Radium 228+226
Client: WESTAR ENERGY
Date: September 26, 2018

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

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

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

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

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

Additional Comments:

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

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: TEC SI CCR
Pace Project No.: 60280651

Sample: MW-7-090618 **Lab ID: 60280651001** Collected: 09/06/18 09:52 Received: 09/13/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.398 ± 0.470 (0.739) C:NA T:76%**	pCi/L	09/25/18 21:19	13982-63-3	
Radium-228	EPA 904.0	**-0.225 ± 0.304 (0.759) C:81% T:77%**	pCi/L	09/24/18 13:02	15262-20-1	
Total Radium	Total Radium Calculation	**0.398 ± 0.774 (1.50)**	pCi/L	09/26/18 09:42	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: TEC SI CCR
Pace Project No.: 60280651

Sample: MW-8-090618 **Lab ID: 60280651002** Collected: 09/06/18 14:14 Received: 09/13/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.739 ± 0.742 (1.16) C:NA T:79%**	pCi/L	09/25/18 21:33	13982-63-3	
Radium-228	EPA 904.0	**0.550 ± 0.439 (0.879) C:80% T:75%**	pCi/L	09/24/18 13:02	15262-20-1	
Total Radium	Total Radium Calculation	**1.29 ± 1.18 (2.04)**	pCi/L	09/26/18 09:42	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: TEC SI CCR
Pace Project No.: 60280651

Sample: MW-9-090618 **Lab ID: 60280651003** Collected: 09/06/18 12:36 Received: 09/13/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.69 ± 0.734 (0.208) C:NA T:76%**	pCi/L	09/25/18 21:33	13982-63-3	
Radium-228	EPA 904.0	**0.841 ± 0.438 (0.770) C:78% T:76%**	pCi/L	09/24/18 13:02	15262-20-1	
Total Radium	Total Radium Calculation	**2.53 ± 1.17 (0.978)**	pCi/L	09/26/18 09:42	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: TEC SI CCR
Pace Project No.: 60280651

Sample: MW-10-090618 **Lab ID: 60280651004** Collected: 09/06/18 11:27 Received: 09/13/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • 1 bottle received empty.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.87 ± 1.04 (0.390) C:NA T:88%**	pCi/L	09/25/18 21:33	13982-63-3	
Radium-228	EPA 904.0	**1.71 ± 0.627 (0.934) C:79% T:83%**	pCi/L	09/24/18 13:03	15262-20-1	
Total Radium	Total Radium Calculation	**3.58 ± 1.67 (1.32)**	pCi/L	09/26/18 09:42	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: TEC SI CCR
Pace Project No.: 60280651

QC Batch: 313310 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60280651001, 60280651002, 60280651003, 60280651004

METHOD BLANK: 1529840 Matrix: Water
Associated Lab Samples: 60280651001, 60280651002, 60280651003, 60280651004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.305 ± 0.311 (0.640) C:78% T:84%	pCi/L	09/24/18 13:03	

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

REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: TEC SI CCR
Pace Project No.: 60280651

QC Batch: 313308 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60280651001, 60280651002, 60280651003, 60280651004

METHOD BLANK: 1529832 Matrix: Water
Associated Lab Samples: 60280651001, 60280651002, 60280651003, 60280651004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0730 ± 0.379 (0.785) C:NA T:87%	pCi/L	09/25/18 21:19	

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

REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: TEC SI CCR
Pace Project No.: 60280651

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: TEC SI CCR
Pace Project No.: 60280651

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60280651001	**MW-7-090618**	EPA 903.1	313308		
60280651002	**MW-8-090618**	EPA 903.1	313308		
60280651003	**MW-9-090618**	EPA 903.1	313308		
60280651004	**MW-10-090618**	EPA 903.1	313308		
60280651001	**MW-7-090618**	EPA 904.0	313310		
60280651002	**MW-8-090618**	EPA 904.0	313310		
60280651003	**MW-9-090618**	EPA 904.0	313310		
60280651004	**MW-10-090618**	EPA 904.0	313310		
60280651001	**MW-7-090618**	Total Radium Calculation	314418		
60280651002	**MW-8-090618**	Total Radium Calculation	314418		
60280651003	**MW-9-090618**	Total Radium Calculation	314418		
60280651004	**MW-10-090618**	Total Radium Calculation	314418		

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: PACE LS Project # 60280651

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

Label _____

LIMS Login

Tracking #: 4592 2780 8039

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

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

Cooler Temperature Observed Temp 4.1 °C Correction Factor: 0 °C Final Temp: 4.1 °C

Temp should be above freezing to 6°C

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

Client Notification/ Resolution:

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

Comments/ Resolution: _____

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

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

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

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: / of /

Section A Required Client Information:

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

Section B Required Project Information:

Report To: Brandon Griffin
Copy To: Jared Morrison, Heath Hornya
Purchase Order No.: 10TEC-0000007599
Project Name: TEC SI CCR
Project Number:

Section C Invoice Information:

Attention: Jared Morrison
Company Name: WESTAR ENERGY
Address: SEE SECTION A
Pace Quote Reference:
Pace Project Manager: Heather Wilson, 913-563-1407
Pace Profile #: 9656, 2

REGULATORY AGENCY

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

Site Location STATE: KS

Section D Required Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-7-090618	WT	G			9/6	0952		2			2						X	X	X		
2	MW-8-090618	WT	G			9/6	1414		2			2						X	X	X		
3	MW-9-090618	WT	G			9/6	1236		2			2						X	X	X		
4	MW-10-090618	WT	G			9/6	1127		2			2						X	X	X		
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	[signature] / Westar	9/12/18	0900	[signature]	9-13-18	1000	4.1	Y	Y MJS 9-13-18	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 09/06/18

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

Chain of Custody

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

State Of Origin: KS
Cert. Needed: [ ] Yes [ ] No
Owner Received Date: 9/13/2018 Results Requested By: 10/4/2018

Pace Analytical®
www.pacelabs.com

Workorder: 60280651 **Workorder Name:** TEC SI CCR

Report To	Subcontract To
Heather Wilson Pace Analytical Kansas 9608 Loiret Blvd. Lenexa, KS 66219 Phone 1(913)563-1407	Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3, & 4 Greensburg, PA 15601 Phone (724)850-5600

WO# : 30265247
30265247

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: Other	Requested Analysis: Radium-226 & Total Radium	Requested Analysis: Radium-228	LAB USE ONLY
1	MW-7-090618	PS	9/6/2018 09:52	60280651001	Water	2	X	X	001
2	MW-8-090618	PS	9/6/2018 14:14	60280651002	Water	2	X	X	002
3	MW-9-090618	PS	9/6/2018 12:36	60280651003	Water	2	X	X	003
4	MW-10-090618	PS	9/6/2018 11:27	60280651004	Water	2	X	X	004
5							X	X	

Transfers	Released By	Date/Time	Received By	Date/Time
1			Emily Kipp	9-13-18 1000 ET 9-17-18
2				
3				

Comments

Cooler Temperature on Receipt 4.1 °C | Custody Seal (Y) or N | Received on Ice (Y) or N | Samples Intact (Y) or N

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

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: / of /

Section A Required Client Information:

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

Section B Required Project Information:

Report To:	Brandon Griffin
Copy To:	Jared Morrison, Heath Hornya
Purchase Order No.:	10TEC-0000007599
Project Name:	TEC SI CCR
Project Number:	

Section C Invoice Information:

Attention:	Jared Morrison
Company Name:	WESTAR ENERGY
Address:	SEE SECTION A
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson, 913-563-1407
Pace Profile #:	9656, 2

REGULATORY AGENCY

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

Site Location STATE: KS

Section D Required Client Information

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

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-7-090618	WT	G			9/6	0952		2			2						X	X	X		
2	MW-8-090618	WT	G			9/6	1414		2			2						X	X	X		
3	MW-9-090618	WT	G			9/6	1236		2			2						X	X	X		
4	MW-10-090618	WT	G			9/6	1127		2			2						X	X	X		
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	BJG / Westar	9/12/18	0900		9-13-18	1000	4.1	Y	Y ~~N~~ 3TJ 9-13-18	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Griffin

SIGNATURE of SAMPLER: BJG DATE Signed (MM/DD/YY): 09/06/18

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

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: PACE LS

Project # # 30265247

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

Tracking #: 4542 2750 8929

Label

LIMS Login ET

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

Thermometer Used 9 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 4.1 °C Correction Factor: 0 °C Final Temp: 4.1 °C

Temp should be above freezing to 6°C

pH paper Lot# 10244971 Date and Initials of person examining contents: MJS 9-13-18

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9. 1 bottle received ~~empty~~ empty MJS 9-13-18
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. All containers needing preservation are found to be in compliance with EPA recommendation.	✓			16. pH<2
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed MJS Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Aqueous Samples Screened > 0.5 mrem/hr		✓		Initial when completed: MJS Date: 9-13-18

Client Notification/ Resolution:

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

Comments/ Resolution: _____

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

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

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

ATTACHMENT 2

Statistical Analyses

ATTACHMENT 2-1

Background Sampling Events Statistical Analyses

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

TECHNICAL MEMORANDUM

March 22, 2022
File No. 0204993

TO: Evergy Kansas Central, Inc. (f/k/a Westar Energy, Inc.)
Jared Morrison – Director, Water and Waste Programs

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

SUBJECT: Background Groundwater Monitoring Data
Statistical Evaluation
Completed January 15, 2018
Tecumseh Energy Center
Bottom Ash Settling Area

Pursuant to Code of Federal Regulations Title 40 (40 CFR) §257.90 (Rule), this memorandum summarizes the statistical evaluation of analytical results for the background monitoring groundwater sampling events for the Tecumseh Energy Center (TEC) Bottom Ash Settling Area (BASA). These background monitoring groundwater sampling events were completed from August 2016 to June 2017, with laboratory results received and accepted on October 17, 2017.

The statistical evaluation discussed in this memorandum was conducted to determine if Appendix III groundwater monitoring constituents have been detected in downgradient wells at concentrations that represent a statistically significant increase (SSI) above background or upgradient wells consistent with the requirements in 40 CFR §257.94.

Statistical Evaluation of Appendix III Constituents

The Rule provides four specific options for statistical evaluation of groundwater quality data collected at a coal combustion residual (CCR) unit (40 CFR §257.93(f)(1-4)). The two statistical methods used for these evaluations, prediction limits (PL) and Parametric Analysis of Variance (ANOVA), were certified by Haley & Aldrich, Inc. on January 15, 2018. The PL method, as determined applicable for this sampling event, was used to evaluate potential SSIs above background. Background levels for each constituent listed in Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids) were computed as upper prediction limits (UPL), considering one future observation, and a minimum 95 percent confidence coefficient. The entire data set for each compliance well was checked for the presence of outliers. If the presence of outliers was confirmed, then the outlier was removed from the data set. After removing confirmed outliers, the entire data set was compared against the interwell

background UPL to check for exceedances. Interwell evaluation compares the data points from downgradient compliance wells against a background data set composed of upgradient well data (MW-7). If all data points were below the background limit, then the well was excluded from further analysis. If more than two data points exceeded the background limit, then the data would be checked for seasonal influences and other significant differences using ANOVA, and SSIs were determined based on the most recent four rounds of the data distribution.

STATISTICAL EVALUATION

As documented in the statistical method certification, the Parametric ANOVA and PL methods were used to complete the statistical evaluation of the referenced data set. A PL procedure is one in which a concentration limit for each constituent is established from the distribution of the background data, with a specified confidence level (e.g., 95 percent). The upper endpoint of a concentration limit is called the UPL. Depending on the background data distribution, parametric or non-parametric PL procedures are used to evaluate groundwater monitoring data using this method. Parametric PLs utilize normally distributed data or normalized data via a transformation of the sample background data used to construct the limit. If the data are non-normal and a transformation is not indicated, non-parametric procedures (order statistics or bootstrap methods) are used to calculate the PL. If all the background data are non-detect, a maximum reporting limit may serve as an appropriate UPL.

The ANOVA is a statistical procedure for comparing average concentration differences between one or more groups (e.g., wells). Depending on the background data distribution, parametric or non-parametric ANOVA procedures are used to evaluate groundwater monitoring data using this method. Parametric ANOVA assesses differences in means, and the non-parametric ANOVA compares median concentration levels. The method determines whether there are statistically significant differences in mean/median concentrations among a set of downgradient wells relative to the background wells. In one-way ANOVA, the null hypothesis is that the groups under comparison have equal means and that any differences in the sample means are due to chance. The alternative hypothesis is stated as the means of the groups are not equal. The decision error, level (α) value shall comply with the performance criteria set forth in 40 CFR §257.93(g)(2).

The statistical evaluation was conducted using the background data set for all Appendix III constituents. The UPLs were calculated from the background well data set using Chemstat software after testing for outlier sample results that would warrant removal from the data set based on likely error in sampling or measurement. Both visual and statistical outlier tests for the background data were performed using Chemstat and U.S. Environmental Protection Agency's ProUCL 5.1 software, and a visual inspection of the data was performed using box plots and distribution plots for the downgradient sample data. No sample data were identified as outliers that warranted removal from the data set.

BACKGROUND DISTRIBUTIONS

The groundwater analytical results for each sampling event from the background sample location (MW-4) were combined to calculate the UPL for each Appendix III constituent. The variability and distribution of the pooled data set was evaluated to determine the method for UPL calculation. Per the

document, *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance*, March 2009, background concentrations were updated based on statistical evaluation of analytical results collected through June 2017.

RESULTS OF APPENDIX III DOWNGRADIENT STATISTICAL COMPARISONS

The entire background data set from the downgradient wells for each of the Appendix III constituents was compared to their respective background UPLs (Table I). A sample concentration greater than the background UPL is considered to represent an SSI. The results of the background groundwater monitoring statistical evaluation is provided in Table I. **Based on this statistical evaluation on groundwater sampling data collected from August 2016 to June 2017, SSIs were identified for multiple constituents above background PLs at the TEC BASA.** Evergy established an assessment monitoring program at the TEC BASA, with the first annual sampling event completed in June 2018.

Tables:

Table I – Summary of Background Groundwater Monitoring Statistical Evaluation

TABLE

TABLE I
SUMMARY OF SEMI-ANNUAL ASSESSMENT GROUNDWATER MONITORING STATISTICAL EVALUATION
BACKGROUND SAMPLING EVENTS (AUGUST 2016 - JUNE 2017)
TECUMSEH ENERGY CENTER
BOTTOM ASH SETTLING AREA

															Interwell Comparison		
Variable	**Frequency of Detection**			**Percent Non-Detects**	**Range of Non-Detects**		**Maximum Detect**	**Variance**	**Standard Deviation**	**Coefficient of Variation**	**Outlier Presence**	**Outlier Removed**	**Trend**	**Distribution of Group***	**Distribution of Well***	**[1]Group Difference**	**Statistical Method**	**[2]Exceedance above Background at Individual Well**
APPENDIX- III: BORON (MG/L)																		
MW-7 (UPGRADIENT)	8	/	8	0%	N/A	:	N/A	0.77	7.07E-04	0.0266	0.0366	No	No	Stable	Parametric				
MW-8	8	/	8	0%	N/A	:	N/A	1.5	1.14E-02	0.107	0.0822	No	No	Stable	Non-parametric	Parametric	Yes	Prediction Limits	Yes
MW-9	8	/	8	0%	N/A	:	N/A	0.41	1.34E-02	0.116	0.458	No	No	Stable		Parametric		Prediction Limits	No
MW-10	8	/	8	0%	N/A	:	N/A	0.27	2.27E-04	0.0151	0.0612	No	No	Stable		Parametric		Prediction Limits	No
APPENDIX- III: CALCIUM (MG/L)																		
MW-7 (UPGRADIENT)	8	/	8	0%	N/A	:	N/A	161	2.17E+01	4.66	0.0309	No	No	Stable	Parametric				
MW-8	8	/	8	0%	N/A	:	N/A	244	3.17E+02	17.79	0.085	No	No	Stable	Parametric	Parametric	Yes	Prediction Limits	Yes
MW-9	8	/	8	0%	N/A	:	N/A	232	1.15E+02	10.72	0.0489	No	No	Stable		Parametric		Prediction Limits	Yes
MW-10	8	/	8	0%	N/A	:	N/A	182	2.73E+01	5.222	0.03	No	No	Stable		Parametric		Prediction Limits	Yes
APPENDIX- III: CHLORIDE (MG/L)																		
MW-7 (UPGRADIENT)	8	/	8	0%	N/A	:	N/A	201	3.34E+01	5.776	0.0297	No	No	Stable	Parametric				
MW-8	8	/	8	0%	N/A	:	N/A	194	1.27E+02	11.29	0.0619	No	No	Stable	Parametric	Parametric	No	ANOVA	No
MW-9	8	/	8	0%	N/A	:	N/A	218	1.92E+02	13.86	0.0707	No	No	Stable		Parametric		ANOVA	No
MW-10	8	/	8	0%	N/A	:	N/A	238	4.11E+01	6.409	0.0278	No	No	Stable		Parametric		ANOVA	Yes
APPENDIX- III: FLUORIDE (MG/L)																		
MW-7 (UPGRADIENT)	8	/	8	0%	N/A	:	N/A	0.33	5.84E-04	0.0242	0.0776	No	No	Stable	Parametric				
MW-8	8	/	8	0%	N/A	:	N/A	0.3	4.00E-04	0.02	0.0755	No	No	Stable	Parametric	Parametric	Yes	Prediction Limits	No
MW-9	8	/	8	0%	N/A	:	N/A	0.56	4.86E-03	0.0697	0.17	No	No	Increase		Parametric		Prediction Limits	Yes
MW-10	8	/	8	0%	N/A	:	N/A	0.48	6.86E-04	0.0262	0.0588	No	No	Stable		Parametric		Prediction Limits	Yes
APPENDIX- III: pH (SU)																		
MW-7 (UPGRADIENT)	8	/	8	0%	N/A	:	N/A	7.3	1.64E-02	0.128	0.018	No	No	Stable	Parametric				
MW-8	8	/	8	0%	N/A	:	N/A	7	2.29E-02	0.151	0.0222	No	No	Stable	Parametric	Parametric	No	Prediction Limits	No
MW-9	8	/	8	0%	N/A	:	N/A	7	1.84E-02	0.136	0.02	No	No	Stable		Parametric		Prediction Limits	No
MW-10	8	/	8	0%	N/A	:	N/A	7	2.13E-02	0.146	0.0215	No	No	Stable		Parametric		Prediction Limits	No
APPENDIX- III: SULFATE (MG/L)																		
MW-7 (UPGRADIENT)	8	/	8	0%	N/A	:	N/A	511	5.76E+02	23.99	0.051	No	No	Stable	Parametric				
MW-8	8	/	8	0%	N/A	:	N/A	785	1.67E+04	129.2	0.188	Yes	No	Stable	Non-parametric	Parametric	Yes	Prediction Limits	Yes
MW-9	8	/	8	0%	N/A	:	N/A	477	1.85E+04	136	0.601	No	No	Stable		Parametric		Prediction Limits	No
MW-10	8	/	8	0%	N/A	:	N/A	226	5.15E+02	22.7	0.121	No	No	Stable		Parametric		Prediction Limits	No
APPENDIX- III: TDS (MG/L)																		
MW-7 (UPGRADIENT)	8	/	8	0%	N/A	:	N/A	1220	1.61E+03	40.16	0.0353	No	No	Stable	Parametric				
MW-8	8	/	8	0%	N/A	:	N/A	1500	5.63E+03	75.02	0.0534	No	No	Stable	Parametric	Parametric	Yes	Prediction Limits	Yes
MW-9	8	/	8	0%	N/A	:	N/A	1420	9.54E+03	97.69	0.0757	No	No	Stable		Parametric		Prediction Limits	Yes
MW-10	8	/	8	0%	N/A	:	N/A	1280	2.51E+03	50.07	0.041	No	No	Stable		Parametric		Prediction Limits	Yes

Notes:

** - Determined using the Shapiro-Wilks statistical test at a 1% significance level and a residual probability plot.*

1: The interwell group difference is determined by comparing the pooled down-gradient well dataset to the pooled up-gradient background well dataset using a parametric t-test or Wilcoxon rank-sum test.

2: Background exceedance at individual down-gradient well is determined by comparing to pooled up-gradient background well dataset using either Analysis of Variance (ANOVA) with multiple comparison or prediction limit methods at a 1% significance level.

3: Background exceedance at individual down-gradient well is determined by comparing to the historic background from the same well using either a parametric control chart or non-parametric prediction limit methods at a 1% significance level.

4: Exceedance above background is determined by evaluating the appropriate interwell or intrawell comparison exceedance.

mg/L - milligrams per liter
N/A= Not applicable
NT - Not tested
SU= standard unit

ATTACHMENT 2-2

March 2018 Semi-Annual Sampling Event Statistical Analyses

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

TECHNICAL MEMORANDUM

March 22, 2022
File No. 0204993-000

TO: Evergy Kansas Central, Inc. (f/k/a Westar Energy Inc.)
Jared Morrison – Director, Water and Waste Programs

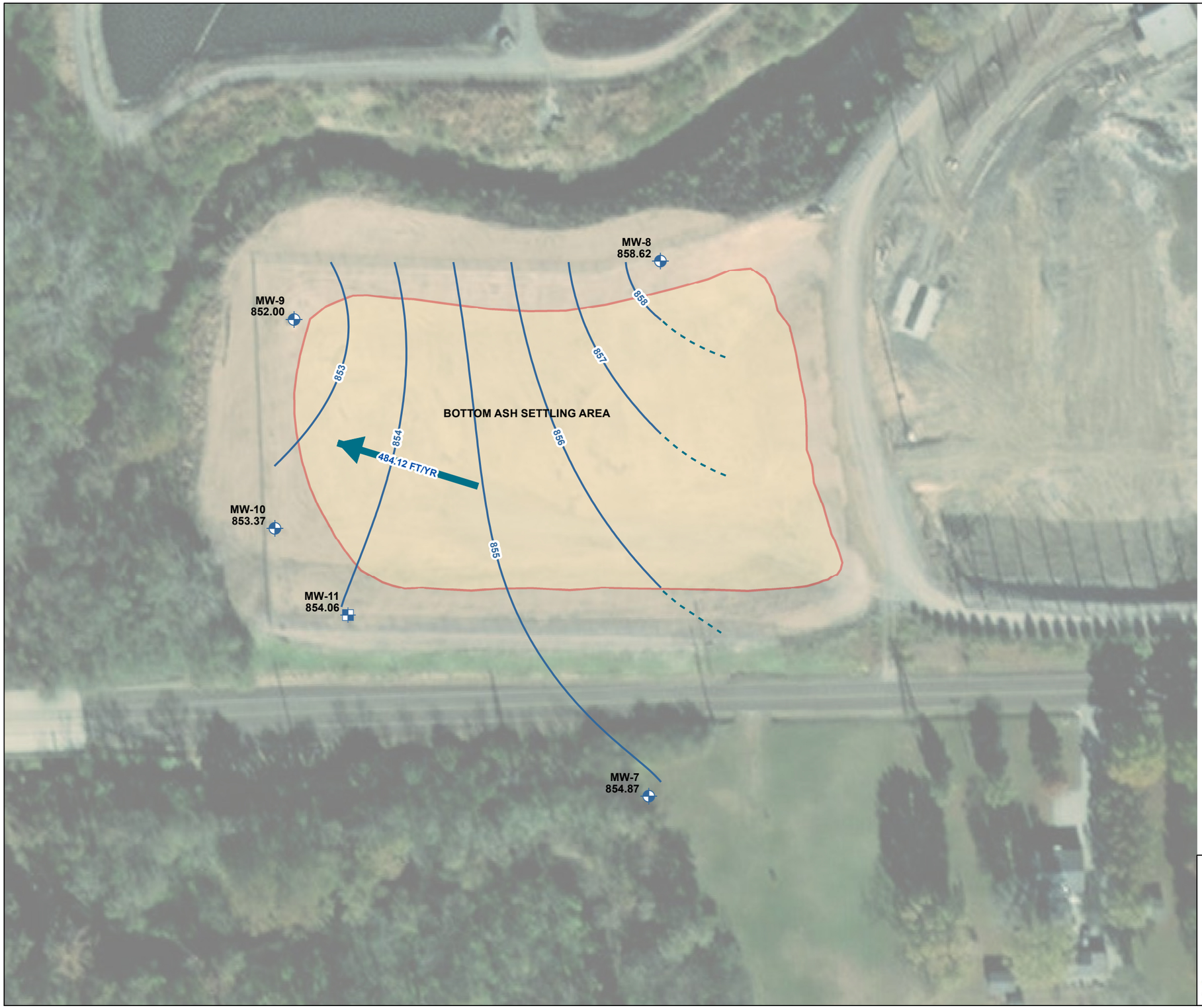
FROM: Haley & Aldrich, Inc.
Steven F. Putrich, P.E., Principal Consultant – Engineering Principal
Mark Nicholls, P.G., Senior Associate – Senior Hydrogeologist

SUBJECT: March 2018 Semi-Annual Groundwater Detection Monitoring Data
Statistical Analyses Summary
Tecumseh Energy Center
Bottom Ash Settling Area

Pursuant to Code of Federal Regulations Title 40 (40 CFR) §257.93 and §257.94 (Rule), this memorandum summarizes the statistical summary of the analytical results for the first semi-annual detection monitoring groundwater sampling event for the Tecumseh Energy Center (TEC) Bottom Ash Settling Area (BASA), which took place in March 2018. This semi-annual detection monitoring groundwater sampling event was completed on March 8, 2018, with laboratory results received and validated in April 2018. Due to the determination of statistically significant increases in the January 2018 statistical analyses, the unit transitioned to an assessment monitoring program; therefore, no statistical analyses were completed on this March 2018 detection monitoring sampling event data.

ATTACHMENT 3

Revised Groundwater Potentiometric Maps



LEGEND

- **MW-8 849.64** WELL NAME AND GROUNDWATER ELEVATION (MARCH 2018)
- MONITORING WELL
- PIEZOMETER OBSERVATION ONLY
- GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 1-FT INTERVAL (AMSL)
- ESTIMATED GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
- BOTTOM ASH SETTLING AREA

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 09 MARCH 2018.

3. AMSL = ABOVE MEAN SEA LEVEL

4. THE APPROXIMATE GROUNDWATER FLOW RATE WAS CALCULATED USING HYDRAULIC CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES FROM SLUG TESTS COMPLETED IN APRIL 2016.

5. AERIAL IMAGERY SOURCE: ESRI, 07 NOVEMBER 2019

N

0 75 150

SCALE IN FEET

HALEY ALDRICH

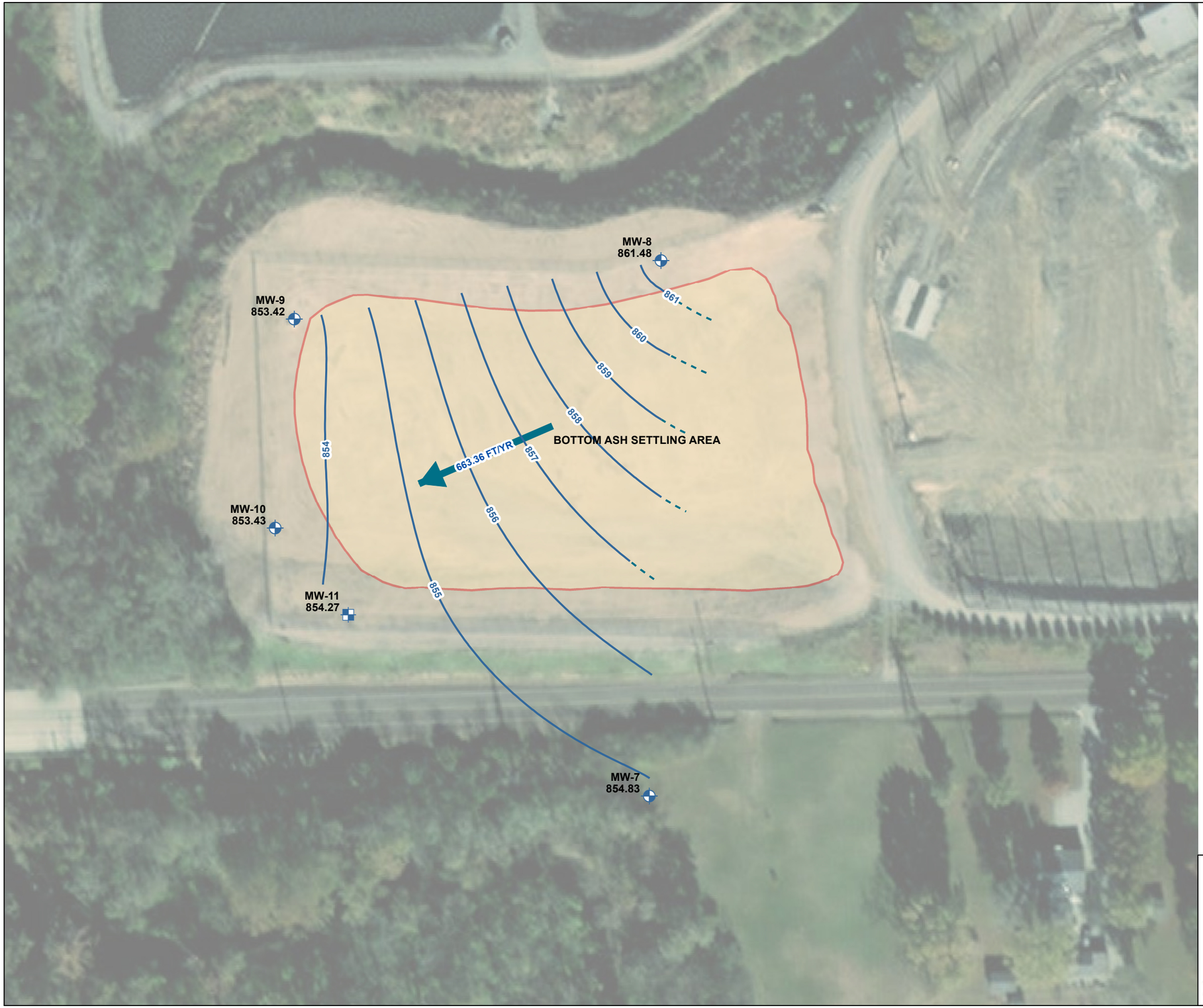
EVERGY KANSAS CENTRAL, INC.
TECUMSEH ENERGY CENTER
TECUMSEH, KANSAS

BOTTOM ASH SETTLING AREA GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR MAP MARCH 09, 2018

evergy

MARCH 2022

FIGURE 2



LEGEND

MW-8 849.64	WELL NAME AND GROUNDWATER ELEVATION (JUNE 2018)
	MONITORING WELL
	PIEZOMETER OBSERVATION ONLY
	GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 1-FT INTERVAL (AMSL)
	ESTIMATED GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR
	GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
	BOTTOM ASH SETTLING AREA

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 06 JUNE 2018.

3. AMSL = ABOVE MEAN SEA LEVEL

4. THE APPROXIMATE GROUNDWATER FLOW RATE WAS CALCULATED USING HYDRAULIC CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES FROM SLUG TESTS COMPLETED IN APRIL 2016.

5. AERIAL IMAGERY SOURCE: ESRI, 07 NOVEMBER 2019

N

0 75 150

SCALE IN FEET

HALEY ALDRICH

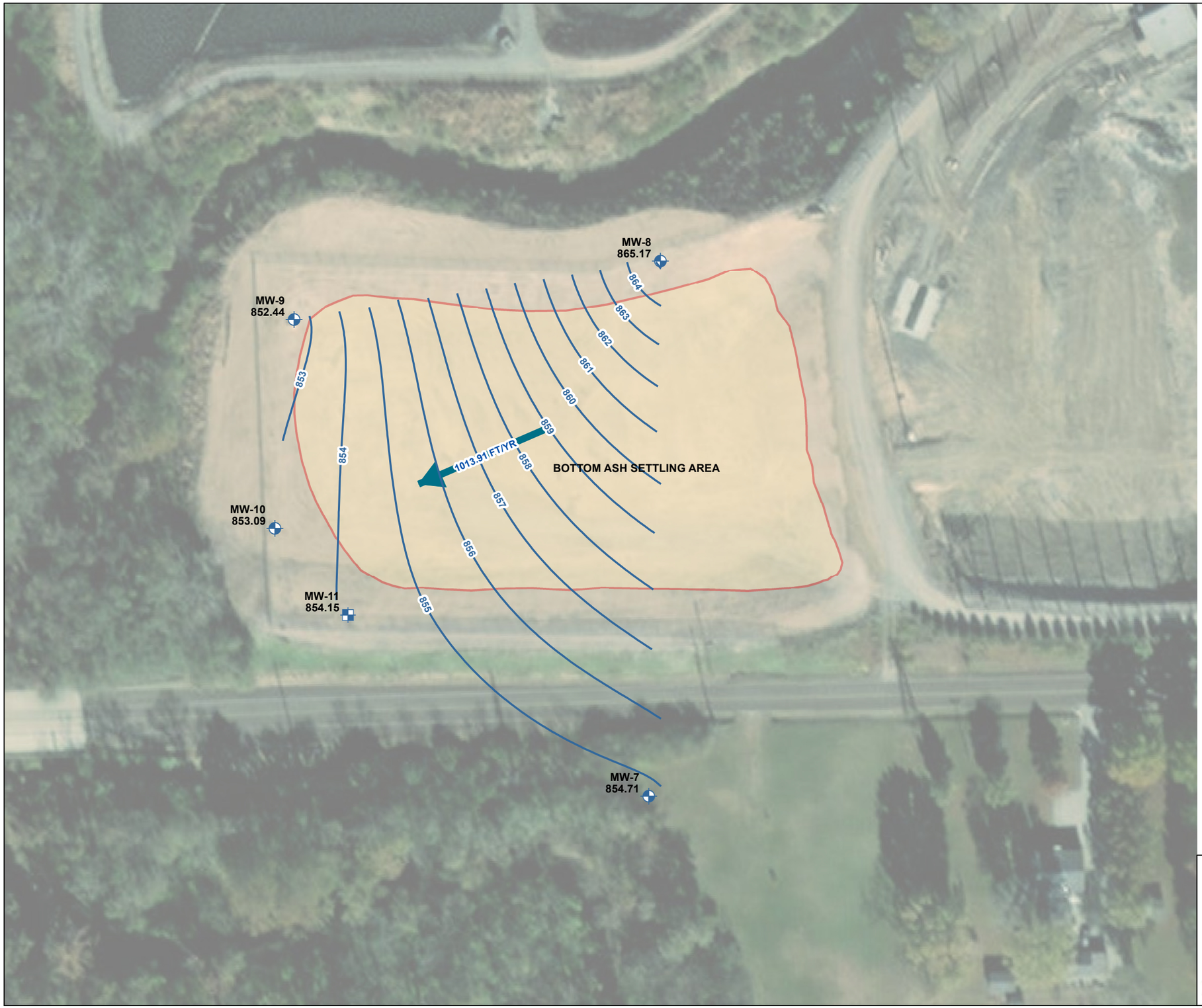
EVERGY KANSAS CENTRAL, INC.
TECUMSEH ENERGY CENTER
TECUMSEH, KANSAS

BOTTOM ASH SETTLING AREA GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR MAP JUNE 06, 2018

evergy

MARCH 2022

FIGURE 3



LEGEND

MW-8 849.64 WELL NAME AND GROUNDWATER ELEVATION (SEPTEMBER 2018)

MONITORING WELL

PIEZOMETER OBSERVATION ONLY

GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 1-FT INTERVAL (AMSL)

ESTIMATED GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR

GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)

BOTTOM ASH SETTLING AREA

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 04 SEPTEMBER 2018.

3. AMSL = ABOVE MEAN SEA LEVEL

4. THE APPROXIMATE GROUNDWATER FLOW RATE WAS CALCULATED USING HYDRAULIC CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES FROM SLUG TESTS COMPLETED IN APRIL 2016.

5. AERIAL IMAGERY SOURCE: ESRI, 07 NOVEMBER 2019

N

0 75 150

SCALE IN FEET

HALEY ALDRICH

EVERGY KANSAS CENTRAL, INC.
TECUMSEH ENERGY CENTER
TECUMSEH, KANSAS

BOTTOM ASH SETTLING AREA GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR MAP SEPTEMBER 04, 2018

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MARCH 2022

FIGURE 4