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31 January 2018
File No. 128064-005

Associated Electric Cooperative, Inc.
2814 South Golden Avenue
P.O. Box 754
Springfield, MO 65801-0754

Attention: Kim Dickerson – Senior Environmental Analyst
Russ Weatherly – Supervisor, Land and Water Resources

Subject: 2017 Annual Groundwater Monitoring and Corrective Action Report for the Ash Pond System
Thomas Hill Energy Center
Clifton Hills, Missouri

Dear Ms. Dickerson and Mr. Weatherly:

Haley & Aldrich, Inc. is pleased to submit this Annual Groundwater Monitoring and Corrective Action Report (Annual Report) for the multi-unit groundwater monitoring system for Cell 001, Cell 003, and Cell 004 (Ash Pond System) at the Thomas Hill Energy Center (THEC). This Annual Report was developed in accordance with the United States Environmental Protection Agency CCR Rule effective 19 October 2015 (Rule), specifically Code of Federal Regulations Title 40, subsection § 257.90(e). The Annual Report documents the design and construction of the groundwater monitoring system for the Ash Pond System consistent with applicable sections of § 257.90 through 257.98.

This report describes activities conducted in the prior calendar year and documents compliance with the Rule. The specific requirements listed in Sections § 257.90(e)(1)-(5) of the Rule are provided in bold/italic type, followed by a short narrative describing how the Rule has been met.

Sincerely yours,
HALEY & ALDRICH, INC.

Steve Putrich, P.E.
Project Principal

Mark D. Nicholls, P.G.
Lead Hydrogeologist

HALEY ALDRICH

www.haleyaldrich.com

2017 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
ASH POND SYSTEM
THOMAS HILL ENERGY CENTER
CLIFTON HILL, MISSOURI

by Haley & Aldrich, Inc.
Cleveland, Ohio

for Associated Electric Cooperative, Inc.
Springfield, Missouri

File No. 128064-005
January 2018

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1. 40 CFR § 257.90 Applicability

1.1 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.

The Associated Electric Cooperative, Inc. (AECI) multi-unit groundwater monitoring system for Cell 001, Cell 003, and Cell 004 (Ash Pond System) at the Thomas Hill Energy Center (THEC), which are the coal combustion residuals (CCR) management units addressed in this Annual Groundwater Monitoring and Corrective Action Report (Annual Report), 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. In particular, this document addresses the requirement for the Owner/Operator to prepare an Annual Report per § 257.90(e) (Rule).

1.2 40 CFR § 257.90(e)

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 is the initial report for the THEC Ash Pond System as required by the Rule as the groundwater monitoring system was established and certified by 17 October 2017. Prior to 17 October 2017, AECI installed a multi-unit groundwater monitoring system at the Ash Pond System consistent with § 257.91. Groundwater sampling and analysis was conducted per the requirements described in § 257.93, and the status of the groundwater monitoring program described in § 257.94 is provided in this report. This Annual Report documents the activities completed in the calendar year 2017.

> ***At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:***
>
> ***(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 Ash Pond System is included in this report as Figure 1. In addition, this information is presented in the CCR Groundwater Monitoring Network Description Report

prepared for AECI, which was placed in the facility's operating record by 17 October 2017 as required by § 257.105(h)(2).

> ***(2) Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;***

The design and construction of the monitoring well network for Ash Pond System at THEC are described in the CCR Groundwater Monitoring Network Description Report dated 17 October 2017. This report was placed in the facility's operating record by 17 October 2017, as required by § 257.105(h)(2). Since the groundwater monitoring system was certified, no new monitoring wells were installed or decommissioned.

> ***(3) 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), a minimum of 8 and as many as 12 independent samples from each background and downgradient monitoring well were collected prior to 17 October 2017. A summary table including the sample names, dates of sample collection, reason for sample collection (detection or assessment), and monitoring data obtained for the groundwater monitoring program for the Ash Pond System is presented in Table I of this report. In 2017, the groundwater monitoring sampling and laboratory analyses were completed under the detection monitoring program.

> ***(4) A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and***

Detection monitoring was conducted in accordance with § 257.94(b), and no transitions between monitoring programs occurred for the Ash Pond System in calendar year 2017.

> ***(5) Other information required to be included in the annual report as specified in §257.90 through §257.98.***

This initial Annual Report documents activities conducted to comply with § 257.90 through § 257.94 of the Rule. It is understood that there are supplemental references in § 257.90 through § 257.98 to information that must be placed in the Annual Report; however, none of the activities referenced as required in the Annual Report are relevant to the groundwater monitoring program for activities completed in calendar year 2017.

1.3 40 CFR § 257.90(f)

The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in § 257.105(h), the notification requirements specified in § 257.106(h), and the internet requirements specified in § 257.107(h).

To comply with the Rule recordkeeping requirements:

- Pursuant to § 257.105(h)(1), this Annual Report must be placed in the facility's operating record.
- Pursuant to § 257.106(h)(1), notification must be sent to the relevant State Director and/or Tribal authority within 30 days of this Annual Report being placed on the facility's operating record [§ 257.106(d)].
- Pursuant to § 257.107(h)(1), this Annual Report must be posted to the AECI CCR Website within 30 days of this Annual Report being placed on the facility's operating record [§ 257.107(d)].

TABLES

TABLE I
SUMMARY OF ANALYTICAL RESULTS
AECI Thomas Hill Energy Center
Ash Pond System
Clifton Hill, Missouri

Location		Sample Name	Sample Date	Field Parameters				USEPA Appendix III Constituents (mg/L)							USEPA Appendix IV Constituents (mg/L)													USEPA Appendix IV Constituents (pCi/L)
				Temperature (Deg C)	Conductivity (µS/cm)	Turbidity (NTU)	pH (su)	Boron, Total	Calcium, Total	Chloride	Fluoride	Sulfate	pH (su)	TDS	Antimony, Total	Arsenic, Total	Barium, Total	Beryllium, Total	Cadmium, Total	Chromium, Total	Cobalt, Total	Lead, Total	Lithium, Total	Molybdenum, Total	Selenium, Total	Thallium, Total	Mercury, Total	Fluoride	Radium-226 & 228 Combined
Up Gradient	MW-1	MW-1-082116	8/21/2016	**19.87**	**3010**	**30.7**	**6.33**	**0.067**	**541**	**27.7**	**0.3**	**2070**	**6.70**	**3389**	<0.0005	<0.001	**0.015**	<0.001	<0.0005	**0.001**	**0.001**	<0.001	**0.140**	**0.001**	**0.003**	<0.001	<0.0008	**0.3**	**1.50**
		MW-1-091716-01	9/17/2016	**17.25**	**3760**	**35.1**	**6.99**	<0.125	**569**	**29.6**	**0.3**	**1970**	**6.72**	**3353**	<0.0005	<0.008	**0.027**	<0.001	<0.001	<0.008	<0.008	<0.008	**0.150**	<0.008	**0.003**	<0.001	<0.0008	**0.3**	**3.16**
		MW-1-101816	10/18/2016	**19.39**	**3690**	**8.33**	**6.54**	**0.112**	**571**	**28**	**0.3**	**1980**	**6.76**	**3438**	<0.0005	<0.004	**0.013**	<0.004	<0.002	<0.004	<0.004	<0.004	**0.140**	<0.004	**0.002**	<0.002	<0.0008	**0.3**	**1.32**
		MW-1-110816	11/8/2016	**17.21**	**3750**	**2.12**	**6.53**	**0.091**	**558**	**28.8**	**0.3**	**979**	**6.69**	**3461**	<0.0005	<0.005	**0.014**	<0.004	<0.002	<0.005	<0.005	<0.001	**0.140**	<0.005	**0.002**	<0.001	<0.0008	**0.3**	**1.30**
		MW-1-121516	12/15/2016	**9.39**	**3690**	**1.59**	**6.48**	**0.111**	**632**	**27.9**	**0.3**	**2100**	**6.78**	**3482**	<0.0005	<0.005	**0.014**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.16**	<0.005	**0.002**	<0.0005	<0.0008	**0.3**	**1.0**
		MW-1-011217	1/12/2017	**11.29**	**3620**	**2.69**	**6.76**	**0.133**	**584**	**26.1**	**0.3**	**2050**	**7.02**	**3490**	<0.0005	<0.005	**0.014**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.14**	<0.005	**0.003**	<0.0005	<0.0008	**0.3**	**1.67**
		MW-1-020217	2/2/2017	**10.40**	**3810**	**8.81**	**6.52**	**0.122**	**595**	**26.2**	**0.3**	**2070**	**6.75**	**3577**	<0.0005	<0.005	**0.012**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.14**	<0.005	**0.003**	<0.0005	<0.0008	**0.3**	**1.27**
		MW-1-030817	3/8/2017	**12.90**	**3790**	**2.60**	**6.77**	**0.127**	**621**	**26.8**	**0.3**	**2100**	**6.74**	**3517**	<0.0005	<0.005	**0.013**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.14**	<0.005	**0.002**	<0.0005	<0.0008	**0.3**	**0.73**
		MW1-041017	4/10/2017	**16.68**	**3740**	**1.69**	**6.63**	**0.094**	**601**	**28.6**	**0.3**	**2080**	**6.73**	**3350**	<0.0005	<0.005	**0.012**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.12**	<0.005	**0.003**	<0.0005	<0.0008	**0.3**	**1.07**
		MW1-050917	5/9/2017	**14.03**	**3770**	**1.04**	**6.63**	**0.104**	**605**	**29.5**	**0.3**	**2070**	**6.28**	**3470**	<0.0005	<0.005	**0.012**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.12**	<0.005	**0.004**	<0.0005	<0.0008	**0.3**	**1.80**
		MW1061317	6/13/2017	**18.32**	**3750**	**4.71**	**6.53**	**0.071**	**572**	**29.8**	**0.3**	**2050**	**6.94**	**3490**	<0.0005	<0.005	**0.012**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.13**	<0.005	**0.004**	<0.0005	<0.0008	**0.3**	**0.58**
		MW1 7-11-17	7/11/2017	**18.60**	**3790**	**1.3**	**6.63**	**0.069**	**562**	**30.8**	**0.3**	**1980**	**7.04**	**3541**	<0.0005	<0.005	**0.012**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.14**	<0.005	**0.004**	<0.0005	<0.0008	**0.3**	**1.25**
	MW-2R	MW7-032317[a]	3/23/2017	**10.40**	**1610**	**50.80**	**7.03**	**0.241**	**215**	**4.0**	**0.4**	**403**	**7.32**	**1220**	<0.0005	<0.005	**0.086**	<0.004	<0.005	<0.008	<0.005	<0.005	**0.01**	<0.008	<0.001	<0.0005	<0.0008	**0.4**	**1.61**
		MW2R051117	5/11/2017	**13.90**	**1730**	**5.66**	**7.07**	**0.200**	**206**	**5.4**	**0.6**	**411**	**7.34**	**1096**	<0.0005	<0.005	**0.057**	<0.004	<0.005	<0.008	<0.005	<0.005	**0.01**	**0.007**	**0.002**	<0.0005	<0.0008	**0.6**	**2.07**
		MW2R061317	6/13/2017	**16.00**	**1740**	**7.10**	**6.95**	**0.187**	**211**	**5.5**	**0.5**	**433**	**7.25**	**1140**	<0.0005	<0.005	**0.063**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.01**	**0.010**	**0.001**	<0.0005	<0.0008	**0.5**	**0.53**
		MW2071117[c]	7/11/2017	**15.60**	**1840**	**4.3**	**7.38**	**0.166**	**210**	**5.5**	**0.5**	**448**	**7.24**	**1277**	<0.0005	<0.005	**0.060**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.02**	**0.011**	**0.002**	<0.0005	<0.0008	**0.5**	**1.86**
		MW-2R	7/31/2017	**14.80**	**1880**	**2.60**	**7.19**	**0.202**	**240**	**5.2**	**0.5**	**474**	**7.05**	**1286**	<0.0005	<0.005	**0.056**	<0.004	<0.005	<0.008	<0.005	<0.005	**0.01**	<0.008	**0.003**	<0.0005	<0.0008	**0.5**	**2.3**
		MW-2R-081417	8/14/2017	**14.50**	**1880**	**2.70**	**7.10**	**0.203**	**241**	**5.1**	**0.5**	**473**	**7.28**	**1342**	<0.0005	<0.005	**0.066**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.01**	**0.010**	<0.001	<0.0005	<0.0008	**0.5**	**1.37**
		MW-2R-083117	8/31/2017	**14.90**	**1770**	**1.50**	**6.96**	**0.205**	**250**	**5.2**	**0.5**	**468**	**7.06**	**1327**	<0.0005	<0.005	**0.065**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.01**	**0.010**	<0.001	<0.0005	<0.0008	**0.5**	**2.70**
		MW-2R-091217	9/12/2017	**14.30**	**1870**	**2.20**	**7.02**	**0.206**	**250**	**5.1**	**0.5**	**467**	**6.98**	**1343**	<0.0005	<0.005	**0.067**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.01**	**0.010**	**0.003**	<0.0005	<0.0008	**0.5**	**1.55**
Down Gradient	MW-3	MW-3-082216	8/22/2016	**19.81**	**3410**	**47.1**	**6.02**	**0.281**	**410**	**12.7**	**0.1**	**1670**	**6.49**	**3482**	<0.0005	**0.026**	**0.032**	<0.001	<0.0005	<0.001	**0.007**	<0.001	**0.030**	**0.003**	**0.003**	<0.001	<0.0008	**0.1**	**1.63**
		MW-3-091816-01	9/18/2016	**18.10**	**4530**	**43.2**	**6.50**	**0.472**	**470**	**13.5**	**0.1**	**2280**	**6.43**	**3911**	<0.0005	<0.008	**0.030**	<0.001	<0.001	<0.008	<0.008	<0.008	**0.030**	<0.008	**0.002**	<0.001	<0.0008	**0.1**	**2.12**
		MW-3-101716	10/17/2016	**19.16**	**4700**	**38.8**	**6.20**	**0.475**	**455**	**13.0**	<0.1	**2260**	**6.48**	**4138**	<0.0005	<0.004	**0.019**	<0.004	<0.002	<0.004	**0.006**	<0.004	**0.020**	<0.004	**0.002**	<0.002	<0.0008	<0.1	**3.2**
		MW-3-110816	11/8/2016	**15.73**	**4710**	**8.95**	**6.25**	**0.458**	**423**	**12.9**	**0.1**	**2280**	**6.48**	**3995**	<0.0005	<0.005	**0.019**	<0.004	<0.002	<0.005	**0.006**	<0.005	**0.020**	<0.005	**0.002**	<0.002	<0.0008	**0.1**	**0.46**
		MW-3-121416	12/14/2016	**10.93**	**4530**	**25.2**	**6.27**	**0.468**	**518**	**13.6**	<0.1	**2220**	**6.60**	**3921**	<0.0005	<0.005	**0.018**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.02**	<0.005	**0.002**	<0.0005	<0.0008	<0.1	**1.90**
		MW-3-011117	1/11/2017	**13.73**	**4510**	**8.11**	**6.33**	**0.453**	**481**	**13.6**	<0.1	**2340**	**6.65**	**3950**	<0.0005	<0.005	**0.017**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.02**	<0.005	**0.003**	<0.0005	<0.0008	<0.1	**1.02**
		MW-3-020217	2/2/2017	**10.47**	**4680**	**6.67**	**6.10**	**0.435**	**484**	**13.6**	**0.1**	**2280**	**6.55**	**3960**	<0.0005	<0.005	**0.016**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.02**	<0.005	**0.002**	<0.0005	<0.0008	**0.1**	**0.67**
		MW-3-030717	3/7/2017	**12.77**	**4530**	**2.02**	**6.31**	**0.449**	**512**	**13.6**	<0.1	**2360**	**6.50**	**3960**	<0.0005	<0.005	**0.017**	<0.004	<0.005	<0.005	**0.007**	<0.005	**0.02**	<0.005	**0.002**	<0.0005	<0.0008	<0.1	**ND**
		MW3-041017	4/10/2017	**14.77**	**4610**	**6.39**	**6.36**	**0.444**	**492**	**13.3**	0.2	**2290**	**6.54**	**3850**	<0.0005	<0.005	**0.017**	<0.004	<0.005	<0.005	**0.007**	<0.005	**0.01**	<0.005	**0.003**	<0.0005	<0.0008	**0.2**	**ND**
		MW3-050917	5/9/2017	**14.04**	**4650**	**3.13**	**6.35**	**0.393**	**498**	**13.6**	<0.1	**2280**	**6.41**	**3790**	<0.0005	<0.005	**0.017**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.02**	<0.005	**0.003**	<0.0005	<0.0008	<0.1	**1.15**
		MW3061317	6/13/2017	**17.01**	**4670**	**5.02**	**6.35**	**0.378**	**483**	**13.6**	<0.1	**2330**	**6.65**	**4000**	<0.0005	<0.005	**0.018**	<0.004	<0.005	<0.005	**0.006**	<0.005	**0.02**	<0.005	**0.003**	<0.0005	<0.0008	<0.1	**ND**
		MW30711117[d]	7/11/2017	**16.4**	**4750**	**4.2**	**6.29**	**0.348**	**472**	**13.7**	<0.1	**2320**	**6.62**	**3985**	<0.0005	<0.005	**0.018**	<0.004	<0.005	<0.005	**0.006**	<0.005	**0.02**	<0.005	**0.004**	<0.0005	<0.0008	<0.1	**0.88**
	MW-4	MW-4-082116	8/21/2016	**16.12**	**510**	**62.7**	**6.63**	**0.050**	**109**	**6.9**	**0.3**	**178**	**7.14**	**505**	<0.0005	**0.002**	**0.171**	<0.001	<0.0005	**0.001**	**0.001**	<0.001	**0.010**	**0.003**	<0.001	<0.001	<0.0008	**0.3**	**0.80**
		MW-4-091716-01	9/17/2016	**16.60**	**765**	**19.7**	**7.10**	<0.125	**99.8**	**9.1**	**0.3**	**116**	**6.97**	**378**	<0.0005	<0.008	**0.15**	<0.001	<0.001	<0.008	<0.008	<0.008	<0.01	<0.008	<0.001	<0.001	<0.0008	**0.3**	**1.68**
		MW-4-101716	10/17/2016	**19.26**	**797**	**3.47**	**6.89**	**0.035**	**105**	**7**	**0.3**	**112**	**6.91**	**454**	<0.0005	**0.006**	**0.141**	<0.004	<0.002	<0.004	<0.004	<0.004	<0.01	**0.005**	**0.001**	<0.002	<0.0008	**0.3**	**1.74**
		MW-4-110816	11/8/2016	**14.29**	**842**	**2.56**	**6.86**	**0.057**	**110**	**7.2**	**0.3**	**159**	**7.06**	**511**	<0.0005	**0.006**	**0.18**	<0.004	<0.002	<0.005	<0.005	<0.005	<0.01	**0.006**	<0.001	<0.002	<0.0008	**0.3**	**1.57**
		MW-4-121416	12/14/2016	**11.11**	**767**	**1.30**	**6.75**	**0.042**	**117**	**7.3**	**0.4**	**104**	**7.15**	**397**	<0.0005	<0.005	**0.142**	<0.004	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	**0.002**	<0.0005	<0.0008	**0.4**	**2.59**
		MW-4-011117	1/11/2017	**12.20**	**819**	**1.82**	**6.79**	**0.031**	**116**	**7.2**	**0.3**	**164**	**6.90**	**489**	<0.0005	<0.005	**0.150**	<0.004	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	**0.001**	<0.0005	<0.0008	**0.3**	**0.68**
		MW-4-020217	2/2/2017	**10.15**	**868**	**4.83**	**6.75**	**0.035**	**122**	**7.0**	**0.3**	**174**	**6.85**	**538**	<0.0005	**0.010**	**0.144**	<0.004	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.001	<0.0005	<0.0008	**0.3**	**1.26**
		MW-4-030817	3/8/2017	**12.00**	**872**	**8.49**	**6.90**	**0.030**	**131**	**6.9**	**0.3**	**188**	**6.92**	**565**	<0.0005	**0.015**	**0.152**	<0.004	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.001	<0.0005	<0.0008	**0.3**	**1.52**
		MW4-041017[b]	4/11/2017	**11.77**	**854**	**8.84**	**6.78**	**0.028**	**118**	**6.7**	**0.3**	**168**	**6.97**	**523**	<0.0005	**0.008**	**0.138**	<0.004	<0.005	<0.005	<0.005	<0.005	<0.01	**0.006**	<0.001	<0.0005	<0.0008	**0.3**	**0.86**
		MW4-050917	5/9/2017	**13.60**	**873**	**9.46**	**6.96**	<0.025	**120**	**6.9**	**0.3**	**176**	**6.93**	**387**	<0.0005	**0.005**	**0.137**	<0.004	<0.005	<0.005	<0.005	<0.005	<0.01	**0.006**	**0.001**	<0.0005	<0.0008	**0.3**	**2.31**
		MW4061317	6/13/2017	**16.47**	**870**	**8.03**	**6.9**	<0.025	**116**	**7.0**	**0.4**	**169**	**6.85**	**558**	<0.0005	**0.007**	**0.137**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	**0.006**	<0.001	<0.0005	<0.0008	**0.4**	**3.13**
		MW4071117	7/11/2017	**15.1**	**868**	**9.1**	**6.90**	**0.026**	**113**	**6.9**	**0.3**	**164**	**6.94**	**514**	<0.0005	**0.008**	**0.136**	<0.004	<0.005	<0.005	<0.005	<0.005	<0.01	**0.006**	**0.001**	<0.0005	<0.0008	**0.3**	**0.94**
	MW-5	MW-5-082116	8/21/2016	**15.15**	**603**	**0.9**	**6.56**	**0.371**	**128**	**6.1**	**0.2**	**329**	**7.21**	**620**	<0.0005	**0.006**	**0.039**	<0.001	<0.0005	<0.001	<0.001	**0.010**	**0.003**	<0.001	<0.001	<0.001	<0.0008	**0.2**	**3.71**
		MW-5-091716-01	9/17/2016	**18.90**	**928**	**9.97**	**7.20**	**0.437**	**125**	**6.1**	**0.3**	**323**	**7.10**	**566**	<0.0005	<0.008	**0.04**	<0.001	<0.001	<0.008	<0.008	<0.008	**0.020**	<0.008	<0.001	<0.001	<0.0008	**0.3**	**1.66**
		MW-5-101816	10/18/2016	**15.88**	**979**	**8.14**	**6.97**	**0.418**	**136**	**6**	**0.2**	**306**	**7.05**	**632**	<0.0005	**0.008**	**0.038**	<0.004	<0.002	<0.004	<0.004	<0.004	<0.01	<0.004	<0.001	<0.002	<0.0008	**0.2**	**1.83**
		MW-5-110816	11/8/2016	**14.04**	**1007**	**2.04**	**6.96**	**0.438**	**133**	**6.5**	<0.1	**323**	**7.32**	**667**	<0.0005	**0.010**	**0.038**	<0.004	<0.002	<0.005	<0.005	<0.005	<0.01	<0.005	<0.001	<0.002	<0.0008	<0.1	**0.99**
		MW-5-011117	1/11/2017	**10.99**	**985**	**0.89**	**7.11**	**0.482**	**152**	**6.4**	**0.3**	**328**	**7.41**	**667**	<0.0005	**0.009**	**0.038**	<0.004	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.001	<0.0005	<0.0008	**0.3**	**1.43**
		MW-5-020217	2/2/2017	**10.18**	**1029**	**0.65**	**7.14**	**0.452**	**153**	**6.2**	**0.2**	**322**	**6.95**	**726**	<0.0005	**0.010**	**0.036**	<0.004	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.001	<0.0005	<0.0008	**0.2**	**1.33**
		MW-5-030917	3/9/2017	**10.39**	**1023**	**0.43**	**7.14**	**0.513**	**196**	**6.2**	**0.2**	**326**	**7.04**	**715**	<0.0005	<0.005	**0.055**	<0.004	<0.005	<0.005	<0.005	<0.005	<0.01	**0.021**	<0.001	<0.0005	<0.0008	**0.2**	**1.42**
		MW5-041117	4/11/2017	**12.09**	**24**	**0.32**	**6.90**	**0.475**	**148.0**	**6**	**0.2**	**329**	**7.06**	**721**	<0.0005	**0.010**	**0.038**	<0.004	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.001	<0.0005	<0.0008	**0.2**	**1.14**
		MW5-050917	5/9/2017	**15.20**	**1032**	**2.57**	**7.05**	**0.434**	**156**	**6.2**	**0.2**	**324**	**7.20**	**591**	<0.0005	<0.005	**0.038**	<0.004	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	**0.001**	<0.0005	<0.0008	**0.2**	**2.35**
		MW5061317	6/13/2017	**16.52**	**1027**	**2.37**	**7.09**	**0.445**	**146**	**6.1**	**0.2**	**328**	**6.99**	**696**	<0.0005	**0.010**	**0.038**	<0.004	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	**0.001**	<0.0005	<0.0008	**0.2**	**ND**
		MW5071117	7/11/2017	**15.6**	**1030**	**2.3**	**7.10**	**0.397**	**142**	**6.2**	**0.2**	**315**	**7.02**	**722**	<0.0005	**0.008**	**0.035**	<0.004	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	**0.001**	<0.0005	<0.0008	**0.2**	**1.32**
Down Gradient	MW-6	MW-6-082216	8/22/2016	**15.67**	**683**	**2.2**	**6.47**	**0.440**	**152**	**11.5**	**0.4**	**353**	**6.86**	**782**	<0.0005	<0.001	**0.044**	<0.001	<0.0005	<0.001	<0.001	<0.001	**0.020**	**0.019**	**0.001**	<0.001	<0.0008	**0.4**	**0.72**
		MW-6-091716-01	9/17/2016	**19.40**	**1067**	**8.21**	**6.90**	**0.545**	**151**	**11.3**	**0.4**	**359**	**7.04**	**680**	<0.0005	<0.008	**0.045**	<0.001	<0.001	<0.008	<0.008	<0.008	**0.030**	**0.020**	<0.001	<0.001	<0.0008	**0.4**	**2.32**
		MW-6-101716	10/17/2016	**20.72**	**1115**	**0.71**	**6.78**	**0.473**	**162**	**11**	**0.4**	**346**	**6.89**	**780**	<0.0005	<0.004	**0.047**	<0.004	<0.002	<0.004	<0.004	<0.004	**0.020**	**0.023**	**0.002**	<0.002	<0.0008	**0.4**	**1.77**
		MW-6-110816	11/8/2016	**16.94**	**1134**	**0.59**	**6.78**	**0.479**	**158**	**11.6**	**0.4**	**361**	**6.90**	**752**	<0.0005	<0.005	**0.049**	<0.004	<0.002	<0.005	<0.005	<0.005	**0.020**	**0.023**	**0.001**	<0.002	<0.0008	**0.4**	**0.99**
		MW-6-121416	12/14/2016	**15.17**	**1114**	**0.19**	**6.77**	**0.499**	**193**	**11.7**	**0.4**	**375**	**7.05**	**777**	<0.0005	<0.005	**0.052**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.02**	**0.024**	<0.001	<0.0005	<0.0008	**0.4**	**2.82**
		MW-6-011217	1/12/2017	**14.61**	**1121**	**2.48**	**6.98**	**0.5**	**179**	**11.8**	**0.4**	**385**	**7.30**	**791**	<0.0005	<0.005	**0.053**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.02**	**0.022**	**0.001**	<0.0005	<0.0008	**0.4**	<0.59
		MW-6-020217	2/2/2017	**13.74**	**1175**	**0.56**	**6.80**	**0.475**	**185**	**11.9**	**0.4**	**385**	**6.99**	**855**	<0.0005	<0.005	**0.1**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.020**	**0.022**	**0.001**	<0.0005	<0.0008	**0.4**	**0.92**
		MW-6-030817	3/8/2017	**14.64**	**1156**	**1.34**	**6.95**	**0.504**	**193**	**11.9**	**0.4**	**390**	**6.95**	**849**	<0.0005	<0.005	**0.055**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.02**	**0.021**	<0.001	<0.0005	<0.0008	**0.4**	**0.73**
		MW6-041017	4/10/2017	**15.18**	**1149**	**0.52**	**6.89**	**0.487**	**182**	**11.7**	**0.3**	**382**	**6.84**	**813**	<0.0005	<0.005	**0.050**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.02**	**0.021**	**0.002**	<0.0005	<0.0008	**0.3**	**0.73**
		MW6-050917	5/9/2017	**15.46**	**1140**	**0.42**	**6.89**	**0.402**	**177**	**11.7**	**0.3**	**372**	**6.89**	**704**	<0.0005	<0.005	**0.050**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.02**	**0.020**	**0.002**	<0.0005	<0.0008	**0.3**	**<0.66**
		MW6061317	6/13/2017	**18.13**	**1140**	**0.50**	**6.93**	**0.446**	**167**	**11.7**	**0.3**	**371**	**6.96**	**833**	<0.0005	<0.005	**0.050**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.02**	**0.019**	**0.001**	<0.0005	<0.0008	**0.3**	**0.78**
		MW6071117	7/11/2017	**16.4**	**1122**	**1.1**	**6.96**	**0.397**	**164**	**11.6**	**0.4**	**356**	**7.20**	**790**	<0.0005	<0.005	**0.048**	<0.004	<0.005	<0.005	<0.005	<0.005	**0.02**	**0.021**	**0.002**	<0.0005	<0.0008	**0.4**	**1.08**

ABBREVIATIONS AND NOTES:

Bold value: Detection above laboratory reporting limit

- USEPA. 2016. Final Rule: Disposal of Coal Combustion Residuals from Electric Utilities. July 26. 40 CFR Part 257. https://www.epa.gov/coalash/coal-ash-ru

[a] - Sample erronesouly labeled MW7-032317

[b] - Sample erroneously labeled MW4-041017

[c] - Sample erroneously labeled MW2-071117

[d] - Sample erroneously labeled MW30711117

µS/cm = microSiemen per centimeter

CCR = coal combustion residuals

ft AMSL = feet above mean sea level

MCL = maximum contaminant level

mg/L = milligrams per liter

NA = not applicable

NS = no sample, sample was lost in transit.

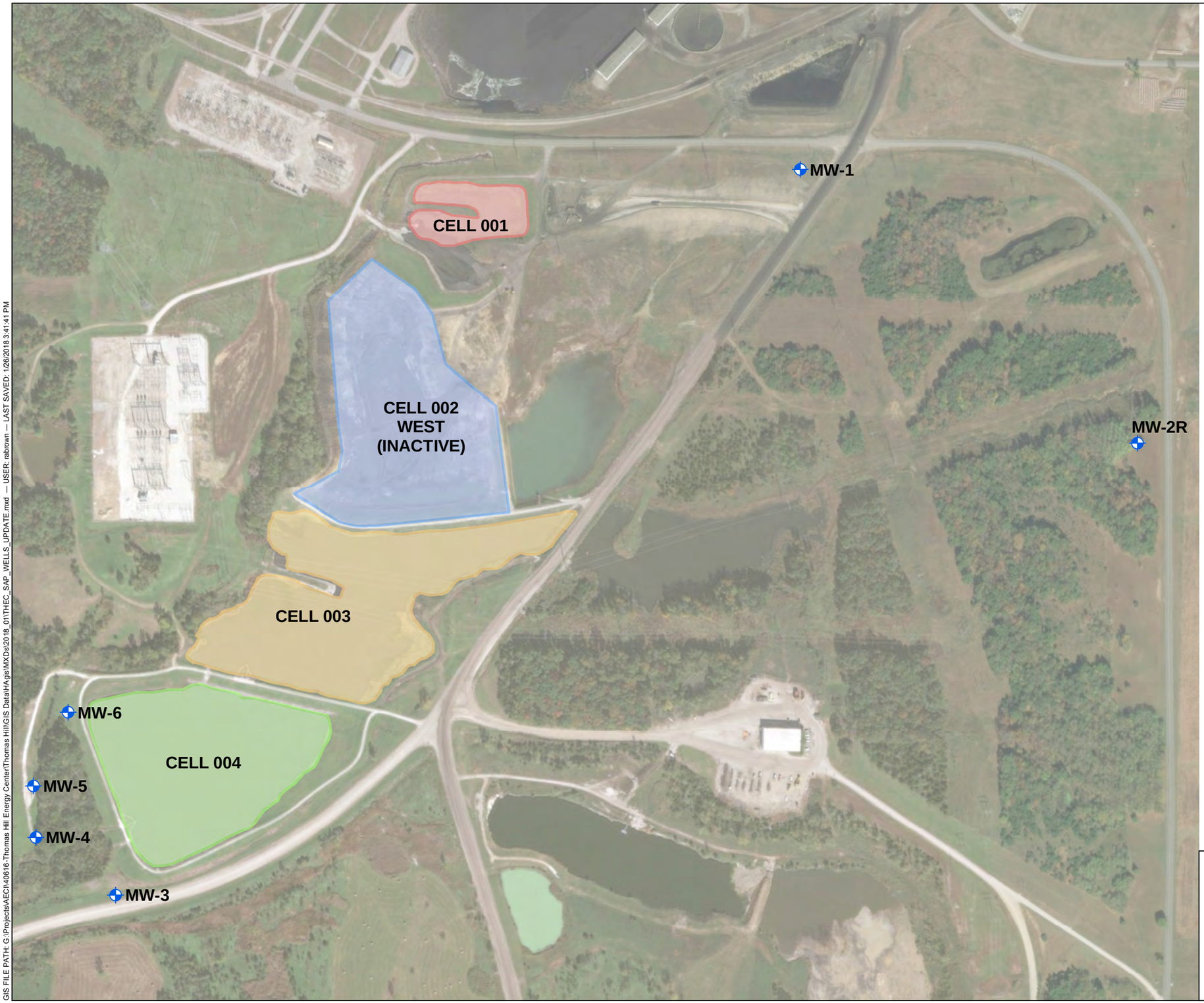
NTU = Nephelometric Turbidity Units

pCi/L = picoCurie per liter

su = standard units

USEPA = United States Environmental Protection Agency

FIGURES



LEGEND

- THEC CCR MONITORING WELL
- PIEZOMETRIC OBSERVATION ONLY
- CELL 001
- CELL 002 WEST (INACTIVE)
- CELL 003
- CELL 004

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. THEC CCR MONITORING ACCOMPLISHED VIA A MULTI-UNIT GROUNDWATER MONITORING SYSTEM, REFERRED TO AS THE ASH POND SYSTEM, THAT INCLUDES: CELL 001, CELL 003, AND CELL 004. CELL 002 WEST IS AN INACTIVE CCR IMPOUNDMENT.

3. AERIAL IMAGERY SOURCE: ESRI, 15 JANUARY 1999. IMAGERY AT THIS SCALE MAY NOT REFLECT CURRENT SURFACE FEATURES.

N

0 400 800
SCALE IN FEET

HALEY ALDRICH

ASSOCIATED ELECTRIC COOPERATIVE, INC.
THOMAS HILL ENERGY CENTER
CLIFTON HILL, MISSOURI

THOMAS HILL ENERGY CENTER
ASH POND SYSTEM
MONITORING WELL LOCATION MAP

aeci

JANUARY 2018
SCALE: AS SHOWN

FIGURE 1

GIS FILE PATH: G:\Projects\AECI\140616-Thomas Hill Energy Center\Thomas Hill\GIS Data\HA\gis\MXDs\2018_01\THEC_SAP_WELLS_UPDATE.mxd — USER: rabrown — LAST SAVED: 1/26/2018 3:41:41 PM