

2021 ANNUAL GROUNDWATER MONITORING AND  
CORRECTIVE ACTION REPORT  
POND 004  
NEW MADRID POWER PLANT  
NEW MADRID, MISSOURI

by  
Haley & Aldrich, Inc.  
Cleveland, Ohio


for  
Associated Electric Cooperative, Inc.  
Springfield, Missouri

File No. 129342-041  
January 2022



# Table of Contents

	Page
<b>List of Tables</b>	<b>ii</b>
<b>List of Figures</b>	<b>ii</b>
<b>1. Introduction</b>	<b>1</b>
1.1 40 CFR § 257.90(E)(6) SUMMARY	1
1.1.1 40 CFR § 257.90(e)(6)(i) – Initial Monitoring Program	1
1.1.2 40 CFR § 257.90(e)(6)(ii) – Final Monitoring Program	1
1.1.3 40 CFR § 257.90(e)(6)(iii) – Statistically Significant Increases	1
1.1.4 40 CFR § 257.90(e)(6)(iv) – Statistically Significant Levels	2
1.1.5 40 CFR § 257.90(e)(6)(v) – Selection of Remedy	2
1.1.6 40 CFR § 257.90(e)(6)(vi) – Remedial Activities	3
<b>2. 40 CFR § 257.90 Applicability</b>	<b>4</b>
2.1 40 CFR § 257.90(A)	4
2.2 40 CFR § 257.90(E) – SUMMARY	4
2.2.1 Status of the Groundwater Monitoring Program	4
2.2.2 Key Actions Completed	4
2.2.3 Problems Encountered	5
2.2.4 Actions to Resolve Problems	5
2.2.5 Project Key Activities for Upcoming Year	5
2.3 40 CFR § 257.90(E) – INFORMATION	5
2.3.1 40 CFR § 257.90(e)(1)	5
2.3.2 40 CFR § 257.90(e)(2) – Monitoring System Changes	5
2.3.3 40 CFR § 257.90(e)(3) – Summary of Sampling Events	5
2.3.4 40 CFR § 257.90(e)(4) – Monitoring Transition Narrative	6
2.3.5 40 CFR § 257.90(e)(5) – Other Requirements	6
2.4 40 CFR § 257.90(F)	8

Mark Nicholls, PG  
Name  
  
Signature

Senior Hydrogeologist  
Title  
28 January 2022  
Date

## List of Tables

<b>Table No.</b>	<b>Title</b>
I	Background Concentrations and Groundwater Protection Standards

## List of Figures

<b>Figure No.</b>	<b>Title</b>
1	Pond 004 Monitoring Well Location Map

## 1. Introduction

This 2021 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) addresses Pond 004 at the New Madrid Power Plant (NMPP), operated by the Associated Electric Cooperative, Inc. (AECI). This Annual Report was developed in accordance with the U.S. Environmental Protection Agency Coal Combustion Residual (CCR) Rule effective 19 October 2015 (Rule) including subsequent revisions, specifically Code of Federal Regulations Title 40 (40 CFR), subsection 257.90(e). The Annual Report documents the groundwater monitoring system for Pond 004 consistent with applicable sections of 257.90 through 257.98, and describes activities conducted in the prior calendar year (2021) and documents compliance with the Rule. The specific requirements listed in § 257.90(e)(1)-(6) of the Rule are provided in Sections 1 and 2 of this Annual Report and are in bold italic font, followed by a short narrative describing how each Rule requirement has been met.

### 1.1 40 CFR § 257.90(e)(6) SUMMARY

***A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit. At a minimum, the summary must specify all of the following:***

#### 1.1.1 40 CFR § 257.90(e)(6)(i) – Initial Monitoring Program

***At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;***

At the start of the current annual reporting period (1 January 2021), Pond 004 was operating under an assessment monitoring program in compliance with 40 CFR § 257.95.

#### 1.1.2 40 CFR § 257.90(e)(6)(ii) – Final Monitoring Program

***At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;***

At the end of the current annual reporting period (31 December 2021), Pond 004 was closed in accordance with the requirements of 40 CFR § 257.102(c). Upon documentation of CCR waste material removal from the unit on 20 May 2020, two consecutive sampling events, May 2020 and August 2020, were used to document that detected appendix IV constituents did not exceed the groundwater protection standards (GWPS) for Pond 004 pursuant to § 257.95(h). The Pond 004 surface impoundment was closed on 14 April 2021 in accordance with the requirements of § 257.102(c).

#### 1.1.3 40 CFR § 257.90(e)(6)(iii) – Statistically Significant Increases

***If it was determined that there was a statistically significant increase over background for one or more constituents listed in appendix III to this part pursuant to §257.94(e):***

##### 1.1.3.1 40 CFR § 257.90(e)(6)(iii)(a)

***Identify those constituents listed in appendix III to this part and the names of the monitoring wells associated with such an increase; and***

Pond 004 was operating under an assessment monitoring program until April 2021 prior to closure; therefore, no statistical evaluations were conducted for appendix III constituents in 2021.

**1.1.3.2** 40 CFR § 257.90(e)(6)(iii)(b)

***Provide the date when the assessment monitoring program was initiated for the CCR unit.***

An assessment monitoring program for Pond 004 was established on 15 August 2018 to meet the requirements of 40 CFR § 257.95. Pond 004 was closed on 14 April 2021 in accordance with the requirements of § 257.102(c).

**1.1.4** 40 CFR § 257.90(e)(6)(iv) – Statistically Significant Levels

***If it was determined that there was a statistically significant level above the groundwater protection standard for one or more constituents listed in appendix IV to this part pursuant to § 257.95(g) include all of the following:***

**1.1.4.1** 40 CFR § 257.90(e)(6)(iv)(a) – Statistically Significant Level Constituents

***Identify those constituents listed in appendix IV to this part and the names of the monitoring wells associated with such an increase;***

No statistically significant levels (SSL) were identified above the GWPS for those constituents listed in appendix IV to this part in 2021 for Pond 004.

**1.1.4.2** 40 CFR § 257.90(e)(6)(iv)(b) – Initiation of the Assessment of Corrective Measures

***Provide the date when the assessment of corrective measures was initiated for the CCR unit;***

No assessment of corrective measures was required to be initiated in 2021 for this unit. Pond 004 was closed on 14 April 2021 in accordance with the requirements of § 257.102(c).

**1.1.4.3** 40 CFR § 257.90(e)(6)(iv)(c) – Assessment of Corrective Measures Public Meeting

***Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and***

An assessment of corrective measures was not required for Pond 004 in 2021; therefore, a public meeting was not held.

**1.1.4.4** 40 CFR § 257.90(e)(6)(iv)(d) – Completion of the Assessment of Corrective Measures

***Provide the date when the assessment of corrective measures was completed for the CCR unit.***

No assessment of corrective measures was required to be initiated in 2021 for this unit. Pond 004 was closed on 14 April 2021 in accordance with the requirements of § 257.102(c).

**1.1.5** 40 CFR § 257.90(e)(6)(v) – Selection of Remedy

***Whether a remedy was selected pursuant to § 257.97 during the current annual reporting period, and if so, the date of remedy selection; and***

Pond 004 was closed on 14 April 2021 in accordance with the requirements of § 257.102(c), and no remedy was required to be selected.

**1.1.6 40 CFR § 257.90(e)(6)(vi) – Remedial Activities**

***Whether remedial activities were initiated or are ongoing pursuant to § 257.98 during the current annual reporting period.***

No remedial activities were required to be initiated in 2021; therefore, no demonstration or certification is applicable for this unit.

## 2. 40 CFR § 257.90 Applicability

### 2.1 40 CFR § 257.90(a)

***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 257.99, except as provided in paragraph (g) [Suspension of groundwater monitoring requirements] of this section.***

AECI has installed and certified a groundwater monitoring system at the NMPP Pond 004. Pond 004 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 the monitoring completed and actions taken at the NMPP Pond 004 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 2021.

#### 2.2.1 Status of the Groundwater Monitoring Program

Pond 004 was closed on 14 April 2021 in accordance with the requirements of § 257.102(c).

#### 2.2.2 Key Actions Completed

The 2020 Annual Groundwater Monitoring and Corrective Action Report was completed in January 2021. Statistical analysis, in support of § 257.95(e), was completed in January 2021 on analytical data from the August 2020 semi-annual assessment monitoring sampling event. The statistical analysis did not identify any appendix IV SSLs.

Pond 004 was closed on 14 April 2021 in accordance with the requirements of § 257.102(c). No sampling events were completed at Pond 004 in 2021.

### 2.2.3 Problems Encountered

No problems (i.e., problems could include damaged wells, issues with sample collection or lack of sampling, or problems with analytical analysis) were encountered at the NMPP Pond 004 in 2021.

### 2.2.4 Actions to Resolve Problems

No problems were encountered at the NMPP Pond 004 in 2021; therefore, no actions to resolve problems were required.

### 2.2.5 Project Key Activities for Upcoming Year

Pond 004 was closed on 14 April 2021 in accordance with the requirements of § 257.102(c). No key activities are planned to be completed in 2022 at the unit under the CCR Rule.

## 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 up gradient) and down gradient 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 NMPP Pond 004 is included in this report as Figure 1. In addition, this information is presented in the CCR Groundwater Monitoring Network Description Report prepared for AECl, which was placed in the facility's operating record by 17 October 2017 as required by § 257.105(h)(2).

### 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 2021.

### 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 down gradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;***



Upon completion of the statistical evaluation of the August 2020 semi-annual assessment monitoring sampling event, Pond 004 was closed in accordance with the requirements of § 257.102(c). No sampling events were completed at Pond 004 in 2021.

#### **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***

The assessment monitoring program was established on 15 August 2018 to meet the requirements of 40 CFR § 257.95. Upon documentation of CCR waste material removal from the unit on 20 May 2020, two consecutive sampling events, May 2020 and August 2020, were used to document that detected appendix IV constituents did not exceed the GWPSs for Pond 004 pursuant to § 257.95(h). The Pond 004 surface impoundment was closed on 14 April 2021 in accordance with the requirements of § 257.102(c).

#### **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 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 2021.

##### **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).***

This unit was closed on 14 April 2021 in accordance with § 257.102(c). Prior to that date, the unit was operating under an assessment monitoring program. No demonstration for alternative detection monitoring frequency 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.**

Pond 004 was closed on 14 April 2021 in accordance with § 257.102(c). Prior to that date, the unit was operating under an assessment monitoring program; therefore, no detection monitoring alternate source 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 was not established for this CCR unit; therefore, no demonstration or certification is applicable. This unit was closed on 14 April 2021 in accordance with § 257.102(c).

**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 was in effect at the CCR unit until closure on 14 April 2021. The background concentrations (upper tolerance limits) and GWPSs established for detected appendix IV constituents for Pond 004 are included in Table I. The background concentrations and GWPSs provided in Table I were utilized for the statistical evaluations completed in 2021 for the August 2020 semi-annual assessment monitoring sampling event.

**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.**

Statistical analyses of assessment monitoring samples collected in August 2020 did not identify any appendix IV SSLs exceeding the established GWPSs. Therefore, no assessment monitoring alternative source demonstration is 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.**

Statistical analyses of assessment monitoring samples collected in August 2020 did not identify any appendix IV SSLs exceeding the established GWPSs; therefore, this criterion is not applicable.

#### **2.4 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).**

In order to comply with the Rule recordkeeping requirements, the following actions must be completed:

- 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)].

## TABLE

**TABLE I**  
**BACKGROUND CONCENTRATIONS AND GROUNDWATER PROTECTION STANDARDS**  
**DETECTED APPENDIX IV CONSTITUENTS**  
ASSOCIATED ELECTRIC COOPERATIVE, INC.  
NEW MADRID POWER PLANT  
POND 004  
NEW MADRID, MISSOURI

Constituent	Background Concentration (UTL)	Groundwater Protection Standard
Arsenic	0.0099	0.010*
Barium	0.800	2*
Cobalt	0.005	0.006**
Fluoride	1.710	4.0*
Lead	0.0047	0.015*
Lithium	0.033	0.040**
Molybdenum	0.010	0.100**
Radium 226 & 228	2.54	5 pCi/L*
Selenium	0.0012	0.05*
Thallium	0.001	0.002*

**Notes:**

1. Groundwater Protection Standards listed were utilized for statistical analyses for the August 2020 semi-annual assessment monitoring sampling event.

\* Value set equal to the maximum contaminant level.

\*\* Value set based on 40 CFR § 257.95(h)(1)

mg/L = milligrams per liter

pCi/L = picoCuries per liter



UTL = upper tolerance limit

**FIGURE**

GIS FILE PATH: G:\Projects\AEC\New Madrid\GIS\MXDs\2020\_12\ANNUAL\_REPORT\129342\_020\_0001\_POND\_4\_WELL\_LOCATION\_MA.Pnxd — USER: khansen — LAST SAVED: 12/30/2020 3:17:17 PM

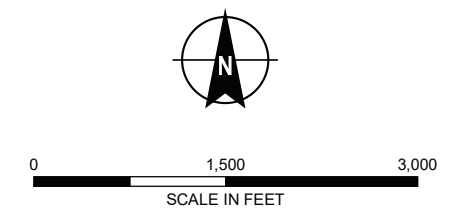


**LEGEND**

-  MONITORING WELL
-  POND 004

**NOTES**

1. ALL DIMENSIONS AND LOCATIONS ARE APPROXIMATE.
4. AERIAL IMAGERY SOURCE: ESRI, 21 APRIL 2019



**HALEY ALDRICH** ASSOCIATED ELECTRIC COOPERATIVE, INC.  
NEW MADRID POWER PLANT  
MARSTON, MISSOURI

**POND 004 MONITORING WELL  
LOCATION MAP**

JANUARY 2022

**FIGURE 1**