CLOSURE PLAN

CFR 257.102(b)

East and West Bottom Ash Ponds

Pirkey Power Plant
Hallsville, Texas

October 2016
Revision 1: December 2021
Revision 2: January 2025

Prepared for : Southwest Electric Power Company - Pirkey Plant

Hallsville, Texas

Prepared by: American Electric Power Service Corporation

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Document ID: GERS-25-005

CLOSURE PLAN
CFR 257.102(b)
PIRKEY POWER PLANT
EAST AND WEST BOTTOM ASH PONDS

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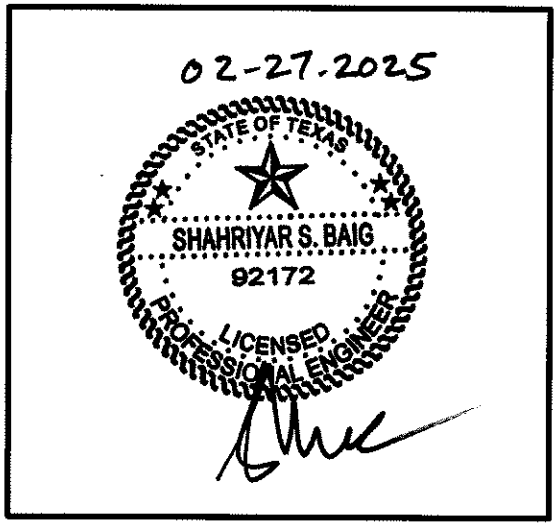

I certify to the best of my knowledge, information, and belief that the information contained in this closure plan meets the requirements of 40 CFR § 257.102(b)

Table of CONTENTS

ATTACHMENTS:

East Bottom Ash Pond (EBAP)

- **Soil Sampling and Analysis Plan**
  - **Figure 1: Site Location Map**
  - **Figure 2: CCR Unit Location Map**
  - **Figure 3: East Bottom Ash Pond Sampling Grid**

West Bottom Ash Pond (WBAP)

- **Soil Sampling and Analysis Plan**
  - **Figure 1: Site Location Map**
  - **Figure 2: CCR Unit Location Map**
  - **Figure 3: West Bottom Ash Pond Sampling Grid**

Revision December 2021:
Revised the schedule to show a sequence change; WBAP closes first then EBAP

Revision January 2025:
Added Section 4.1 and attached the Sampling and Analysis Plan.

1.0 OBJECTIVE

This report was prepared by AEP- Geotechnical Engineering Services (GES) section to fulfill requirements of CCR 257.102(b) (30 TAC 352.1211) for Closure Plans of Existing CCR Surface Impoundments.

2.0 DESCRIPTION OF THE CCR UNIT

The Henry W. Pirkey Power Station is located at 2400 FM 3251 and south of Hallsville, Texas. It is owned and operated by Southwest Electric Power Company (SWEPCO). The facility operates two surface impoundments for managing CCR materials called the East Bottom Ash Pond (East BAP) and the West Bottom Ash Pond (West BAP). These two ponds and a Clearwater Pond are collectively referenced at the Bottom Ash Complex. The Clearwater Pond is not a CCR surface impoundment.

The East BAP is located directly adjacent to and east of the West BAP. The East BAP receives sluiced bottom ash and has a surface area of 31.5 acres and a storage capacity of 188 acre-feet. The pond is almost entirely incised, with a reported maximum embankment height of 4 feet.

The West BAP, which also receives sluiced bottom ash, is located northwest of the main plant buildings and shares its eastern border with the western border of the East BAP. The West BAP receives sluiced bottom ash and has a surface area of 30.9 acres and a storage capacity of 188 acre-feet. The maximum embankment height is 25 feet. The main upstream embankment slopes are 3 feet horizontal to 1 foot vertical (3:1 H:V); while the main downstream slopes area 2.5:1 H:V.

The sluicing of CCR materials is alternated between the two CCR surface impoundments. CCR material is sluiced to one pond while the CCR material is dewatered and excavated from the other pond. The transport water from the sluicing operation is discharged into the Clearwater Pond. The plant recycles the water from the Clearwater Pond for plant operations.

3.0 DESCRIPTION OF CLOSURE PLAN 257.102(b)(1)(i)

[A narrative description of how the CCR unit will be closed in accordance with this section]

Closure of the Pirkey Power Plant East and West Bottom Ash Ponds will be completed by removal of all CCR material and sediments from each pond.

4.0 CLOSURE BY REMOVAL 257.102 (b)(1)(ii)

[If closure of the CCR unit will be accomplished through removal of CCR from the CCR unit, a description of the procedures to remove the CCR and decontaminate the CCR unit in accordance with paragraph (c) of this section.]

Closure by removal of the East and West bottom ash ponds will include removal of all CCR from the surface impoundments. The removal of all CCR and any sediments will be accomplished by dredging and/or mechanical means. The CCR material will be either placed in the onsite CCR landfill or hauled

offsite for beneficial reuse. A visual evaluation of the pond bottom by a third party consultant will be the basis for declaring the CCR material has been removed. After all CCR material has been removed, an additional 12 inches of soil from the pond bottom will be removed. Following the removal of CCR and soil, the dikes forming the pond will be used as subgrade material to regrade the area. The disturbed area will be seeded at the completion.

4.1 SOIL SAMPLING AND TESTING

To confirm and verify that the subsurface soils are free from any release or contamination due to the storage of the CCR materials in the ponds, soil samples will be collected, and laboratory tests performed. All the CCR and additional 1-foot of native soils has been removed from the East and West Bottom Ash Ponds. A detailed scope is provided in the Soil Sampling and Analysis Plan attached for reference.

4.2 CLOSURE PERFORMANCE STANDARDS 257.102 (c)

[An owner or operator may elect to close a CCR unit by removing and decontaminating all areas affected by releases from the CCR unit. CCR removal and decontamination of the CCR unit are complete when constituent concentrations throughout the CCR unit and any areas affected by releases from the CCR unit have been removed and groundwater monitoring concentrations do not exceed the groundwater protection standard established pursuant to §257.95(h) for constituents listed in appendix IV to this part.]

Closure of the CCR unit will be completed when all CCR materials in the unit, and any areas that may have been affected by releases from the CCR unit, have been removed and groundwater monitoring demonstrates that all concentrations of the assessment monitoring constituents listed in appendix IV to part 257 do not exceed either statistically equivalent background levels or MCLs for two consecutive sampling events using the statistical procedures in § 257.93(g).

5.0 ESTIMATE OF MAXIMUM CCR VOLUME 257.102 (b)(1)(iv)

[An estimate of the maximum inventory of CCR ever on-site over the active life of the CCR unit.]

The estimated maximum CCR volume on-site is 188 Acre-Ft. or 303,307 cubic yards for the East Bottom Ash Pond and 188 Acre-Ft. or 303,307 cubic yards for the West Bottom Ash Pond.

6.0 ESTIMATE OF LARGEST AREA OF CCR REQUIRING COVER 257.102 (b)(1)(v)

[An estimate of the largest area of CCR unit ever requiring a final cover

This pond will be closed by removal of CCR materials as such this section is not applicable.

7.0 CLOSURE SCHEDULE 257.102(b)(1)(vi)

[A schedule for completing all activities necessary to satisfy the closure criteria in the section, including an estimate of the year in which all closure activities for the CCR unit will be completed. The schedule should provide sufficient information to describe the sequential steps that will be taken to close the CCR unit, including identification of major milestones such as coordinating with and obtaining necessary approvals and permits from other agencies, the dewatering and stabilization phases of the CCR surface impoundment closure, or installation of the final cover system, and the estimated timeframes to complete each step or phase of the CCR unit closure.

The generating units will cease operation in March 2023. During 2021, a splitter dike was constructed within the East BAP so that operations could continue until the generating units cease operations. The following schedule is related to the work necessary to complete final closure activities of both ponds.

Initiate engineering and design for closure	December 2020
Modify the East BAP	September 2021
Bid and award construction contract	November 2021 – March 2022
Dewater and remove CCR from West BAP	October 2021 – June 2022
West BAP remove soil and Regrade area to drain	June 2022-October 2022
Dewater and remove CCR from East BAP	April 2023-July 2023
East BAP remove soil and regrade area to drain	July 2023 – December 2023
Soil Sampling	January 2025

ATTACHMENTS

American Electric Power/Southwestern Electric Power Company

Soil Sampling and Analysis Plan – East Bottom Ash Pond

Henry W. Pirkey Power Plant
2400 FM 3251
Hallsville, Harrison County, Texas

January 2025

Soil Sampling and Analysis Plan – East Bottom Ash Pond

Henry W. Pirkey Power Plant
2400 FM 3251
Hallsville, Harrison County, Texas

January 2025

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Contents

Figures

Acronyms and Abbreviations

AEP	American Electric Power Company
CCR	Coal Combustion Residue
CFR	Code of Federal Regulations
COC	Chemical of Concern
CQA	Construction Quality Assurance
DPT	Direct Push Technology
EBAP	East Bottom Ash Pond
EPA	Environmental Protection Agency
Ft bgs	Feet Below Ground Surface
GWPS	Groundwater Protection Standard
HASP	Health and Safety Plan
JSA	Job Safety Analysis/Analyses
NELAP	National Environmental Laboratory Accreditation Program
pCi/g	Picocuries/gram
PCL	Protective Concentration Level
RALs	Residential Assessment Levels
SAP	Sampling and Analysis Plan
SPLP	Synthetic Precipitation Leaching Procedure
SWEPCO	Southwestern Electric Power Company
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TRRP	Texas Risk Reduction Program
USCS	Unified Soil Classification System

1 Introduction

Southwestern Electric Power Company (SWEPCO), a subsidiary of American Electric Power (AEP), owns and operated the Henry W. Pirkey Power Plant (the Plant), located at 2400 FM 3251 in Harrison County, approximately five miles southeast of Hallsville, Texas and approximately eight miles southwest of Marshall, Texas (**Figure 1**). The Plant operated from 1985 to 2023 and consists of four coal combustion residuals (CCR) waste management units (West Bottom Ash Pond, East Bottom Ash Pond, Flue Gas Desulfurization Stack out Area, and Landfill) (Arcadis, 2016). A site plan showing the Plant and CCR units is provided as **Figure 2**.

Arcadis U.S., Inc. (Arcadis), on behalf of AEP, has prepared this Soil Sampling and Analysis Plan (SAP) to support closure of the EBAP. As part of closure, SWEPCO must demonstrate that the unit has been adequately decontaminated for the list of constituents in 40 CFR 257 Appendix IV and this SAP covers the collection and analysis of soil samples to make this demonstration.

This SAP will be provided to the Texas Commission on Environmental Quality (TCEQ) for review. After receiving TCEQ's concurrence to proceed with sampling, the SAP will be implemented and a report with justification for the sampling approach and summarizing the sampling results will be prepared and submitted to the TCEQ as part of the EBAP closure package. The soil SAP for the WBAP is provided under separate cover.

2 Unit Description

The base of the EBAP was constructed in 1983 and 1984 with a compacted clay liner and was placed into operation in 1985. The EBAP had a surface area of 28 acres and a storage capacity of 188-acre-feet. The embankments were constructed of compacted clay on a 3:1 slope (Sargent & Lundy, 1983). The EBAP received bottom ash and economizer ash sluiced from the power plant boiler. Clear water overflowed from the EBAP and discharged into the Secondary Ash Pond located directly south of the EBAP. Bottom ash and economizer ash were periodically excavated from the EBAP and hauled by truck to the on-site landfill for disposal (Arcadis, 2016).

A groundwater monitoring system was developed for the EBAP in 2017, and assessment monitoring was initiated in April of 2018 and continues through present day.

3 Summary of Closure Activities

As required in 40 Code of Federal Regulations (CFR) §257.101(a)(1) (30 TAC 352), the owner or operator of an existing unlined CCR surface impoundment must close the CCR unit. AEP submitted an Alternative Closure Demonstration Report in accordance with §257.103(f)(2) to the Environmental Protection Agency (EPA) dated November 30, 2020, which was determined complete by EPA in a letter January 11, 2022. (Akron, 2023). AEP submitted the Intent to Initiate Closure Notification for the EBAP to the TCEQ on April 25, 2023. A Closure Plan for the EBAP was prepared in accordance with 40 CFR §257.102(b) in October 2016 and revised in December 2021. As stated in the Closure Plan, the EBAP was to be closed by CCR removal in accordance with §257.102(c).

AEP discontinued sluicing CCR to the EBAP and sending miscellaneous non-CCR wastewater streams to the EBAP on April 25, 2023. Per 40 CFR §257.102(c) and 30 TAC §352.1221, part of the closure by removal process involves removing and decontaminating all areas affected by releases from the CCR unit. In order to achieve this

goal, AEP determined that in addition to removal of the CCR, an additional 12 inches (minimum) of existing soil beneath the pond would be excavated.

Removal of CCR and an additional one foot of underlying soil from the EBAP has been completed. A construction as-built drawing showing the contours of the bottom of the pond after CCR and additional soil removal from the EBAP was prepared by the Construction Quality Assurance (CQA) contractor (Akron, 2023). The contractor used the outer banks of the pond as clean fill material. The thickness of fill material placed around the outer portions of the EBAP ranged from six to seven feet, while approximately 0.5 feet of fill material was placed around the inner areas of the EBAP.

A closure certification report for the EBAP dated October 12, 2023 was submitted to the TCEQ for review and approval (Akron, 2023). However, the TCEQ informed AEP in a June 10, 2024 teleconference that soil sampling for the 40 CFR §257 Appendix IV constituents was required to demonstrate that the unit was adequately decontaminated. TCEQ approval is therefore pending completion of the soil sampling and analyses described herein. The report summarizing the soil sampling activities will be certified by a Texas Professional Engineer (P.E.) and submitted with the Closure Certification Report for TCEQ approval. The objective of the proposed soil sampling strategy in Section 4 is to provide this demonstration.

4 Soil Sampling Strategy and Methodology

As stated previously, the EBAP had an area of approximately 28 acres. The objective of the soil sampling is to collect samples from native soil underlying the former pond to demonstrate that CCR and soil removal activities performed during the EBAP closure were adequate to decontaminate the area.

4.1 Pre-Sampling Activities

A site-specific Health and Safety Plan (HASP) and relevant task-specific Job Safety Analyses (JSA) will be prepared for the project, prior to mobilizing personnel to the site. Arcadis will work with AEP to incorporate any AEP-specific health and safety requirements into the plan. The HASP will be reviewed and signed off by the onsite Arcadis field scientist/geologist, who will then review it during an initial health and safety meeting with subcontractors (utility locator, driller, surveyor). Daily tailgate safety meetings will be conducted and documented in the field notes.

Arcadis will mobilize to the site to measure out a one-acre grid on the EBAP (**Figure 3**). Each grid block will be assigned an identifier (e.g., A1, B1, etc.). A sample location will be selected randomly using a random number generator within each grid block and marked in the field with a stake. Therefore, it is estimated that approximately 28 soil borings will be advanced within the EBAP. Arcadis will work with a surveyor from AEP's CQA contractor, Akron Consulting Company, LLC (Akron), to establish the grid, survey the sample locations, and determine the depth at which native soil will be encountered in the EBAP. The sample identification number and depth to native soil at each location will be marked on the sample location marker. If the original sample location must be relocated due to site conditions (e.g., inaccessibility, obstructions, etc.), the random number generator will be used to select another location within the grid.

Prior to initiating any intrusive work, the presence of subsurface and overhead utilities will be investigated. In accordance with the Arcadis Utility Location and Clearance Standard, the following will be completed:

- Plant specific excavation/digging permit prior to any sampling activities.

- After sample locations have been marked in the field, Arcadis or its drilling contractor will notify Texas 811 a minimum of 48 hours in advance of commencing intrusive activities at the site and identify any potential subsurface utility conflicts with proposed sampling locations.
- In addition, Arcadis will review any prior utility clearance for the unit or available drawings showing underground utilities in the sampling areas.
- If the prior utility clearance information or drawings showing underground utilities in the sampling area are not available, the soil boring locations will be cleared for subsurface utilities to a minimum depth of 5 feet below ground surface (ft bgs) utilizing a hand auger as a soft-dig utility clearance technique. If any obstruction is identified, the soil boring location will be field adjusted.

4.2 Sampling Methodology

Drilling will be performed by a Texas licensed drilling company with oversight by a field scientist or field geologist. Soil sampling will be performed using a track-mounted Direct-Push Technology (DPT) rig. The DPT rig will be positioned over the proposed sampling location in the grid block to advance the soil sampler through the fill material to the top of the native soil. The soil will be continuously logged by a field scientist or geologist for lithologic characteristics according to the Unified Soil Classification System (USCS). The field scientist/geologist will note general visual and olfactory observations, soil types and horizons, and depth to native soil.

Once native soil is reached beneath the clean fill material, a discrete grab sample will be collected from the upper one foot by the field scientist/geologist. The field scientist/geologist will ensure that adequate sample volume is collected for analysis of total 40 CFR §257 Appendix IV constituents and possible analysis using the Synthetic Precipitation Leaching Procedure (SPLP), if needed for data evaluation purposes. In addition to the initial sample collected from the upper foot, two additional vertical delineation samples will be collected from estimated depths of 1-2 and 2-3 feet. The additional samples will be placed on hold and analyzed only if needed.

Soil samples will be placed in clean sampling jars provided by the laboratory and labeled with the sample number (Grid Designation-Sample Depth-Date), sampler's initials, sample time, and requested analyses. The field scientist/geologist will wear a new pair of nitrile gloves for each sample collected. The samples will be placed in a cooler with ice and sent to the laboratory under proper chain of custody.

4.3 Investigation-Derived Waste Management

Soil cuttings generated during drilling will be placed back in the borehole, and the boreholes will be filled with bentonite. A decontamination pad will be constructed within the footprint of the EBAP. The soil sample tubes will be decontaminated between samples and downhole equipment in contact with soil will be decontaminated between soil sample locations. The drillers will use the onsite potable water source to decontaminate the downhole equipment and samplers using a high-pressure water washer or other suitable equipment. No soap will be used, and the pad will be constructed to prevent erosion and run-off from the pad. Accumulated water will be allowed to evaporate or will be drummed and characterized for proper disposal. General trash (e.g., used gloves, plastic liners, paper products, disposable sampling equipment, etc.) will be collected, containerized, and managed with general facility trash.

5 Sample Analysis

All 28 initial soil samples collected from the EBAP will be submitted to a National Environmental Laboratory Accreditation Program [NELAP] accredited laboratory for analysis of the Appendix IV to 40 CFR 257constituents, as follows:

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Fluoride
- Lead
- Lithium
- Mercury
- Molybdenum
- Selenium
- Thallium
- Radium 226 and 228 combined

Each of the 28 initial soil samples collected at the EBAP will be analyzed for the metal constituents listed above. Arcadis will work with the laboratory to ensure that the detection limits are below the comparative criteria (i.e., the residential soil-to-groundwater ($^{GW}Soil_{Ing}$) Tier 1 Protective Concentration Level (PCLs) and/or Texas-Specific Background concentration for metals, whichever is higher). Fluoride and lithium do not have Tier 1 PCLs for the $^{GW}Soil_{Ing}$ pathway; therefore, they will only be analyzed using SPLP.

Radium also does not have a Tier 1 PCL for the $^{GW}Soil_{Ing}$ pathway; however, EPA has established a radium level of 5 picoCuries per gram (pCi/g) as a protective health-based level for cleanup of soil (EPA, 2014) If there are exceedances of the EPA established radium level, select samples will be run for SPLP. During a teleconference on June 10, 2024, between AEP and the TCEQ regarding soil sampling for closure, TCEQ agreed that fewer samples could be collected for radium 226/228; therefore, 50% of the initial soil samples will be analyzed for radium 226/228 combined.

If there are metal exceedances of the Tier 1 Residential $^{GW}Soil_{Ing}$ PCL , Tier 2 PCLs may be calculated using the site-specific average pH concentration of 5.8 as presented in the Affected Property Assessment Report for the Trash Landfill A, Trash Landfill B, and Trash Landfill C dated July 24, 2023 (Arcadis, 2023). Otherwise SPLP analysis will be performed if the total concentration results for a constituent exceed the respective Tier 1 ($^{GW}Soil_{Ing}$ PCL). The SPLP results will be compared to the Appendix IV site-specific CCR GWPS.

6 Data Evaluation

Arcadis will implement the general procedures for data evaluation and usability assessment as defined in the TCEQ Regulatory Guidance for Review and Reporting of Chemicals of Concern (COC) Concentration Data RG-366/TRRP-13 to validate data received from the analytical laboratory. Validated data will then be compared to assessment levels to determine whether the unit has been adequately decontaminated. The procedure for evaluation of the results is discussed in the following section.

6.1 Evaluation of Results

Total metal concentrations will be evaluated to determine if any of the Appendix IV COC concentrations exceed the $^{GW}Soil_{Ing}$ PCLs. If the Texas-Specific Background concentration for a metal is greater than the $^{GW}Soil_{Ing}$ PCL, the background concentration becomes the PCL. Determination of successful decontamination will be as follows:

- If the Appendix IV COC concentrations are equal to or less than their respective Tier 1 $^{GW}Soil_{Ing}$ PCLs, 5 pCi/gram for Radium, and the site-specific GWPS for fluoride or lithium, decontamination has been confirmed in that area.
- If any Appendix IV COC exceeds their respective Tier 1 $^{GW}Soil_{Ing}$ PCLs, a Tier 2 PCL may be calculated, and the analytical results may be compared to the Tier 2 PCLs and if the Appendix IV COC concentrations are equal to or less than their respective Tier 2 PCL, decontamination has been confirmed in that area.
- If a COC exceeds the respective Tier 1 or Tier 2 PCL, or if the Tier 2 PCL is not used, the soil sample will be analyzed using SPLP. The SPLP results will be compared to the site-specific GWPS. If the SPLP results are equal to or less than the GWPS, decontamination has been confirmed in that area.
- After the above evaluation sequence, if it is decided that one or more metal exceedances of a comparative criterion cannot be resolved, Arcadis will request that the laboratory analyze the next shallowest vertical delineation sample from the location where the exceedance(s) occurred for that COC(s) to perform vertical delineation. The results will then follow the above sequence of PCL comparison until the vertical extent has been delineated. Horizontal delineation will also be completed as needed.
- If additional step out locations are needed to achieve vertical or horizontal delineation, Arcadis will revisit the sampling grid to collect appropriate samples.
- Based on the results, AEP will evaluate the need for any additional decontamination activities of the area.

7 Report Preparation and Certification

Arcadis will prepare a report summarizing the results of the soil sampling at the EBAP. The report will be certified by a Texas-licensed P.E. and will include:

- A justification for the sampling approach.
- A summary of the soil sampling activities performed to support the closure of the CCR unit and how these activities were performed in accordance with the SAP.
- Discussion of any deviations from the SAP and rationale for those deviations.
- Figures depicting sampling locations, and sample results.
- Data summary tables for metals and radium-226/228, including comparative criteria and SPLP results (as applicable).
- Calculations for Tier 2 PCLs (as applicable).
- Comparison of the analytical results to the site-specific GWPS, as applicable.
- Appendices containing laboratory reports, data usability evaluations/data validation reports, any other reports or correspondence that support the EBAP closure.

8 References

AEP. 2020. Notice of Intent to Comply with the Site-Specific Alternative to Initiation of Closure, Henry W. Pirkey Power Plant, CCR Units – East Bottom Ash Pond and West Bottom Ash Pond. November 30.

AEP. 2021. Closure Plan, East and West Bottom Ash Ponds, Pirkey Power Plant, Hallsville, Texas. December.

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Arcadis. 2016. East Bottom Ash Pond – CCR Location Restriction Evaluation. July 6.

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EPA. 2014. Document Display | NEPIS | US EPA

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TCEQ. 2024. Teleconference with AEP. June 10.

TCEQ. 30 TAC 350. Texas Risk Reduction Program.

TCEQ. 30 TAC 352. Coal Combustion Residuals Waste Management

Figures

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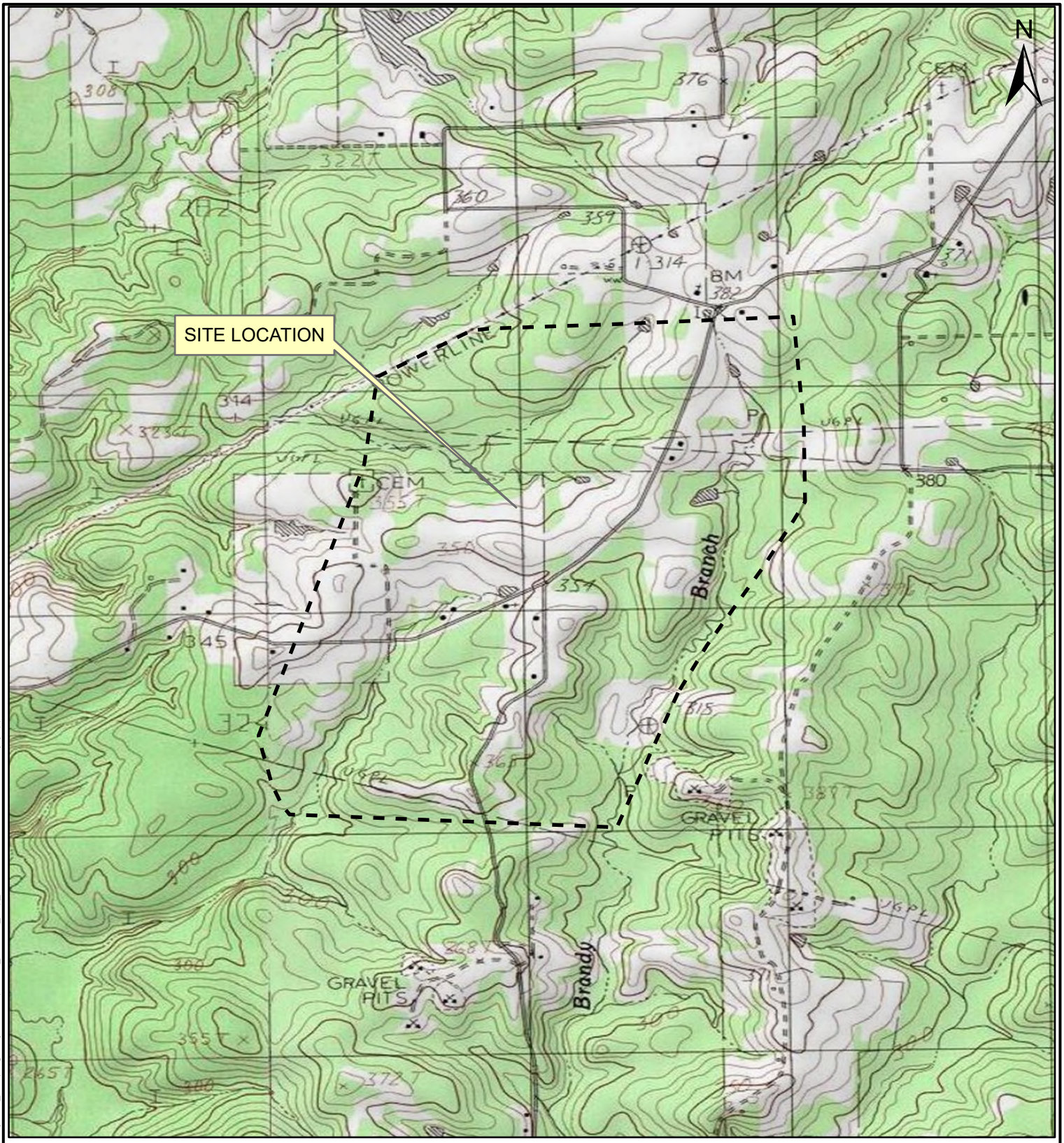

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GRAPHIC SCALE IN FEET

NOTE:

1. BASEMAP SOURCE: 7.5 MINUTE TOPOGRAPHIC QUADRANGLE FOR CASON, TEXAS, 2011

HENRY W. PIRKEY POWER PLANT
2400 FM 3251
HALLSVILLE, HARRISON COUNTY, TEXAS

SOIL SAMPLING AND ANALYSIS PLAN - EAST BOTTOM ASH POND

SITE LOCATION MAP

ARCADIS

FIGURE
1

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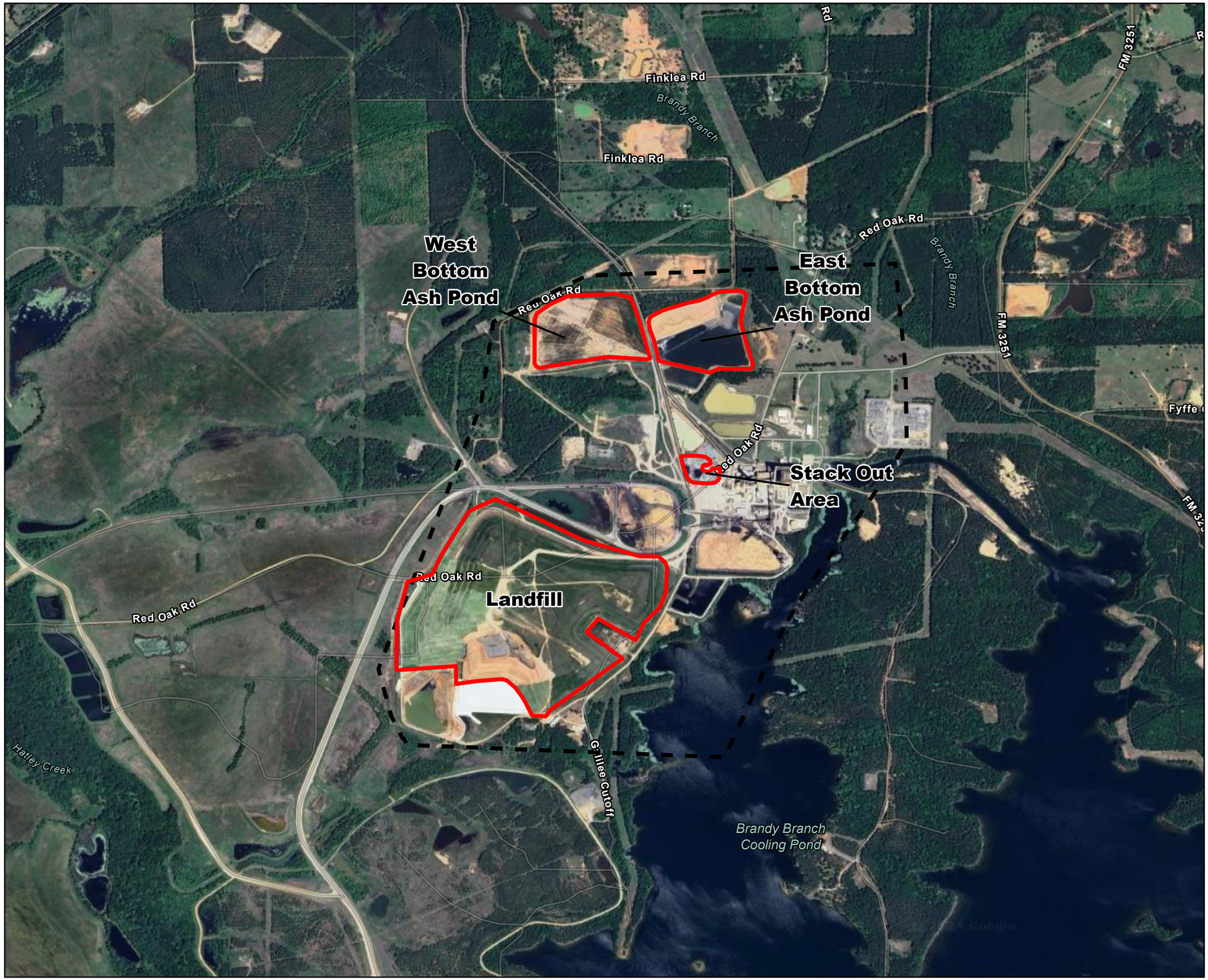

N

LEGEND

- SITE BOUNDARY
- COAL COMBUSTION RESIDUAL (CCR) UNIT

0 1,500 3,000

GRAPHIC SCALE IN FEET

NOTE:

1. BASEMAP SOURCE: GOOGLE EARTH PRO, DECEMBER 2023

HENRY W. PIRKEY POWER PLANT
2400 FM 3251
HALLSVILLE, HARRISON COUNTY, TEXAS

SOIL SAMPLING AND ANALYSIS PLAN - EAST BOTTOM ASH POND

COAL COMBUSTION RESIDUAL (CCR) UNIT LOCATION MAP

ARCADIS

FIGURE
2

Path: T:_ENV\AEP\Pirkey Plant\ArcPro_Figures\AEP_PirkeyPlant_SamplingAnalysisPlan.aprx\CCR_LocationMap_EastBottomAshPond Last Saved By: jrapp 12/16/2024

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LEGEND

- PROPOSED WELL LOCATION
- COAL COMBUSTION RESIDUAL (CCR) UNIT
- 1-ACRE SAMPLING GRID

0 200 400

GRAPHIC SCALE IN FEET

NOTES:

1. BASEMAP SOURCE: GOOGLE EARTH PRO, DECEMBER 2023
2. SAMPLE LOCATIONS WILL BE SELECTED RANDOMLY USING A RANDOM NUMBER GENERATOR WITHIN EACH GRID.

HENRY W. PIRKEY POWER PLANT
2400 FM 3251
HALLSVILLE, HARRISON COUNTY, TEXAS

SOIL SAMPLING AND ANALYSIS PLAN - EAST BOTTOM ASH POND

EAST BOTTOM ASH POND SAMPLING GRID

ARCADIS

FIGURE
3

American Electric Power/Southwestern Electric Power Company

Soil Sampling and Analysis Plan – West Bottom Ash Pond

Henry W. Pirkey Power Plant
2400 FM 3251
Hallsville, Harrison County, Texas

January 2025

Soil Sampling and Analysis Plan – West Bottom Ash Pond

Henry W. Pirkey Power Plant
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Contents

Figures

Acronyms and Abbreviations

AEP	American Electric Power Company
amsl	Above Mean Sea Level
CCR	Coal Combustion Residue
CFR	Code of Federal Regulations
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EPA	Environmental Protection Agency
Ft bgs	Feet Below Ground Surface
GWPS	Groundwater Protection Standard
HASP	Health and Safety Plan
JSA	Job Safety Analysis/Analyses
NELAP	National Environmental Laboratory Accreditation Program
pCi/g	Picocuries/gram
PCL	Protective Concentration Level
RALs	Residential Assessment Levels
SAP	Sampling and Analysis Plan
SPLP	Synthetic Precipitation Leaching Procedure
SWEPCO	Southwestern Electric Power Company
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TRRP	Texas Risk Reduction Program
USCS	Unified Soil Classification System
WBAP	West Bottom Ash Pond

1 Introduction

Southwestern Electric Power Company (SWEPCO), a subsidiary of American Electric Power (AEP), owns and operated the Henry W. Pirkey Power Plant (the Plant), located at 2400 FM 3251 in Harrison County, approximately five miles southeast of Hallsville, Texas and approximately eight miles southwest of Marshall, Texas (**Figure 1**). The Plant operated from 1985 to 2023 and consists of four coal combustion residuals (CCR) waste management units (West Bottom Ash Pond, East Bottom Ash Pond, Flue Gas Desulfurization Stack out Area, and Landfill) (Arcadis, 2016). A site plan showing the Plant and CCR units is provided as **Figure 2**.

Arcadis U.S., Inc. (Arcadis), on behalf of AEP, has prepared this Soil Sampling and Analysis Plan (SAP) to support closure of the WBAP. As part of closure, SWEPCO must demonstrate that the unit has been adequately decontaminated for the list of constituents in 40 CFR 257 Appendix IV and this SAP covers the collection and analysis of soil samples to make this demonstration.

This SAP will be provided to the Texas Commission on Environmental Quality (TCEQ) for review. After receiving TCEQ's concurrence to proceed with sampling, the SAP will be implemented and a report with justification for the sampling approach and summarizing the sampling results will be prepared and submitted to the TCEQ as part of the WBAP closure package. The soil SAP for the EBAP is provided under separate cover.

2 Unit Description

The base of the WBAP was constructed in 1983 and 1984 with a compacted clay liner and was placed into operation in 1985. The WBAP had a surface area of 30.9 acres and a storage capacity of 188-acre-feet at an elevation of 354 feet above mean sea level (amsl) and 216.5 acre-feet at an elevation of 355 feet amsl. The embankments were constructed of compacted clay on a slope ranging from 2.5:1 to 3:1 (Sargent & Lundy, 1983). The WBAP received bottom ash and economizer ash sluiced from the power plant boiler. Clear water overflowed from the WBAP and discharged into the Secondary Ash Pond located southeast of the WBAP. Bottom ash and economizer ash were periodically excavated from the WBAP and hauled by truck to the on-site landfill for disposal (Arcadis, 2016).

A groundwater monitoring system was developed for the WBAP in 2017, and assessment monitoring was initiated in April of 2018 and continues today.

3 Summary of Closure Activities

As required in 40 Code of Federal Regulations (CFR) §257.101(a)(1) (30 TAC 352), the owner or operator of an existing unlined CCR surface impoundment must close the CCR unit. AEP submitted an Alternative Closure Demonstration Report in accordance with §257.103(f)(2) to the Environmental Protection Agency (EPA) dated November 30, 2020, which was determined complete by EPA in a letter dated January 11, 2022. (Akron, 2023). AEP submitted the initial Intent to Initiate Closure Notification for the WBAP to the TCEQ on March 30, 2022, and submitted a revised notice on May 25, 2022. A Closure Plan for the WBAP was prepared in accordance with 40 CFR §257.102(b) in October 2016 and revised in December 2021. As stated in the Closure Plan, the WBAP was to be closed by CCR removal in accordance with §257.102(c).

AEP ceased sluicing CCR to the WBAP and sending miscellaneous non-CCR wastewater streams to the WBAP on March 30, 2022. Per 40 CFR §257.102(c) and 30 TAC §352.1221, part of the closure by removal process involves removing and decontaminating all areas affected by releases from the CCR unit. In order to achieve this goal, AEP determined that, in addition to removal of the CCR, an additional 12 inches (minimum) of existing soil beneath the pond would be excavated.

Removal of CCR and an additional one foot of underlying soil from the WBAP has been completed. A construction as-built drawing showing the contours of the bottom of the pond after CCR and additional soil removal from the WBAP was prepared by the Construction Quality Assurance (CQA) contractor (Akron, 2023). The contractor used the outer banks of the pond as clean fill material. Thickness of fill material around the outer portions of the WBAP ranged from six to seven feet, while the inner areas of the WBAP received approximately 0.5 feet of fill material.

A closure certification report for the WBAP, dated December 30, 2022 was submitted to the TCEQ for review and approval (Akron, 2022). However, the TCEQ informed AEP in a June 10, 2024 teleconference that soil sampling for the 40 CFR §257 Appendix IV constituents was required to demonstrate that the unit was adequately decontaminated. TCEQ approval is therefore pending completion of the soil sampling and analyses described herein. The report summarizing the soil sampling activities will be certified by a Texas Professional Engineer (P.E.) and submitted with the Closure Certification Report for TCEQ approval. The objective of the proposed soil sampling strategy in Section 4 is to provide this demonstration.

4 Soil Sampling Strategy and Methodology

As stated previously, the WBAP had an area of approximately 30.9 acres. The objective of the soil sampling is to collect samples from native soil underlying the former pond to demonstrate that CCR and soil removal activities performed during the WBAP closure were adequate to decontaminate the area.

4.1 Pre-Sampling Activities

A site-specific Health and Safety Plan (HASP) and relevant task-specific Job Safety Analyses (JSA) will be prepared for the project prior to mobilizing personnel to the site. Arcadis will work with AEP to incorporate any AEP-specific health and safety requirements into the plan. The HASP will be reviewed and signed off by the onsite Arcadis field scientist/geologist, who will then review it during an initial health and safety meeting with subcontractors (utility locator, driller, surveyor). Daily tailgate safety meetings will be conducted and documented in the field notes.

Arcadis will mobilize to the site to measure out a one-acre grid on the WBAP (**Figure 3**). Each grid block will be assigned an identifier (e.g., A1, B1, etc.). A sample location will be selected randomly using a random number generator within each grid block and marked in the field with a stake. Therefore, it is estimated that 31 soil borings will be advanced within the WBAP. Arcadis will work with a surveyor from AEP's CQA contractor, Akron Consulting Company, LLC (Akron), to establish the grid, survey the sample locations, and determine the depth at which native soil will be encountered in the WBAP. The sample identification number and depth to native soil at each location will be marked on the sample location marker. If the original sample location must be relocated due to site conditions (e.g., inaccessibility, obstructions, etc.), the random number generator will be used to select another location within the grid.

Prior to initiating any intrusive work, the presence of subsurface and overhead utilities will be investigated. In accordance with the Arcadis Utility Location and Clearance Standard, the following will be completed:

- Plant-specific excavation/digging permit prior to any sampling activities.
- After sample locations have been marked in the field, Arcadis or its drilling contractor will notify Texas 811 a minimum of 48 hours in advance of commencing intrusive activities at the site and identify any potential subsurface utility conflicts with proposed sampling locations.
- In addition, Arcadis will review any prior utility clearance for the unit or available drawings showing underground utilities in the sampling areas.
- If the prior utility clearance information or drawings showing underground utilities in the sampling area are not available, the soil boring locations will be cleared for subsurface utilities to a minimum depth of 5 feet below ground surface (ft bgs) utilizing a hand auger as a soft-dig utility clearance technique. If any obstruction is identified, the soil boring location will be field adjusted.

4.2 Sampling Methodology

Drilling will be performed by a Texas licensed drilling company with oversight by a field scientist or field geologist. Soil sampling will be performed using a track-mounted Direct-Push Technology (DPT) rig. The DPT rig will be positioned over the proposed sampling location in the grid block to advance the soil sampler through the fill material to the top of the native soil. The soil will be continuously logged by a field scientist or geologist for lithologic characteristics according to the Unified Soil Classification System (USCS). The field scientist/geologist will note general visual and olfactory observations, soil types and horizons, and depth to native soil.

Once native soil is reached beneath the clean fill material, a discrete grab sample will be collected from the upper one foot by the field scientist/geologist. The field scientist/geologist will ensure that adequate sample volume is collected for analysis of total 40 CFR §257 Appendix IV constituents and possible analysis using the Synthetic Precipitation Leaching Procedure (SPLP), if needed for data evaluation purposes. In addition to the initial sample collected from the upper foot, two additional vertical delineation samples will be collected from estimated depths of 1-2 and 2-3 feet. The additional samples will be placed on hold and analyzed only if needed.

Soil samples will be placed in clean sampling jars provided by the laboratory and labeled with the sample number (Grid Designation-Sample Depth-Date), sampler's initials, sample time, and requested analyses. The field scientist/geologist will wear a new pair of nitrile gloves for each sample collected. The samples will be placed in a cooler with ice and sent to the laboratory under proper chain of custody.

4.3 Investigation-Derived Waste Management

Soil cuttings generated during drilling will be placed back in the borehole, and the boreholes will be filled with bentonite. A decontamination pad will be constructed within the footprint of the WBAP. The soil sample tubes will be decontaminated between samples and downhole equipment in contact with soil will be decontaminated between soil sample locations. The drillers will use the onsite potable water source to decontaminate the downhole equipment and samplers using a high-pressure water washer or other suitable equipment. No soap will be used, and the pad will be constructed to prevent erosion and run-off from the pad. Accumulated water will be allowed to evaporate or will be drummed and characterized for proper disposal. General trash (e.g., used gloves, plastic liners, paper products, disposable sampling equipment, etc.) will be collected, containerized, and managed with general facility trash.

5 Sample Analysis

All 31 initial soil samples collected from the WBAP will be submitted to a National Environmental Laboratory Accreditation Program [NELAP] accredited laboratory for analysis of the Appendix IV to 40 CFR 257constituents, as follows:

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Fluoride
- Lead
- Lithium
- Mercury
- Molybdenum
- Selenium
- Thallium
- Radium 226 and 228 combined

Each of the 31 initial soil samples collected at the WBAP will be analyzed for the metal constituents listed above. Arcadis will work with the laboratory to ensure that the detection limits are below the comparative criteria (i.e., the residential soil-to-groundwater ($^{GW}Soil_{Ing}$) Tier 1 Protection Concentration Level (PCLs) and/or Texas-Specific Background concentration for metals, whichever is higher). Fluoride and lithium do not have Tier 1 PCLs for the $^{GW}Soil_{Ing}$ pathway; therefore, they will only be analyzed using SPLP.

Radium also does not have a Tier 1 PCL for the $^{GW}Soil_{Ing}$ pathway; however, EPA has established a radium level of 5 picoCuries per gram (pCi/g) as a protective health-based level for cleanup of soil (EPA, 2014). If there are exceedances of the EPA established radium level, select samples will be run for SPLP. During a teleconference on June 10, 2024, between AEP and the TCEQ regarding soil sampling for closure, TCEQ agreed that fewer samples could be collected for radium 226/228; therefore, 50% of the initial soil samples will be analyzed for radium 226/228 combined.

If there are metal exceedances of the Tier 1 Residential $^{GW}Soil_{Ing}$ PCL, Tier 2 PCLs may be calculated using the site-specific average pH concentration of 5.8 as presented in the Affected Property Assessment Report for the Trash Landfill A, Trash Landfill B, and Trash Landfill C dated July 24, 2023. (Arcadis, 2023). Otherwise, SPLP analysis will be performed if the total concentration results for a constituent exceed the Tier 1 $^{GW}Soil_{Ing}$ PCL. The SPLP results will be compared to the Appendix IV site-specific CCR GWPS.

6 Data Evaluation

Arcadis will implement the general procedures for data evaluation and usability assessment as defined in the TCEQ Regulatory Guidance for Review and Reporting of Chemical of Concern (COC) Concentration Data RG-366/TRRP-13 to validate data received from the analytical laboratory. Validated data will then be compared to assessment levels to determine whether the unit has been adequately decontaminated. The procedure for evaluation of results is discussed in the following section.

6.1 Evaluation of Results

Total metal concentrations will be evaluated to determine if any of the Appendix IV COC concentrations exceed the $^{GW}Soil_{Ing}$ PCLs. If the Texas-Specific Background concentration for a metal is greater than the $^{GW}Soil_{Ing}$ PCL, the background concentration becomes the PCL. Determination of successful decontamination will be as follows:

- If the Appendix IV COC concentrations are equal to or less than their respective Tier 1 $^{GW}Soil_{Ing}$ PCLs, 5 pCi/gram for Radium, and the site-specific GWPS for fluoride or lithium, decontamination has been confirmed in that area.
- If any Appendix IV COC exceeds their respective Tier 1 $^{GW}Soil_{Ing}$ PCLs, a Tier 2 PCL may be calculated, and the analytical results may be compared to the Tier 2 PCLs and if the Appendix IV COC are equal to or less than their respective Tier 2 PCL, decontamination has been confirmed in that area.
- If a COC exceeds the respective Tier 1 or Tier 2 PCL, or if the Tier 2 PCL is not used, the soil sample will be analyzed using SPLP. The SPLP results will be compared to the site-specific GWPS. If the SPLP results are equal to or less than the GWPS, decontamination has been confirmed in that area.
- After the above evaluation sequence, if it is decided that one or more metal exceedances of a comparative criterion cannot be resolved, Arcadis will request that the laboratory analyze the next shallowest vertical delineation sample from the location where the exceedance(s) occurred for that COC(s) to perform vertical delineation. The results will then follow the above sequence of PCL comparison until the vertical extent has been delineated. Horizontal delineation will also be completed, as needed.
- If additional step out locations are needed to achieve vertical or horizontal delineation, Arcadis will revisit the sampling grid to collect appropriate samples.
- Based on the results, AEP will evaluate the need for any additional decontamination activities of the area.

7 Report Preparation and Certification

Arcadis will prepare a report summarizing the results of the soil sampling at the WBAP. The report will be certified by a Texas-licensed P.E. and will include:

- A justification for the sampling approach.
- A summary of the soil sampling activities performed to support the closure of the CCR unit, and how these activities were performed in accordance with the SAP.
- Discussion of any deviations from the SAP and rationale for those deviations.
- Figures depicting sampling locations, and sample results.
- Data summary tables for metals and radium-226/228, including comparative criteria and SPLP results (as applicable).
- Calculations for Tier 2 PCLs (as applicable).
- Comparison of the analytical results to the site-specific GWPS, as applicable.
- Appendices containing laboratory reports, data usability evaluations/data validation reports, any other reports or correspondence that support the WBAP closure.

8 References

AEP. 2020. Notice of Intent to Comply with the Site-Specific Alternative to Initiation of Closure, Henry W. Pirkey Power Plant, CCR Units – East Bottom Ash Pond and West Bottom Ash Pond. November 30.

AEP. 2021. Closure Plan, East and West Bottom Ash Ponds, Pirkey Power Plant, Hallsville, Texas. December.

Akron Consulting. 2023. West Bottom Ash Pond CCR Removal Certification, H.W. Pirkey Power Plant, Hallsville, Harrison County, Texas. December 30.

Arcadis. 2023. Affected Property Assessment Report – Trash Landfill A (WMU 002), Trash Landfill B (WMU 004), and Trash Landfill C (WMU 021). July 24.

Arcadis. 2016. West Bottom Ash Pond – CCR Location Restriction Evaluation. May 25.

Environmental Protection Agency (EPA). 40 CFR 257. Criteria for Classification of Solid Waste Disposal Facilities and Practices.

EPA. 2014. Document Display | NEPIS | US EPA

Sargent & Lundy, 1983. “Henry W. Pirkey Power Plant, Design Summary for Lignite Storage Area and Wastewater Pond Facilities”, January 31.

TCEQ. 2024. Teleconference with AEP. June 10.

TCEQ. 30 TAC 350. Texas Risk Reduction Program.

TCEQ. 30 TAC 352. Coal Combustion Residuals Waste Management

Figures

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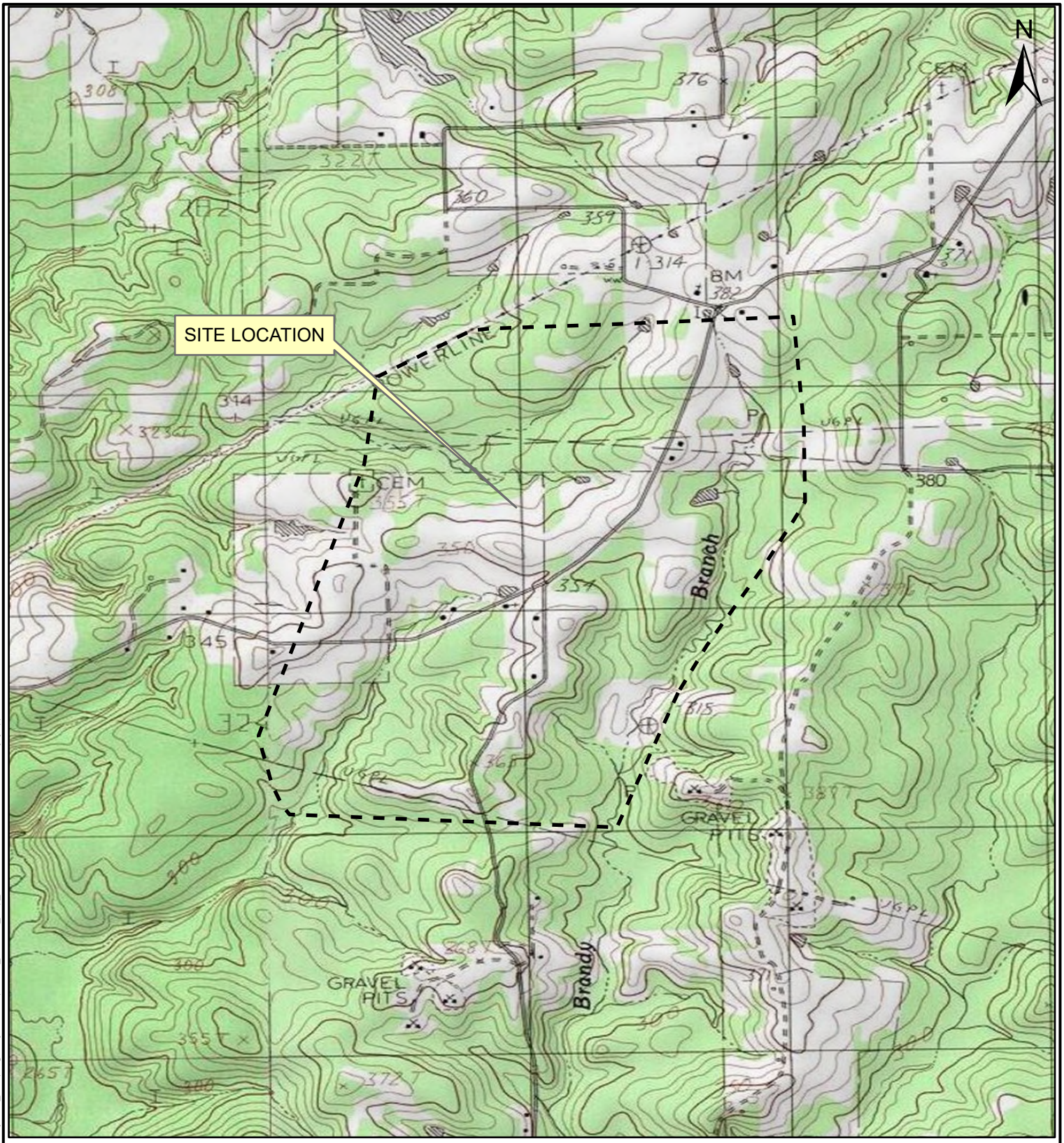


0 2,000 4,000

GRAPHIC SCALE IN FEET

NOTE:

1. BASEMAP SOURCE: 7.5 MINUTE TOPOGRAPHIC QUADRANGLE FOR CASON, TEXAS, 2011

HENRY W. PIRKEY POWER PLANT
2400 FM 3251
HALLSVILLE, HARRISON COUNTY, TEXAS

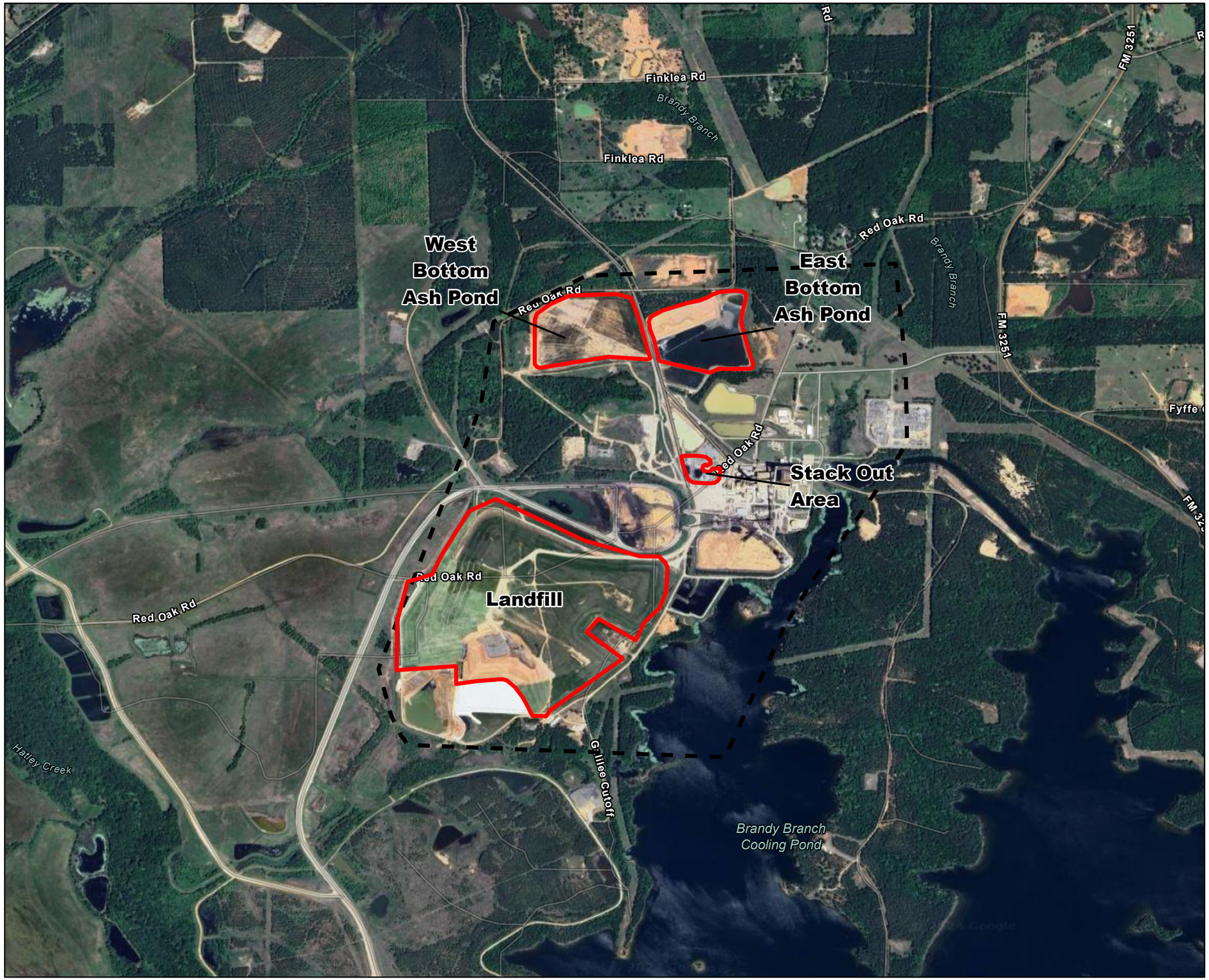
SOIL SAMPLING AND ANALYSIS PLAN - WEST BOTTOM ASH POND

SITE LOCATION MAP

ARCADIS

FIGURE
1

Path: T:_ENV\AEP\Pirkey Plant\ArcPro_Figures\AEP_PirkeyPlant_SamplingAnalysisPlan.aprx\Site_Location_Map_WestBottomAshPond Last Saved By: jrapp 12/16/2024



N

LEGEND

- SITE BOUNDARY
- COAL COMBUSTION RESIDUAL (CCR) UNIT

0 1,500 3,000

GRAPHIC SCALE IN FEET

NOTE:

1. BASEMAP SOURCE: GOOGLE EARTH PRO, DECEMBER 2023

HENRY W. PIRKEY POWER PLANT
2400 FM 3251
HALLSVILLE, HARRISON COUNTY, TEXAS

SOIL SAMPLING AND ANALYSIS PLAN - WEST BOTTOM ASH POND

COAL COMBUSTION RESIDUAL (CCR) UNIT LOCATION MAP

ARCADIS

FIGURE
2

Path: T:_ENV\AEP\Pirkey Plant\ArcPro_Figures\AEP_PirkeyPlant_SamplingAnalysisPlan.aprx\CCR_LocationMap_WestBottomAshPond Last Saved By: jrapp 12/16/2024

N

LEGEND

- PROPOSED WELL LOCATION
- COAL COMBUSTION RESIDUAL (CCR) UNIT
- 1-ACRE SAMPLING GRID

0 200 400

GRAPHIC SCALE IN FEET

NOTES:

1. BASEMAP SOURCE: GOOGLE EARTH PRO, DECEMBER 2023
2. SAMPLE LOCATIONS WILL BE SELECTED RANDOMLY USING A RANDOM NUMBER GENERATOR WITHIN EACH GRID.

HENRY W. PIRKEY POWER PLANT
2400 FM 3251
HALLSVILLE, HARRISON COUNTY, TEXAS

SOIL SAMPLING AND ANALYSIS PLAN - WEST BOTTOM ASH POND

WEST BOTTOM ASH POND SAMPLING GRID

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FIGURE
3