CARDINAL OPERATING COMPANY

CARDINAL PLANT

FUGITIVE DUST CONTROL PLAN

Prepared By:

Cardinal Operating Company
Cardinal Plant
306 County Road 7 East
Brilliant, Ohio 43913

Review by:
Amanda Graphics, LLC
2554 Red Rock Blvd.
Grove City, OH 43123

Revision 4 – September 2023

Table of Contents

Certification Statement ..... **iii**
1.0 Introduction **1**
2.0 Facility Description and Contact Information **1**
2.1 Facility Information **1**
2.2 Contact Information **1**
2.3 Activities at the Facility **2**
2.4 Site Maps **3**
3.0 Fugitive Dust Control Selection **4**
3.1 Paved and Unpaved Roadways **4**
3.1.1 Overview **4**
3.1.2 Landfill and Plant Roadways **4**
3.2 Landfill **5**
3.2.1 Overview **5**
3.2.2 Gypsum Unloading and Placement **5**
3.2.3 Bottom Ash Handling and Storage **5**
3.2.4 Wind Erosion **5**
3.3 Fly Ash Reservoir **6**
3.4 Bottom Ash Pond **6**
4.0 Plan Assessment **7**
5.0 Citizen Complaint Log **7**
5.1 Plant Contacts **7**
5.2 Follow-up **7**
5.3 Corrective Actions and Documentation **7**
6.0 Annual Report **8**
7.0 Plan Amendments **8**
8.0 Recordkeeping **8**
8.1 Recordkeeping **8**
8.2 Notification **8**
8.3 Internet Site Requirements **9**

Appendices

Appendix A – 40 CFR Part 257.80 Air Criteria (Fed. Reg. April 17, 2015)

Appendix B – Cardinal Plant General Site Map

Appendix C – Plan Modification Documentation

Professional Engineer's Certification

By means of this certification, I certify that I have reviewed this CCR Fugitive Dust Control Plan and it meets the requirements of section 40 CFR 257.80(b).

Francis S. Brezny

Printed Name of Registered Professional Engineer

Signature

50400	OH	1/5/2022
Registration No.	Registration State	Date

1.0 INTRODUCTION

This CCR Fugitive Dust Control Plan (Plan) has been prepared pursuant to the air criteria of 40 CFR part 257.80 (see Appendix A). The Plan has been prepared in accordance with the air criteria and following good engineering practices to include measures that will effectively minimize CCR from becoming airborne at the facility. The Plan and subsequent amendments will be placed in the operating record and retained in the office of the Cardinal Plant Environmental Manager (PEM). The Plan and subsequent amendments will also be placed on Buckeye Power's publicly accessible internet website titled "CCR Rule Compliance Data and Information." The plan will be amended whenever there is a change in conditions that would substantially affect the written plan in effect, such as the construction and operation of a new CCR unit. Where appropriate, the Plan incorporates fugitive dust control requirements as contained in the Ohio EPA air permits issued for the plant.

There are two CCR surface impoundments and one CCR landfill located at Cardinal Plant that are subject to the Plan. The surface impoundments are the bottom ash pond (BAP) and the FAR II fly ash reservoir (FAP). The Cardinal Residual Waste Landfill (Landfill) receives both gypsum and bottom ash which is periodically removed from the bottom ash pond. The Plan addresses these CCR units and the associated paved and unpaved roadways.

2.0 FACILITY DESCRIPTION AND CONTACT INFORMATION

2.1 Facility Information

Facility Information

Name of Facility: Cardinal Operating Company – Cardinal Plant

Street: 306 County Road 7 East

City: Brilliant State: Ohio ZIP Code: 43913

County: Jefferson

Latitude: 40º 15' 8" N Longitude: 80º 38' 54" W

2.2 Contact Information

Facility Operator:

Name: Cardinal Operating Company – Cardinal Plant
Attention: Bethany Schunn - Plant Manager
Address: 306 County Road 7 East
City, State, Zip Code: Brilliant, Ohio 43913

Facility Owner:
Name: Buckeye Power, Inc.
Attention: Caitlin Schiebel – Buckeye Power, Director of Environmental Compliance
Address: 6677 Busch Blvd.
City, State, Zip Code: Columbus, Ohio 43229

Plan Contact:
Name: Melissa Myers – Cardinal Plant Environmental Manager
Address: 306 County Road 7 East
City, State, Zip Code: Brilliant, Ohio 43913
Telephone number: 740-598-6576
Email address: mjmyers@cardinalopco.com

2.3 Activities at the Facility

The Cardinal Power Plant is located on the shore of the Ohio River at Brilliant, Ohio, and consists of three electric generating units. Buckeye Power owns Cardinal's nominally rated 600-megawatt Units 1 & 2, as well as Unit 3 rated at a nominal 630-megawatts. Cardinal Operating Company manages and operates all three Cardinal units. Approximately 4.2 million tons of coal per year are converted to electricity at the Cardinal Plant, powering thousands of homes, businesses, schools, and industrial facilities.

All three units are equipped with Chiyoda Jet Bubbling Reactor flue gas desulfurization (FGD) technology that produces synthetic gypsum as a by-product. The gypsum slurry is dewatered and transported by truck to the Landfill or transported offsite for the production of consumer products. The Landfill is located on Plant property approximately 1.8 miles northwest of the FGD systems.

Bottom ash is produced by all three Cardinal Units and is wet sluiced to the BAP during unit operations. The bottom ash is routinely reclaimed from the pond, loaded into trucks and transported to the Landfill for storage and use as a construction material. Bottom ash that is not used for construction purposes will be placed within the Landfill.

The fly ash handling system is enclosed. All three units are equipped with electrostatic precipitators for removal of fly ash from the flue gas and collection in hoppers. Fly ash is stored in silos, conditionally moisturized and loaded on to trucks and transported to the Landfill.

2.4 Site Maps

A USGS topographic map for the Cardinal Plant is included in Appendix B. The map is marked to depict the general locations of the plant site, bottom ash pond, fly ash reservoir (pond), and landfill.

3.0 FUGITIVE DUST CONTROL SELECTION

3.1 Paved and Unpaved Roadways

3.1.1 Overview

Trucks are used to transport CCR to the Landfill from the plant site. Gypsum is hauled from the plant over plant paved roadways to a public roadway. The trucks travel over public roadways to the landfill entrance. Within the landfill entrance, the trucks travel approximately 1.5 miles over landfill paved roadways to the disposal area, followed by a much shorter unpaved roadway that varies with the location of the active fill area. Similarly, bottom ash and fly ash trucks travel approximately 0.5 miles over unpaved plant roadways and 1.2 miles over paved plant roadways and then travel over public roadways to the landfill entrance. The applicable and adequate fugitive dust control measures were primarily selected in accordance with the measures contained in Ohio EPA Air Permit to Install (PTI) for the landfill roads and the Title V permit for the plant roads. The roadways are also subject to visible emission limits as contained in the air permits. Periodically, public roads traveled by trucks may be addressed to minimize fugitive dust due to plant activity.

3.1.2 Landfill and Plant Roadways

The primary appropriate and applicable fugitive dust control measures for roadways are watering, sweeping, and speed controls. Water trucks are used as needed based upon routine inspections and other observations to minimize or eliminate fugitive dust. Chemical suppressants or stabilizers may also be used on unpaved roadways depending on specific site conditions. A street sweeper/vacuum truck is used to clean paved roadways. Posted speed limits are 15 mph for paved and unpaved roads. Trucks transporting materials that are likely to become airborne will be covered during transit. Earth or other materials that may be deposited onto paved roadways from trucks will be promptly removed to minimize fugitive emissions. Implementation of control measures will not be necessary for roadways that are covered with snow and/or ice or if sufficient precipitation occurs to minimize or eliminate fugitive dust. Implementation of any control measures may be suspended if unsafe or hazardous driving conditions would be created by its use.

3.2 Landfill

3.2.1 Overview

The landfill receives gypsum and bottom ash from the Cardinal Plant. Both materials contain moisture (conditioned) but water or chemical suppressants are added at the landfill as necessary to minimize fugitive dust emissions. The landfill activities are subject to Ohio EPA Air Permit to Install (PTI) No. P0122403. This permit specifies the applicable and appropriate fugitive dust control measures for the site to minimize or eliminate fugitive emissions. The permit also includes visible particulate emissions limits as well as monitoring, recordkeeping and reporting requirements. [Note: "conditioned" CCR means the material has sufficient moisture content to prevent wind dispersal but will not result in free liquids]

3.2.2 Gypsum Unloading and Placement

Gypsum is unloaded from trucks in the active fill area of an open landfill cell, where a bulldozer or similar equipment will spread and compact the materials. A roller may also be used for compaction. The fugitive dust control measures for truck unloading includes maintaining moisture in the material and taking precautionary measures (minimize drop height). The measures for spreading and compacting include maintaining vehicle speed and watering materials.

3.2.3 Bottom Ash and Fly Ash Storage and Handling

Bottom ash and fly ash is unloaded from trucks into a storage pile within the landfill area for disposal, or beneficial use in construction activity. While the bottom ash and fly ash is typically moist, depending on the amount of moisture remaining in the ash and seasonal conditions, there may be fugitive emissions from the pile or truck unloading and loading activities. A review of potential control measures concluded that the applicable and appropriate options consist of: applying chemical suppressant or water to the pile to minimize fugitive emissions as needed and maintaining moisture in the material and taking precautionary measures (minimize drop height) for truck unloading and loading. Trucks transporting bottom ash or fly ash will utilize a cover to prevent the material from becoming airborne. Enclosures, compaction and daily cover are not applicable given the size of the area and characteristics of the material.

3.2.4 Wind Erosion

Generally, landfill disposal areas can be classified as closed or open. Closed areas have received final cover and vegetation has been established. Open areas contain both the active fill area and areas that have been compacted but not yet received final cover. The open area fugitive dust control measures include: precautionary measures such as minimizing the amount of open area and pile height; compacting material as it is unloaded; watering; and application of chemical suppressants.

3.3 Fly Ash Reservoir

Historically, fly ash is mixed with water and pumped to the FAR. However, Cardinal converted to a dry fly ash system in 2021, and the Fly Ash Reservoir has initiated closure. Due to the wet condition of the ash and location of the pond surface below the dam crest and valley wall elevations, the pond typically has no fugitive emissions. However, certain seasonal weather conditions combined with pond water levels may create dry areas within the pond which may result in windblown fugitive dust from the pond surface. Historical review of potential control measures concluded that very limited options are applicable and appropriate since the unstable surface of the pond will not support the application of water, chemical suppressants, or cover materials. Wind barriers and enclosures are not appropriate due to the very large surface area of the pond. During closure, the construction team will be responsible for implementing appropriate dust control (water or cover material). Once the reservoir is fully closed and vegetated, dust control methods will not be required.

3.4 Bottom Ash Pond

Cardinal Plant bottom ash is produced by all three Cardinal Units and is wet sluiced to the BAP during unit operations. The bottom ash is routinely reclaimed from the pond, loaded into trucks and transported to the Landfill for disposal or beneficial reuse. Ash is dredged from the pond and placed adjacent to the pond where it gradually dewaters. The ash is then loaded onto trucks for transport to the landfill. While the bottom ash typically remains wet, depending on the amount of moisture remaining in the ash and seasonal conditions, there may be fugitive emissions from the pile or truck loading activities. A review of potential control measures concluded that the applicable and appropriate options consist of: watering, chemical suppressant application, wind barriers, and minimizing drop height. Water or chemical dust suppressant is applied to the pile to minimize fugitive emissions as needed. A berm is maintained around the pile to serve as a windbreak. The berm is constructed of soil and vegetation. Water spray is applied as needed to the material handling activities and the drop from the loader into the trucks is minimized to

further minimize fugitive emissions. Enclosures, compaction and daily cover are not applicable given the size of the area and characteristics of the material.

The BAP is currently undergoing retrofit, Once completed, the southern portion of the BAP will receive CCR wastes, and the northern pond will receive low volume waste. Future dust controls associated with the retrofitted southern BAP are presented in Section 3.5.

3.5 Retrofitted Southern Bottom Ash Pond

Once the Southern Bottom Ash Pond has been fully retrofitted, bottom ash will be wet sluiced to the pond. Bottom ash will be routinely reclaimed from the pond, loaded into trucks and transported to the Landfill for disposal or beneficial reuse. Ash will be dredged from the pond and placed on the staging island where it gradually dewaters. The ash is then loaded onto trucks for transport to the landfill. While the bottom ash typically remains wet, depending on the amount of moisture remaining in the ash and seasonal conditions, there may be fugitive emissions from the pile or truck loading activities. A review of potential control measures concluded that the applicable and appropriate options consist of: watering, chemical suppressant application, wind barriers, and minimizing drop height. Water or chemical dust suppressant is applied to the pile to minimize fugitive emissions as needed. Water spray is applied as needed to the material handling activities and the drop from the loader into the trucks is minimized to further minimize fugitive emissions. Enclosures, compaction and daily cover are not applicable given the size of the area and characteristics of the material.

4.0 PLAN ASSESSMENT

The Plan will be periodically assessed to verify its effectiveness, and if necessary, amended in accordance with Section 7.0 below. The Landfill, FAP, BAP, and associated paved and unpaved roadways are inspected on a weekly basis. The purpose of the inspections is to determine if the control measures for each CCR unit as described above are being implemented as necessary to minimize or eliminate fugitive emissions. Records of inspections and the control measures implemented as a result of the inspections will be maintained. The PEM will review the inspection records when preparing the Annual Report (see Section 6.0 below) to assess the effectiveness of the Plan and determine if additional or modified measures are warranted. No inspection is necessary if the surface is covered with snow and/or ice or if precipitation has occurred that is sufficient to minimize or eliminate fugitive emissions. Implementation of any control measure may be suspended if unsafe or hazardous driving conditions would be created by its use.

5.0 CITIZEN COMPLAINT LOG

5.1 Plant Contacts

Generally, complaints made to the plant are by telephone and received by the PEM (Plant Contact). In the case of holiday, weekends, or other times when the PEM may not be onsite, the plant guard houses or plant general phone number may receive complaint information by telephone that is provided to the PEM at the earliest convenience. Complaints may also be made to Ohio EPA who in turn will contact the PEM.

5.2 Follow-up

All complaints will be entered into a log by the PEM with details noted such as the nature of the complaint, date, time, and other relevant details. All complaints will be followed up which may include: checking plant operations at the time of the event, reviewing inspection records, discussing with other plant personnel, reviewing weather data, collecting samples and contacting the person making the complaint to obtain additional information.

5.3 Corrective Action and Documentation

Corrective actions will be taken as needed and documented. If it is determined that the Plan needs to be amended as a result of the corrective actions, it will be amended in accordance with the Plan. If possible, the PEM will follow-up with the complainant and/or Ohio EPA to explain the findings of the complaint investigation, corrective actions or sampling results. Citizen complaints will be recorded in the annual Report.

6.0 ANNUAL REPORT

The Annual CCR fugitive dust control report (Annual Report) will be prepared which includes the following components: description of actions taken to control CCR fugitive dust; a record of all citizen complaints; and a summary of any corrective measures taken. The initial Annual Report will be completed no later than 14 months after placing the initial CCR fugitive dust control plan in the facility's operating record. The deadline for completing subsequent reports is one year after the date of completing the previous report. The Annual Report will be deemed complete when the plan has been placed in the facility's operating record as described in Section 8.0.

7.0 PLAN AMENDMENTS

This Plan is a "living" document and will be amended, as necessary, whenever there is a change in condition that would substantially affect the written plan in effect. The Plan will be amended in the case of construction and operation of a new CCR unit. Amendments and revisions made to the Plan will be documented in

Appendix C. The amended Plan will be placed into the facility's operating record as described in Section 8.0.

8.0 RECORDKEEPING, NOTIFICATION and INTERNET REQUIREMENTS

8.1 Recordkeeping

The Plan and files of all related information will be maintained in a written operating record at the facility for at least five years following the date of each occurrence, measurement, maintenance, corrective action, report, record or study. Files may be maintained on a computer or storage system accessible by a computer. One recordkeeping system may be used for the BAP, FAP and Landfill if the system identifies each file by the name of each unit (i.e. BAP, FAP, or Landfill). The Plan (and any subsequent amendment of the plan) and the Annual Report will be kept in the facility's operating record as they become available. Only the most recent Plan must be maintained in the record. [§ 257.105]

8.2 Notification

Ohio EPA will be notified within 30 days of when the Plan (or any subsequent amended Plan) or the Annual Report is placed in the operating record and on the publicly available internet site. This notification will be made before the close of business on the day the notification is required to be completed. "Before the close of business day" means the notification must be postmarked or sent by e-mail. If the notification deadline falls on a weekend or federal holiday, the notification is automatically extended to the next business day. [§ 257.106]

8.3 Internet Site Requirements

The most recent Plan and annual Report will be placed on the facility's CCR website titled "CCR Rule Compliance Data and Information" within 30 days of placing them in the operating record. [§ 257.107]

Appendix A

Operating Criteria (re: Fed. Reg. Vol. 80, No. 74, April 17, 2015)
§ 257.80 Air criteria.

(a) The owner or operator of a CCR landfill, CCR surface impoundment, or any lateral expansion of a CCR unit must adopt measures that will effectively minimize CCR from becoming airborne at the facility, including CCR fugitive dust originating from CCR units, roads, and other CCR management and material handling activities.

(b) *CCR fugitive dust control plan.*

The owner or operator of the CCR unit must prepare and operate in accordance with a CCR fugitive dust control plan as specified in paragraphs (b)(1) through (7) of this section. This requirement applies in addition to, not in place of, any applicable standards under the Occupational Safety and Health Act.

(1) The CCR fugitive dust control plan must identify and describe the CCR fugitive dust control measures the owner or operator will use to minimize CCR from becoming airborne at the facility. The owner or operator must select, and include in the CCR fugitive dust control plan, the CCR fugitive dust control measures that are most appropriate for site conditions, along with an explanation of how the measures selected are applicable and appropriate for site conditions. Examples of control measures that may be appropriate include: Locating CCR inside an enclosure or partial enclosure; operating a water spray or fogging system; reducing fall distances at material drop points; using wind barriers, compaction, or vegetative covers; establishing and enforcing reduced vehicle speed limits; paving and sweeping roads; covering trucks transporting CCR; reducing or halting operations during high wind events; or applying a daily cover.

(2) If the owner or operator operates a CCR landfill or any lateral expansion of a CCR landfill, the CCR fugitive dust control plan must include procedures to emplace CCR as conditioned CCR. Conditioned CCR means wetting CCR with water to a moisture content that will prevent wind dispersal, but will not result in free liquids. In lieu of water, CCR conditioning may be accomplished with an appropriate chemical dust suppression agent.

(3) The CCR fugitive dust control plan must include procedures to log citizen complaints received by the owner or operator involving CCR fugitive dust events at the facility.

(4) The CCR fugitive dust control plan must include a description of the procedures the owner or operator will follow to periodically assess the effectiveness of the control plan.

(5) The owner or operator of a CCR unit must prepare an initial CCR fugitive dust control plan for the facility no later than October 19, 2015, or by initial receipt of CCR in any CCR unit at the facility if the owner or operator becomes subject to this subpart after October 19, 2015. The owner or operator has completed the initial CCR fugitive dust control plan when the plan has been placed in the facility's operating record as required by § 257.105(g)(1).

(6) *Amendment of the plan.* The owner or operator of a CCR unit subject to the requirements of this section may amend the written CCR fugitive dust control plan at any time provided the revised plan is placed in the facility's operating record as required by § 257.105(g)(1). The owner or operator must amend the written plan whenever there is a change in conditions that would substantially affect the written plan in effect, such as the construction and operation of a new CCR unit.

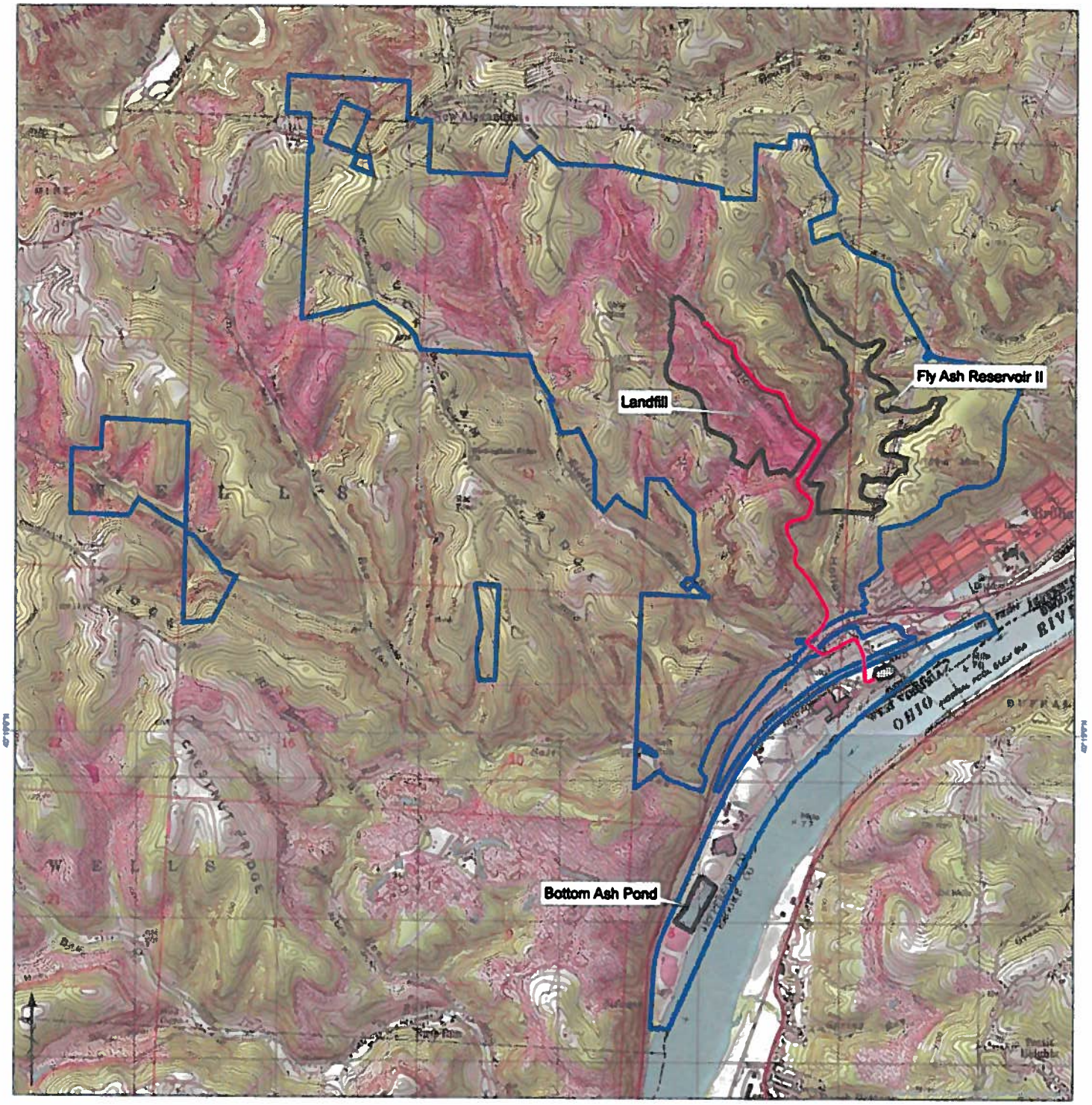
(7) The owner or operator must obtain a certification from a qualified professional engineer that the initial CCR fugitive dust control plan, or any subsequent amendment of it, meets the requirements of this section.

(c) *Annual CCR fugitive dust control report.* The owner or operator of a CCR unit must prepare an annual CCR fugitive dust control report that includes a description of the actions taken by the owner or operator to control CCR fugitive dust, a record of all citizen complaints, and a summary of any corrective measures taken. The initial annual report must be completed no later than 14 months after placing the initial CCR fugitive dust control plan in the facility's operating record. The deadline for completing a subsequent report is one year after the date of completing the previous report. For purposes of this paragraph (c), the owner or operator has completed the annual CCR fugitive dust control report when the plan has been placed in the facility's operating record as required by § 257.105(g)(2).

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

Appendix B

Cardinal Plant



Legend

- Landfill Haul Road
- Cardinal Plant Property Boundary
- Unit 3
- Units 1-2
- FGD Gypsum Dome

1:24 000

0 0.2 0.4 0.8 1.2 1.6 Miles

Jefferson County, Brilliant, OH

Appendix C

Record of Plan Revisions		
Revision Number	Date	Revision Description
0	5/21/2015	Initial Plan
1	4/12/2017	Update Plan Contact/Clarify OEPA notification
2	7/26/2018	Change in plant operational control, plant manager and contact information
3	12/10/2021	Updated newly issued State Air PTI, retrofitted BAP and FAR II closure.
4	9/8/2023	Update Melissa Myers as Plan Contact